



INTERMEDIATE ENVIRONMENTAL MONITORING REPORT DURING WORKS

PRELIV – SUMMARY OF RESULTS

Introduction

The main objective of this environmental report during works is to address the base values of the main parameters identified during the elaborations of the EMRbW. These values were established during the Inception Phase and will serve as the base for evaluation of effects of river training and works to the environment.

According to the ToR, one Monitoring report must be prepared every 3 months from the start of the construction works at each critical sector till the end of works (at critical sectors on which dredging activities are performed) and until the start of the Defects Notification Period (for critical sectors on which river training structures have been constructed), identifying all changes in environmental parameters compared to the base values identified in the Environmental Monitoring Report Before Works, also arguing the reasons for these changes, as well as their long-term impact to the integrity of the affected areas.

Works have begun in Preliv on November 7th 2019 and they have not been finished by the end of January 2020, so this report is necessary in order to identify the current status of environment after three months.

The Environmental Monitoring Report n° 1 covers the following fields:

- Hydromorphology
- Sediment and water quality
- Waste
- Biology
 - Phytoplankton
 - Macrozoobenthos
 - Vegetation (*Limosella aquatica*)
 - Birds (*Charadrius dubius* and *Riparia riparia*)
 - Fish (*Acipenser ruthenus*)
- Development of vegetation and riparian areas
- Protected Areas and Ecological Networks

The table below shows the works to be carried out in the critical sector Preliv and their exact location according to the Final Design:

N°	Name of critical sector	Type of works	Chainage from	to
	Preliv	Chevron n° 1	1200+600	

The report shows the status of environment once completed three months of works, according to ToR statements.

Description of work site

Preliv is the only critical sector where works execution is in progress in this moment. Construction works are being performed on one location Chevron n° 1. According to Engineer's proposal, chevron n°2 will not be executed due to the changes occurred in the riverbed since the project were designed.



Floating barge with construction material is used as a temporary storage for solid material like steel armature (reinforcement bar) and new rolls of geotextile are into the foil Floating office.

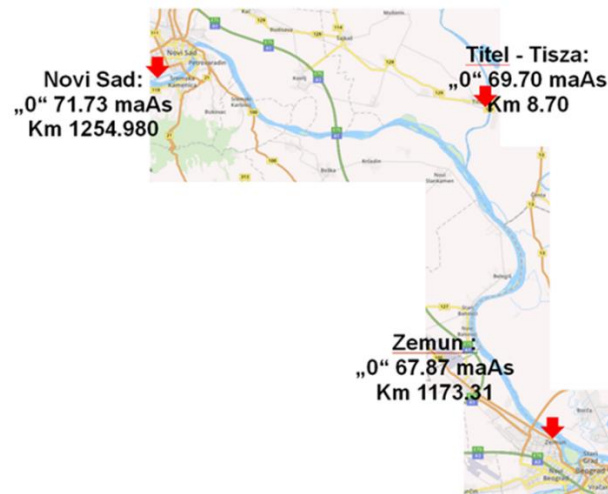
Status of the works after 3 months

The construction Works in the sector 24 (Preliv) are not completed. The table below shows the current status of each planned activity per structure.

Sector 24	Chevron n° 1
Geotextile	Completed
Base layer (phase I)	On going
Base layer (phase II)	On going
Profiling the base layer	Not started
Construction of the body	Not started
Profiling of body	Not started

Project context

Gauging station Zemun is referent station for stretch Preliv.



Stretch has right river band shape with radius which gradually becomes smaller. The most upstream part of the stretch is narrow (about 500m) with talweg depth about 6.5m. Cross-section is U shaped and provides optimal transportation capacity in terms of discharges and bed load transportation.

Left riverbank is protected with longitudinal dike from km 1206+350 to km 1202+400 (source: Detail Design). According to the available satellite images, space between training construction and riverbank is mostly filled in with sand and covered with vegetation

Main navigational problems are occurred in river band where water current is divided into two branches with similar capacity for transportation of water, sediment and bed load. Curvature radius of outer riverbank is about 2200m and consequence of such small radius and sharp curve



is intensive helicoid flow. Nature of helicoid flow is to undermine the outer riverbank and to deposits excavated material on the opposite side. Most likely, the sand deposit was emerged into the middle of the river is consequence of the above depicted complex currents. Historically, navigation was carried out in both branches, depending on upstream flowing conditions.

