Institute for Hydraulic Engineering and Hydrometry

Federal Agency for Water Management

Laboratory of Hydraulics, Hydrology and Glaciology

ETH zürich VAW

River Alpenrhein – Morphological model tests

Client: Internationale Rheinregulierung

Internationale Rheinregulierung

Initial situation:

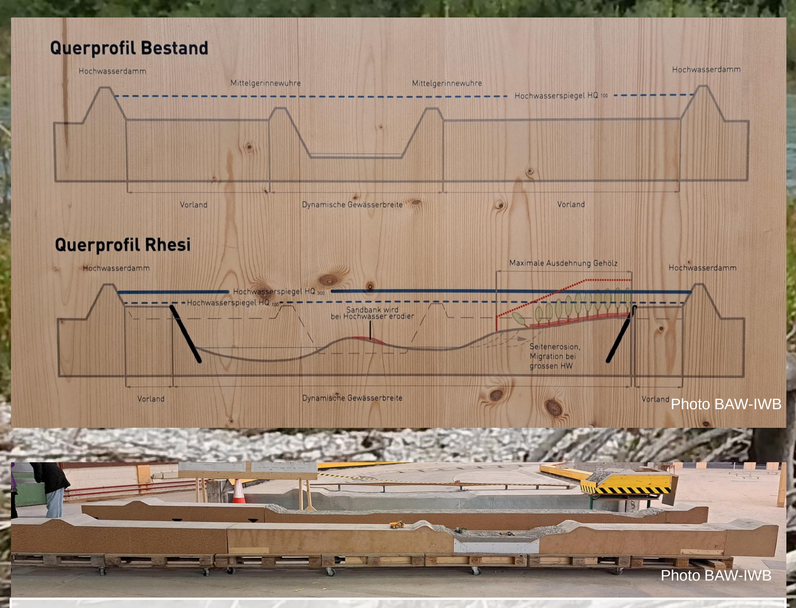
- Improvement of flood protection (from 4,300 m³/s compared to 3,100 m³/s at present), among other things, through significant widening of the riverbed from approx. 70 m today to approx. 380 m in the future.

Questions (selection):

- Determination of scour depths for the design of bank protection
- Morphology of the river Rhine (scours, banks, branches) in the planned target state
- How can the Rhine develop as self-dynamically as possible towards the target state (initial measures)?

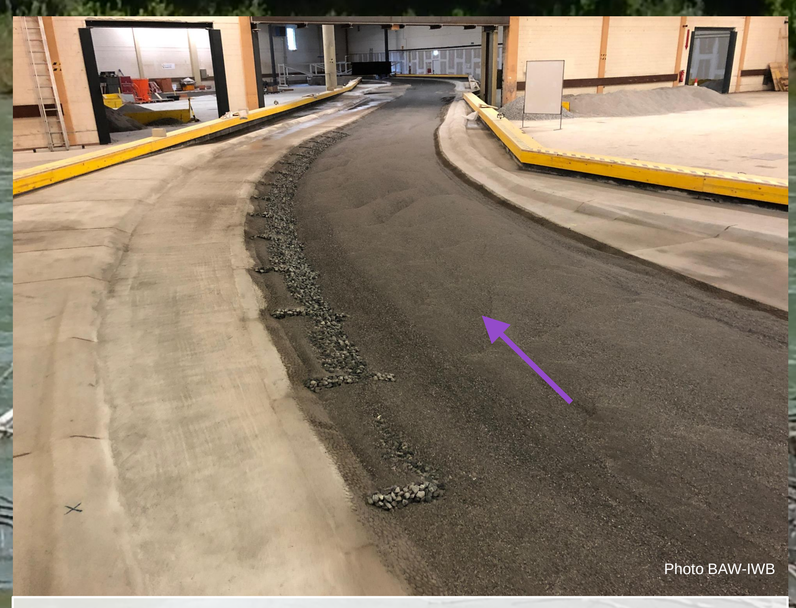
3 model experiments, each on a scale of 1:50:

