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REPORT

Focused ESIA Scoping Report for the Demolition of the Old Sava Bridge

Client: ERM Environment Resource Management SRL

Prepared by:	ENVICO d.o.o. Belgrade, Serbia
Title:	**Focused ESIA Scoping Report for the Demolition of the Old Sava Bridge**
Client:	ERM Environment Resource Management SRL
Developed by:	Dušan Nedeljković Isak Marčetić Miloš Tišović
QA/QC:	Tatjana Jovančević
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Abbreviations and Acronyms

A&A	Description
E&S	Environmental and Social
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EPC	Engineering, procurement, and construction
EPs	Equator Principles
EPFI	Equator Principle Financial Institution
ERM	Environmental Resource Management
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
EU	European Union
GDP	Gross Domestic Product
GIIP	Good International Industry Practice
GIP	Good International Practice
IBA	Important Birds Area
IFC	International Finance Corporation
IFC PS	International Finance Corporation Performance Standards
IFI	International Finance Institution
LV	Limit value
MAC	Maximum allowable concentration
MSDS	Material Safety Data Sheet
OHS	Occupation Health & Safety
PE	Public Enterprise
PPE	Personal Protective Equipment
PUC	Public Utility Company
TMP	Traffic Management Plan
TV	Target value
UXO	Unexploded ordnance
WEEE	Waste Electrical and Electronic Equipment
WGIP	Working Group on Indigenous Populations

1. INTRODUCTION

In order to reduce traffic congestion in the City of Belgrade and increase capacity of the road network, a New road-tram bridge across the Sava river and associated approach roads, connecting New Belgrade and Belgrade side, is planned to be constructed. The new bridge will be constructed on the location of the existing Old Sava Bridge, meaning that it will be required to be demolished.

This report represents the Focused ESIA Scoping Report for a demolition of the Old Sava Bridge (the Project) and has been prepared as part of the Project's Environmental and Social Impact Assessment (ESIA) process. The Focused ESIA, including this Scoping Report, is being developed in addition to the Environmental Impact Assessment for the construction of the New Sava Bridge, and is specifically developed to demonstrate compliance with international Lender's requirements. In particular, the Scoping Report considers good international industry practice guidelines and IFC Performance Standards.

Scoping is the process of determining the content and extent of the matters that should be covered in the subsequent Focused ESIA Report and associated documentation. It should be noted that the Scoping Report is not intended to provide detailed information regarding the Project. Instead, it is a preliminary overview of the Project intended to form the basis for early identification of the potential Project impacts. Scoping is designed to ensure that consequent Focused ESIA Report will focus on the most important impacts and relevant mitigation measures.

1.1. Report Rationale

Republic of Serbia (hereinafter "Financier") and Belgrade Land Development Public Agency (Beoland), acting on behalf of the Republic of Serbia (hereinafter "Investor") and PowerChina International Group Limited (hereinafter "Contractor") concluded on December 11, 2020 Contract Agreement for the Project "Construction of the New Bridge across the Sava River on the location of the old Sava bridge in Belgrade".

Project will be financed by commercial loan, provided by BNP Paribas (the Lender).

The Lender has contracted global environmental consultancy company "Environmental Resource Management" (ERM) to perform Environmental and Social Assessment of the Project, including Environmental&Social Due Diligence for the construction of the New Sava Bridge and E&S assessment of the demolition of the existing Old Sava Bridge. Envico d.o.o. Belgrade has been sub-contracted by the ERM to provide local support for the Project.

In line with the Lender's requirements and E&S Standards, Envico d.o.o. Belgrade has developed Focused ESIA Scoping Report.

In accordance with the International Finance Corporation (IFC) E&S Categorisation, this project can be assigned a Category B, meaning that potential adverse future environmental and social impacts are typically site-specific, and readily identified and addressed through mitigation measures.

An Environmental and Social (E&S) Assessment of the Project has been carried out against the IFC Performance Standards (PS) designed to facilitate achievement of a good international

practice related to sustainable development that is expected from clients implementing projects financed by the bank. BNP Paribas bank is working with the Contracting Parties to ensure that the Project's environmental and social risks are appraised and managed in accordance with the applicable standards.

This document represents the Focused Environmental and Social Impact Assessment (Focused ESIA) Scoping Report for the project "Demolition of the Old Sava Bridge" *(full Project name: "Demolition of the old bridge and transport of his steel elements by the river to the location in Veliko Selo, municipality of Palilula").*

1.2. ESIA Methodology

The impact assessment will be undertaken following a generally accepted ESIA process (Figure 1) that predicts and evaluates the impacts the Project could have on aspects of the physical, biological, social/ socio-economic and cultural environment, and identifies measures that the Project will take to avoid, minimise/reduce, mitigate, offset or compensate for adverse impacts and to enhance positive impacts where practicable.

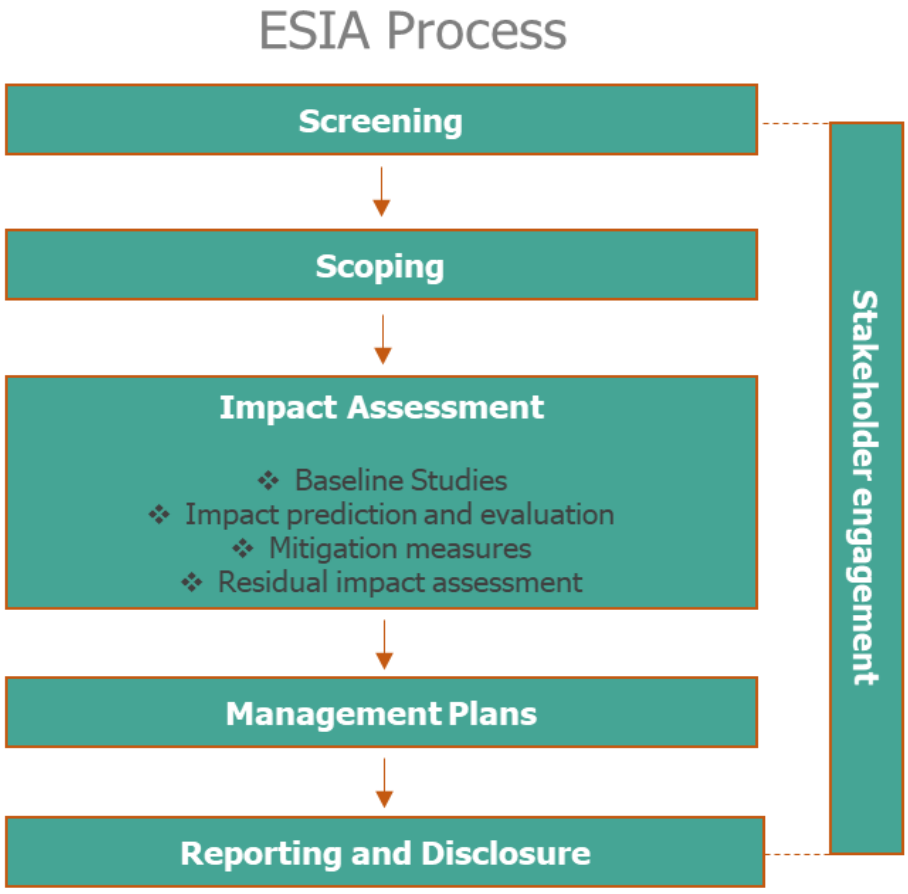

Figure 1 ESIA process

1.1.1. Screening and Scoping

Screening is the first phase in an impact assessment process in which the need for an assessment and the level of assessment required is determined for a particular project. In this

regard, screening process is generally used to categorize projects and concludes the extent of potential environmental and social risks and impacts associated with the project. Given the scope of the Project and limited footprint and potential impacts, screening and scoping processes are merged into one report. A scoping aims to identify the potential Area of Influence for the Project, to identify potential interactions between the Project and resources/receptors in the Area of Influence and the impacts that could result from these interactions, and to prioritize these impacts in terms of their likely significance. For this purpose, Leopold matrix was developed (Table 18).

1.1.2. Baseline Conditions

The impact assessment process shall be based on secondary as well as primary environmental and social data. The Project has acquired limited primary baseline data and so far, has relied mostly on officially available secondary data. In chapter 4.3, full scope of the required environmental baseline is presented.

1.1.3. Impact Identification

Considering baseline conditions at the Project location and proposed project design, impact identification and assessment is performed. It is an iterative process where effects of all identified impacts arising out of the project, including residual impacts, are identified and assigned a mitigation measure. The impact assessment comprises of the following steps:

- Impact Prediction;
- Impact Evaluation;
- Mitigation; and
- Residual Impact Evaluation.

1.1.4. Stakeholder Analysis and Consultation

One of the main emphasis of the ESIA is identification of key stakeholders required to understand the groups/communities that are or will be affected by the Project. The Project shall disclose sufficient information about impacts arising from the project and engage with stakeholders in a meaningful manner throughout the lifecycle of the project and provide grievance mechanism where affected parties can submit objections and complaints. For this purpose a tailor-made Stakeholder Engagement Plan shall be developed.

1.3. Limitations

The report has been developed based on the project level information provided by the Client and the main contractor. Most of the design documentation is on the conceptual level. Due to the early stage of the design documentation, some of the assessments are based on the roughly estimated data and thus discrepancies may occur when compared to design information once they are completed.

2. REGULATORY REQUIREMENTS AND STANDARDS

This chapter provides an overview of national and international environmental, social, health and safety framework within which the impact assessment shall be performed.

2.1. National Legislation

Law on Environmental Protection ("Official Gazette of the RS", No. 135/2004, 36/2009, 43/2011 and 14/2016, 76/2018, 95/18 - oth. law and 95/2018 - oth. law), as umbrella legislation, introduces main principles as well as integral system of environmental protection including, but not limited to environmental impact assessment, integrated prevention and pollution, water, soil, biodiversity, air quality and noise, waste and chemical management, energy, climate, stakeholder engagement, access to information. Further, regulatory requirements related to these aspects are set out in the large number of laws and bylaws.

Being a candidate for future membership of the European Union (EU), enactments and revisions of these laws and associated by-laws in the area of environmental protection are driven by the EU acquis approximation and transposition.

In general, one of the main requirements of the IFIs' is for the projects to comply with E&S requirements set by national legislation.

In line with the Law on Environmental Impact Assessment (Official Gazette of RS, No. 135/2004, 36/2009), the subject of the impact assessment shall be future and existing projects, changes in technology, reconstructions, capacity expansions, closure of projects that may have a significant impact on the environment. The Law introduces two lists of projects which determine the need for an EIA.

The EIA Report for the construction of the New Sava Bridge has been developed by the Transportation Institute CIP d.o.o, Belgrade, and has been approved by the Ministry of Environmental Protection in February 2021, No.: 353-02-264/2020-03.[1]

In line with the Serbian regulatory requirements, separate Environmental Impact Assessment Report for the Demolition of the Old Sava Bridge is not required.

2.2. Risk Management Framework

BNP Paribas has adopted Equator Principles in October 2008. Since then, the Lender considers that E&S assessment as an integral part of the regular due diligence conducted for project-related transactions.

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects

[1] https://www.ekologija.gov.rs/lat/obavestenja/procena-uticaja-na-zivotnu-sredinu/zahtevi/zahtevi-za-davanje-saglasnosti-na-studije-o-proceni-uticaja/zahtev-za-davanje-saglasnosti-na-studiju-o-proceni-uticaja-na-zivotnu-sredinu-projekta-izgradnje-novog-mosta-na-mestu-starog-savskog-mosta

and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making.

Equator Principle Financial Institutions (EPFIs) commit to implementing the EPs in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to comply with the EPs.

In line with the EP, projects located in Non-Designated Countries (including Serbia), shall comply with the applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).

In line with the EP and IFC PS, the Project is classified as Category B:

- Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.

Category B projects require an Environmental Analysis to assess any potential future environmental and social impacts associated with the proposed project, identify potential environmental and social improvement opportunities, and recommend any measures needed to prevent, minimize, and mitigate adverse impacts. The scope and format of the environmental and social analysis will vary depending on the project but will typically be narrower than the scope of a full ESIA.

2.2.1. IFC Performance Standards and Guidelines

The IFC Performance Standards (PSs) are directed towards clients, providing guidance on how to identify environmental and social risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts, so that development opportunities are enhanced.

In line with the IFC Guidance Note 1[2] – Assessment and Management of Environmental and Social Risks (GN27), a Limited or Focused Environmental and Social Assessment is performed for projects for which potential limited adverse environmental and social risks and/or impacts are expected and for which the development of a full-scale ESIA is not required by the host country's environmental assessment laws and regulations.

IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. Together, the eight PSs establish standards that the client is to meet throughout the life of the Project.

A summary of the IFC's Performance Standards is presented in Table 1.

[2] https://www.ifc.org/wps/wcm/connect/9fc3aaef-14c3-4489-acf1-a1c43d7f86ec/GN_English_2012_Full-Document_updated_June-27-2019.pdf?MOD=AJPERES&CVID=mKqITOj

Table 1 IFC's Performance and Standards and EBRD's Performance Requirements

No.	Requirements	Comment
PS 1 Assessment and Management of Environmental and Social Risks and Impacts	PS 1 establishes the importance of integrated assessment to identify the environmental and social impacts and issues associated with projects. According to the PS1, the Client shall: ▪ establish and maintain an Environmental and Social Management System (ESMS); ▪ establish, as appropriate, environmental and social policies; ▪ develop an Environmental and Social Management Plan; ▪ establish and maintain an organisational structure for ensuring on-going compliance with relevant national regulatory requirements and the PSs; ▪ monitor the environmental and social performance of the project, to determine whether the project is being implemented in accordance with the PRs or to take the necessary action to ensure such compliance; ▪ undertake effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.	Applicable
PS 2 Labour and Working Conditions	PS 2 establishes the need for implementing a human resources management system, which guarantees respect of workers' rights and provides them with safe and healthy working conditions and which: ▪ promotes the fair treatment, non-discrimination, and equal opportunity of workers. ▪ establishes, maintains, and improves the worker-management relationship. ▪ promotes compliance with national employment and labour laws. ▪ protects workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. ▪ avoids the use of forced labour.	Applicable
PS 3 Resource Efficiency and Pollution Prevention	PS 3 recognises that increased economic activity and urbanisation can generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. Therefore, resource efficiency and pollution prevention and control are essential elements of environmental and social sustainability and projects must meet good international practice (GIP) in this regard. This PR acknowledges the importance of using best available techniques and GIP to optimise resource use and efficiently prevent and control release of pollutants into the environment.	Applicable
PS 4 Community Health, Safety, and Security	PS 4 recognises the importance of avoiding or mitigating adverse health and safety impacts and issues associated with project activities on workers, project-affected communities and consumers. The client shall ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.	Applicable

No.	Requirements	Comment
PS 5: Land Acquisition and Involuntary Resettlement	PS 5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land.	Applicable
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	PS 6 recognises that the conservation of biodiversity and sustainable management of living natural resources are fundamental to environmental and social sustainability. PS 6 addresses how clients can sustainably manage and mitigate impacts on biodiversity and ecosystem services throughout the project's lifecycle.	Applicable
PS 7 Indigenous People[3]	/	Not applicable
PS 8 Cultural Heritage	PS 8 recognises the importance of cultural heritage for present and future generations. The aim is to protect cultural heritage and to guide clients in avoiding or mitigating adverse impacts on cultural heritage in the course of their business operations.	Applicable

[3] United Nations Working Group on Indigenous Populations, 1982 (WGIP): Indigenous communities, peoples, and nations are those that, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop, and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems.

2.2.1.1. IFC Environmental, Health And Safety Guidelines

IFC has prepared a set of Guidance Notes, corresponding to the Performance Standards on Environmental and Social Sustainability. These Guidance Notes offer helpful guidance on the requirements contained in the Performance Standards, including reference materials, and good sustainability practices to improve project performance.

The General Environmental, Health, and Safety (EHS) Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors with the notion that the document should be used together with the relevant Industry Sector Guidelines. The IFC EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP).

Environmental, Health, and Safety Guidelines for construction and decommissioning provides specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities.