Left riverbank, which is exposed to the erosion, is also protected (source: Detail design), but much details about this construction was not available.

Water quality monitoring

Detailed Monitoring plan for both water and sediment quality was created in accordance with monitoring plan from the Inception Report but also in accordance with currently valid dynamic plan and prediction that working period are going to be longer than it was planned.

Regular water quality monitoring is performed every third month (four times per year), while additional monitoring is performed more frequently. During additional monitoring campaigns parameters like temperature, TSS and mineral oil are being determined. Extra monitoring of these parameters is not predicted within the Inception Report for the locations where the construction is performed, only where dredging and sediment disposal is performed. However, the SEM team concluded that additional monitoring could be useful for screening the situation during works execution.

Until now, one regular monitoring campaign were carried out on the section Preliv, at the beginning of February 2020 (03/02/2020). During this campaign, samplings were performed at the position located about 100 m downstream from the works. Sampling and further analyses were performed by accredited laboratory ANAHEM from Belgrade.

In the meantime, one additional water screening analyses was performed, at the same time when regular analyses was carried out. Lfor short analyses, water sample was taken upstream from the construction site.

Sediment monitoring

Until now one sampling campaign was carried out in Preliv, in the same time as water samples were taken at the beginning of February 2020, at the position downstream from the works execution is performed.

Additional sampling and testing of sediment quality during the construction works is not proposed with the Inception Reports, only for the dredging and sediment disposal activities.

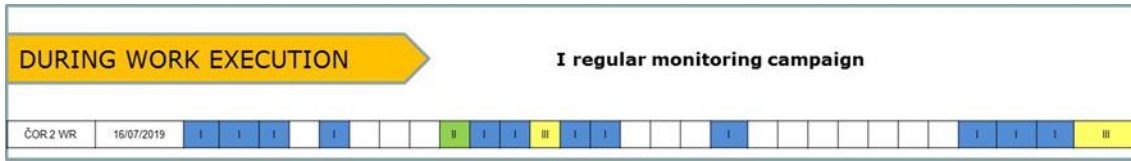
Review of water and sediment quality results

Results obtained during the first regular sampling campaign carried out on 03/02/2020 show that quality of water sample was not quite different than quality of the samples analysed in previous performed baseline obtaining campaign (other official campaigns are not performed on this location on the Danube River).

The results of the physicochemical analyzes show that the quality of the River Danube at location Preliv (Beška) - downstream of the work site predominantly corresponds to the quality of water I class, except for nitrates, total nitrogen and BPK5, that correspond to quality water of the II class.

In terms of the microbiological classification of the quality of this sample, it can be concluded that the Danube waters at the site of Preliv (Beška) belong to the class I for total coliform, class II for coliform bacteria of fecal origin and intestinal enterococci, and class IV for aerobic heterotrophs.

No one analyzed priority and priority hazardous substances were detected within the taken sample.



Quality of parameters temperature, suspended matters and mineral oils of additionally taken sample corresponds to the class I of water quality:

PRELIV			
SAMPLING POINTS AND OBJECTS AT THE SITE	RESULTS OF WATER QUALITY IN DIFFERENT CAMPAIGNS		
	3/2/2020		
	temperature (°C) / suspended matters (mg/l) / mineral oils (mg/l)		
Sampling point 1 (upstream)	7.5	6	<0.1
Sampling point 2 (downstream)	7.5	12	<0.1

LEGEND:	CLASS	II CLASS	III CLASS	IV CLASS	V CLASS
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Results of the sediment quality obtained during regular monitoring campaigns performed on 03/02/2020 show that all parameters values are below target values and most of them are not even detected.

Waste

During this period regular inspections have been carried out with the purpose of detecting uncontrolled discharges of waste or pollution incidents. The monitoring has been done by visual inspection of vessels and water analysis.

