Quality assurance of engineered barriers in underground waste disposals

2015 - 2018: Ultrasonic investigation of an engineered test barrier (drift seal) @ ERAM Morsleben: Contract work for BGE.

Engineered test barrier
- „plug“ of salt concrete
- 25 m x 5 m x 5 m
- Pressure experiment successful
- Cracks at surface and at depth

Ultrasonic investigation
- From surface and boreholes
- Commercial and newly developed instrumentation
- Cracks and other features detected up to depth of 8 m

Left: Front face of the test drift seal, data acquisition with the ultrasonic deep penetration system LAUS. Right: crack and object indications detected by LAUS. Contract work for BGE.

From 2019 (planned): BAM thematic project SealWasteSafe

Idea: New Materials!
- Replacing cement by „Geopolymer“ (Patent pending BAM 7.4)
- No shrinking, low heat development
- No cracking even if poured in large batches
- Low CO₂ Footprint

Research required:
- Material properties
- Optimization
- Quality assurance
- Monitoring

Preliminary experiments with geopolymers using NaCl aggregate: already close to required parameters!

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