Specific guidelines include as well strategies for noise and vibration reduction, management approach for soil erosion, techniques for reduction and control of air emissions from construction and decommissioning sites, solid waste management, techniques for prevention, minimization, and control of hazardous materials impacts, management of wastewater discharges and contaminated land.

In line with IFC's PSs, general as well as industry specific EHS Guidelines, the following aspects shall be considered for the purpose of the E&S impact assessment during decommissioning of the Old Sava Bridge:

1) Environmental:
    - Noise and Vibration
    - Soil Erosion
        - Sediment mobilization and transport
        - Clean runoff management
        - Road design
        - Disturbance to water bodies
        - Structural (slope) stability
    - Air Quality
    - Solid Waste
    - Hazardous Materials
    - Wastewater Discharges
    - Contaminated Land

2) Occupational Health and Safety:
    - Over-exertion
    - Slips and Falls
    - Work in Heights
    - Struck By Objects
    - Moving Machinery
    - Dust
    - Confined Spaces and Excavations
    - Other Site Hazards

3) Community Health and Safety:
    - General Site Hazards
    - Disease Prevention
    - Traffic Safety

The listed aspects will be assessed if applicable and against the scale of the Project, proposed demolition activities, current land use and project location. In light of this, only relevant impacts will be considered and assessed, and appropriate mitigation measures proposed.

3. PROJECT DESCRIPTION

The city of Belgrade generates approximately 35 to 40% of GDP of Serbia. One of the constraints to growth is the increasing level of traffic congestion in the city centre.

Conducted traffic analysis of different scenarios street network for 2021 showed a large volume of traffic on the street network gravitating towards the zone of „Belgrade Waterfront".

It is expected that the newly built settlement of Belgrade Waterfront with modern residential and business areas will be populated and working in the full capacity in the near future.

From a total of approx. 10,000 vehicles that have been estimated to be generated in the area, more than 50% are using one of the bridges in the arrival or departure, which shows that the bridges in this area are very important for the connection to the city in a broader sense as well as Sava riverbank area.

This existing old bridge was constructed as a temporary structure, during the World War II, following the bombing and the collapse of the "King Alexander the 1st" bridge, in April of 1941. The piers of the Old Sava Bridge are constructed on the wooden piles. This, and the fact that the bridge is almost 80 years old, make it unfit for use due to the necessity of frequent repairs, high maintenance costs and reduced traffic capacity.

Construction of the New Sava Bridge will be conducted in four main phases presented below.

Table 2 Main phases of the New Sava Bridge construction

No.	Phases
1.	Demolition of the old bridge and transport of his steel elements by the river to the location in Veliko Selo, municipality of Palilula;
2.	Construction of the new Bridge over the Sava River including ramps, elevators, stairs and all accompanying structures, facilities and bridge equipment
3.	Construction of approach roads and tram line from the bridge to the roundabout, on the Belgrade side, including all accompanying structures, facilities, and equipment
4.	Construction of approach roads and tram line from the Bridge to the roundabout, on New Belgrade side including all accompanying structures, facilities and equipment

Figure 2 Old Sava bridge
(Source: https://rs.n1info.com/vesti/a553069-stari-savski-most-u-parku-usce/)

Figure 3 Old Sava Bridge Macro location

3.1. Location Description

The Old Sava Bridge is located on Sava River in the central area of the Belgrade city (Figure 3). It is currently used for tram, car and bus traffic, as one of the bridges connecting two municipalities, Novi Beograd (left river bank) and Savski Venac (right river bank).

As per 2021 General Plan of Belgrade, a plan of the wider spatial unit, the project area belongs to central spatial zone, the units "Sava Amphitheatre" and "Prokop". The unit of the "Sava Amphitheatre" is defined as city center with prevailing commercial and residential zone. In

addition to the commercial and residential use, the plans include areas for traffic, public services/ facilities, larger complexes, as well as green areas.

According to the Spatial plan of developing a special purpose area, a part of the coastal area of the City of Belgrade - the coastal area of the river of Sava, for the Belgrade Waterfront project (Official Gazette of RS, No. 7/15), the prevailing existing purpose of surfaces within the urban development project include commercial zones and city center, infrastructure surfaces and facilities and partly green and free areas.

Right riverbank, located at the municipality of Savski Venac, is currently under intensive construction predominantly for residential and commercial purpose, with many construction sites, within Belgrade Waterfront project.

The close vicinity of the bridge at the left riverbank is not so developed and is currently of mixed use as commercial, recreational, residential, and as historical monument.

Within the wider project area, especially on the right riverbank, almost all types of traffic and traffic subsystems interact, through the dense street network of roads of different level of importance including tram lines.

The construction site is planned to be organized in the area at the left riverbank, immediately downstream from the bridge (Figure 4). The area will be used for disassembling of the old bridge segments to smaller parts and for connection of the segments for the new bridge and for the offices, workshops, etc. This location has been chosen due to vicinity of the bridge location, the availability of water and electricity connections infrastructure, vicinity of the batching plant, and vicinity of traffic routes (highway, railway, Sava River and Danube).

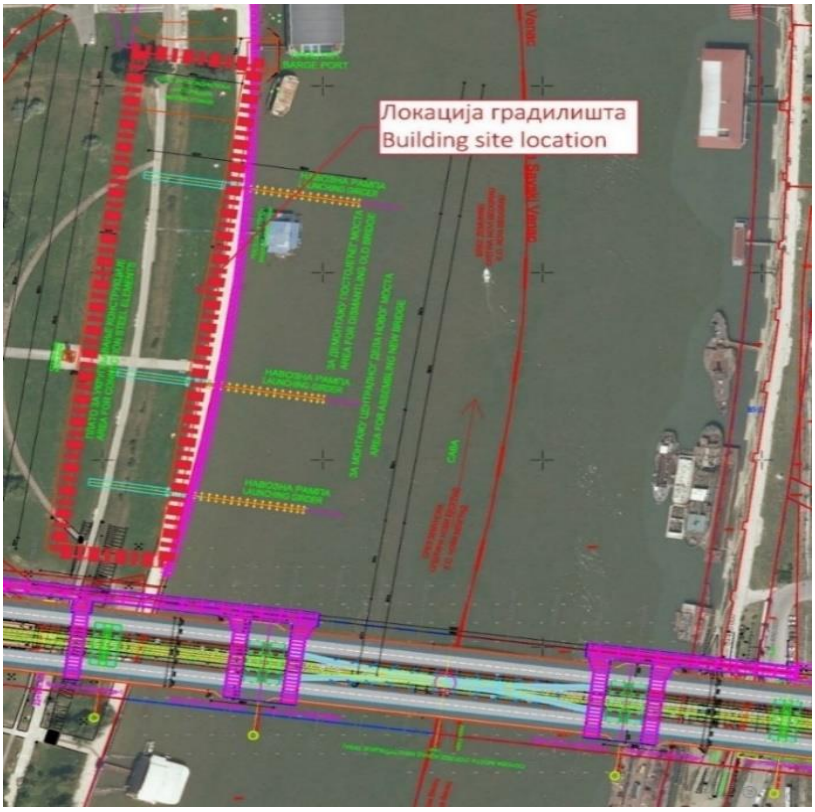

Figure 4 Construction site location

According to the conditions issued by the Institute for Nature Protection of Serbia in the Decision, no. 020-1513 / 2, Article 3, June 19, 2019, no protected areas are located in the immediate vicinity of the Project.

As per the Law on Cultural Goods (Official Gazette of RS No. 71/94, 52/11, 99/11, 6/20 and 35/21) and based on available data in the vicinity of project location there is a part of the cultural goods under the protection "Riverside Area of New Belgrade" and cultural monument "Staro Sajmiste - Gestapo camp" (Official Gazette of the City of Belgrade, no. 16/87). The Monument of Yugoslav victims of genocide, related to the Staro Sajmiste camp, is located at the river side next to the former campground.

According to the Conditions obtained from PUC "Belgrade Waterworks and Sewerage", part of the bridge over the river Sava at the left riverbank, and the planned construction site/camp at the same bank are located within the narrow sanitary protection zone (Zone II) of Belgrade water supply source. The other side of the project area, at the right riverbank, is partly in the wide zone of sanitary protection (Zone III).

Figure 5 Location of temporary storage of dismantled bridge

Location in Veliko Selo, is planned for storage of the dismantled bridge. It is located on the Danube River, downstream from Belgrade, on the right riverbank (Figure 5). The land is reportedly full owned by the City of Belgrade, and there is a plan to construct central wastewater treatment plant for the City of Belgrade. The land around the location is mainly agricultural or unused with not settlements in the close vicinity. The location was not visited within the scope of the assessment.

3.2. Technological Concept

For the purpose of construction of the new bridge, the existing tram/road bridge, with length of 401.2 m, needs to be removed. The bridge was constructed as a temporary structure, during the World War II. The piers of the Old Sava Bridge are constructed on the wooden piles.

The activities related to the "Design for Construction Permit for Demolition" are in the early stages of development. Upon completion, the design is subject to the official review by the committee from the Faculty of Civil Engineering University of Belgrade.

Currently, demolition methodology is elaborated by the Contractor in the documents Preliminary demolition methodology and Demolition Technology Existing Rivets, as per Employers Requirements/Beoland/September 2020 and based on Study on demolition/CIP/2019 ("Elaborat rušenja postojećeg mosta).

In general, the Contractor should disassemble steel parts of the bridge, demolish concrete columns and cut wooden piles. The demolition will be performed through several steps as follows:

1. Step - Make bridge structure as light as possible before disassembly

This will be achieved by demolition and removal of all non-structural elements, i.e. asphalt, bridge deck, rails, railway expansion joints, columns of overhead line, cables and installations for lightening and power supply boxes, fences, lights and revision trolley and other non-structural elements.

2. Step – Disassembly of the steel structure in such manner to enable efficient and technically correct future assembly

Between each of the sections planned for disassembly there is an assembling piece with rivets connection, which will be dismantled with appropriate tools and in a manner to enable future adequate reassembly. Near the poles S2, S3, S4, S5, S6 and S7 stiffeners and the temporary piers will be constructed to allow safe lifting and manipulation of elements.

The disassembled parts will be transported to the construction site at the left river bank, next to the bridge location, for further disassembling to smaller pieces.

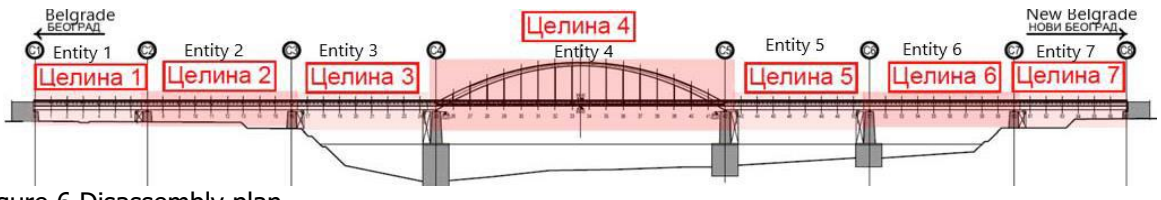

Figure 6 Disassembly plan

3. Step – Demolition of the concrete columns

Demolition of the columns in the riverbed will be done without disruption of the river traffic. A free passage for vessels 75 m wide will be assured and adequate signalling will be installed on the river in order to maintain safe traffic in the vicinity of the works. Concrete and

reinforcement waste must not fall into the river but will be collected on the barges and transported to the official depot (public landfill).

4. Step – Cutting of the piles

Existing piles may stay in the water on the level of river bad or pulled out of the water at the locations where future piles has to be installed.

Contractor shall perform all activities in accordance with requirements of authorities in charge such as PE 'Plovput', PE 'Srbija Vode' and other relevant stakeholders.

5. Step - Transport of generated waste

Construction waste will be transported by barge to the official depot (public landfill).

The Contractor has to collect, handle, pack and transport and dispose of the waste in accordance with Law on Waste Management (Official Gazette of RS, No. 36/09, 88/10 and 14/16), and relevant by-laws.

6. Step – Disassembly of steel elements in smaller pieces and transport to the storage site

At the construction site at the left riverbank, the main bridge elements will be disassembled in smaller pieces in a manner to allow future efficient and technically feasible reassembly. The elements will be marked with practical naming convention, mark location of every element on the bridge, and make a plan for transport and storage. The elements will be transported by river to the location in Veliko Selo, owned by city of Belgrade, where it will be temporary stored (Figure 7).

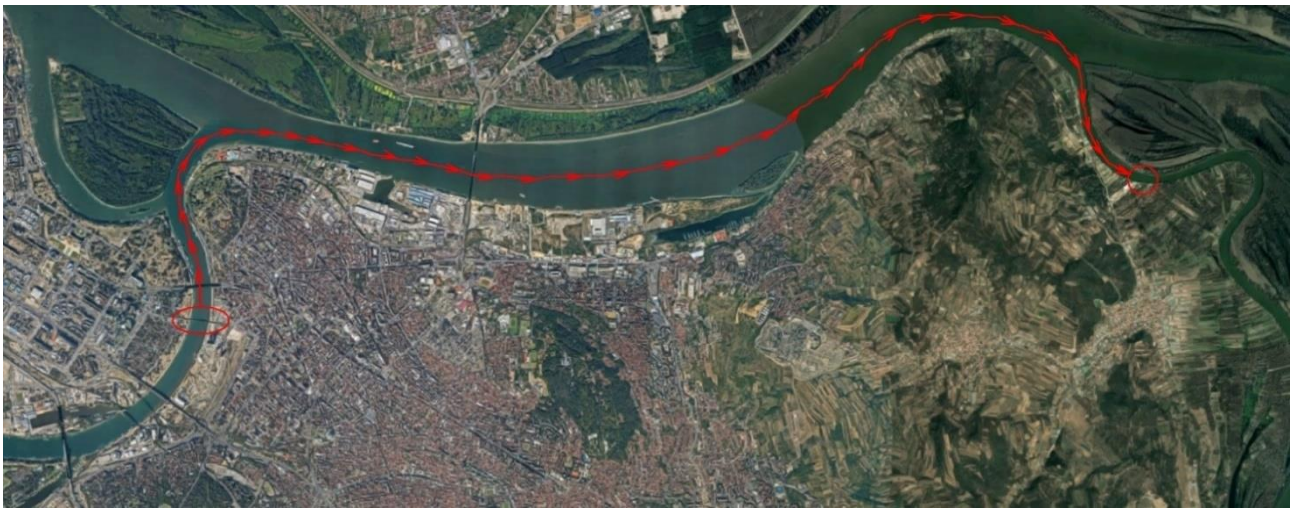

Figure 7 Transport route and storage location for the removed bridge
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

Disassembly and demolition will be conducted in phases as follows:

a) Phase 1 - Disassembling of non-structural parts of steel structure

In this phase, the removal of tram tracks, bridge installations, catenary, lighting and parts of the steel structure with no load-bearing function (pavement slabs, substructure for carrying tram traffic, fences, etc.) are performed (Figure 8 and Figure 9).

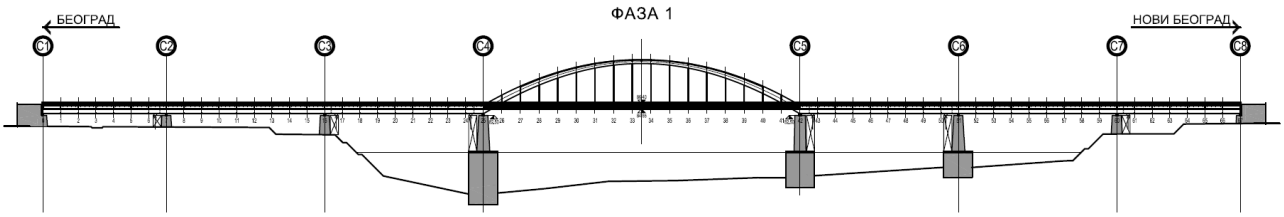

Figure 8 Demolition segments
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

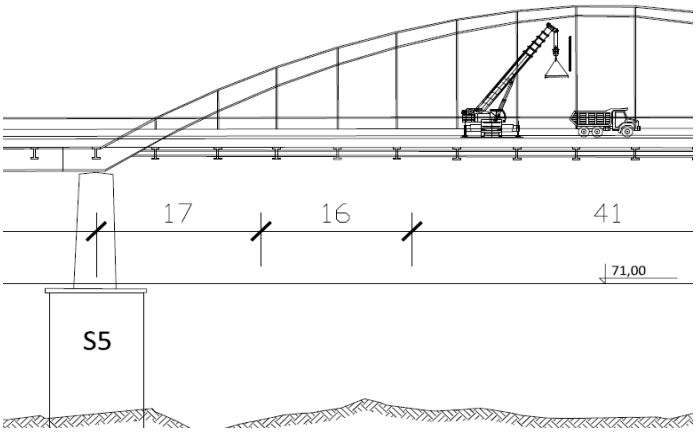

Figure 9 Demolition phase 1
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

b) Phase 2 - Installation of temporary supports and discontinuity of the structure

Temporary supporting structures are placed on the extensions of the main pillars and other places in order for them to be able to accept the weight from the divided steel structure (Figure 10 and Figure 11).