Conclusions show that all the established preventive measures are being followed by WKSC, so during this period there has been no incident related to discharges or waste.

Phytoplankton

This is typical phytoplankton community structure for this season. Community structure was uniform along depth gradient and among localities.

Macrozoobenthos

Mussels population were represented by three genera and six species. Several individuals of Swollen river mussel (*Unio tumidus*) and Painter's mussel (*Unio pictorum*) has been recorded in sediment and in shallow water closer to the right bank. Asian clam (*Corbicula fluminea*) and *Corbicula fluminalis* were present by 20-30 individuals in sediment closer to the right bank and in shallow water. Quagga mussel and Zebra mussel (*Dreissena rostriformis bugensis* and *D.*



polymorpha) were present by 10-15 individuals. In the river sediment downstream of work zone, two individuals of Zebra mussel (*Dreissena polymorpha*) were recorded.

Sector	<i>Unio</i> sp.	Other species
Sector 24 Preliv	<i>Unio tumidus</i> <i>Unio pictorum</i>	<i>Corbicula fluminea</i> <i>Corbicula fluminalis</i> <i>Dreissena polymorpha</i> <i>Dreissena rostriformis bugensis</i>

Birds

Bird populations was represented by Mallard (*Anas platyrhynchos*), colony (around 50-60 individuals) of European herring gull (*Larus argentatus*) on the sandbars, several individuals of House sparrows (*Passer domesticus*) on the right bank, two Grey herons (*Ardea cinerea*) closer to the right bank and colony (around 20-30 individuals) of Carrion crow (*Corvus corone*) on the sandbar, together with European herring gull.

Sector	<i>Charadrius dubius</i>	<i>Riparia riparia</i>	Other species
Sector 24 Preliv	--	--	<i>Anas platyrhynchos</i> <i>Passer domesticus</i> <i>Ardea cinerea</i> <i>Corvus corone</i> <i>Larus argentatus</i> <i>Cygnus olor</i>

Fishes

In two standing nets on the left bank were no fishes. In pulling net on the left bank (location 2B) one individual of Common nase (*Chondrostoma nasus*) have been found. Right bank (location 1 A) was without catch.

Due to low temperature and Danube water level, fish populations have retreated to greater depths (special fish habitats) where are more favourable temperature conditions and more successful wintering of the fish community.

Sectors	<i>Acipenser ruthenus</i>	Other species
Sector 24 Preliv	-	<i>Chondrostoma nasus</i>

Macrovegetation

Woody plants are in winter hibernation, but some herbaceous plants (*Lamium* sp) are still green, with leaves.

Sector	Species: <i>Limosella aquatica</i>	Other species
Sector 24 Preliv	No results	<i>Populus x euroamericana</i> <i>Populus alba</i>



		<p><i>Salix alba</i> <i>Xanthium strumarium</i> <i>Fraxinus</i> sp. <i>Acer</i> sp.</p>
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Plants

Not any individual of species *Limosella aquatica* and *Lindernia palustris* have been found.

Sector	<p>Species: <i>Limosella aquatica</i> Species: <i>Lindernia palustris</i></p>
Sector 24 Preliv	No results

Development of vegetation

Current work activities include work on the river and from the river and none of activities are taking place on and from the river bank and habitat. As a consequence, none of the negative impacts on the vegetation, habitats or land conditions have been occurred. Forest vegetation has regular life and space development. Basic humus layer is preserved, land conditions is favourable for small vertebrate and invertebrate organisms and there is enough humidity for some part of life cycles. Changed physical conditions, except variable water level, have not been registered. Conclusion: vegetation and habitats are not damaged or endangered due to above mentioned facts.

Riparian areas

Water level is decreased. Vegetation habitats, plant litter layer and humus forest layer are preserved. Birds are occurred by six genera, typical for this season and this type of habitat. Invertebrate animals are represented by Mussels (families Unionidae, Cyrenidae and Dreissenidae) and one unidentified individual of Crustacea. Vertebrata have not been recorded. Vegetation and animals are not endangered in no way.

