Co-financed by the Connecting Europe Facility of the European Union

Data Collection, hydraulic and morphological modelling of the Danube River and the Sava River in the Republic of Serbia

Lot 1: **Hydraulic and morphological modelling of the SRB-CRO common stretch of the Danube River**

Stakeholders' Forum Meeting Number 15

07/05/2025, on-line

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Table of Content

Basic Project Data

- Contract: Data Collection, hydraulic and morphological modelling of the Danube River and the Sava River in the Republic of Serbia - Lot 1: **Hydraulic and morphological modelling of the SRB-CRO common stretch of the Danube River**
- Contracting Authority: Ministry of Construction, Transport and Infrastructure
- Contractor: Hidrozavod DTD AD Novi Sad, Republic of Serbia
- Contract signature date: 11 June 2024
- Commencement date: 14 June 2024
- Duration: 12 months
- Contract is part of activities within the EU CEF funded project “Preparing FAIRway 2 works in the Rhine-Danube Corridor”

Activities Breakdown – part 1

		2024							2025					
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
		Month of the Contract												
No.	**Activity/Task/Output/Report**	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
Activity 0	**Inception phase**													
Meeting	Kick-off meeting	☺												
Task 00-01	Preparation of the communication matrix													
Task 00-02	Application of visibility guidelines													
Task 00-03	Acquisition of existing documentation													
Task 00-04	Preparation of Inception Report													
Output 00-01	**Communication matrix**	☺												
Output 00-02	**Project templates**	☺												
Output 00-03	**Inception report**	☺												
Activity 1	**1D hydraulic modelling**													
Task 1.1	Data Collection													
Task 1.2	Hydrological Study													
Task 1.3	Model Setup													
Task 1.4	Model Calibration													
Task 1.5	Model Simulation													
Task 1.6	Analysis and Results													
Task 1.7	Update of ENRs													
Meeting	Stakeholders' Forum meeting		☺											
Output 01-01	**1D model calibrated and running**				☺									
Output 01-02	**Updated ENRs**					☺								
Output 01-03	**Technical Report on 1D Hydraulic Modeling and Update of ENRs**						☺							
Activity 2	**Redefinition and prioritization of navigational bottlenecks**													
Task 02-01	Update of the bottleneck catalogue													
Task 02-02	Prioritize bottlenecks for which 2D models will be developed													
Meeting	Stakeholders' Forum meeting				☺									
Output 02-01	**Technical report on redefined bottlenecks elaborated**						☺							
Output 02-02	**Technical report on prioritization of bottlenecks elaborated**							☺						

Activities Breakdown – part 2

		2024							2025					
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
		Month of the Contract												
No.	**Activity/Task/Output/Report**	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
Activity 3	**Definition of criteria for the multi-criteria analysis**													
Task 03-01	Definition of MCA													
Task 03-02	Elaboration of Technical report on the definition of the MCA													
Meeting	Stakeholders' Forum meeting					☺								
Meeting	Stakeholders' Forum meeting						☺							
Meeting	Stakeholders' Forum meeting							☺						
Output 03-01	**Technical report on the definition of the MCA elaborated**							☺	☺					
Activity 4	**2D hydrodynamic and morphological modelling**													
Task 04-01	Data Collection													
Task 04-02	Model Setup													
Task 04-03	Model Calibration													
Task 04-04	Model Verification													
Task 04-05	Definition of Variants for each Bottleneck													
Task 04-06	Preparation of Model for Considered Variants													
Task 04-07	Analysis of Results													
Task 04-08	Application of MCA													
Task 04-09	Elaboration of Technical Report on 2D Modeling and Application of MCA													
Meeting	Stakeholders' Forum meeting									☺				
Meeting	Stakeholders' Forum meeting										☺			
Meeting	Stakeholders' Forum meeting												☺	
Output 04-01	**2D Model Calibrated and Running**							☺		☺				
Output 04-02	**Bottlenecks Variants Defined**								☺		☺			
Output 04-03	**Technical Report on 2D Modeling and Application of MCA**											☺	☺	
Activity 5	**Elaboration of an Integrated study on alternative solutions**													
Task 05-01	Elaboration of an Integrated study on alternative solutions													
Meeting	Stakeholders' Forum meeting													☺
Output 05-01	**Integrated study on alternative solutions elaborated**												☺	☺