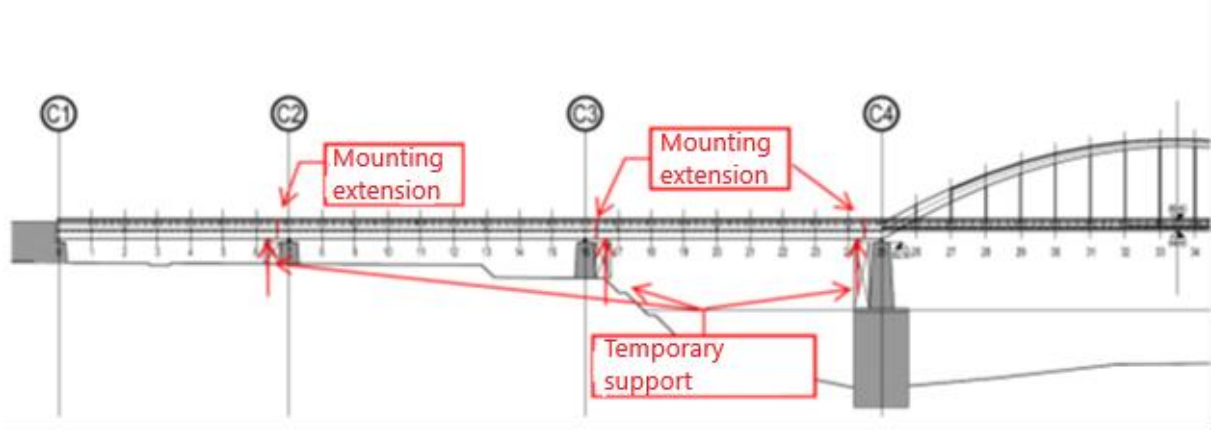

Figure 10 Mounting extensions and temporary support Phase 2
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

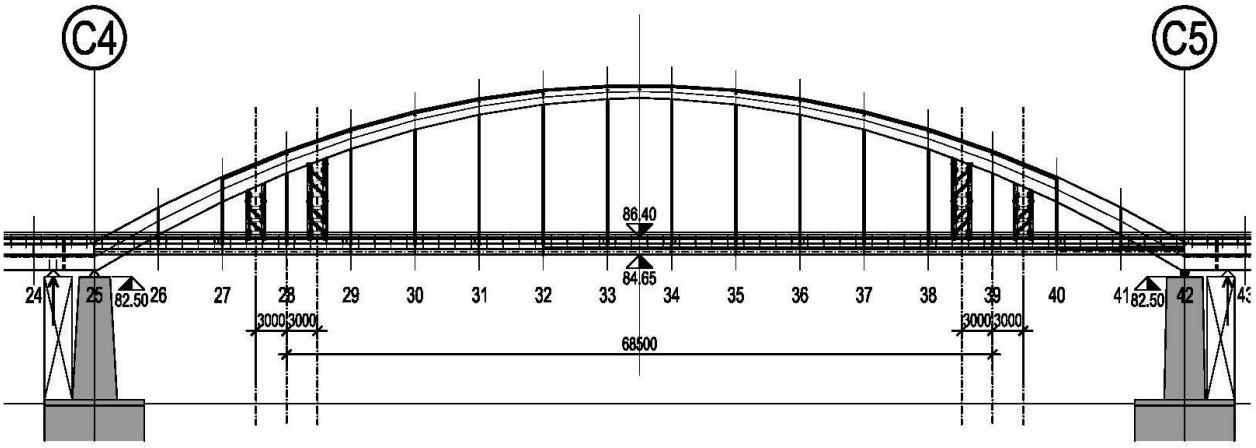

Figure 11 Demolition Phase 2
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

c) Phase 3 - Fixing of construction parts on barges and river transport

Taking into account that it is necessary to install a system for lifting and lowering cable presses on the temporary supports, and that such an endeavour requires a certain amount of time, a navigable profile of at least 55 meters wide will be provided for the entire time barges stay under the bridge, in accordance with the conditions issued by Ministry of Construction, Traffic and Infrastructure – Water Directorate on 21/09/2021 (Figure 12 and Figure 13).

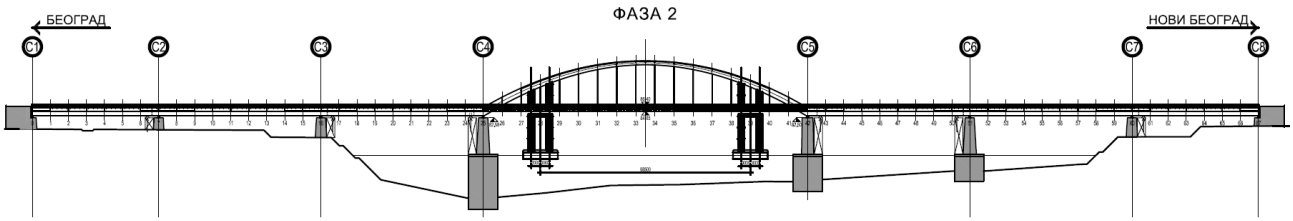

Figure 12 Demolition Phase 3 – Navigable profile

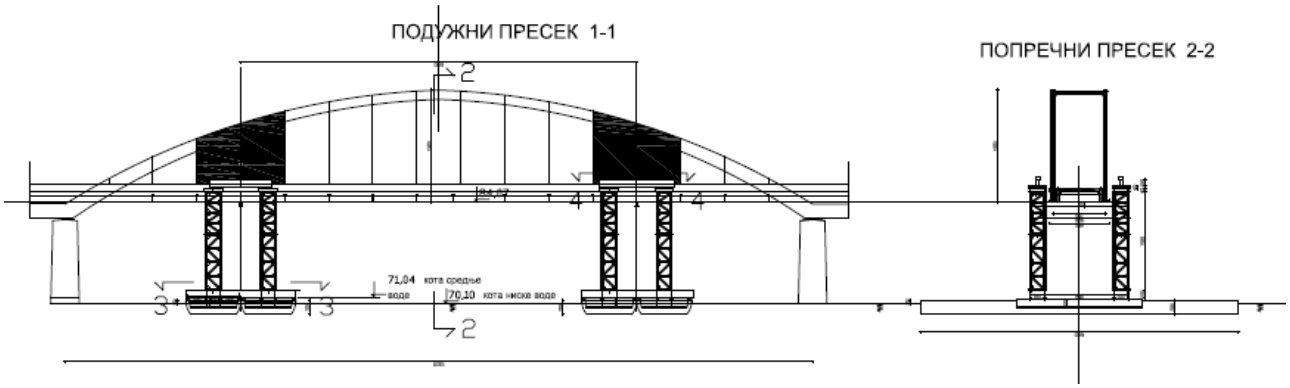

Figure 13 Demolition Phase 3 - Navigable profile cross section

d) Phase 4 - Disassembly of construction parts on the shore and transport.

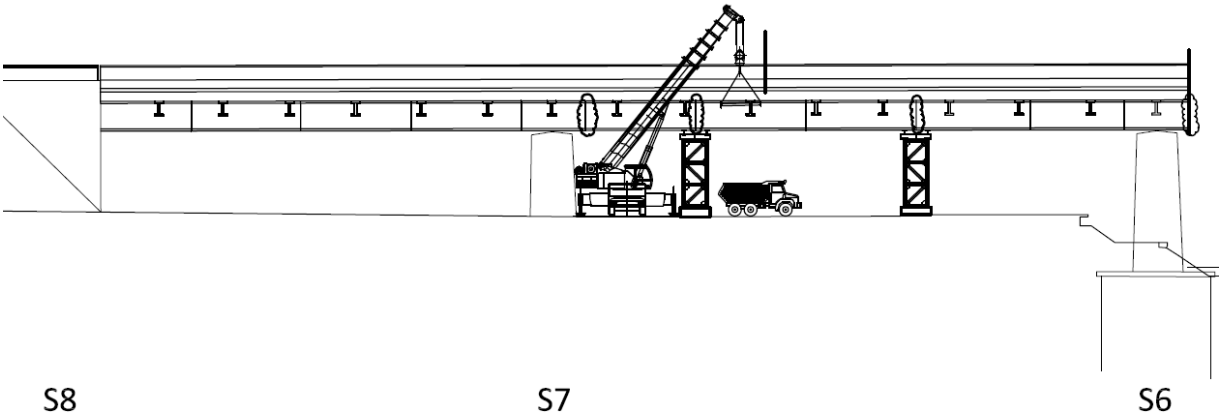

Figure 14 Demolition Phase 4
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

e) Phase 5 - Launching of the main span to the land via launch beams and launch bearings

The steel structure is first lowered onto the launching girders via a cable jacks and then launched over a ramp to the shore.

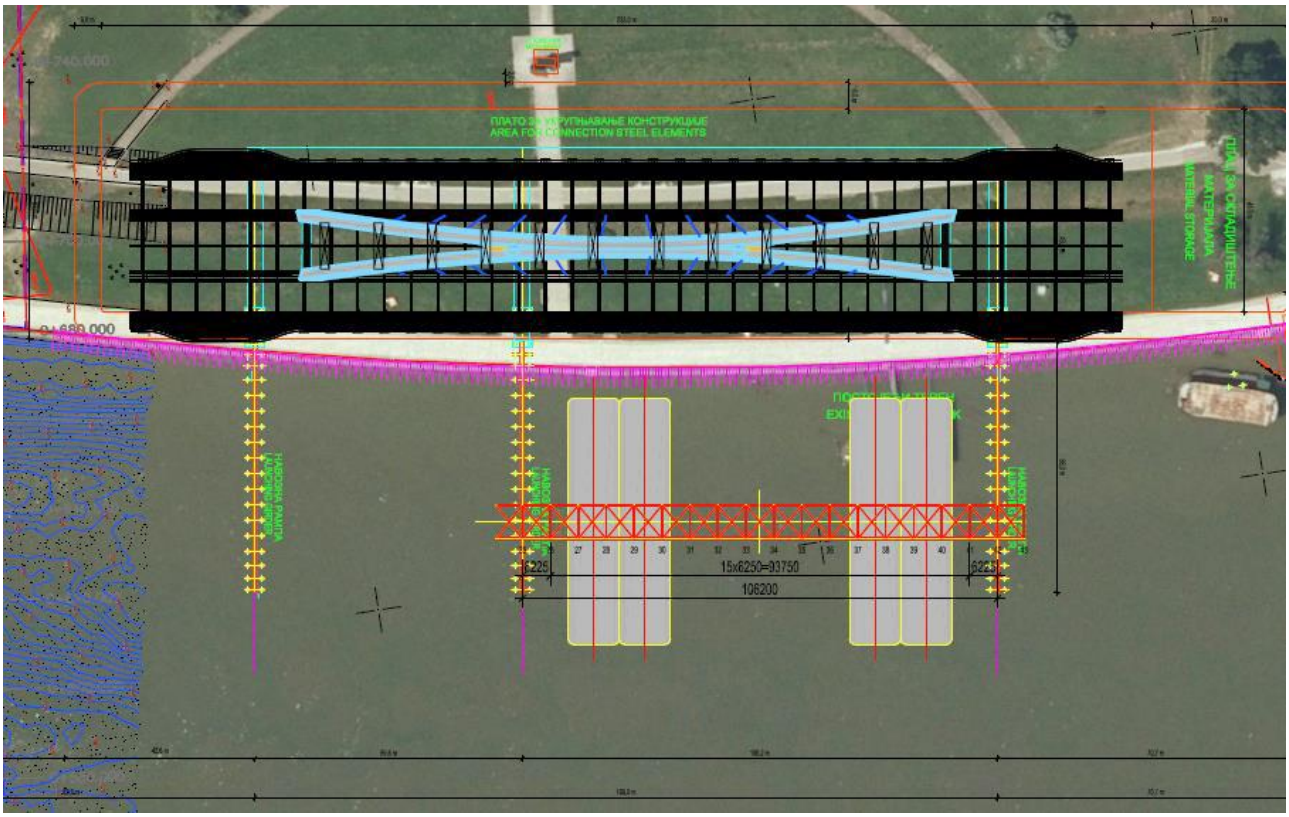

Figure 15 Demolition Phase 5
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

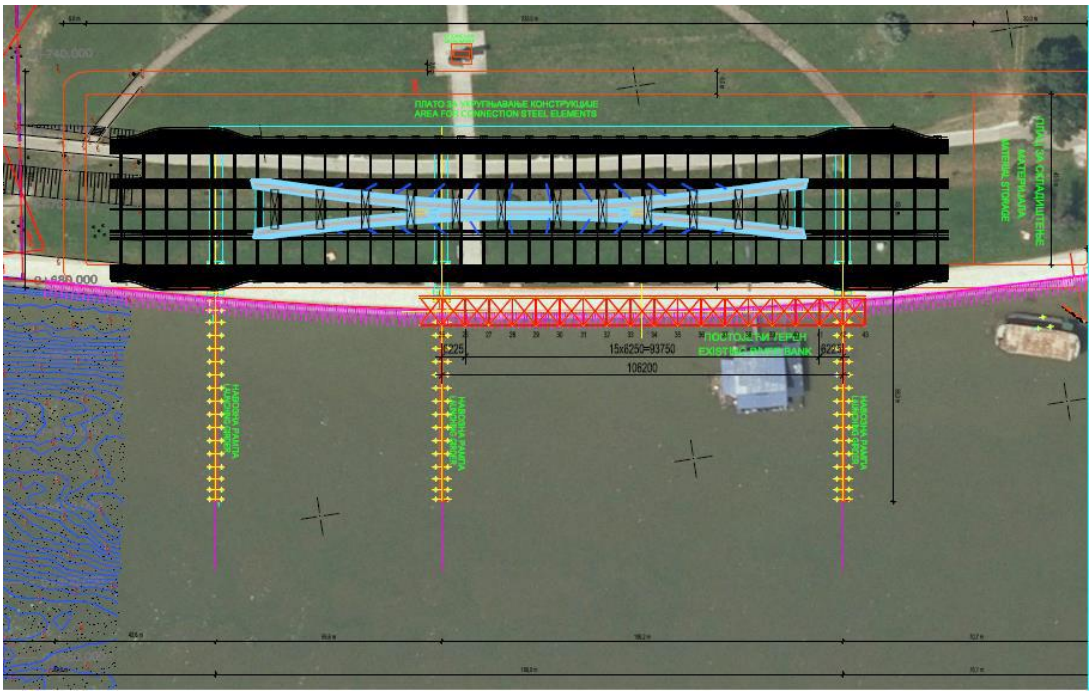

Figure 16 Demolition Phase 5
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

