



Interdisciplinary
research symposium
on the safety of nuclear
disposal practices



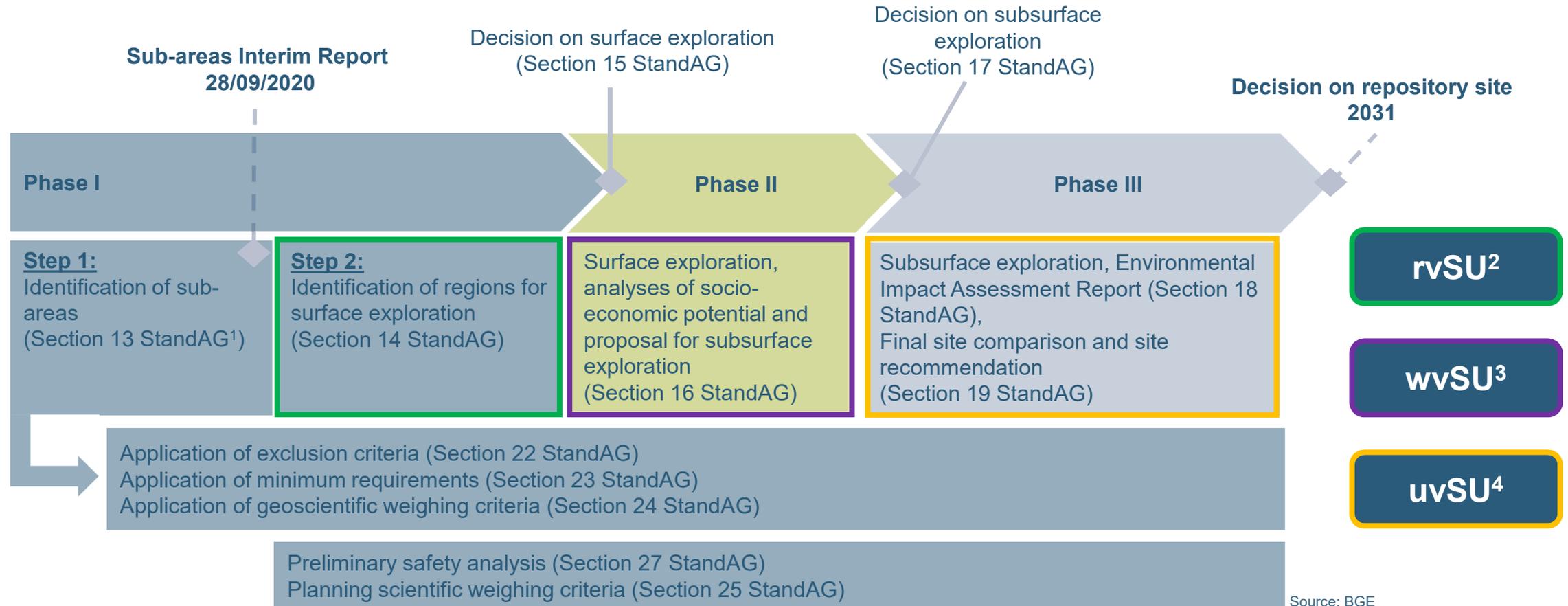
BUNDESGESELLSCHAFT
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Preliminary safety analysis in the high-level radioactive waste site selection procedure in Germany

Interdisciplinary research symposium
on the safety of nuclear disposal practices 2021