- Present geometry of the river Rhine in the section Wiednau / Höchst (calibration of the model)
- Widening of the Rhine according to the planning in the section Wiednau / Höchst (morphology, bank protection)
- Measures for the self-dynamic widening of the river Rhine in the Oberriet / Koblach section



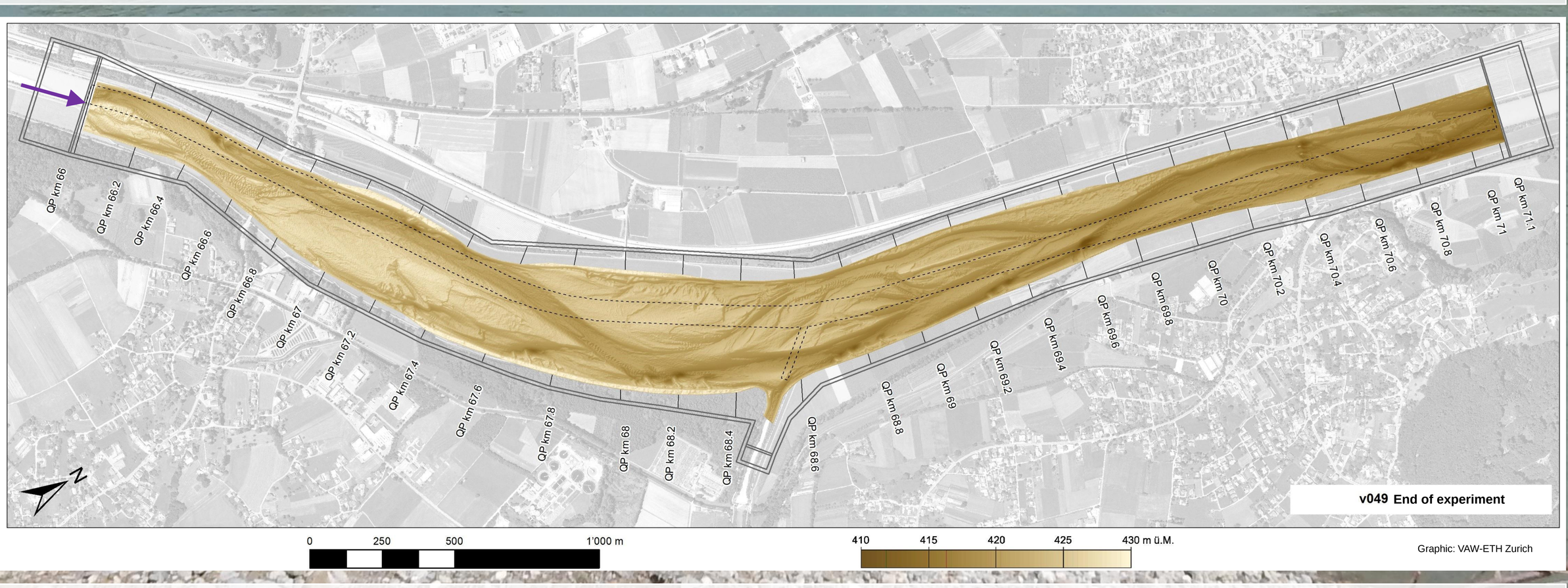
Planned widening (drawn and sections from model test)

Morphology and scour of bridge piers (without debris accumulation)



Development of bank protection in the narrow bend near Au-Lustenau

Self-dynamically developed morphology of the Rhine in the section Oberriet / Koblach, starting from three construction stages with initial measures, mainly consisting of side channels, gravel deposits and groynes



Key results:

- Design of bank protection in areas subject to particularly high stress.
- Information on scour depths for the design of bank protections in sections outside the model tests.
- Effect of initial measures for the self-dynamic widening of the Rhine.

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