Protected areas

The selected quarry is located inside the National Park Fruška Gora. The EIA concluded that any impact could be expected in the National Park due to the fact that the quarry is currently active for some other uses. Some visuals inspections have been carried out during the firsts three months of activity in order to verify the accomplishment of the preventive measures defined in the EIA Report, as well as the preventive measures proposed in the EMRbW and the Environmental Plan presented by the WKSC. During this period, negative effect over the National Park of "Fruška Gora" due to the activities of this project have not been observed.

Ecological network

According to Decree on Ecological Network ("Official Gazette RS" No. 102/2010), in the wider area of work zone, except Danube river in general, are no ecological important areas, ecological corridors and protective zones.

Summary of results

After field surveys during November 2017, August 2018, October 2019 and January 2020, the following target species have been found **in sector Preliv.**

Period	Macrozoobenthos <i>Unio</i> sp.	Fishes	Plants	Plants	Birds	Birds
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		<i>Acipenser ruthenus</i>	<i>Limosella aquatica</i>	<i>Lindernia palustris</i>	<i>Riparia riparia</i>	<i>Charadrius dubius</i>
November 2017	-	-	-	-	-	-
August 2018	-	-	-	-	-	-
October 2019	<i>Several Unio tumidus</i> <i>3 Unio pictorum</i>	23 individuals	-	-	-	-
January 2020	<i>Several Unio tumidus</i> <i>Several Unio pictorum</i>	-	-	-	-	-

Summary of main impacts in the sector during this period

In this sector is defined the construction of one river training structure: Chevron n° 1.

During these three months activities have been focused on the construction of chevron 24.1. The monitoring activities during this period has been focused on determination of the potential effects on biological parameters and water and sediments parameter, due to the fact that the effects on the hydromorphology would be analysed once the works will have been completed.

According to the data explained in precedent sections, several monitoring have been executed during this months, the last of them after complete three months since the beginning of works in Preliv. The obtained results have been compared with data included in Environmental Monitoring Report before Works.

Regarding water and sediments, after this first three months it is possible to conclude that there are no significant effects over these parameters. The obtained results during field surveys in July are significantly similar to the previous ones. This can be interpreted as the works are not affecting the quality of water and sediments in the vicinity of critical sector of Preliv.

From the point of view of biology, the results show that the nature is not been affected by the works. Results obtained until now are line with normal status during each season, especially birds and fishes.

Bearing in mind that works are being executed from the water, the riparian vegetation existing in the riverbanks are not suffering any impact except a little dust deposited on leaves. This impact cannot be avoided because mainly depends on wind direction. However, it is not significant impact and the general status of riparian habitat remains in good conditions.

None of individuals of protected species of plants have been affected during these months and wildlife seems not to be impressed by the presence of machinery and workers. Protected species of birds have not been detected in Preliv during the field surveys.

Protective and corrective measures

The following mitigation measures have been carried out during these months to reduce or to avoid the described adverse impacts resulting from the proposed project activities:

- Confirm the absence of the river mussel (*Unio* sp.) in the vicinity of the working area.
- Perform monitoring of spills and suspended concentration during the execution of the works. If excedance of the critical concentration is observed the work intensity is to be reduced;
- Monitor the incidence of works over the vegetation surrounding the working area



- Monitor the variations, if any, of wildlife population around the working areas, focused on the main species mentioned in the EIA.

Conclusions & Recommendations

Works that are being executed currently on critical sector Preliv are following the methods and recommendations regarding environment protection included in EIA report and official decision. Additionally, WKSC is accomplishing the environmental measures included in the tender specifications and taking into consideration conclusions of Inception Report. The environmental monitoring begun at the same moment that the works and has been considered one of the most important elements of the project. Thank to this, the measures implemented by WKSC and the continuous monitoring are avoiding negative effects over the nature.

The main recommendation is to continue with the strong and continuous monitoring until the end of works in this sector. If any negative effect would appear, the environmental team should be immediately advised in order to take the most adequate corrective measures.