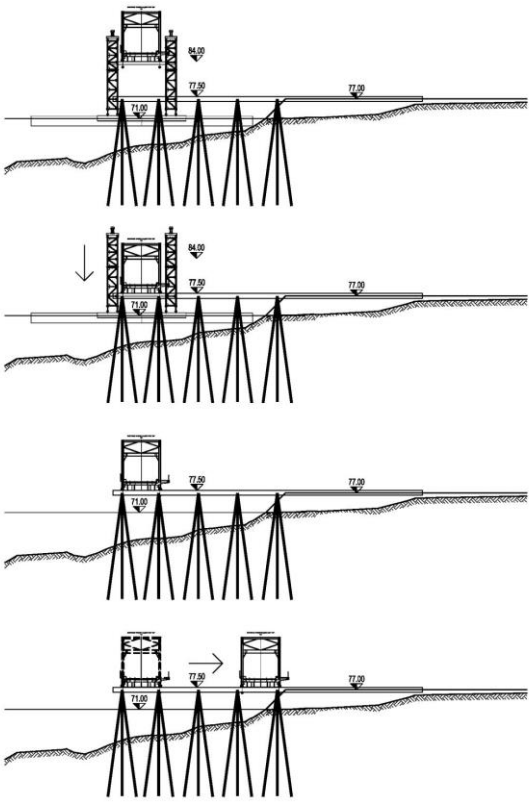

Figure 17 Demolition Phase 5
(Source: Preliminary Demolition Methodology/Power China/13.07.2021)

f) Phase 6 – Disassembling of the structure into smaller pieces suitable for river transport.

g) Phase 7 - Loading on barges and transport to a temporary location in Veliko Selo.

h) Phase 8 - Demolition of the pillars of the old bridge

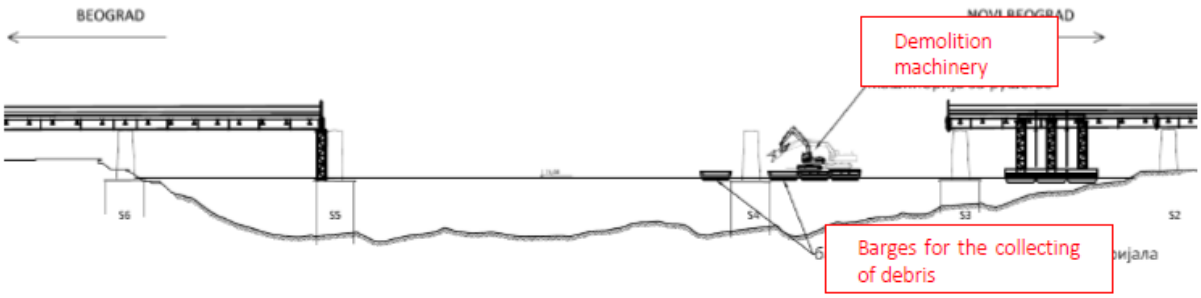

Figure 18 Demolition Phase 8

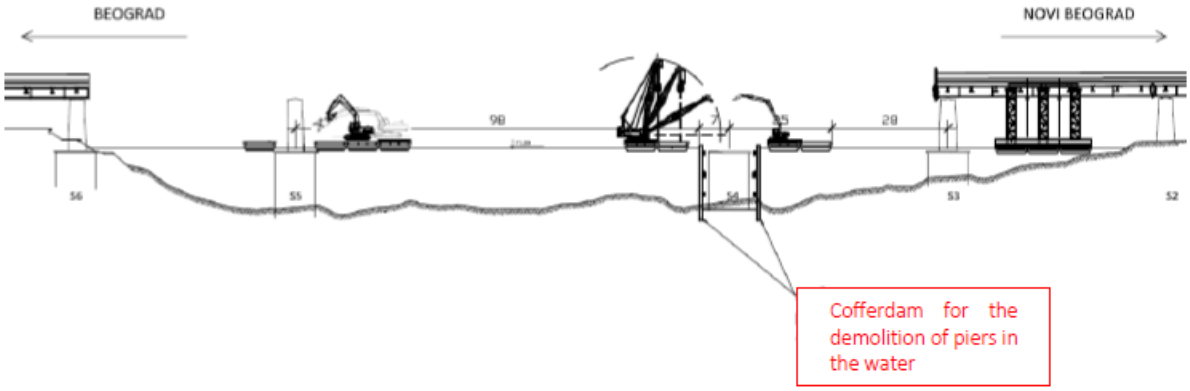

Figure 19 Demolition Phase 8

In order to demolish the piers and foundations in the river, it is necessary to demolish in the dry, i.e. by using cofferdam. This will be the subject of detailed analysis of the Design.

The demolition of the concrete structure in the river, is separated into two phases:

1. Demolition from barges,
2. Demolition in a cofferdam.

In both phases, it is necessary to implement measures to prevent uncontrolled separation of the concrete structure and falling to the river bottom.

As for the demolition of concrete structures on the shores, method is simpler, but it is more sensitive because of noise, vibration and dust emission in urban environment. Therefore, it is planned to use demolition shears, since they provide great benefits in terms of reducing noise, vibration and dust during operation.

During the dismantling operation, certain modifications of river traffic must occur (closing, narrowing of the navigable profile), and for all changes it is necessary to obtain the conditions of the competent authorities.

The main construction site will be organized on the left riverbank, immediately downstream from the bridge, between the Brankov Bridge and the Old Sava Bridge (Figure 20) The area will be used for disassembly of the old bridge and for connection of the segments for the new bridge. As per the Employers Requirements/Beoland/September2020 the site should comprise the following:

- Contractor's offices, canteen, workshops, plant yard, parking areas,
- Access roads and tracks and/or temporary diversions,
- Materials storage area(s),
- Fuel Station(s),
- A laboratory,
- Sign boards,
- The Engineer's and offices for Employer,
- Any other facilities required for the construction works.

Maintenance or refuelling of the mechanization will be organized out of the site at servicing facility and fuel stations. Since the current terrain of the future construction site is in two levels, both levels will be backfilled at the level of +76masl, based on a 100 yeas probability at the confluence of the Sava and the Danube (coincidence of large waters of the Sava and the Danube). From the construction site three launching girders will be installed in the river. On the right bank of the Sava, a special mini-construction site should be formed at the S1 pillar, which would be used only for the equipment for pushing the structure.

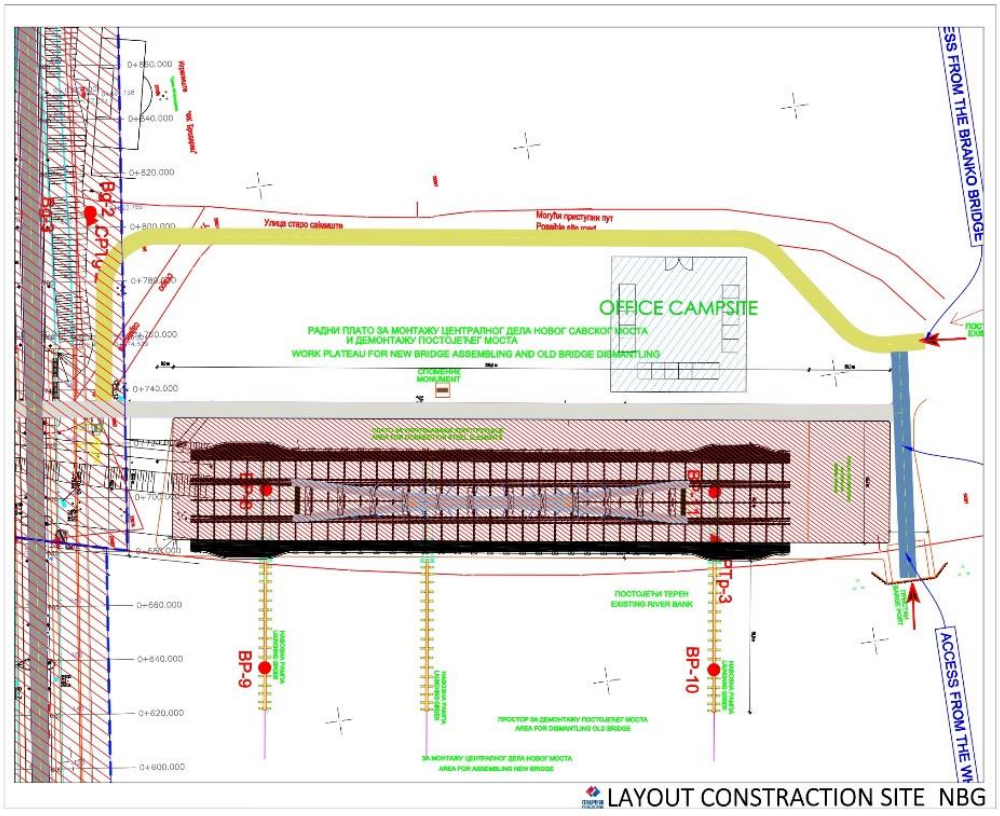

Figure 20 Construction site organization

3.2.1.1. Waste Generation

During the bridge disassembly the following type of waste are expected/ possible to be generated:

Waste type	Waste index	Hazardous/non-hazardous
Waste oils and liquid fuel remains (excluding cooking oils and oils from chapters 05, 12 and 19)	13	
Waste hydraulic oils	1301	Hazardous
Waste motor oils, gear oils and lubricating oils	1302	Hazardous
Oil/water separator content	1305	Hazardous
Waste liquid fuels	1307	Hazardous
Packaging waste, absorbents, wiping cloths, filter materials and protective fabrics, unless otherwise specified	**15**	
Packaging (including specially collected packaging in municipal waste)	15 01	Non-hazardous
Absorbents, filter materials, wiping cloths and protective clothing	15 02	Hazardous
Construction and demolition waste (including soil excavated from contaminated locations)	**17**	
Concrete, bricks, tiles and ceramics	1701	Non-hazardous
Wood, glass and plastics	1702	Non-hazardous
Bituminous mixtures, tar and tar products	1703	Hazardous and Non-hazardous
Metals (including their alloys)	1704	Non-hazardous
Soil (including soil excavated with contaminated sites), excavated stone	1705	Hazardous and Non-hazardous
Insulation materials and construction materials containing asbestos	1706	Hazardous
Gypsum-based construction material	1708	Non-hazardous
Other construction and demolition waste	1709	
Communal waste (household waste and similar commercial and industrial waste), including separately collected fractions	**20**	
Separately collected different type of communal waste (wood, plastic, paper, metal, etc)	20 01	Hazardous and non-hazardous
Other communal waste	20 03	Non-hazardous

The expected quantity of non-hazardous construction waste generated from demolition works prior to disassembling of the bridge are as follows:

- rubbles/debris – 3,000.00 m^3,
- concrete – 10,000.00 m^3,
- steel – 2,100,000.00 kg,
- electric cable 10 kV - 650 m,
- other electric cables - 650 m.

Additionally, the following materials and their quantities are estimated for the demolition works:

- Surface soil layers: 10,000.00 m^3,
- Working plateau (sand and gravel for filling): 1,500.00 m^3,
- Excavation works: 11,500.00 m^3,

- Excavation works in the river: 18,000.00 m^3.

Waste will be collected separately, i.e., through primary selection on site, appropriately temporary stored at a location to be determined by the Waste Management Plan, and finally delivered to a certified waste operator for final disposal.

As per available information construction waste will be mostly transported via river, on barges to the municipal landfill.

3.2.1.2. Hazardous Materials

Standardized high-pressure cylinders with oxygen and acetylene will be used for dismantling of the structural parts. Besides, oils and oil derivatives, antifreeze, thinners, acids, paints and varnishes, additives are in plan to be used at the site in small quantities.

The hazardous materials need to be stored and handled according to the environmental, health and safety and fire protection requirements, and will be subject of the supervision by the personnel in charge for EHS and also by the state authorities/inspectors.

3.3. Planned Works and Schedule

The works will be performed in accordance with the Design Documentation and the Construction Permit (Permit for Demolition).

Reportedly working hours are defined with the Special location conditions issued by the Ministry of Construction, Transportation and Infrastructure, and will be mostly regular/normal daylight hours.

During preparation of this Study, no precise data on the commencement of works were available, but as per tentative plan it is expected to star with the project activities, i.e. mobilization and design preparation, etc. in April 2022, and to complete the dismantling phase within 12 months. (Figure 21). The works on the dismantling will last 6 months, with no overlapping with work on construction of the new bridge.

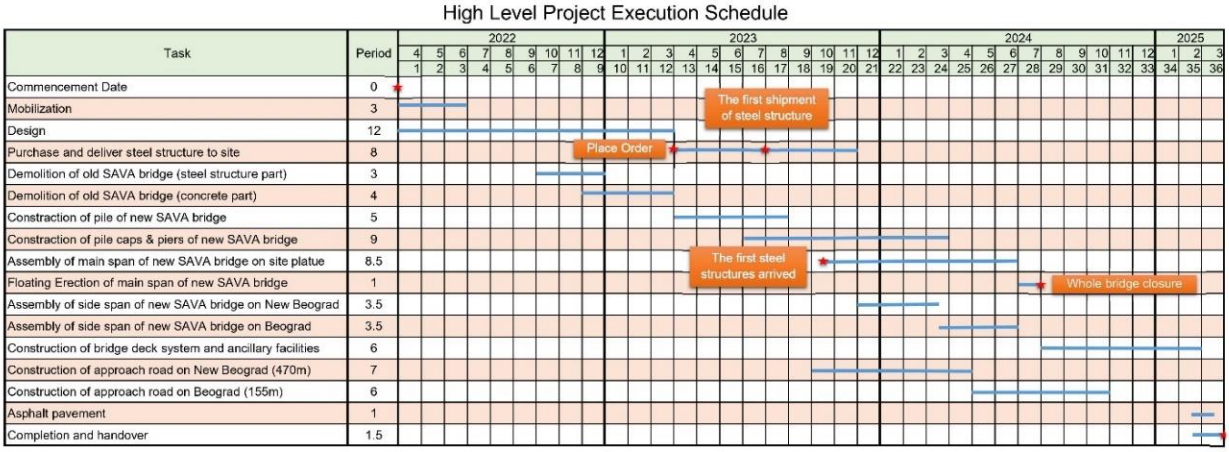

Figure 21 Hight level project execution schedule

4. ENVIRONMENTAL & SOCIAL BASELINE CONDITIONS

4.1. Environmental Baseline Summary

This chapter presents relevant environmental baseline information, including air quality, noise, soil quality, ground and surface water quality, biodiversity, as well as social baseline.

4.1.1. Air Quality

According to the 2020 annual air quality report[4], quality of air in agglomeration Belgrade, is categorised as category III, i.e. over-polluted air, due to concentrations that exceeded limit values of suspended particles PM_{10} and $PM_{2.5}$.

Air quality control on the territory of Belgrade is carried out by a state and local monitoring network of measuring stations. There are three monitoring points within radius of 800 m from the Project which provide most relevant data, namely: point SI-MM1 (Miloša Pocerca 5) 700 m south-east from the bridge, SI MM3 (Obelićev venac) 800 m north-east from the bridge and SI MM8 (BAS station, Železnička 8) 150 m north from the bridge (Figure 22). Monitoring results from 2019 and 2018 are presented in Table 3 below.

Table 3 Air quality monitoring results

Parameter	Unit	MAC / LV / TV	Sampling points					
			2019			2018		
			SI-MM1	SI-MM3	SI-MM8	SI-MM1	SI-MM3	SI-MM8
Continuous fixed measurements (daily 24-hour measurements)								
Soot	µg/m³	50 (MAC)	18	17	16	18	18	19
NO_2	µg/m³	40 (LV)	**53**	**44**	**61**	**51**	**45**	**70**
SO_2	µg/m³	50 (LV)	/	/	<10	/	/	<10
PM_{10}	µg/m³	40 (LV)	/	/	/	/	/	/
$PM_{2.5}$	µg/m³	25 (LV)	/	/	/	/	/	/
CO	mg/m³	3 (LV)	/	/	/	/	/	/
O_3	µg/m³	/	/	/	/	/	/	/
B	µg/m³	/	/	/	/	/	/	/
T	µg/m³	/	/	/	/	/	/	/
X	µg/m³	/	/	/	/	/	/	/
Continuous fixed measurements (24-hour, once a week)								
PM_{10}	µg/m³	40 (LV)	/	/	**42,2**	/	/	**42,3**
As	ng/m³	6 (TV)	/	/	1,8	/	/	1,8
Cd	ng/m³	5 (TV)	/	/	0,4	/	/	0,8
Ni	ng/m³	20 (TV)	/	/	7,3	/	/	0,5
Pb	ng/m³	500 (LV)	/	/	10,8	/	/	14,6
Benzo(a)pyrene	ng/m³	1 (TV)	/	/	**1,9**	/	/	**1,77**
Benzene	µg/m³	5 (LV)	/	/	**5,2**	/	/	**5,6**
MAC - Maximum allowable concentration LV – Limit value TV – Target value								

[4] Air quality in R.Serbia 2020, Ministry of Environmental Protection, Serbian Environmental Protection Agency, http://www.sepa.gov.rs/download/izv/Vazduh_2020.pdf

The results of the daily continuous measurements show that the average annual concentrations in 2019 and 2018, exceeded the prescribed limit value for NO_2 at all three measuring points.