Activities Breakdown – part 3

		2024							2025					
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
		Month of the Contract												
No.	**Activity/Task/Output/Report**	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
Activity 6	**Project Management**													
Task 06-01	Reporting													
Task 06-02	Ensuring Adequate Visibility													
Task 06-03	Project Closure													
R2	MPR01 (for the M2)			☺										
R3	MPR02 (for the M3)				☺									
R4	MPR03 (for the M4)					☺								
R5	MPR04 (for the M5)						☺							
R6	MPR05 (for the M7)								☺					
R7	MPR06 (for the M8)									☺				
R8	MPR07 (for the M9)										☺			
R9	MPR08 (for the M10)											☺		
R10	MPR09 (for the M11)												☺	
R11 (Output 06-01)	**Interim report**							☺						
R12	Draft Final report												☺	
R13 (Output 06-02)	**Final report**													☺

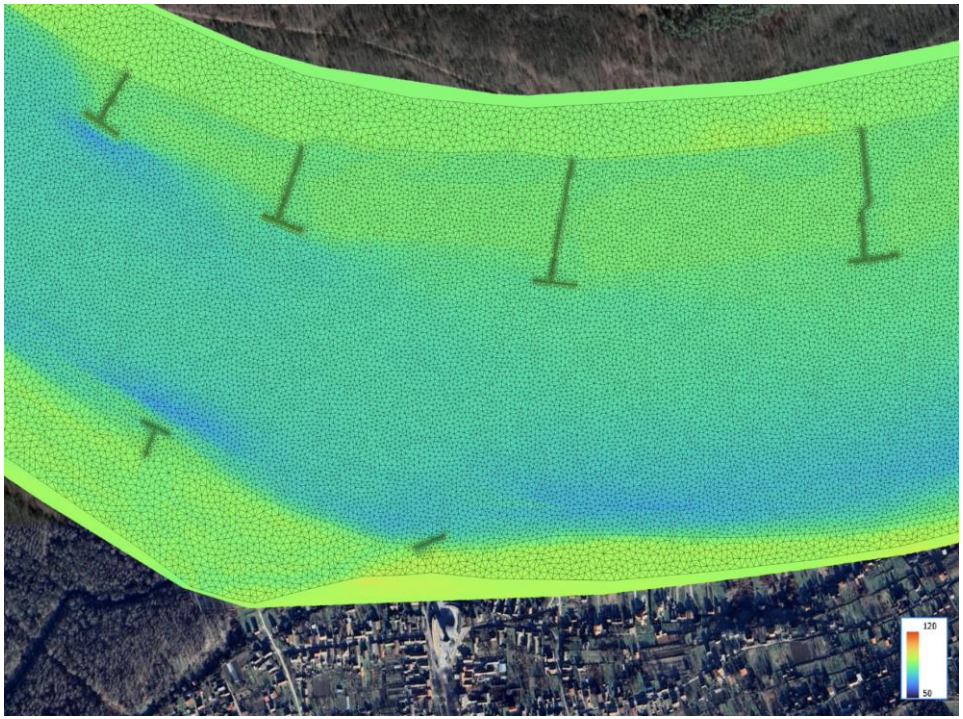
Activity 4 - Task 04-01 - Data Collection

- The existing dataset for the model has been supplemented with project documentation provided by Plovput
- Based on this documentation, a digital riverbed model has been updated
- This completes the set of input data
- Task 04-01 is finalized

Activity 4 - Task 04-02 - Model Setup

- Software used for the modeling is Basement 2D
- Steps in model setup include the following:
  - Creation of the DTM
  - Development of the computation grid which results in the computational geometry
  - Setting of the model parameters
- The digital model of the riverbed (with the computational grid) for the Aljmaš section can be seen at the Figure 1
- Task 04-02 is finalized

Figure 1: The digital model of the riverbed in the Aljmas section with the computational mesh.



Activity 4 - Task 04-03 - Model Calibration

- Steps in the model calibration include iterative setup of model parameters to match the results of available measurements:
  - Measured flow velocities
  - Suspended sediment distribution
  - Bathymetric measurements from September 2023
- Task 04-03 is finalized

Activity 4 - Task 04-04 - Model Verification

- Steps in the model verification include control confirmation of model parameters to match the results of data set available for the verification:
  - Measured flow velocities
  - Suspended sediment distribution
  - Bathymetric measurements from May 2023
- Model verification is limited by the availability of data for the verification
- Task 04-04 is finalized