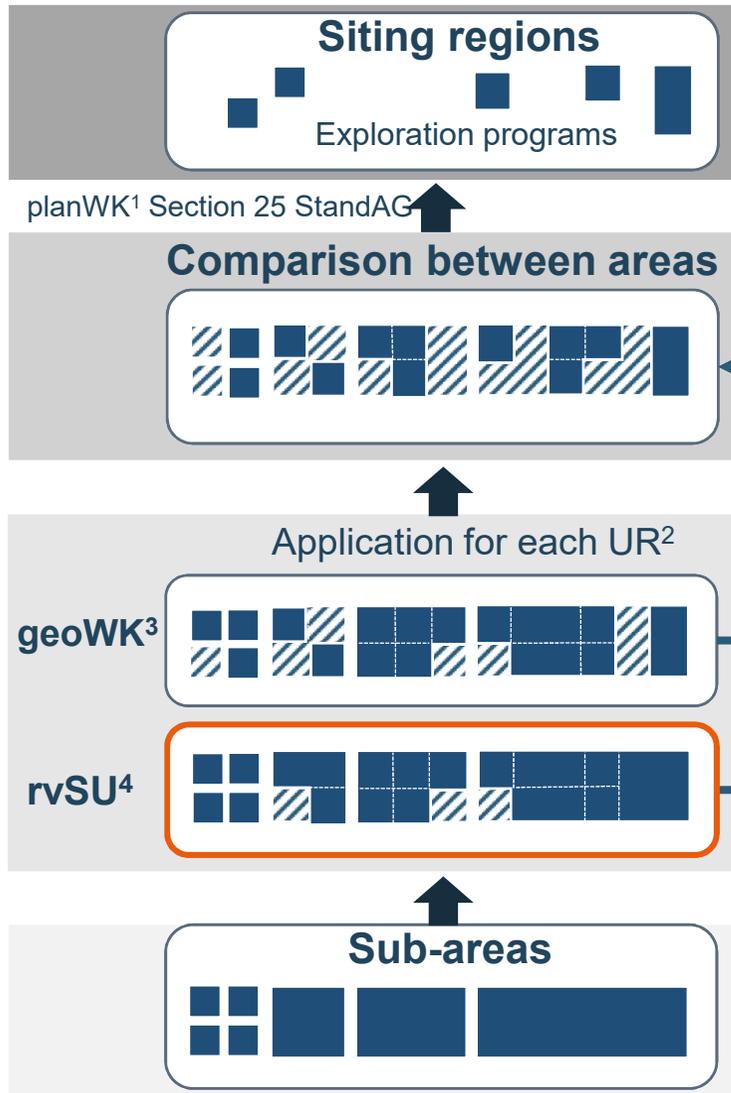
Eva-Maria Hoyer, Phillip Kreye, Thomas Lohser, Wolfram Rühaak
10. – 12.11.2021, Berlin

Implementation of the German Site Selection Procedure



¹StandAG: 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
²rvSU: representative preliminary safety analysis, Section 14 StandAG
³wvSU: further developed preliminary safety analysis, Section 16 StandAG
⁴uvSU: comprehensive preliminary safety analysis, Section 18 StandAG

Preliminary Safety Analysis



Source: BGE

Preliminary Safety Analysis (Section 27 para. 1 and 2 StandAG)

- (1) Subject [...] is the assessment of the extent to which **safe containment** of the radioactive waste can be expected by exploiting the geological conditions [...]
- (2) The preliminary safety analyses [...] shall consider the repository system in its entirety and assess its safety [...]

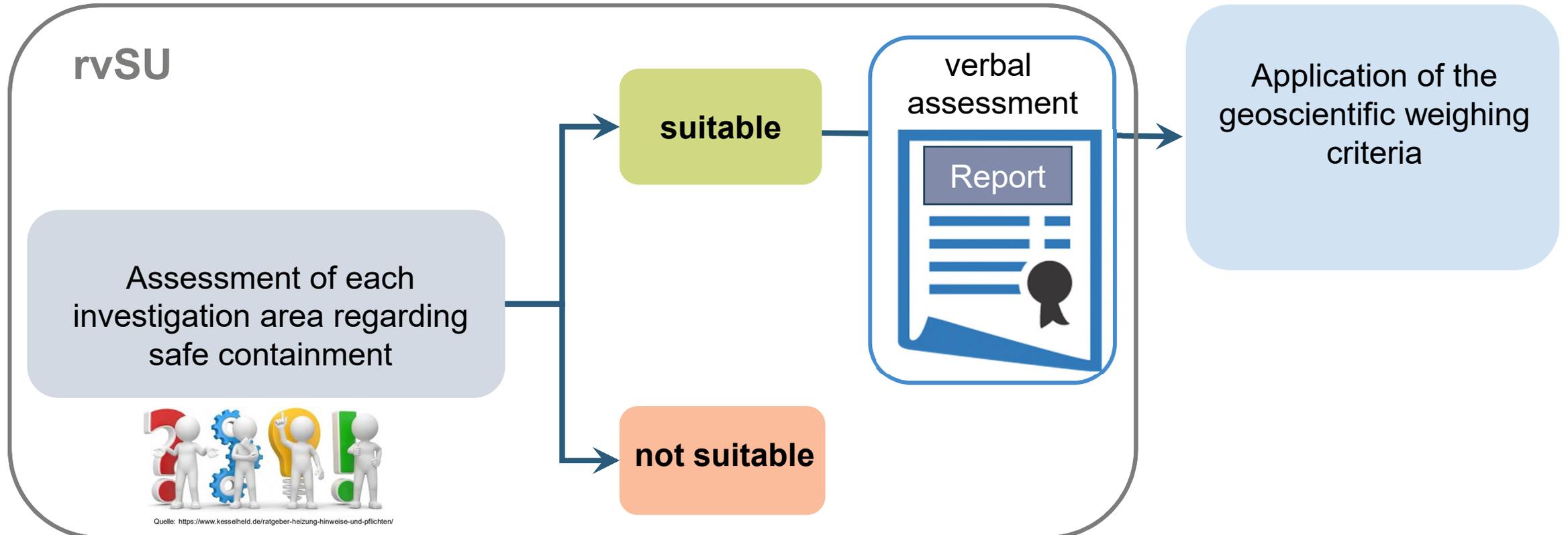
¹planWK: planning scientific weighing criteria

