

# FLOOD CONTROL ILL-GÖFIS, RETENTION AREA SCHILDRIED

Martin Netzer<sup>1</sup>

After the floods of 1999 and 2000 the settlement Göfis Schildried was inundated again in August 2005 and took away severe damage. This was caused by intense rain in the catchment area of the Ill, which measures 1400 km<sup>2</sup>. The total daily precipitation occurred to sum up to 230 mm within 24 hours and exceeded the local maximums at several monitoring stations which have taken records since the end of the 19<sup>th</sup> century. A peak discharge of 700 m<sup>3</sup>/s was recorded in the Ill. During the flood of 1999 it was about 550 m<sup>3</sup>/s, which as well was the highest value ever recorded until then.

The precautions made in 2002 including the embankment of the settlement as well as the installation of a pumping station, represented a protection of the existing values. In the ruling of the district authority Feldkirch they were entitled as temporary measure, and never meant to be made for a flood like the one that took place in 2005. In the meantime people worked on



the flood control concept, its implementation was decided and the permit process was induced.

After the flood of 2005 it had to be expected that there will be even larger events than the design flood event which was the indication of the new river training concept that had currently just been finished. The settlement could only be made secure by severe technical measures, and it's a fact that any flood control facilities like embankments and pumping stations still include a high remaining risk.

**Fig. 1** Schildried during the flood of 2005.

Immediately after the flood the situation was discussed by the affected residents of Schildried, the governor Dr. Sausgruber, other members of the government of Vorarlberg as well as some representatives of the municipality Göfis. They decided that the residents of Schildried should be resettled to other places, the houses would be removed and the area will further be used as a retention area. Decisive was the endangerment of human lives implemented by the risk of limited security of the protection buildings against natural disasters when exceeding the design event. To prevent social hardships or compromised existential backgrounds, each

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<sup>1</sup> Projektleiter, Amt der Vorarlberger Landesregierung, Abteilung Wasserwirtschaft, Josef-Huter-Straße 35, A-6900 Bregenz, Österreich (Tel.: +43-5574-511-27479; Fax: +43-5574-511-927495; email: martin.netzer@vorarlberg.at)

individual situation of the owners was handled separately. Besides the estimated transfer fees, the responsible body held out the prospect of some special money out of public donations. Different banks as well as the residential building support position achieved an agreement on propitious loans for the affected citizens. The following months were shaped by intense conversations within the representatives of the government and the residents to accomplish complete transfer contracts.



**Fig. 2** Schildried after the flood of 2005

The water constructions support act was the legal background for the financial support. § 26 expresses that as long as the expenses for the river training measures exceed the transfer costs



**Fig. 3** Schildried: pulling down of the houses 2006

for the objects and properties at risk, these costs can be supported as well. The results of the cost-benefit analysis can be subsumed to the fact that the decision to resettle the residents of Schildried is also the best solution from the economic point of view. The area was taken over into public water property and devoted into a retention area by the government of Vorarlberg and the municipality Göfis. After the certification of the essential demolition permits, the buildings were torn down during the summer of 2006.

Only the inhabitants of two buildings at the base of the slope couldn't be convinced of the signification of the resettlement. After obtaining the essential authorizations concerning the law of conservation of nature, the water law and the forest law, a 400 m wide embankment surrounding these two buildings as well as a drinking water well was constructed. They also installed a drainage system for the hinterland. The new top of the embankment including the freeboard guarantees safety up to HQ 300. Previously numerous infrastructural facilities like culverts, sewer tunnels and other supply lines as well as a voltage transformation substation had to be replaced. Bridge buildings respectively power line poles situated in the retention area were protected against undermining. The road between Göfis and Frastanz is not the only possible approach to Göfis, a fact that makes a short term flooding of the road every 5 years tolerable. The area surrounded by the former embankment amounts approximately 3.2 ha. About 95000 m<sup>3</sup> retrieved retention capacity supports the passive flood control. The construction work was finished in the summer of 2007. The transfer costs for the buildings and the properties, and the construction of the retention area required a total amount of € 4.8 Mio.

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