At monitoring station SI MM8 (BAS station, Železnička 8) weekly continuous measurements showed exceedance of limit values for PM_{10}, Benzo(a)pyrene and Benzene in both years.

Figure 22 Location of air quality monitoring points in the Project vicinity

4.1.2. Noise And Vibration

Predominant noise source in the project area is very intensive traffic over the bridge and in surrounding area. Regular public transport over the Old Sava Bridge consists of two bus lines, four tram lines, and two minibus lines. During the night only one tram line is active.

Due to the steel structure of the bridge and the lack of adequate systems for mitigation of noise and vibration, the bridge itself presents additional significant source of noise. This problem is especially noticeable during periods when trams are passing over the bridge, depending on the tram type, condition and speed, the total equivalent noise levels during their passage can increase more than 10 dB from the existing road traffic noise level.

Noise measurements were performed from June 21 to June 22 in 2019 by the accredited laboratory of the Institute for Transportation CIP at 4 points around the bridge as follows:

- Point 1 - indoors on the nineteenth floor in the living room of the apartment 19.01, Lamellae A of the Belgrade Waterfront complex.
- Point 2 -open space on the nineteenth floor on the terrace next to the living room of the apartment 19.01, Lamella A of the Belgrade Waterfront complex.
- Point 3 - open space on the second floor within the terrace for rest and recreation of the residents of Lamellae A of the Belgrade Waterfront complex.
- Point 4 was placed at the open space on the New Belgrade side of the Sava quay, at the

height of Lamellae A of the Belgrade Waterfront complex.

Measurements were performed in five 15-minute intervals during the day (24 hours), two measurements in the period from 6 am to 6 pm (day measurement), one measurement in the period from 6 pm to 10 pm (evening measurement) and two measurements in the period from 10 pm to 6 am (night measurements). The results are provided in Table 4 , while their locations are given in Figure 23.

Figure 23 Positions of noise measuring points
(Source: EIA Study, No. 913-128/17, CIP, 2021)

Table 4 Relevant values of equivalent (L_{en}) noise levels by measuring points and periods of the day

Measuring point designation	Distance from the bridge (m)	Measuring period		
		Day	Evening	Night
		[dB(A)]	[dB(A)]	[dB(A)]
MT1	100	37	37	36
MT2	145	58	59	57
MT3	145	56	55	56
MT4	100	60	61	61

(Source: EIA Study, No. 913-128/17, CIP, 2021)

Measured values exceeding the prescribed limits, as per Table 5, of indoor and outdoor noise indicators are highlighted. Day and evening limits are exceeded on the measuring points MT1 and MT4, while night limits are exceeded on all four measuring points.

Table 5 Limit values for indoor and outdoor areas

Measuring point designation	Area use	Limit values*	
		Day and Evening	Night
		[dB(A)]	[dB(A)]
MT1	Living rooms (bedroom and living room) in a residential building with closed windows.	35	30
MT2 / MT3	Business-residential areas, commercial-residential areas and children's playgrounds	60	50
MT4	Areas for rest and recreation, hospital zones and convalescent homes, cultural and historical sites, large parks	50	40
*Ordinance on Noise Indicators, Limit Values, Methods for Assessing Noise Indicators, Disturbances and Harmful Effects of Noise in the Environment (Official Gazette of RS, No. 75/10), Annex II, Table 1 and 2.			

During the measurement another significant sources of noise were detected, namely restaurants on the water and at the riverbank, especially during the late evening and night hours. Also, the intensive constructions activities at the right riverbank present another significant source of noise although of temporary character and only during the day. Therefore, these noise sources contributed significantly to total noise levels at the measuring points, i.e. result in significant exceeding of permitted levels.

4.1.3. Soil

The soil quality monitoring program on the territory of Belgrade is performed by the City Institute for Public Health, Belgrade. Based on the results of the conducted analysis of soil contamination on the territory of Belgrade in 2018 at 48 locations and total of 96 samples the most common exceedances were related to the content of nickel (Ni), in the soil in 85 out of 96. The increased nickel content in the soil is related to the specific geochemical composition of the surface soil layers in this area and in most cases, it is not predominantly caused by contamination of anthropogenic origin. This can be concluded based on the analysis of a large number of samples and long-term monitoring of soil pollution in the observed area, since similar nickel concentrations are recorded in most of the tested samples.

Increased concentration of other metals was found as follows: Lead (Pb) in 6 samples, Cadmium (Cd) 4 samples, Zink (Zn) in 10 samples, Copper (Cu) in 18 samples, Chromium (Cr) and Arsenic (As) in 4 samples. These are mainly as a result of purposes and activities in the immediate vicinity of sampling sites (point source contamination) and/or air pollution (diffuse spread of pollutants).

Registered increase of organic parameters was found as follows: total Hydrocarbons (C10-C40) in 21 samples, and pesticide residues DDT 3 at three locations.

However, no data on soil quality is present for the Project area. Therefore, it is recommended to conduct baseline soil sampling (see chapter 4.3.3).

4.1.4. Groundwater

The project "Operational Monitoring of the Groundwater of the Republic of Serbia" was realized in the period November 2018 - April 2019 by the Department of Hydrogeology, Faculty of Mining and Geology in Belgrade and the Institute of Public Health in Kragujevac. The project, among others, included groundwater sampling and analysis in Belgrade, at the left bank of the Sava, upstream from the Old Sava Bridge.

Sampling was performed in the period of "low waters" from November 15, 2018 to December 1, 2018 and in the period of "high waters" from March 20, 2019 to April 15, 2019.

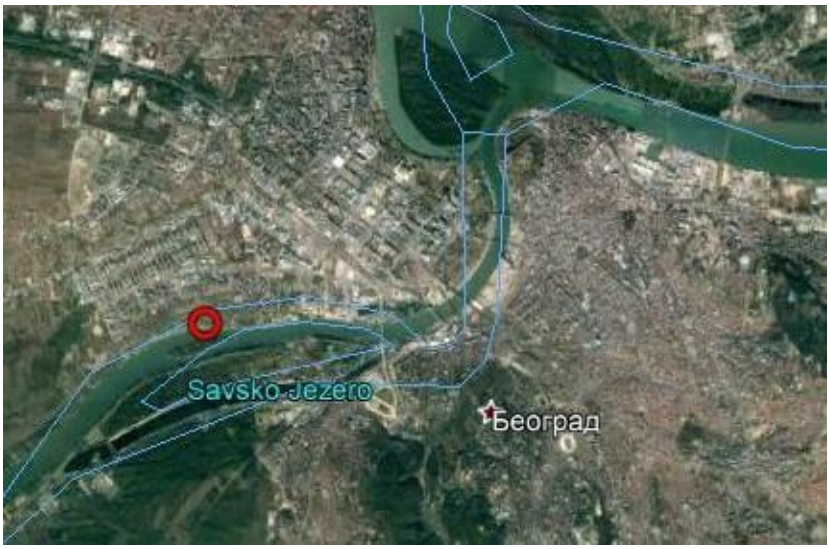

Figure 24 Location of the groundwater monitoring point
(Source: EIA Study, No. 913-128/17, CIP, 2021)

Analyses of groundwater, of the left bank of the Sava conducted in the period of low (autumn) waters showed an exceedance of manganese (Mn) content comparing to the drinking water standard.

However, no data on groundwater quality are available for the project area. Therefore, it is recommended to conduct baseline groundwater sampling (see chapter 4.3.2).

4.1.5. Surface Water

In the area potentially impacted by the Project, the main surface water body is Sava River. Based on the Decree on the Categorization of Watercourses (Official Gazette of the SRS, No. 5/68) the Sava River (from the border with Croatia to the confluence with the Danube River) belongs to the II class of watercourses. Class II includes waters that are suitable for swimming, recreation, and water sports, for breeding fewer noble species of fish (cyprinids), as well as waters that can be used with normal treatment methods (coagulation, filtration and disinfection) as drinking water and for the food industry.

According to the Rulebook on Parameters of Ecological and Chemical Status of Surface Waters and Parameters of Chemical and Quantitative Status of Groundwater (Official Gazette of RS,

No. 74/11) the Sava River belongs to type 1 watercourses - large lowland rivers with fine sediment dominance.

For the analysis of the surface water quality, the data from the Report " Results of Surface Water and Groundwater Quality Testing for 2019" of the Environmental Protection Agency were used. The nearest monitoring station is located at the Ostružnica profile, located approximately 14 km upstream from the project area. The results of monthly sampling, show that the following parameters deviate from the envisaged limit values of pollutants for class II surface waters:

- Dissolved oxygen (Class III),
- Total coliforms (Class III),
- Fluoranthene in two sample (Class III/IV).

However, no data on surface water quality are available for the closer project area. Therefore, it is recommended to conduct baseline surface water and sediment sampling (see chapters 4.3.4 and 4.3.5).

4.1.6. Biodiversity

The project location is partly in the ecologically important area of the "Confluence of the Sava into the Danube" as per Ordinance on Ecological Network (Official Gazette of RS, No. 102/2010).

The Sava with the coastal area in its natural and close-natural state is an ecological corridor of international importance.

The area between the Sava Bridge and the Gazela bridge, as per the current use and as well as per the Spatial Plan of the Special Purpose Area of the Coastline of the City of Belgrade - the area of the Sava River for the "Belgrade Waterfront" Project (Official Gazette of RS, No. 7/2015) is a public green area (Park Republike Srpske), a park on the left bank of the Sava from the old bridge to the bridge Gazela, in total area of 10,6 ha. This public green area is an integral part of the cultural property under the prior protection "Coastal Area of New Belgrade". The part of the park right next to the bank of the Sava is an integral part of the Ecologically significant area "The confluence of the Sava and the Danube" (a protected natural asset of international importance).

In the immediate proximity of the Project area there are no protected areas under national or international regulations. The nearest protected areas are (Figure 25):

- Protected Habitat Fungi of Ada Ciganlija ("Gljive Ade Ciganlije") located 7 km upstream;
- Pigmy Cormorant wintering site, IBA ("Zimovalište Malog vranca") located approximately 3 km east upstream;
- Nature protected areas Great War Island ("Veliko ratno ostrvo"), located 1.7 km downstream;

The project location is located about 2.5 km from the confluence of the Sava into the Danube. The closest protected area is the "Great War Island" a landscape of outstanding features". In 2008, the Institute for Nature Protection of the Republic of Serbia protected the winter habitat of Pigmy Cormorant in a triangle area formed between the lower peak of Ada Ciganlija, Belgrade Fair and Mala Ciganlijana, with the Decision on prior protection of the "Habitat of the

Phalacrocorax pygmaeus on the Sava in Belgrade". This area is located about 3 km from the project location.

The project location is partly placed in the ecologically significant area "Confluence of the Sava into the Danube" of the ecological network of the Republic of Serbia, as well as the internationally important area for birds with the same name and designation RS017IBA.

According to the conditions issued by the Institute for Nature Protection in the Decision under 03 no. 020- 1513/2, on June 19, 2019 at the location planned for the construction of the New Sava Bridge, there are no protected areas for which a protection procedure has been conducted or initiated, as well as no recorded natural assets.

Figure 25 Nature protected areas in the Project vicinity

4.1.6.1. Flora

In the area closer to the river, grass areas dominate and solitary trees of decades-old age, of weaker condition, in accordance with the characteristics of the species, and smaller groups of deciduous trees and shrubs are present.

4.1.6.2. Fauna

The most noticeable group of animals in Belgrade is birds. Previous research has established the presence of about 200 (196) bird species in the area of the Belgrade estuary, the Great and the Small War Island, while for the entire IBA area "Confluence of the Sava into the Danube" about 210 species have been recorded, however the actual wealth is probably up to 230 species.

The entire IBA (Important Birds Area - RS017IBA) covers a surface of 10 km of the Sava River and 39 km of the Danube. The IBA area "The confluence of the Sava into the Danube" was identified on the basis of the presence of three bird species according to the criteria for regionally important areas at the European level (B criteria). These are the pygmy cormorant (Phalacrocorax pygmaeus), the night raven (Nicticorax nicticorax) and the white-tailed eagle (Haliaetus albicilla).

The project location does not present a significant area of any of these species at any time of the year (nesting, wintering, migration), nor a significant feeding area.

The largest habitat of pygmy cormorant in Serbia is located a few kilometres upstream from the location of the bridge construction, but this locality is important only during the winter period. For the last twenty years, night ravens have not nested on the Great and Small War Islands, but mainly around the "Mika Alas" fishpond or the City Forest near Pančevo. At the project location individual specimens can be found in the period from March to September.

The white-tailed eagle is a species with a large range. The closest site where this species nests, to the project area, is the Great War Island where one pair nests. It occupies a territory of about 5-8 km around the nest. Individuals of this species are seen throughout the year in the vicinity of the Project site, but mostly at higher altitudes.

The outskirts of the city, due to the larger green and water areas, as well as less pollution, due to which is the higher density of insect populations, is an important area of bat nutrition. So far, the presence of 15 species of bats has been recorded in Belgrade, where they find adequate habitats, hunting territories and numerous shelters (Paunović et al., 2011).

In addition, in the project area several species of amphibians and reptiles can be found (primarily edible frog- Rana esculenta, dice snake - Natrix tessellata and grass snake - Natrix natrix), but since the banks of the Sava in the zone of the works are developed, there are no adequate habitats for the presence of a larger number of representatives of these groups of organisms, therefore, the impact of the bridge construction on them is negligible.

The subject area is inhabited also by synanthropic animal species (primarily, except for birds, small and medium-sized mammals).

4.1.7. Cultural Heritage

In terms of cultural heritage there are several protected monuments in the vicinity of the Project (Figure 26), namely:

- Monument of Culture – Staro sajmiste, 200 m downstream,
- Monument of Culture – Bristol hotel, 300 m north-east,
- Monument of Culture – Cross from the Mali Pijac, 300 m north-east,
- Monument of Culture – Vuco house on the Sava River, 350 m north-east,
- Monument of Culture of great importance – Belgrade Cooperative Building, 280 m north-east,
- Monument of Culture of great importance – Railway station, 500 m east.

Figure 26 Cultural assets and prior protected assets

The whole "Coastal Area of New Belgrade" includes a wider area between the Gazela Bridge and the Old Tram and Branko's Bridge, the left bank of the Sava and the right bank of the Danube to the mouth of the river, has been designated as cultural assets under prior protection, meaning that it has been acknowledged as area of cultural value.

The rich cultural layers of Belgrade, as one of the cities with the longest urban tradition, its historically most important and most valuable areas and the rivers Sava and Danube, form part of the coastal area and are an integral part thereof. As material evidence of historical, cultural, social, sociological, urban, architectural and economic development, they represent exceptional and inseparable values of the city's cultural heritage.

4.1.8. Climate

Climate of Belgrade and its wider surroundings belongs to moderate-continental type, with not many days with strong frost during winter, and moderately warm summers.

4.1.8.1. Air Temperature

Table 6 presents average monthly values of air temperature in Belgrade for 2020.

Table 6 Average monthly values of air temperature in Belgrade for 2020

Temperature °C	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average annual value
Average max value	5,9	12,3	13,8	20,7	21,6	25,9	29,0	30,9	27,3	19,2	9,9	8,4	18,7
Average min value	-1,0	3,9	5,2	7,8	12,0	16,6	18,2	19,8	16,4	10,6	5,2	3,5	9,8
Normal value	2,0	7,6	9,1	14,3	16,6	20,9	23,7	24,9	13,4	14,3	7,2	5,6	13,3

The following conclusions can be made concerning air temperature measurements for 2020:

- The mean annual air temperature is 13,3 °C,
- The coldest month of the year is January with a mean monthly air temperature of -9,8°C,
- The warmest month is August with a mean monthly air temperature of 18.7 °C.