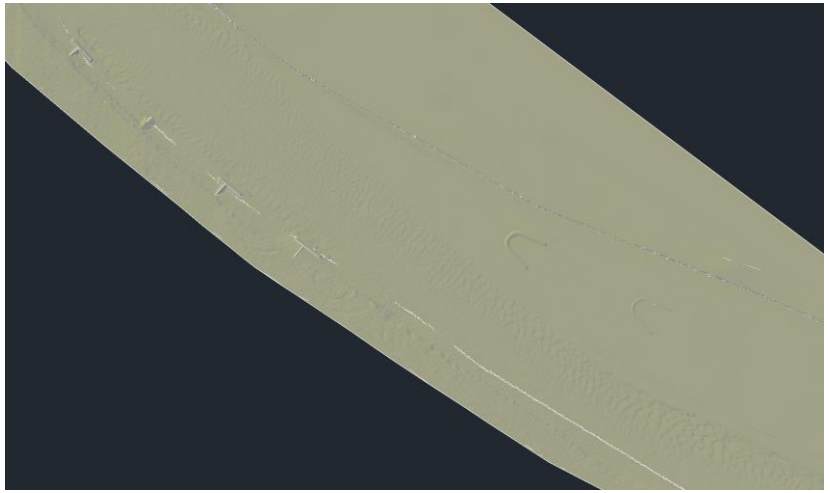
Activity 4 - Task 04-05 - Definition of Variants for each Bottleneck

- Four scenarios are defined:
  - Scenario 1: Do nothing
  - Scenario 2: Structural and revitalization measures (2 chevrons, 3 sills (Apatin), 2 sidearm openings (Civutski Rukavac and Aljmas))
  - Scenario 3: Navigational fairway realignment
  - Scenario 4: Full structural intervention (2 chevrons, 4 sills (Apatin), 1 groin (Civutski Rukavac), 4 sills (Staklar))
- Task 04-05 is finalized

Activity 4 - Task 04-06 - Preparation of Model for Considered Variants

- Figure 2 shows the model representation of chevrons
- Figure 3 presents the simulation results of the flow calculation for the “do nothing” scenario (Scenario 1) at the mean flow rate
- The results of this simulation serves as the initial condition for the sediment transport model
- Task 04-06 is finalised

Figure 2: The terrain model for the scenario 2 (two chevrons analyzed as proposed measures)



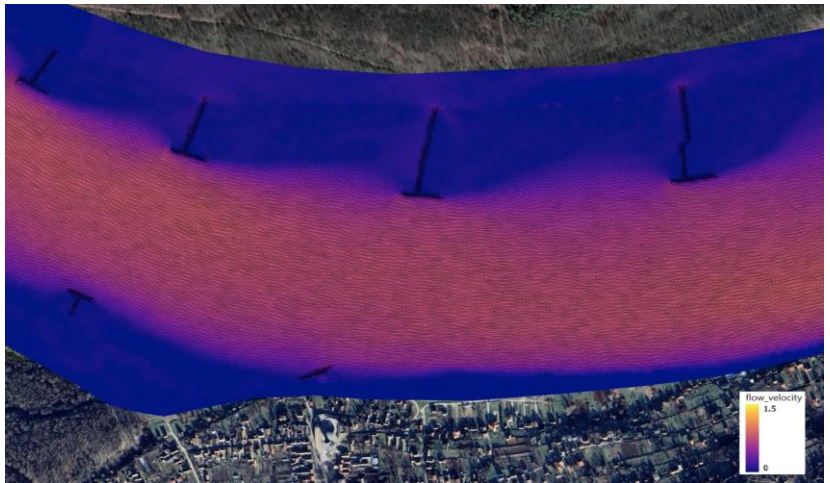


Figure 3: A computationally obtained representation of depth-averaged flow velocity vectors under mean flow conditions (Aljmas sector)

Activity 4 - Task 04-07 - Analysis of Results

To be detailed in the presentation of Mr. Rosic

Task 04-07 is dominantly finalised

Activity 4 - Task 04-08 - Application of MCA

To be detailed in the presentation of Mr. Rosic

Activity 4 - Task 04-09 - Elaboration of the Technical Report on 2D Modeling and Application of MCA

First Draft report on 2D modeling delivered on 28.04.2024

Finalization of Technical Report on 2D Modeling and Application of MCA will be detailed in the presentation of Mr. Rosic

Activity 4 overview

Output 04-01 - 2D Model Calibrated and Running - Finalized

Output 04-02 - Bottlenecks Scenarios Defined - Finalized

Output 04-03 - Technical Report on 2D Modeling and Application of MCA – partially finalized

Activity 5

Output 05-01 - Integrative study on alternative solutions – in progress

To be elaborated according to the ToR:

- 1D hydraulic modelling;
- Defined critical sectors for navigation;
- Prioritized critical sectors for navigation;
- Criteria of the mutually agreed multi-criteria analysis;
- Alternative solutions;
- Results of 2D modelling of alternative solutions;
- Application of the multi-criteria analysis;
- Elaboration of favorable selected solutions;
- Environmental aspects;
- Addressing the climate change issue;
- All activities of the Stakeholders' Forum in all phases of the process.

Next steps

- Finalization of the Tasks 04-07, 04-08 and 04-09
- Continuation and finalization of the Activity 5 – Elaboration of an integrative study on alternative solutions

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Thank you for your kind attention

07/05/2025, on-line

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Q&A