²UR: investigation area

³geoWK: geoscientific weighing criteria

⁴rvSU: representative preliminary safety analysis

Goal of the Representative Preliminary Safety Analysis



Quelle: <https://www.kesselheld.de/ratgeber-heizung-hinweise-und-pflichten/>

Source: BGE



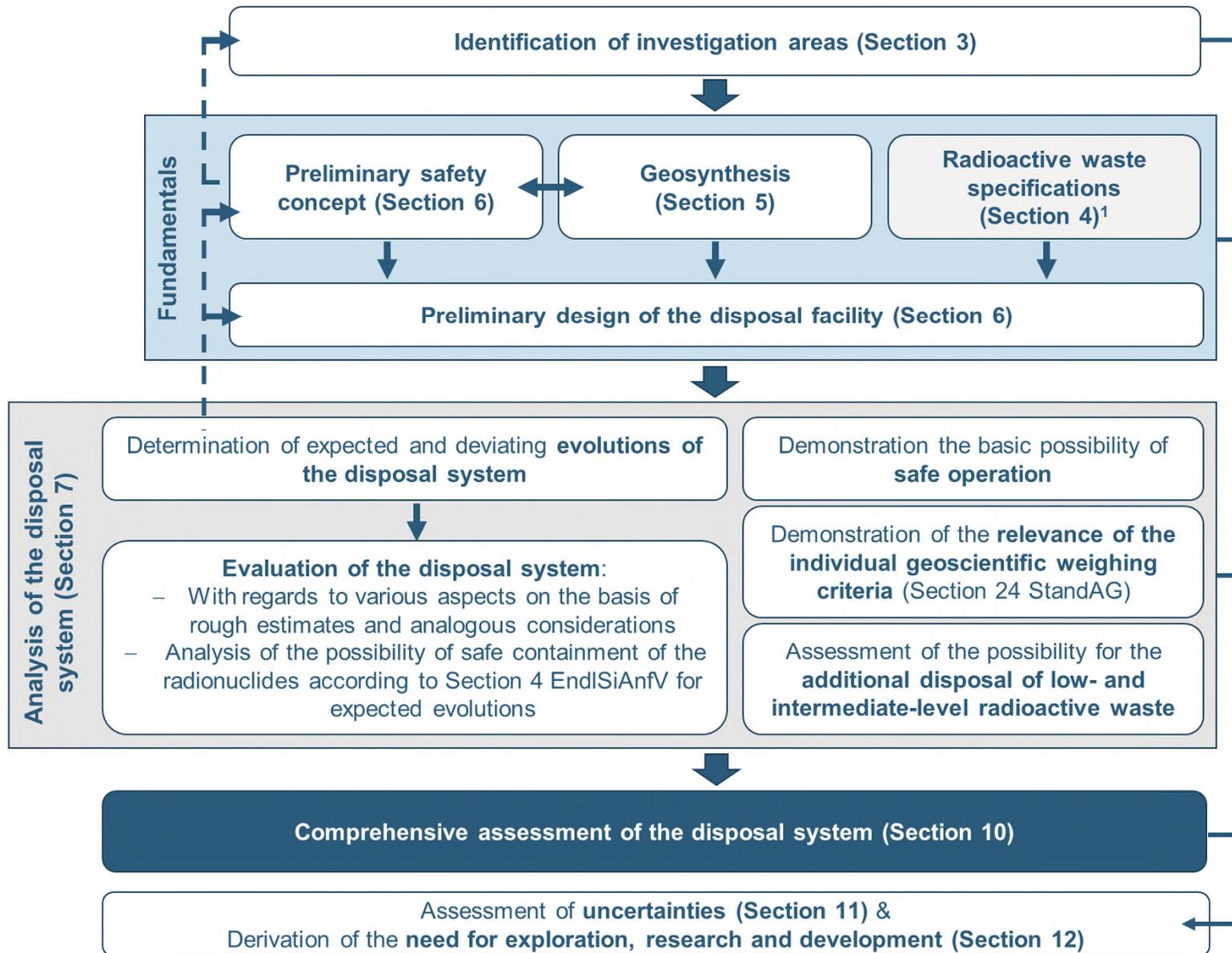
