Mont Terri Rock Laboratory

Field report: October 5-18, 2020 (Phase 26)

Distribution
Authorities
Swisstopo: P. Bossart, O. Lateltin
BfE (CH): M. Stauffer, Ph. Schaub
EC: Ch. Davies

Delegates of the Project Partners
ANDRA: E. Huret
BASE: A. Liebscher
BGE: M. Wengler
BGR: D. Rebscher
CHEVRON: R. Ewy
CRIEPI: S. Yokoyama
DOE: J. Birkholzer
ENRESA: J.C. Mayor
ENSI: M. Herfort
ETH: R. Kipfer
FANC: F. Bernier
GRS: K. Wieczorek
Helmholtz: M. Kühn
IRSN: J.-M. Matray
JAEA: Y. Sugita
NAGRA: O. Leupin
NWMO: L. Kennell-Morrison
Obayashi: T. Shimura
RWM: S. Thompson
SCK•CEN: C. Bruggeman
Swisstopo: A. Möri
TOTAL: A. Brisset

Principal Investigators and Experiment Delegates of Phase 26 experiments

Supporting Research Organisations
Paul Scherrer Institute PSI: S. Churakov, Th. Gimmi, M. Glaus, L. van Loon
EPFL: L. Laloui, R. Bernier-Latmani, B. Lecampion, M. Violay
SHELL: N. Kampman, K. Bisdom

Project Management
Swisstopo: C. Nußbaum (Project Manager), T. Theurillat (Site Manager), S. Schefer (Dep. Site Manager), D. Jaeggi (Research Associate)
GGT: F. Burrus (Project Engineer), Th. Küttel, R. Daneluzzi
PF (Progressive Rock Mass Failure and Overbreak Sealing) experiment

- On Monday, October 5, H. Gutgesell and H.W. Sassmanshausen (Schützeichel) installed the PF lining in borehole BPF-7 (Figure 1).
- From Monday to Friday, M. Ziegler (ETHZ) finished to build and settle the photogrammetric system inside BPF-7 (Figures 2 & 3).
- On Wednesday, October 7, M. Rahn (ENSI) made a surprise visit to the rock lab and with the help of S. Chatelain, P. Steiner and C. Nicaty (swisstopo) took three samples of core BPF-3 (Figure 4).

SW-A (Large-Scale Sandwich Seal in Opalinus Clay) experiment

- On Monday, October 5, S. Zejeri, D. Durmisi, E. Cossnig (VSH) and J. Zambetti (D’ANDREA SA) installed the pressure chamber in shaft BSW-A1 (Figure 5).
- On Tuesday, H. Gutgesell and H.W. Sassmanshausen (Schützeichel) cut and adjusted the steel mesh and installed a ladder to safely reach the bottom of shaft 1 (12.18 m). Lights were also installed.
- On Wednesday, F. Köringer (KIT) and T. Theurillat (swisstopo) tested the insertion of TDR probe rods in a BSW-A1 core. This device will be used during the Sandwich experiment in order to measure the humidity of the rock (Figure 6).
- On Monday, October 12, A. Eul, H. Gutgesell and H.W. Sassmanshausen (Schützeichel) installed the drill rig above shaft 2 (BSW-A2) and by Friday, October 16, drilled down to 3.5 m.
- From Tuesday to Thursday, October 13-15, T. Tietz, U. Nowak and F. Schulte (BGR), installed seismic receivers in shaft BSW-A1, and characterized the EDZ. They were measuring during times with no drilling (Figure 7).
- On Thursday, October 15, C. Fixar and D. Nowotny (BGR) installed the ERT-equipment inside BSW-A1 (Figure 8) and on Friday started the first measurements. They will continue next week.

CS-A (Well Leakage Simulation & Remediation) experiment

- On Monday, October 5, P. Steiner and C. Nicaty (swisstopo) performed geodesic measurements to determine the height of the top of the gallery (Figure 9). A lot of space is required to remove the instrumentation in borehole BCS-A1 in one piece! They measured over a thousand points and compared them with a newly made photogrammetric model of the same area for quality control.

Varia

- On Tuesday, G. De Santa and J. Faehendrich (Inelectro SA) together with T. Theurillat and S. Schefer (swisstopo) evaluated improvements and fixed some flaws of the experiment alarm system in the lab.
- Important information: The COVID-19 travel restrictions in many countries are changing from week to week. Make sure to check your arrangements when coming to Mont Terri before leaving home!

C. Nussbaum and S. Schefer, October 18, 2020
<table>
<thead>
<tr>
<th>Visits</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fri</td>
<td>09.10.2020</td>
<td>Bundesamt für Bauten und Logistik BBL</td>
<td>10</td>
<td>R. Nicol</td>
</tr>
<tr>
<td>Sat</td>
<td>10.10.2020</td>
<td>Cerf / Nicol families</td>
<td>11</td>
<td>R. Nicol</td>
</tr>
<tr>
<td>Mon</td>
<td>12.10.2020</td>
<td>Swisstopo</td>
<td>2</td>
<td>R. Nicol</td>
</tr>
<tr>
<td>Tue</td>
<td>13.10.2020</td>
<td>Association of retired employees ABB, Baden</td>
<td>29</td>
<td>H. Hauser, R. Nicol</td>
</tr>
<tr>
<td>Wed</td>
<td>14.10.2020</td>
<td>Huggenberger AG, Daniel Naterop</td>
<td>8</td>
<td>D. Jaeggi</td>
</tr>
<tr>
<td>Thu</td>
<td>15.10.2020</td>
<td>Folio Magazine, Monika Bachmann</td>
<td>2</td>
<td>C. Nussbaum</td>
</tr>
<tr>
<td>Sat</td>
<td>17.10.2020</td>
<td>Group Franziska Grossen</td>
<td>12</td>
<td>H. Hauser</td>
</tr>
</tbody>
</table>

**Figure 1: PF:** Installation of the PF lining by Schützeichel (Photo: T. Theurillat, swisstopo).
Figure 2: PF: M. Ziegler (ETHZ) making adjustment on the photogrammetric system within the steel casing (Photo: C. Nicaty, swisstopo).

Figure 3: PF: The finished installation of the photogrammetric system inside BPF-7 (Photo: C. Nicaty, swisstopo).
Figure 4: PF: M. Rahn (ENSI) and S. Chatelain (swisstopo) collecting a sample on a monitoring borehole’s core (Photo: C. Nicaty, swisstopo).

Figure 5: SW-A: Preparation for the pressure chamber cementation (Photo: T. Theurillat, swisstopo).
**Figure 6:** SW-A: F. Königer and T. Theurillat testing a TDR probe on BSW-A1 drilling cores (Photo: P. Steiner, swisstopo).

**Figure 7:** SW-A: T. Tietz (BGR) during the installation on the rope in shaft 1 (Photo: S. Schefer, swisstopo).
Figure 8: SW-A: D. Novotny and C. Fixar during the safety instructions for the shaft work (Photo: S. Schefer, swisstopo).

Figure 9: CS-A: P. Steiner (swisstopo) measuring over 1000 points with the tachymeter for the quality control of the photogrammetric model (Photo: C. Nicaty, swisstopo).