



# Challenges for geomechanical laboratory analyses of claystones with regard to the time frame of the site selection process

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**Abstract.** The current programme for the site selection process in Germany schedules 11 months for geomechanical laboratory tests per potential future site (BGE, 2022). For the laboratory analysis of rock salt, this time frame seems realistic as no hydromechanical coupling has to be taken into account. In the case of a crystalline basement, the intact rock matrix is low permeable, but transport processes are dominated by ubiquitous fracture networks, which are hard to capture in laboratory settings. Thus, the effect that hydromechanical coupling in low permeable rock has on the speed of laboratory measurements will probably be no problem. However, for claystones, the geomechanical processes within the rock matrix strongly depend on the hydromechanical coupling, which thus determines the speed with which, for example, loading ramps can be applied in the laboratory. The need to maintain the pore pressure equilibrium during the experiments in order to know the acting effective stresses slows down the speed of the measurements significantly. Given the tight time frame of 11 months and the numerous parameters which have to be analysed according to law (StandAG, 2017), the low speed with which the experiments can be performed represents a severe hindrance. It is thus important to establish measurement protocols which enable the simultaneous determination of several parameters in order to save time. Based on our experience with experiments on Opalinus Clay, we offer a first idea of how such a measurement protocol could look and would like to invite a discussion on how to optimise experiments on claystones further in order to have a chance to meet the very tight time frame required by the site selection process.

## References

- BGE: Zeitliche Betrachtung des Standortauswahlverfahrens aus Sicht der BGE, Rahmenterminplanung für Schritt 2 der Phase I bis zum Vorschlag der Standortregionen und zeitliche Abschätzungen für Phase II und III, Bundesgesellschaft für Endlagerung mbH (BGE), Stand 16 December 2022.
- StandAG: Standortauswahlgesetz vom 5. Mai 2017 (BGBl. I S. 1074), das zuletzt durch Artikel 1 des Gesetzes vom 7. Dezember 2020 (BGBl. I S. 2760) geändert worden ist, 2017.