WATER MANAGEMENT CONCEPT DORNBIRNERACH

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PRESENTATION OF THE PROBLEM

The reason to provide a Water Management Concept for the catchment area of the Dornbirnerach (215 km²) arose from the structural problems concerning waters in this region.

- Flood control: The existing deficiencies were clearly shown flood events the last years.
- Ecology: The catchment area of the Dornbirnerach is covered by a widely spread net of waters often lacking any natural base. Some valuable surfaces of the vicinities of the waters should be connected with the waters more efficiently.
- Bed-load: Partial problems concerning its transport do appear, for example fine material in the shallow sections of the Dornbirnerach.

PURPOSE

These various interdisciplinary aspects should be coordinated to achieve the greatest possible use for all affected persons in the catchment area of the Dornbirnerach. The project was divided into four stages of work, altogether covered by 13 activity packages. The most important of these activity packages were: hydrology, hydraulics, sediment budget, hydraulic structures, space claims, preservation of nature and landscape, ecology of waters, general orientation, activity program, and digital final project.

RESULTS

The hydraulic calculations were executed with a numeric 2d simulation model. In this way the complex flow at overflow sections, reverse flows, confinements and particularly the retention effect in the foreland could be registered transiently. Besides the HQ5, HQ30 and HQ100, also the HQ300 was examined for the waters management concept to estimate the residual risk. The planning of measures was executed in consideration and integration of the affected municipalities, authorities, to representatives of the nature protection and the fishery, in order to reach a high grade of acceptance.

All hydraulically relevant measures were examined with special regard to their effect on the downstream areas. The engineers tried to find alternatives to the recurring clearance of the strong deposits of fine material out of the riverbed. However, conclusion of the waters management concept was that there is no useful alternative. The main attention was not only paid to the protective hydraulic structures directly at the water, but also on the management of the joint planes. This means that existing inundation of the agricultural areas will still be used as a retention space prospectively. Altogether 150 measures have been worked out and classified by priority by means of an analysis. Finally all results have been incorporated into a geographical information system.

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RESULTS OF HYDRAULIC CALCULATIONS (WATER DEPHTS)

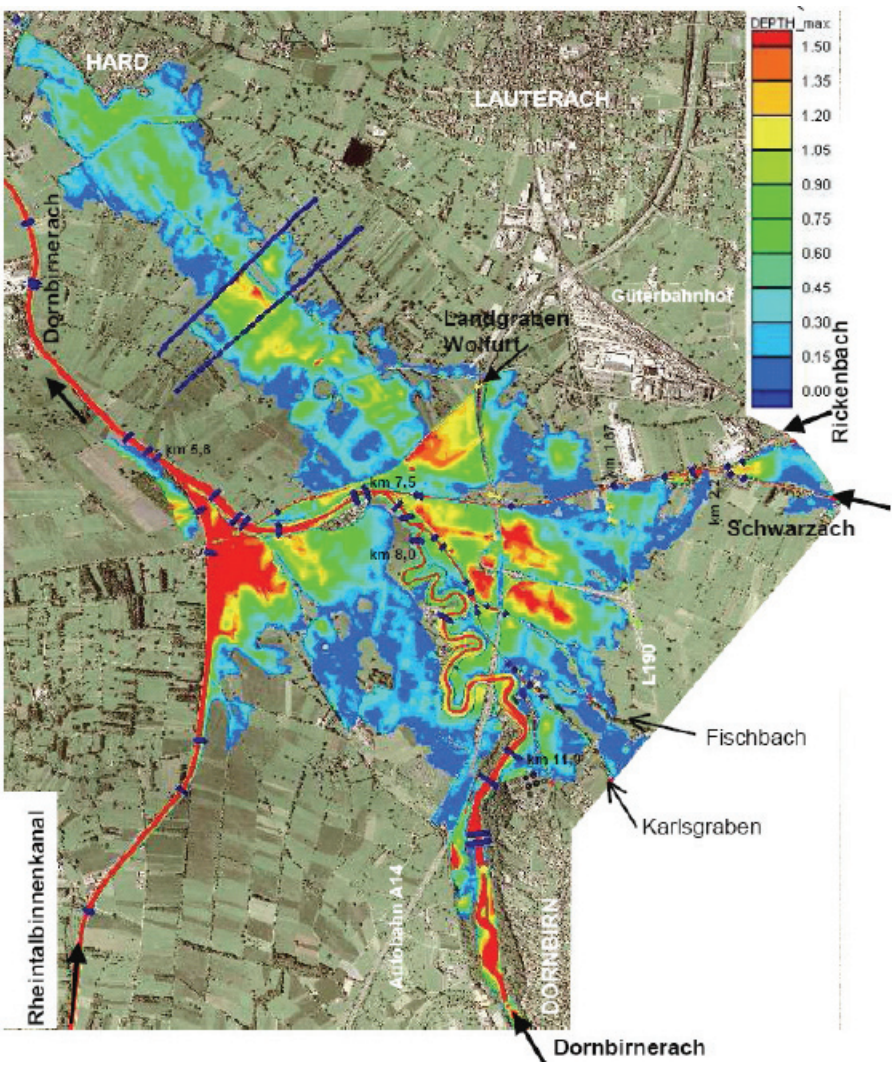

Fig. 1: Image of wide agriculturally used inundation areas, which should be kept as retention areas in the future.

CONCLUSION

The hydraulic calculations have been the biggest expenditure. At first, this expenditure was strongly underestimated and so the originally tight schedule had to be extended for approximately six months. The time involved for elaboration was very high, not only for the instructed engineer's offices, but also for all others who were constantly integrated into the planning process at road shows. Therefore extensive documents, containing important watereconomic and ecological information, are available to various prospective interested parties. Now the inundation maps represent an important foundation not only for water management but also, for example, for the regional fire brigades.

The positive experiences initiated other water management concepts. In 2007 people started to work on the concept for the Ill and in 2008 a water management concept for the Bregenzerach should start. If these are concluded, Vorarlberg will have important water-economic bases for all its main waters.

Keywords: water management concept, universal strategy, planning of measures