

Operation of gauging stations, discharge measurements and determination of infiltration for the catchment area of the waterworks „Burgdorfer Holz“

Client: Wasserverband (Water Board) Peine (WV Peine)

Location: Peine, Germany

Scope of work: Migration of historical records into a hydrological *WISKI**-database for the catchment, including the setup of new gauging stations

Method: discharge measurements, determination of exact rating curves, long-term evaluation of all available data

INTRODUCTION

To secure the drinking water supply for the region of Hanover, the WV Peine applied for the right to extract water in the Waterworks (WW) Burgdorfer Holz from the Seebeeke aquifer before the water authorities in 2010. Our company was responsible for the evaluation of the historic and long term hydrological records of the Seebeeke and the determination of infiltration rates in the catchment.

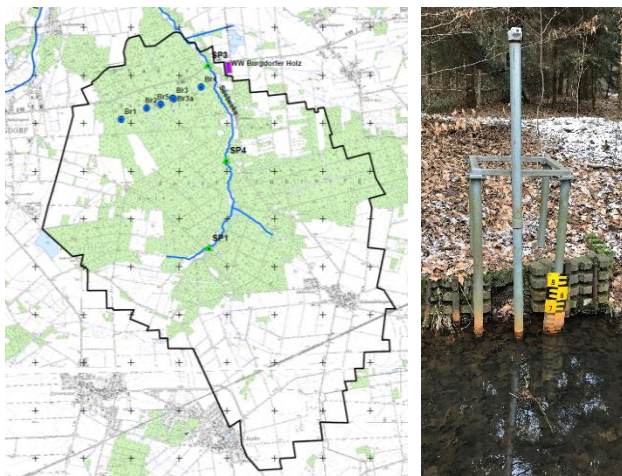


Fig. 1: Catchment area and wells of the WW Burgdorfer Holz (left) and well SP1 at the upper section of the Seebeeke (right)

METHOD

For this purpose, old water level records of the catchment (1961-2015) were transformed into digital data. This was the basis for the determination of detailed rating curves and infiltration estimates.

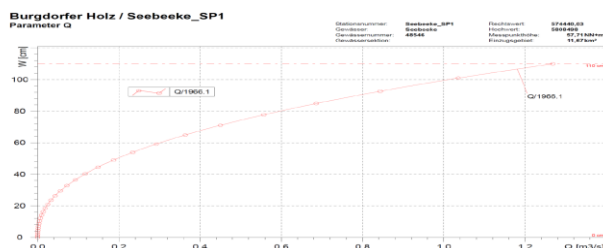


Fig. 2: Rating curve for the Seebeeke

RESULTS & CONCLUSIONS

With the historical data we could demonstrate that the Seebeeke also fell dry prior to the ground water extraction. The infiltration of water from the Seebeeke into the ground water aquifer is insignificant.

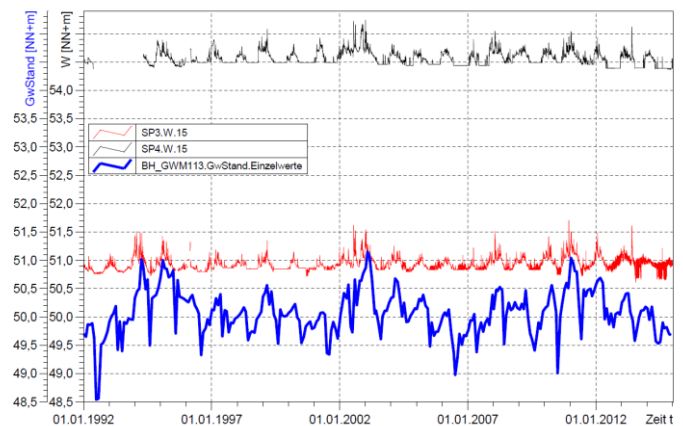


Abb. 3: Verhältnis von Oberflächengewässer zu Grundwasserstand

Our detailed ADCP measurements show that the infiltration from the Seebeeke into the groundwater aquifer is restricted to a very short period.

The analysis of discharge dynamics also shows that the inflow from upstream is critical, especially during the summer months - it is not sufficient to maintain low flow. Therefore, the Seebeeke falls dry several times during the summer period. A considerable part of the Seebeeke catchment is underline by an impermeable layer and hence is not in contact with the groundwater aquifer. Consequently, a recharge of discharge from the groundwater is not possible.

*hydrological database & software for statistical evaluation by the company Kisters