Data from the measuring station Belgrade Observatory, for the period 1990 - 2019, shows the following:

- Average annual air temperature was 13.17° C,
- Average maximum annual air temperature was 18° C,
- Average minimum annual air temperature was 9.01° C,
- Absolute annual maximum was 43.6° C in 2007,
- Absolute annual minimum was -15.5° C.

4.1.8.2. Air Humidity

Table 7 presents relative air humidity in Belgrade for 2020.

Table 7 Relative air humidity in Belgrade for 2020

Parameter	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average annual value
Average monthly value	81	65	62	47	64	69	62	61	57	76	85	81	67,5

Based on the data for 2020, it can be concluded:

- Annual average relative humidity was 67,5 %,
- Maximum relative humidity values occur in November (81 %), December and January (81 %), i.e. in the winter period,
- Minimum values of relative humidity occur in April (47 %).

Data from the measuring station Belgrade Observatory, for the period 1990 - 2019, shows the following:

- The relative annual humidity was 67.5%,
- The highest average monthly humidity occurs is December, followed by January and November,
- The lowest average monthly humidity most often occurs during August, July, April and March.

4.1.8.3. Cloudiness

Table 8 presents number of cloudy days in Belgrade in 2020.

Table 8 Number of cloudy days in 2020

Parameter	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average annual
Number of cloudy days	4,9	5,3	5,6	2,8	5,9	5,4	3,5	3,0	3,1	5,6	7,8	7,1	5

The cloudiest days are in November and December, while the least are in April, August and September.

4.1.8.4. Precipitation

Table 9 presents monthly rainfall in Belgrade for 2020.

Table 9 Monthly rainfall in Belgrade for 2020

Parameter	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual rainfall
Average monthly rainfall	22,1	55,9	48,0	8,9	70,9	158,5	37,6	89,6	22,1	93,3	12,6	34,8	654,3
Max daily rainfall	9,3	15,0	15,5	6,2	18,5	64,9	15,2	39,9	12,1	34,9	5,3	15,2	

- According to the data for 2020, the average annual rainfall was 654,3 mm.
- The highest average rainfall occurs in June with 158.5 mm, while the month with the lowest rainfall is April with an average of 8.9 mm.

Data from Belgrade Observatory, for the period 1989 - 2019, show the following:

- Average annual rainfall was 682,075 mm,
- Maximum monthly precipitation was recorded in June, followed by May, July and September,
- Minimum monthly precipitation was recorded in February and March, followed by April, August, and October,
- Maximum annual rainfall was recorded in 2014 (1095.1 mm) and 1999 (1051.2 mm),
- Minimum annual rainfall was measured in 2000 and amounted to 367.7 mm,
- Maximum monthly precipitation was recorded in May 2014 (280.4 mm), then July 1999 (262.5 mm), July 2014 (250.6 mm) and June 1994 (212,2 mm),
- Minimum monthly precipitation was recorded in October 1995 (0.3 mm), then February 1998 (2.3 mm), March 2012 (2.4 mm), December 2016 (2.8 mm) and July 2013 (2,9 mm),
- Maximum precipitation for one day was recorded in May 2014 and was 109.8 mm.

4.1.8.5. Insolation

Data from Belgrade Observatory, for the period 1989 - 2019, show the following:

- The average insolation was 2,175 hours,
- The month with the highest insolation is July (followed by August and June),
- The month with the lowest insolation is December and then November,
- The maximum monthly insolation was recorded in July 2007, and it was 359 h,
- The minimum monthly insolation was recorded in January 1997 and was 18,1 hours,
- The highest mean monthly values of insolation are in July (314,67 h), while the lowest are in December (56,05 h).

4.1.8.6. Wind

Table 10 presents wind speed registered in Belgrade in 2020, while Figure 27 presents dominant direction.

Table 10 Wind speed in Belgrade for 2020

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average annual
Average speed (m/s)	1,6	2,1	2,4	2,0	1,7	1,9	1,6	1,7	1,8	1,7	1,5	3,1	1,9

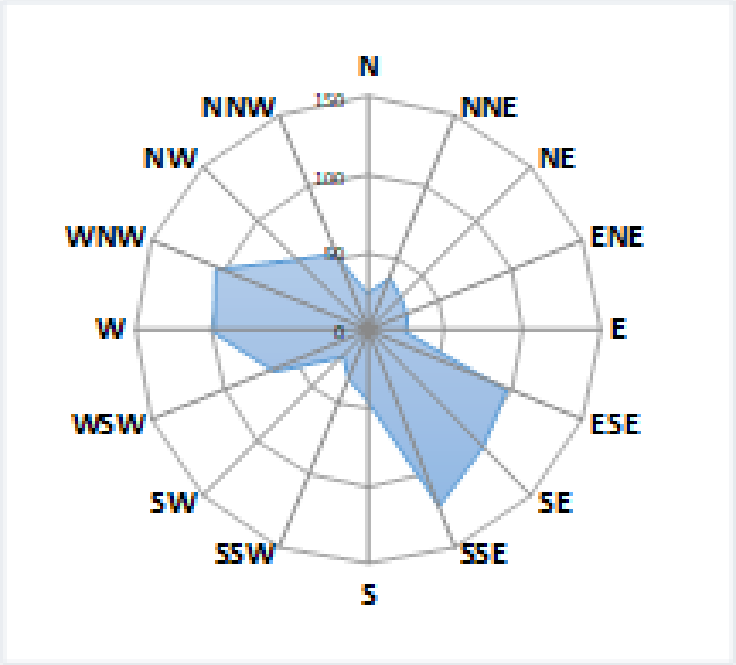

Figure 27 Wind rose for 2020

From the data above the following can be concluded:

- Average annual wind speed in 2020 was about 2 m/s,
- The most prominent directions being the northwest and southeast,
- The strongest winds usually blow from the southeast December to March.

Data from Belgrade Observatory, for the period 1989 – 2019 (Figure 28), show the following:

- The prevailing winds for Belgrade are southeast (229°) and west (211°),
- The wind is mostly of low intensity (0-3.5 m/s),
- The west wind usually blew during summer and winter, and the least during fall,

- The winds with the highest average speed during the winter were the west, west-southwest and northwest ones,
- During spring, the winds were east-southeast and east one, during summer it was north-northwest, and during the autumn the winds were southeast and east.

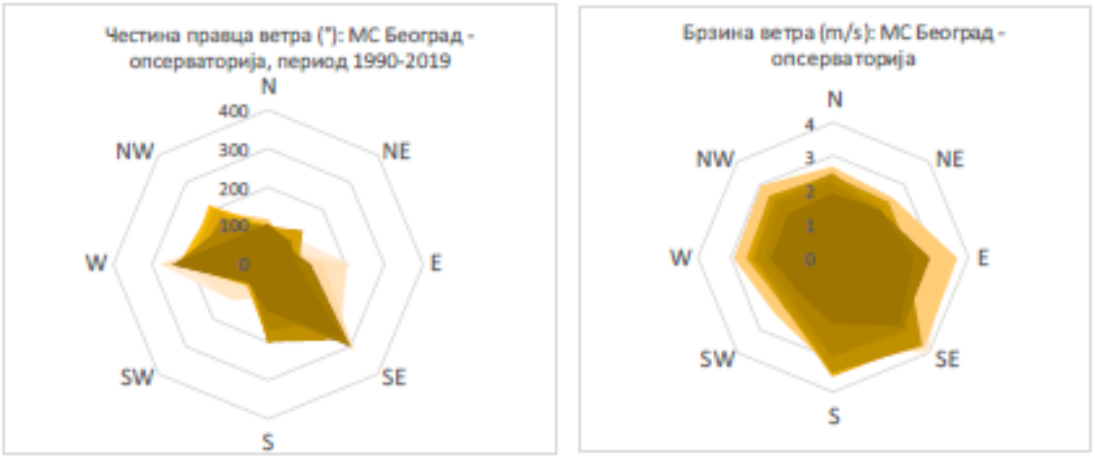

Figure 28 Annual frequency and wind speed for the period from 1990 to 2019
(Source: EIA Study, No. 913-128/17, CIP, 2021)

4.2. Socio-Economics Baseline Summary

4.2.1. Population Demographic

The wider area of the impact of the construction of the bridge over the Sava River on the site of the old bridge on the population, includes the City of Belgrade. Belgrade is organized in 17 city municipalities with an area of 3,234 km^2 and 1,694,480 inhabitants, or 524 inhabitants / km^2, according to estimates from 2020.

In line with the last official census from 2011, Belgrade had 1,658,151 inhabitants, which is 23% of the total population of the Republic of Serbia. The share of the population of the city of Belgrade in the total population of Serbia was constantly growing, starting with 9.7% in 1948.

The total estimated population of the two municipalities, New Belgrade and Savski Venac, located on either side of the bridge is 246,840 based on 2020 estimates (Table 11). New Belgrade is six times bigger than Savski Venac and represents 13% of the Belgrade or 3% of the Serbia population.

Table 11 Population statistics

Territorial unit	Population*			Average number of household members
	Total	Male	Female	
New Belgrade	211,788	97,872	113,916	2.6
Savski Venac	35,052	15,866	19,186	2.4
Belgrade City	1,694,480	799,786	894,694	2.7
Serbia	6,899,126	3,360,306	3,538,820	2.9
*(official estimate on 30.06.2020)				

With more than 21 % of its citizens being over the age of 65, Serbia's proportion of elderly people is among the highest in the world. Belgrade City is very close, with 20 % of the elderly population. The main factor contributing to this situation, besides low birth rates, is outmigration of young people.

As can be seen in Table 12, the age structure of New Belgrade and Savski Venac municipalities is more favourable than the age structure of the population in Belgrade City and Serbia for age group 0-14. On the other hand, the population age structure of 65 and over of the two municipalities is less favourable than all the above. The overall average age in all areas is alarmingly high, with the country average being 43.4.

Table 12 Population statistics – age structure

Territorial unit	Population*						Average age
	0-14	%	15-64	%	65 and over	%	
New Belgrade	33,555	15.8	132,785	62.7	45,448	21.5	43.1
Savski Venac	5,484	15.6	21,563	61.5	8,005	22.8	43.3
Belgrade City	258,060	15.2	1,098,630	64.8	337,790	19.9	42.5
Serbia	984,675	14.2	4,458,276	64.6	1,456,175	21.1	43.4
*(official estimate on 30.06.2020)							

In the narrower zone of influence of the construction of the bridge over the Sava River on the site currently occupied by the old Sava Bridge on the population, on the right bank of the Sava, there are facilities of the "Belgrade Waterfront" project.

According to the Report on the Strategic Assessment of the Spatial Plan of the Special Purpose Area -the Sava Riverbank Area for the "Belgrade Waterfront" project on the environment (2014), according to the 2002 Census, there were a total of 1,012 inhabitants in the planning area. In the inter-census period, the number of inhabitants decreased by 2.4%, so according to the results of the 2011 Census, it amounted to 988 inhabitants.

Within large age groups, according to the results of both censuses, the population aged 27-65 dominates (52.4% in 2002 and 60.2% in 2011), with a tendency of further growth, while the share of children under 15 is low (13.3% in 2002 and 11.8% in 2011) and tends to decrease further.

The realization of the project "Belgrade Waterfront" will increase the total population of the planned area by almost 18 times, with a simultaneous change in the demographic characteristics of the population.

The mentioned changes will directly affect, first of all, the organization of public and communal services, as well as the organization of traffic, which will primarily reflect the impact of the population on the environment.

In relation to the planned number of inhabitants within the scope of the Plan, which amounts to about 17,700, the approximate number of school-age children (primary school) in the total population is about 10%, i.e. 1,770 children, while the number of preschool children would be 1,858, i.e. 10.5% of the planned population.

4.2.2. Employment

As with other available statistical information, most of the employment and unemployment figures are available at the municipal level (Table 13). The table presents data from the municipalities for 2019, however according to more recent official reports, the unemployment rate in Serbia has been reducing over the past few years and in 2020 it was 9 %, while in Belgrade City it was 7.5 %. Although official sources accredit these results to economic growth, some experts claim that additional factors, such as significant economic out migration of people, particularly to EU countries, are also at play.

Table 13 Employment and unemployment statistics 2019

Territorial unit	Employed, %			Unemployed, %			
	Total	of that Women	of that young people (15-29)	Total	Applying for a first job	No qualifications	of that Women
Savski Venac	15,737	51.30	11.1	1,329	39.7	11.8	59.4
New Belgrade	85,437	51.76	11.1	8,034	30.7	9.8	61.7

The situation in the two municipalities is almost identical with minor differences. The situation for women in Savski Venac is less favourable than in New Belgrade, with a lower percentage of women who are employed while in terms of unemployment is opposite situation where more women are unemployed in New Belgrade. In both municipalities higher percentage of women are unemployed, as opposed to men. The level of education among unemployed persons is higher in New Belgrade than in Savski Venac.

In both municipalities, the number of self-employed persons compared to those working as employees in legal entities is low: 3.4% in Savski Venac and 7 % in New Belgrade, both lower than the overall average in Belgrade City and particularly Serbia as a whole, where that percentage goes up to 17 % (Table 14). In both municipalities, there are almost no registered individual agricultural producers.

Table 14 Employment in legal entities and self-employment (official statistics 2018)

Territorial unit	Employees in legal entities, %	Entrepreneurs (self-employed), %	Individual agricultural producers (self-employed), %
Savski Venac	96.60	3.4	-
New Belgrade	93.0	7.0	-
Belgrade City	87.65	12.04	0.3
Serbia	79.63	17.37	3.0

A detailed overview of employment by sectors in the two municipalities is provided in Table 15 below. Trade, both wholesale and retail is predominant sector in New Belgrade. In Savski Venac, government and social insurance together with health and social work accounts for 60 %.

Table 15 Employment by sectors in the municipalities (annual average for 2019, official statistics)

Employees by sector of employment	Savski Venac, %	New Belgrade, %
Agriculture, forestry and water management	0.1	0.4
Mining	0.1	0.1
Manufacturing	2.1	4.7
Production of electricity, gas, water, wastewater management	0.5	1.4
Construction	2.6	5.7
Wholesale, retail and vehicle repairs	4.8	19.7
Transport and storage	3.6	4.9
Accommodation and restaurants	2.2	3.6
Information and communication	4.1	8.9
Finances and insurance	2.4	7.3
Real estate	0.3	0.7
Expert, scientific and technical services	5.1	11.4
Administrative and support services	5.3	14.3
Government and social insurance	41.4	7.4
Education	4.5	3.5
Health and social work	18.8	2.7
Art, leisure and sports	1.2	1.5
Other services	1.0	1.6

4.3. Environmental Baseline Proposal

In order to define a baseline environmental condition in the area under potential impact from the project, prior to commencing the planned works, it is required to conduct sampling of environmental media and to perform analyses of these samples.

4.3.1. Air Quality

Air quality monitoring in the city of Belgrade is carried out by the state and the local air quality monitoring networks. Since the air quality monitoring in Belgrade is carried out continuously by authorized organizations, including the monitoring points located in the immediate vicinity of the Sava Bridge, data from these points are sufficient to be used as a baseline.

4.3.2. Groundwater

Baseline groundwater quality is very important, since the project is located in the sanitary protection zone of the Belgrade water supply source.

Groundwater needs to be sampled on both riverbanks, in minimum upstream and downstream from the project area. On the right riverbank the downstream groundwater sample needs to be taken downstream from the construction site. This way baseline will cover full project area, i.e. the bridge and the construction site. For the sampling, and possible for the future monitoring, it is required to install monitoring well of approximately 10 m depth. Locations and installation need to be agreed with the PUC Waterworks and Sewerage.

In order to optimize the works, the contractor needs to be aware that as per the approved EIA for construction of the new bridge the project envisages also the construction of four monitoring wells, two on both sides of the riverbank, upstream and downstream from the

bridge. So, the well installed as per proposal in this study can be used during the construction phase as well.

It is also recommended to sample the water from ranney well used for water supply, the closest ones upstream and downstream from the site, to be agreed with the PUC Belgrade Waterworks and Sewerage.

Scope of the parameters to be analysed in groundwater samples should be in line with the Ordinance on Limit Values of Pollutants in Surface and Groundwater and Sediments and Deadlines for Their Achievement (Official Gazette of RS, No. 50/12). (See Annex 6.2)

The list of parameters to be analysed should include the parameters which exceeded the limits in the groundwater monitoring (chapter 4.1.4).

