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Arbeitsbericht NAB 19-02

Quaternary Borehole QBO Gebenstorf-Brüel (QGBR)

Data Report

August 2019

National Cooperative
for the Disposal of
Radioactive Waste

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1 Introduction

In the context of the sectoral plan "Sachplan geologische Tiefenlager" (SGT) Nagra is currently investigating three sites (Jura Ost, Nördlich Lägern, Zürich Nordost) in northern Switzerland to potentially host repositories for radioactive waste. The field exploration project "Quartär untersuchungen" (QAU) is dedicated to the characterisation of Quaternary deposits in and around these siting regions to further constrain scenarios of their geological long-term evolution. The investigations support the reconstruction of Quaternary landscape evolution.

The borehole (Quartärbohrung, QBO) at Gebenstorf-Brüel (QBO Gebenstorf-Brüel / QGBR, Tab. 1) is part of this Quaternary investigation program (QAU; compare Nagra 2017). The drill site at Gebenstorf-Brüel is located close to the southern end of the Gebenstorf-Stilli Trough. It was chosen to characterize the geometry and infill of this glacially overdeepened section of the Lower Aare Valley. Today, the study area is characterized by the confluence of Aare, Reuss and Limmat, and the transition between the Folded and Tabular Jura (Fig. 1, Fig. 2; Bitterli-Dreher et al. 2007, Graf 2009). The drilling was conducted between 09.07. and 04.09.2018 in combination of pile-drive coring using a Düsterloh Hammer and wireline drilling with a tripletube core barrel, i.e. with a plastic core liner.

This report covers the request for a documentation of the authorized works (UVEK 2018, Dispositiv 5.14) and documents also the first results of the lab analyses (UVEK 2018, Dispositiv 5.15). The works on-site described in the work program ("Arbeitsprogramm", Nagra 2018) have been carried out. This report corresponds to the data report that was announced in this work program.

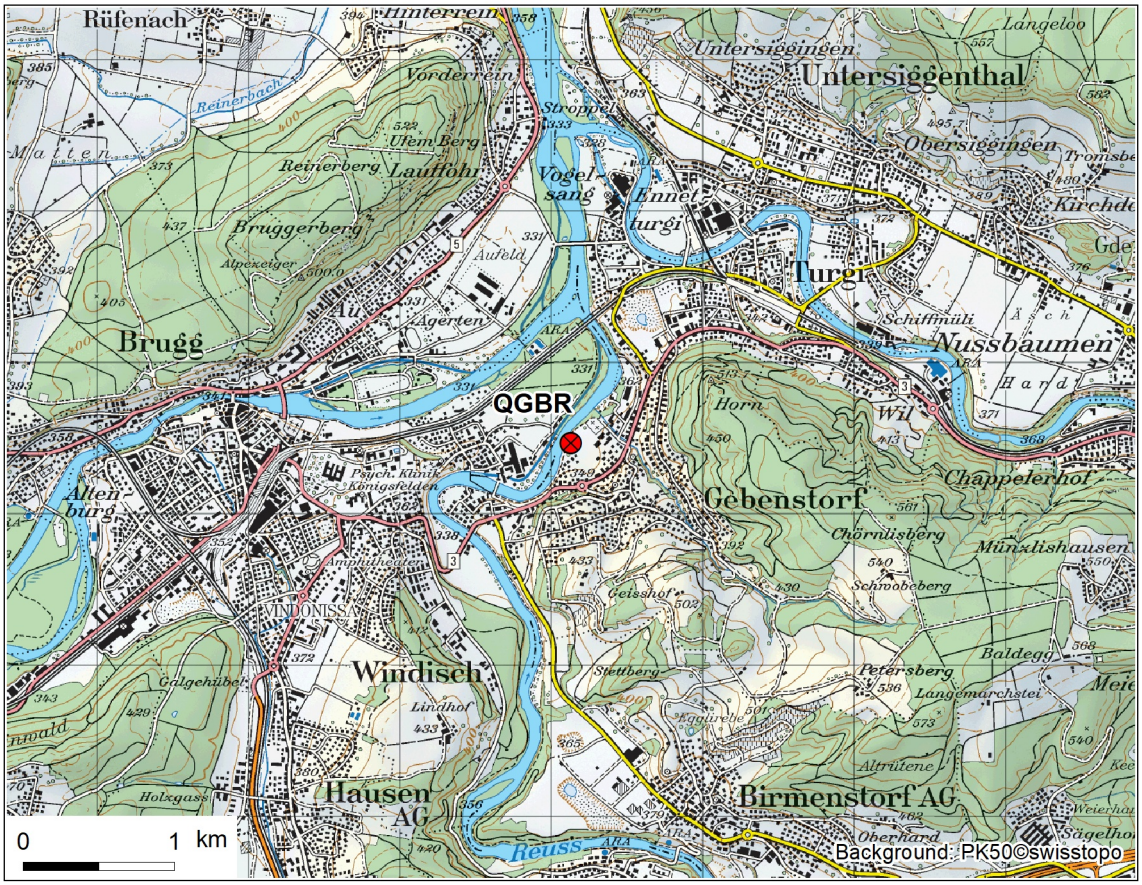

Fig. 1: Location of the Quaternary borehole Gebenstorf-Brüel (QGBR)

In this report, we present core images, sedimentological descriptions, and geophysical measurements of the cores, all of which were acquired at the University of Bern. Additionally, a borehole geophysical report of BLM Gesellschaft für Bohrlochmessung and R. Garrard (Nagra) and a technical report of Fretus AG and P. Hinterholzer-Preisegger (Nagra) are presented in appendices H and I, respectively. This report is the basis for planning further core analysis and later interpretation in the larger geological context.

Fig. 2: Detailed location of the Quaternary borehole Gebenstorf-Brüel (QGBR)

Tab. 1: Key data of the Quaternary borehole Gebenstorf-Brüel (QGBR)

Coordinates	2'660'131.12 E, 1'259'468.39 N
Elevation (m a.s.l.)	337.27
Depth (m b. ground)	123.5