Mont Terri Rock Laboratory

Field report: November 8–14, 2021 (Phase 27)

CD-A (Influence of Humidity on Cyclic and Long-Term Deformations) experiment
- On Wednesday, C. Oreja (ATB SA) measured the convergences in the Twin Niches.
- On Wednesday, G. Pomar and J. Oviedo (Amberg) improved the sealing of the suction probes in the Twin Niches.
- On Wednesday, J. Gisiger and A. Ammon (Solexperts) performed maintenance work.

CS-E (Mini-Fracturing and Sealing) experiment
- On Friday, A. Rinaldi and L. Passarelli (ETHZ) emptied borehole BCS-D4 from the water used for the sparker during the last measuring phase. With the help of S. Gremlich and S. Schefer (swisstopo) they removed the seismic receivers from BCS-D5 and re-assembled the string for next week’s insertion into BCS-D4 (Figure 1).

DR-E (Long-term Diffusion in Fault Zone) experiment
- On Thursday, R. Wüst, O. Leupin (Nagra), D. Jaeggi and S. Schefer (swisstopo) scouted the locations for the drilling campaign. The aim will be to penetrate the Main Fault and test the properties of the fault with respect to iodide diffusion.

FE-G (Monitoring the Gas Composition within the FE Experiment) experiment
- On Thursday and Friday, Y. Tomonaga (Entracers GmbH) performed a gas sampling at the FE experiment. Samples were collected from all gas sampling ports within the FE drift as well as from the FE niche (Figure 2). He was joined on Friday by T. Guillelmo and E. Stopelli (Nagra)
- On Friday, S. Giroud and M. Capucine (EAWAG) were on site to remove the miniRuedi and take it back to EAWAG for maintenance work after four years of constant analyses.

FE-M (Long-Term Monitoring of the Full-Scale Emplacement Experiment) experiment
- On Wednesday, J. Gisiger and A. Ammon (Solexperts) performed TDR measurements.

FS-B (Imaging the Long-Term Loss of Faulted Host Rock Integrity) experiment
- From Monday to Tuesday, D. Rebscher (BGR) installed one additional platform tiltmeter in front of the door of the Niche MA to densify the network around the injection and to investigate the influence of the niche geometry on the tilt signals.
- From Monday to Friday, Y. Guglielmi and F. Soom (LBNL) prepared the next phase of the experiment. They prepared the deployment of the DORSA probe into BFS-B1 and replaced the injection line in BFS-B2 with a steel line.
- From Monday to Friday, M. Robertson (LBNL) is setting up the background recording of the DAS and DTS optical fibres and performed maintenance on the entire fibre-optic measurement system. (Figure 3)
- On Tuesday and Wednesday, S. Gremlich and S. Schefer (swisstopo) helped to empty boreholes
BFS-B1, BFS-B2, BFS-1, BFS-2 and BFS-3, sampled the water and performed camera inspections (Figure 4).

**GT (Gas Transport Models and the Behavior of OPA to Gas Pressure) experiment**
- On Wednesday, J. Gisiger and A. Ammon (Solexperts) performed maintenance on the data acquisition system.

**HE-E (In-Situ Heater Test in VE Microtunnel) experiment**
- On Wednesday, J. Gisiger and A. Ammon (Solexperts) performed maintenance work.

**HS (Hydrogeological Survey of the Mont Terri Anticline) experiment**
- On Wednesday, J. Gisiger and A. Ammon (Solexperts) performed maintenance work and checked the packer/interval pressures.

**HT (Hydrogen Transfer in Opalinus Clay) experiment**
- On Monday, Wednesday and Friday, T. Theurillat (swisstopo) took two water samples.

**PF (Progressive Rock Mass Failure and Overbreak Sealing) experiment**
- On Thursday, M. Ziegler, T. Theurillat, V. Regard and S. Gremlich (swisstopo) removed the permanent acoustic sensors from the monitoring boreholes to prepare next week’s cross-hole seismic measurements (Figure 5).

**SM-C (Permanent Nanoseismic Monitoring) experiment**
- From Monday to Friday, D. Rebscher (BGR) installed 3 additional platform tiltmeters in Ga98 close to the hydrostatic levelling system (HLS). These tiltmeters will allow the comparison with the data measured by the HLS.

**SW-A (Large-Scale Sandwich Seal in Opalinus Clay) experiment**
- On Wednesday and Thursday, G. Pomar and J. Oviedo (Amberg) put all remaining cables from downhole shaft sensors into resin filled boxes. This will tighten the sensors and allows for an increased injection pressure. It is planned to resume pressurized injection beginning of next week.

**Varia**
- On Thursday, the national “future day” allowed children of the age 11-12 to visit their parent’s workplace. It was a pleasure showing these little scientists around… (Figure 6).

**Visits**

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D. Jaeggi and S. Schefer, November 14, 2021
Figure 1: **CS-E:** A. Rinaldi and L Passarelli removing the seismic sensors from BCS-D5 (Photo: S. Schefer, swisstopo).

Figure 2: **FE-G:** Y. Tomonaga taking gas samples (Photo: S. Schefer, swisstopo).
Figure 3: FS-B: M. Robertson has found the problem on the fibre! (Photo: S. Schefer, swisstopo).

Figure 4: FS-B: Emptying BFS-B1 (Photo: V. Regard, swisstopo).
Figure 5: **PF:** Preparing next week’s cross-hole measurements (Photo: V. Regard, swisstopo).

Figure 6: **Varia:** O. Leupin explaining CO$_2$-storage to the next generation scientists during the “future day” (Photo: S. Schefer, swisstopo).