4.3.3. Soil

Soil samples for the baseline analysis need to be taken from the core of all 4 monitoring wells in 1m interval and where potential contamination is noticed. Additionally, at least three grab surface soil samples need to be taken from the construction site, and one on each riverbank in the vicinity of the bridge.

Scope of the parameters to be analysed in the soil samples should be in line with the Ordinance on Limit Values for Polluting, Harmful and Hazardous Substances in Soil (Official Gazette of RS, No. 30/2018 and 64/2019). (See Annex 6.3)

The list of parameters to be analysed should include the parameters which exceeded the limits in the soil quality monitoring of Belgrade area (chapter 4.1.3).

4.3.4. Surface Water

Prior to demolition works and the construction site set up, baseline sampling of surface waters needs to be conducted upstream and downstream from the bridge on the right riverbank and upstream from the bridge and downstream from the construction site on the left river bank. Surface water needs to be sampled at these four sampling points. Scope of the parameters to be analysed in the samples should be in line with the Ordinance on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Their Achievement (Official Gazette of RS, No. 50/12). (See Annex 6.1)

The list of parameters to be analysed should include the parameters which exceeded the limits in the surface water samples at Ostružnica profile, upstream from the site (chapter 4.1.5).

4.3.5. Sediment

Prior to demolition works and the construction site set up, baseline sampling of river sediment should be performed at the same sampling points as for the surface water sampling. Scope of the parameters to be analysed in the soil samples should be in line with the Ordinance on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for their achievement (Official Gazette of RS, No. 50/12). (See Annex 6.4)

4.3.6. Noise

Noise measurements performed from 21-22 June 2019 by the accredited laboratory of the Institute for Transportation CIP at 4 points around the bridge, as elaborated in the chapter 4.1 should be taken as baseline values.

Table 16 presents summary of the works proposed for the baselines assessment and for the further monitoring.

Table 16 Summary of the baseline assessment works

Media	Location	Number of samples	Scope of analysis	Baseline frequency	Baseline cost estimate (EUR)	Comment
Air quality	Data from the existing air quality monitoring network stations				-	-
Installation of monitoring wells	Left riverbank: upstream from the bridge and downstream from the construction site. Rights riverbank: Upstream and downstream from the bridge	4 of 10m	-	-	cca. 5,000	Location and installation to be agreed with the PUC Waterworks and Sewerage
Groundwater	New monitoring wells	4 from new monitoring wells (one per well)	As per the Decree on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Their Achievement (Official Gazette of RS, No. 50/12)	1-2 before the works	cca. 2,500	-
	The closest renney well upstream and downstream	2				Sampling to be agreed with the PUC Waterworks and Sewerage
Soil	Construction site	3	As per the Decree on Limit Values for Polluting, Harmful and Hazardous Substances in Soil (Official Gazette of RS, No. 30/2018 and 64/2019)	one time before the works	cca. 11,800	-
	New monitoring wells	40				-
Surface water	Left riverbank: upstream from the bridge and downstream from the construction site. Rights riverbank: Upstream and downstream from the bridge	4	As per the Decree on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Their Achievement (Official Gazette of RS, No. 50/12)	1–2 time before the works.	cca. 1,800	-

Media	Location	Number of samples	Scope of analysis	Baseline frequency	Baseline cost estimate (EUR)	Comment
Sediment	Left riverbank: upstream from the bridge and downstream from the construction site. Rights riverbank: Upstream and downstream from the bridge	4	As per the Decree on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Their Achievement (Official Gazette of RS, No. 50/12)	1–2 time before the works.	cca. 3,000	-
Noise	Data from the noise measurement from 21-22/06/2019 CIP				-	-

5. ENVIRONMENTAL & SOCIAL IMPACTS AND MITIGATION MEASURES

5.1. Impact Assessment Methodology

This section sets out methodology to be implemented during the development of the Focused ESIA Report and the identified potentially significant environmental and social impacts associated with the decommissioning of the Old Sava Bridge. The identification of potential impacts is based on the design and information available at the time of the Focused ESIA Scoping Report development.

A modified Leopold matrix was used to identify interactions between parts of the project and environmental and social topics (Table 17).

Table 17 Interactions between project activities and environment

	Aspect							Receptor				
	Emissions to air	Noise/vibrations	Natural resource use	Wastewater	Hazardous materials	Waste generation	Cultural heritage	Soil/Groundwater	Surface Water	Biodiversity	Health and Safety / Accidents and injuries	Community
Construction site setup	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demolition works	✓	✓	✓		✓	✓		✓	✓	✓	✓	
Disassembling	✓	✓			✓	✓				✓	✓	
Chemical storage					✓			✓	✓	✓	✓	
Transport / Traffic	✓	✓			✓				✓		✓	✓
Waste management				✓	✓	✓		✓	✓	✓	✓	
Accidental Spillages				✓	✓	✓		✓	✓	✓	✓	✓
Major accidents	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓

The principal impact assessment steps to be undertaken include:

- Impact prediction: to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities.
- Impact evaluation: to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor.
- Mitigation and enhancement: to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.
- Residual impact evaluation: to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

Once impacts and their characteristics are defined, the next step is to assign each impact a "magnitude" (negligible, small, medium and large). Magnitude describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the impact. The magnitude degree depends on the impact characteristics, namely, extent, duration, scale, frequency and likelihood for unplanned events.

Once magnitude of impact and sensitivity/vulnerability/importance of resource/receptor have been characterised, the significance can be assigned for each impact. Impact significance is designated using the matrix presented in Table 18. The assessment of sensitivity and magnitude are used to define the significance of the impact, ranging from negligible to major.

Table 18 Impact significance matrix

	Sensitivity/vulnerability			
Magnitude of Impact		Low	Medium	High
	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The impact scale is defined as follows:

- **Negligible** significance is one where a resource/receptor will essentially not be affected in any way by a particular activity.
- **Minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/ vulnerability/ importance.
- **Moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit.
- **Major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors.

For each key impact, a magnitude is assigned and corresponding mitigation measures will be proposed.

5.2. Environmental And Social Scoping Table

The major impacts during the decommissioning will be emissions into the air from exhaust gases from construction machinery, emissions of dust during demolition and earthworks, solid waste generation, as well as noise emission as a result of the operation of construction machinery and equipment. In Table 19 the main impacts are presented, with impact characteristic being assessed and mitigation measures proposed. These will be assessed in a greater detail in the Focused ESIA Report.

Table 19 Environmental and social impacts and mitigation scoping table

Environmental and Social Issue	Impacts	Receptor	Geographical Scope of Impact	Potential Impact Mitigation Measures
Environment				
Air Quality	▪ Gaseous emission (NOx, SOx, CO, PM_{10}) and VOCs, generated from vehicles, machinery, welding equipment. ▪ Dust fugitive emission generated from demolition works, earth excavation/stripping, grinding, backfilling, construction waste handling and transport. The type of the paints at the metal parts of the bridge is not known so there is a potential to be lead-based. If so, dust emitted from grinding and cutting can contain lead paint particles.	Community/Soil/ Surface water	Local	▪ All vehicles, machines and equipment must comply with quality, technical safety and environmental requirements; ▪ Prepare Traffic Management Plan; ▪ Training, limiting speed, regular vehicle and machinery maintenance, turn off vehicles and machinery when idle; ▪ Sprinkling material and increase moisture content for open materials, sealing trucks, covering materials, visually monitor dust generation and concentrations in the air; ▪ Sample the paints of the metal parts and analyse led content. If the paint is lead based implement addition mitigation measures, e.g. wet grinder and cutters.
Noise and vibration	▪ Noise emission from vehicles, machinery, and tools. ▪ There is possibility for cumulative impact with other projects in the vicinity of the site during construction.	Community	Local	▪ All vehicles, machines and equipment must comply with quality, technical safety and environmental requirements; ▪ Training, regular vehicle and machinery maintenance, turn off vehicles and machinery when idle; ▪ Limit the hours of operation for specific pieces of equipment or operations during quiet hours and at night.
Soil quality and erosion	▪ Topsoil disturbance by stripping topsoil and backfilling during preparation of the construction site; ▪ Soil, groundwater or surface waters contamination due to accidental spillage of waste, chemicals, oils or fuels from	Soil/ground water/surface water	Local	▪ Scheduling earthworks to avoid heavy rainfall periods; ▪ Timely and careful removal and proper temporary storage of top soil at specially designated locations; ▪ Top soil should be re-used for rehabilitation of construction site;

Environmental and Social Issue	Impacts	Receptor	Geographical Scope of Impact	Potential Impact Mitigation Measures
	storage and handling of waste, chemicals and fuel and from construction machinery. ▪ Accidental release of wastewater in soil, ground water or surface water.			▪ Suspend activities during high winds to the extent practical; ▪ Store properly hazardous materials, oils, waste and fuels; ▪ Provide impermeable surface and adequate drainage systems to minimize and control water infiltration especially in areas with chemicals, waste and fuel storage, parking and washing areas, etc.; ▪ Use backfill material of proven quality; ▪ Proper and regular offsite maintenance of vehicles and other machinery and, refuelling; ▪ Provide spill kits at the site and train workers to use them.
Waste (non-hazardous and hazardous)	▪ Generation of construction and demolition waste non-hazardous and hazardous from the demolition works. ▪ Generation of municipal and packaging waste. ▪ Generation of hazardous waste (oily rags, used oil filters, and used oil, batteries, hazardous packaging, as well as spill clean-up materials from oil and fuel spills, spill contaminated soil, WEEE, etc,) at the construction site. ▪ Improper storage and handling of hazardous waste, can cause soil and groundwater or surface water contamination.	Soil/ground water/surface water	Local	▪ Develop a site waste management plan; ▪ Avoid or minimize generation of waste (as far as practicable); ▪ Prevent demolition waste during demolition and loading to barges from falling to the river; ▪ Train workers on the correct waste management handling and disposal; ▪ Construction and demolition waste must be separated, loaded in barges properly until handed over to the authorized company for further treatment or disposal; ▪ Hazardous waste must be officially categorised; ▪ Provide proper storage of hazardous waste in accordance with regulation, i.e. roofed, secured, locked, with impermeable lining and secondary containment;

Environmental and Social Issue	Impacts	Receptor	Geographical Scope of Impact	Potential Impact Mitigation Measures
Hazardous materials	▪ Improper storage and handling of fuel, lubricants and chemicals, can cause soil and groundwater or surface water contamination.	Soil/ground water/surface water	Local	▪ Provide training on hazardous material management; ▪ Avoid or minimize use of hazardous materials (where practicable); ▪ Provide proper storage of hazardous materials in accordance with relevant regulation, roofed, secured, locked, impermeable lining and secondary containment, MSDS; ▪ Develop and implement a plan for responding to accidental releases; ▪ Provide spill response equipment and train works to use it.
Wastewater	▪ Improper management of sanitary wastewater and storm water and associated uncontrolled surface runoff can lead to soil and groundwater and surface water contamination.	Soil/ground water/surface water	Local	▪ All the manipulation areas, storage of chemicals, fuel and waste, area for washing of mechanization, parking area, need to be installed on the impermeable surface with water drainage system. ▪ All wastewaters collected at the construction site needs to be treated (oil separator, settling pits, etc.) before discharge to the public sewer or to the Sava river. ▪ Prepare environmental monitoring plan and perform monitoring of wastewater, surface water and groundwater; ▪ Install and regularly empty mobile toilets; ▪ Regular cleaning of oil separators and septic pits must be performed by certified company; ▪ Adhere to conditions of water management company;
Biodiversity	▪ Loss of terrestrial and aquatic flora and fauna due to clearance of vegetation and removal of topsoil at the construction site and removal of the bridge piles.	Soil/surface water	Local	▪ Minimize land use; ▪ Re-use of topsoil for rehabilitation of the construction site and re-vegetate it; ▪ Optimize works on removal of the bridge piles.

Environmental and Social Issue	Impacts	Receptor	Geographical Scope of Impact	Potential Impact Mitigation Measures
Major accident or disaster	▪ UXO - unplanned activation of UXO presents risk to human life and hazardous materials release and material damage. ▪ Flooding of the construction site present risk to human life and hazardous materials release and material damage. ▪ Fire at the construction site present risk to human life and hazardous materials release and material damage.	Community/soil/ surface water/groundwater	Local	▪ Perform UXO clearance investigation and verification and UXO monitoring during excavation works. ▪ Track hydrological information for flood wave level and arrival time as precaution; ▪ Implement Fire Protection plan and measures as per relevant regulation; ▪ Train workers on emergency response.
OHS				
OHS risks during demolition activities	▪ Air emission and dust ▪ Noise and vibration ▪ Rotating and moving equipment ▪ Operation of heavy and other machinery ▪ Hazardous waste management ▪ Traffic ▪ Working at heights ▪ Working in the proximity and above water ▪ Electrical hazard ▪ Hazardous materials ▪ Night-shift work	Construction site workers	Local	▪ Implement OHS Management Plan; ▪ Provide proper Personal Protective Equipment (PPE) to workers (protective glasses, dust mask), emergency eyewash and sanitary facilities; ▪ If lead based paint was used in at the bridge, adequate must be used while grinding and cutting. ▪ Limit the duration of exposure to elevated levels of noise and vibrations; ▪ OHS training for operators and other personnel; ▪ Only trained and qualified personnel shall operate heavy and other machinery; ▪ Ensure proper use of ladders and scaffolds by trained employees; ▪ Implement and monitor fall prevention and fall protection measures; ▪ Establish speed limits at the construction site premises;

Environmental and Social Issue	Impacts	Receptor	Geographical Scope of Impact	Potential Impact Mitigation Measures
				▪ Conducting subsurface clearance survey prior to any excavation work; ▪ Implement record keeping of all near miss situations on site; ▪ Conduct OHS training after each near miss situation or work injury; ▪ Implement record keeping of all work injuries, professional illnesses and fatalities; ▪ Provide adequate lighting for work during night-time
Social				
General site hazard	▪ Risks of accidents involving non workers (community members).	Community	Local	▪ Ensure construction site is fenced off to prevent non workers from entering. ▪ Use of construction signs and warnings.
Traffic management and safety	▪ Traffic jams impacting users of roads and facilities in the vicinity; ▪ Accidents involving non workers (community members).	Community	Local	▪ Implement general TMP for the entire location; ▪ Enforce workers' code of conduct (guidance on safe driving).
Information disclosure	▪ Public is not unaware of road closures and inaccessible access roads causing increased traffic and traffic jams.	Community	Local	▪ Inform the competent authorities, persons / organizations in case of any traffic regime changes.
Grievance management	▪ External grievances are not recognized (recorded) and addressed by subcontractors.	Community	Local	▪ Ensure that subcontractors bring external grievances to the attention of EPC and are adequately addressed.

6. ANNEXES

6.1. Surface Water Parameters and Limit Values

Parameter	Unit	Limit Value (1)				
		Class I (2)	Class II (3)	Class III (4)	Class IV (5)	Class V (6)
General						
pH (12)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	<6.5 or <8.5
Suspended materials (9) (12)	mg/L	25	25	-	-	-
Oxygen regime						
Dissolved oxygen	mg O2/L	-(8) (or PN)	-(8)	5	4	<4
Oxygen saturation	%					
- epilimnion (stratified water)		90-110	70-90	50-70	30-50	<30
- hypolimnion (stratified water)		70-90	70-50	30-50	10-30	<10
- unrecorded water		70-90	50-70	30-50	10-30	<10
BOD 5	mg O2/L	-(8) (or PN)	-(8)	7	25	> 25
Chemical Oxygen Demand (bichromate method)	mg O2/L	10 (or PN)	15	30	125	> 125
Chemical Oxygen Demand (permanganate method)	mg O2/L	5 (or PN)	10	20	50	> 50
Total Organic Carbon (TOC)	mg/L	-(8) (or PN)	-(8)	15	50	> 50
Nutrients						
Total nitrogen	mg N/L	1 (or PN)	2	8	15	> 15
Nitrates	mg N/L	-(8) (or PN)	-(8)	6	15	> 15
Nitrite	mg N/L	0.01 (or PN)	0.03	0.12	0.3	> 0.3
Ammonium ion	mg N/L	-(8) (or PN)	-(8)	0.6	1.5	> 1.5
Non-ionized ammonia (9)	mg/L NH3	0.005	0.025	-	-	-
Total phosphorus (7)	mg P/L	-(8) (or PN)	-(8)	0.4	1	> 1
Orthophosphates	mg P/L	-(8) (or PN)	-(8)	0.2	0.5	> 0.5

Parameter	Limit Value (1)					
	Unit	Class I (2)	Class II (3)	Class III (4)	Class IV (5)	Class V (6)
Salinity						
Chlorides	mg/L	50 (or PN)	-(8)	150	250	> 250
Total residual chlorine (9)	mg/L HOCl	0.005	0.005	-	-	-
Sulphates	mg/L	50 (or PN)	100	200	300	> 300
Total mineralization	mg/L	<1000 (or PN)	1000	1300	1500	> 1500
Electrical conductivity at 20 ° C	mS/cm	<1000 (or PN)	1000	1500	3000	> 3000
Metals						
Arsenic	µg/L	<5 (or PN)	10	50	100	> 100
Boron	µg/L	300 (or PN)	1000	1000	2500	> 2500
Copper	µg/L	5 (T = 10) 22 (T = 50) 40 (T =100) 112 (T = 300)	5 (T = 10) 22 (T = 50) 40 (T =100) 112 (T = 300)	500	1000	> 1000
Zinc	µg/L	30 (T = 10) 200 (T = 50) 300 (T =100) 500 (T = 500)	300 (T = 10) 700 (T = 50) 1000 (T =100) 2000 (T = 500)	2000	5000	> 5000
Chrome (total)	µg/L	25 (or PN)	50	100	250	> 250
Iron (total)	µg/L	200	500	1000	2000	> 2000
Organic Substances						
Phenolic compounds (such as C_2H_5OH)	µg/L	<1	1	20	50	> 50
Petroleum hydrocarbons (9)		(10)	(10)	-	-	-
Surface active substances (such as lauryl sulphate)	µg/L	100	200	300	500	> 500
AOH (adsorbent organic halogen)	µg/L	10	50	100	250	> 250

Parameter	Limit Value (1)					
	Unit	Class I (2)	Class II (3)	Class III (4)	Class IV (5)	Class V (6)
Microbiological parameters						
Fecal coliforms	cfu/100ml	100	1000	10000	100000	> 100000
Total coliforms	cfu/100ml	500 (11)	10000	100000	1000000	> 1000000
Intestinal enterococci	cfu/100ml	200	400	4000	40000	> 40000
Number of aerobic heterotrophs (Kohl method)	cfu/100ml	500	10000	100000	750000	> 750000

Notes:
T - hardness of water (mg/L $CaCO_3$); PN - natural level.

(1) Unless otherwise stated, the values are expressed as the total concentration in the sample taken.

(2) The class description corresponds to the excellent ecological status according to the classification given in the Rulebook on the parameters of ecological, chemical and quantitative status of surface and groundwater ("Official Gazette of RS", No. 74/2011). Surface waters belonging to this class provide on the basis of the limit values of quality elements for the functioning of ecosystems, life and protection of fish (salmonids and cyprinids) and can be used for the following purposes: supply of drinking water with prior treatment by filtration and disinfection, bathing and recreation, irrigation, industrial use (process and cooling water).

(3) The description of the class corresponds to the good ecological status according to the classification given in the Rulebook on the parameters of ecological, chemical and quantitative status of surface and groundwater ("Official Gazette of RS", No. 74/2011). Surface waters belonging to this class provide on the basis of the limit values of quality elements for the functioning of ecosystems, life and protection of fish (cyprinids) and can be used for the same purposes and under the same conditions as surface waters belonging to class I.

(4) The description of the class corresponds to the moderate ecological status according to the classification given in the Rulebook on the parameters of ecological, chemical and quantitative status of surface and groundwater ("Official Gazette of RS", No. 74/2011). Surface waters belonging to this class are provided on the basis of the limit values of quality elements for life and protection of cyprinids and can be used for the following purposes: drinking water supply with prior treatment by coagulation, flocculation, filtration and disinfection, bathing and recreation, irrigation, industrial use (process and cooling water).

(5) The description of the class corresponds to the poor ecological status according to the classification given in the Rulebook on the parameters of ecological, chemical and quantitative status of surface and groundwater ("Official Gazette of RS", No. 74/2011). Surface waters belonging to this class based on the limit values of the quality elements can be used for the following purposes: drinking water supply using combination of previously mentioned treatments and advanced methods of treatment, irrigation, industrial use (process and cooling water).

(6) The description of the class corresponds to the poor ecological status according to the classification given in the Rulebook on the parameters of ecological, chemical and quantitative status of surface and groundwater ("Official Gazette of RS", No. 74/2011). Surface waters belonging to this class cannot be used for any purpose.

(7) The total phosphorus is analysed from the filtrate, i.e. from the dissolved phase which was obtained by filtration through a 0.45 mm filter.

(8) See Table 3-12 and Table 3-13 for limit values for pollutants for class I and II of surface water.

Parameter	Limit Value (1)					
	Unit	Class I (2)	Class II (3)	Class III (4)	Class IV (5)	Class V (6)
(9) The parameter is monitored only in surface waters called salmonid or cyprinid. (10) Petroleum products must not be present in water in such quantities as to: form a visible film on the surface of water or coatings on the shores of watercourses and lakes, give a recognizable "hydrocarbon" flavour to fish, cause harmful effects in fish. (11) Based on a 95% estimate. (12) The deviation from the limit values in case of specific geographical conditions is allowed.						
Ordinance on limit values for pollutants in surface and ground waters and sediments closing dates to reach them ("Official Gazette of the Republic of Serbia", No. 50/2012)						

6.2. Groundwater Parameters and Limit Values

No.	Parameter	Remediation limit values (µg/l)
1.	Water temperature	
2.	Air temperature	
3.	Odour	
4.	Flavour	
Metals		
5.	Cadmium (Cd)	6
6.	Chromium (Cr)	30
7.	Copper (Cu)	75
8.	Nickel (Ni)	75
9.	Lead (Pb)	75
10.	Zinc (Zn)	800
11.	Mercury (Hg)	0.3
12.	Arsenic (As)	60
13.	Barium (Ba)	625
14.	Cobalt (Co)	100
15.	Molybdenum (Mo)	300
16.	Antimony (Sb)	20
17.	Beryllium (Be)	15
18.	Selenium (Se)	160
19.	Tellurium (Te)	70
20.	Thallium (Tl)	7
21.	Tin (Sn)	50
22.	Vanadium (V)	70
23.	Silver (Ag)	40
Inorganic compounds		
24.	Cyanide-free	1500
25.	Nitrate	50000
Aromatic hydrocarbons		
26.	Benzene	30
27.	Ethylbenzene	150
28.	Xylene	70
29.	Styrene	300
30.	Toluene	1000
Polycyclic aromatic hydrocarbons (PAH)		
31.	Anthracene	5
32.	Benzo(a)anthracene	0.5
33.	Benzo(a)pyrene	0.05
34.	Benzo(g,h,i)perylene	0.05
35.	Benzo(k)fluoranthene	0.05
36.	Chrysene	0.2
37.	Fluoranthene	1
38.	Indeno(1,2,3-cd) pyrene	0.05
39.	Naphthalene	70
40.	Phenanthrene	5
41.	PAHs total	
Others		
42.	Phthalate total	5
43.	Mineral oils	

6.3. Soil Quality Parameters and Limit Values

Parameter	Soil (mg/kg absolutely dry matter)	
	Limit value	Remediation Threshold
Metals		
Cadmium	0.8	12
Chromium	100	380
Copper	36	190
Nickel	35	210
Lead	85	530
Zinc	140	720
Mercury	0.3	10
Arsenic	29	55
Barium	160	625
Cobalt	9	240
Molybdenum	3	200
Antimony	3	15
Beryllium	1.1	30
Selenium	0.7	100
Tellurium	-	600
Thallium	1	15
Tin	-	900
Vanadium	42	250
Silver	-	15
Inorganic compounds		
Cyanide - free	1	20
Cyanide – complex (pH <5) [1*]	5	650
Cyanide - complex (pH ≥ 5)	5	50
Thiocyanate (Total)	1	20
Bromide (mg Br/l)	20	-
Fluoride (mg F/l)	500*	-
Aromatic organic compounds		
Benzene	0.01	1
Ethylbenzene	0.03	50
Toluene	0.01	130
Xylene	0.1	25
Styrene (vinylbenzene)	0.3	100
Phenol	0.05	40
Cresols (Total)	0.05	5
Catechol (o-dihydroxybenzene)	0.05	20
Resorcinol (m- dihydroxybenzene)	0.05	10
Hydroquinone (p- dihydroxybenzene)	0.05	10
Dodecylbenzene	-	1000
Aromatic solvents	-	200
Polycyclic aromatic hydrocarbons (PAH)		
PAHs (Total) [2*]	1	40
Chlorinated hydrocarbons		
Vinyl chloride	0.01	0.1
Dichloromethane	0.4	10
1,1-dichloroethane	0.02	15
1,2-dichloroethane	0.02	4
1,1-dichloroethene	0.1	0.3
1,2-dichloroethene (cis, trans)	0.2	1
Dichloropropane	0.002	2
Trichloromethane (chloroform)	0.02	10
1,1,1-trichloroethane	0.07	15
1,1,2-trichloroethane	0.4	10
Trichloroethene	0.1	60
Carbon tetrachloride	0.4	1
Tetrachloroethene	0.002	4
Chlorobenzene (Total) [3*]	0.03	30
Chlorophenols (Total) [4*]	0.01	10
Chloronapthaline	-	10

Parameter	Soil (mg/kg absolutely dry matter)	
	Limit value	Remediation Threshold
Mono chloro aniline	0.005	50
Polychlorinated biphenyls (Total) [5*]	0.02	1
Extractable halogenated organic compounds	0.3	-
Dichloroaniline	0.005	50
Trichloroaniline	-	10
Tetrachloroaniline	-	30
Pentachloroaniline	-	10
4-chloromethylphenol	-	15
Dioxins	-	0.001
Pesticides		
DDT / DDD / DDE (Total)	0.01	4
Drini [6*]	0.005	4
Aldrin	0.00006	-
Dieldrin	0.0005	-
Endrin	0.00004	-
HCH compound [7*]	0.01	2
α-HCH	0.003	-
β-HCH	0.009	-
γ-HCH	0.00005	-
Atrazine	0.0002	6
Carbaryl	0.00003	5
Carbofuran	0.00002	2
Chlordane	0.00003	4
Endosulfan	0.00001	4
Heptachlor	0.0007	4
Heptachlorepoxide	0.0000002	4
Maneb	0.002	35
MCPA [8*]	0.00005	4
Organotin compounds (Total)	0.001	2.5
Azinphos-methyl	0.000005	2
Other pollutants		
Cyclohexanone	0.1	45
Phthalates (Total) [9*]	0.1	60
Mineral oils	50	5000
Pyridines	0.1	0.5
Tetrahydrofuran	0.1	2
Tetrahydrothiophene	0.1	90
Bromoform	-	75
Acrylonitrile	0.000007	0.1
Butanol	-	30
1,2 butylacetate	-	200
Ethyl acetate	-	75
Diethylene	-	270
Ethylene glycol	-	100
Formaldehyde	-	0.1
Isopropanol	-	220
Methanol	-	30
Methyl-tertiary-butyl-ether (MTBE)	-	100
Methyl ethyl ketone (MEK)	-	35
Ordinance on the limit values of polluting, harmful and hazardous substances in soil ("Official Gazette of the Republic of Serbia", No. 30/2018 and 64/2019)		

1* The pH value is determined in 0.01 M CaCl2.
2* Sum of ten polycyclic aromatic hydrocarbons (anthracene, benzo (a) anthracene, benzo (k) fluorantene, benzo (a) pyrene, crysine, phenanthrene, fluorantene, indeno (1,2,3-cd) pyrene, naphthalene and benzo (ghi) perylene).
3* A collection of all chlorobenzenes (mono-, di-, tri-, tetra-, penta- and hexachlorobenzene).
4* The sum of all chlorophenols (mono-, di-, tri-, tetra- and pentachlorophenols).
5* In the case of remediation values, the sum of the congener is taken into account polychlorinated biphenyls: PCB 28, 52, 101, 118, 138, 153 and 180; and in the case of borderlines maximum values are taken into account the sum of the same congeners other than PCB 118.
6* "Drini" means the sum of aldrin, dieldrin, and endrin.
7* HCH compounds (hexachlorcyclohexane) means the sum of α-HCH, β-HCH, γ-HCH and δ-HCH.
8* MCPA - 4-chloro-o-toluoxyacetic acid (C9H9ClO3).

9* The sum of all phthalates.
* Differentiation according to clay content: (F) = 175 = 13 · L (L =% clay).

6.4. Sediment Parameters and Limit Values

Parameter	Units	Target value	Maximum allowable concentration	Remediation value
Arsenic (As)	mg/kg	29	42	55
Cadmium (Cd)	mg/kg	0.8	6.4	12
Chromium (Cr)	mg/kg	100	240	380
Copper (Cu)	mg/kg	36	110	190
Mercury (Hg)	mg/kg	0.3	1.6	10
Lead (Pb)	mg/kg	85	310	530
Nickel (Ni)	mg/kg	35	44	210
Zinc (Zn)	mg/kg	140	430	720
Mineral oil	mg/kg	50	3000	5000
Polycyclic aromatic hydrocarbons (PAH) (1)	mg/kg	1	10	40
Naphthalene	mg/kg	0.001	0.1	
Anthracene	mg/kg	0.001	0.1	
Phenanthrene	mg/kg	0.005	0.5	
Fluoranthenes	mg/kg	0.03	3	
Benzo (a) anthracene	mg/kg	0.003	0.4	
Crisis	mg/kg	0.1	11	
Benzo (k) fluoranthene	mg/kg	0.02	2	
Benzo (a) pyrene	mg/kg	0.003	3	
Benzo (g, h, i) perylene	mg/kg	0.08	8	
Indeno (1,2,3-cd) pyrene	mg/kg	0.06	6	
Polychlorinated Biphenyls (PCBs) (2)	µg/kg	20	200	1
DDD	µg/kg	0.02	2	
DDE	µg/kg	0.01	1	
DDT	µg/kg	0.09	9	
DDT total (3)	µg/kg	10	-	4000
Aldrin	µg/kg	0.06	6	
Dieldrin	µg/kg	0.5	450	
Endrin	µg/kg	0.04	40	
Cyclodien pesticides (4)	µg/kg	5	-	4000
α-HCH	µg/kg	3	20	
β-HCH	µg/kg	9	20	
γ-HCH (lindan)	µg/kg	0.05	20	
HCH total (5)	µg/kg	10	-	2000
Alpha-endosulfan	µg/kg	0.01	1	4000
Heptachlor	µg/kg	0.7	68	4000
Heptahlor-epoksid	µg/kg	0.0002	0.002	4000
Ordinance on limit values for pollutants in surface and ground waters and sediments closing dates to reach them ("Official Gazette of the Republic of Serbia", No. 50/2012)				

1) the parameter refers to the sum of the following compounds: naphthalene, anthracene, phenanthrene, fluoranthene, benzo (a) anthracene, chrysene, benzo (k) fluoranthene, benzo (a) pyrene, benzo (g, h, i) perylene, indeno (1,2,3-cd) pyrene
(2) the parameter refers to the sum of the following individual compounds: PCBs 28, 52, 101, 118, 138, 153 and 180.
(3) the parameter refers to the sum of DDT, DDD and DDE
(4) parameter refers to the sum of aldrin, dieldrin and endrin
(5) the parameter refers to the sum of four isomers of hexachlorocyclohexane: α-HCH, β-HCH, γ-HCH, δ-HCH

www. envico.rs

Consultant:

ENVICO d.o.o. Belgrade
Vardarska 19/IV
11000 Belgrade, Republic of Serbia
Tel: +381 11 64 17 257

Client:

ERM Environment Resource Management SRL