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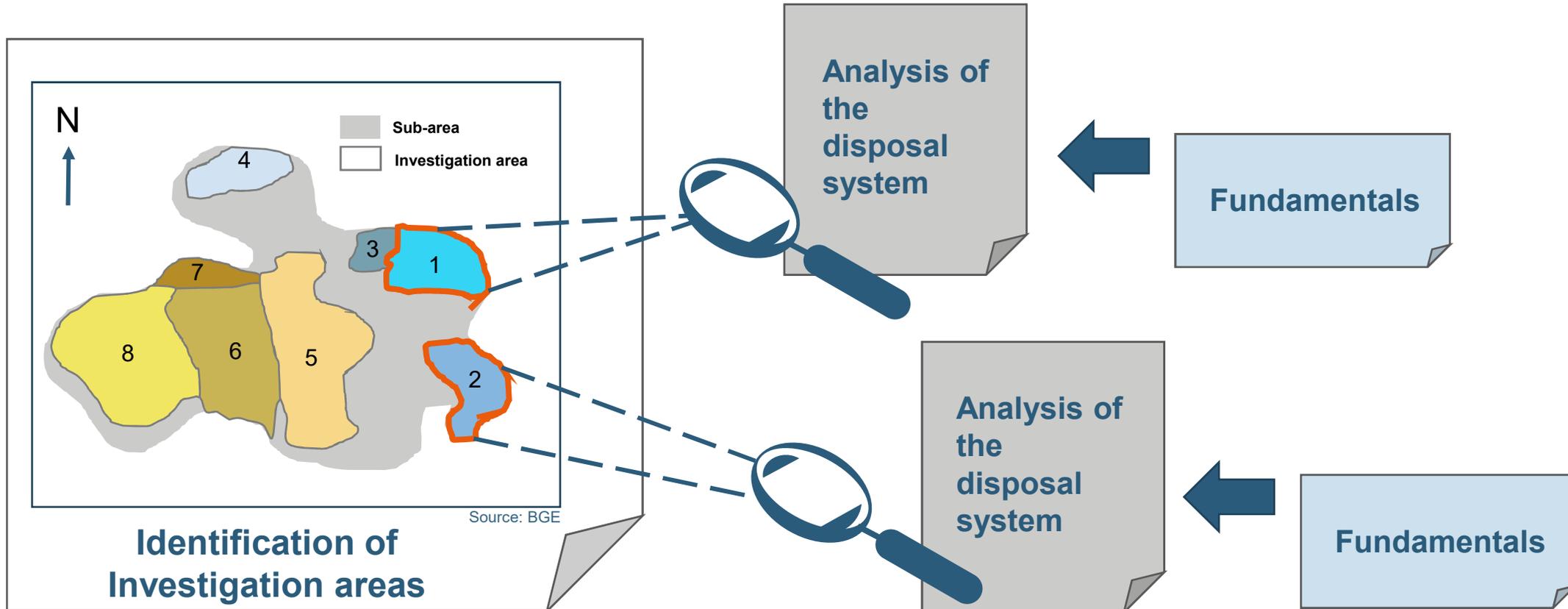
Content of the representative preliminary safety analysis

pursuant to the
**Disposal Safety
Analysis Ordinance**
– EndlSiUntV¹



Source: BGE

Representative Preliminary Safety Analysis



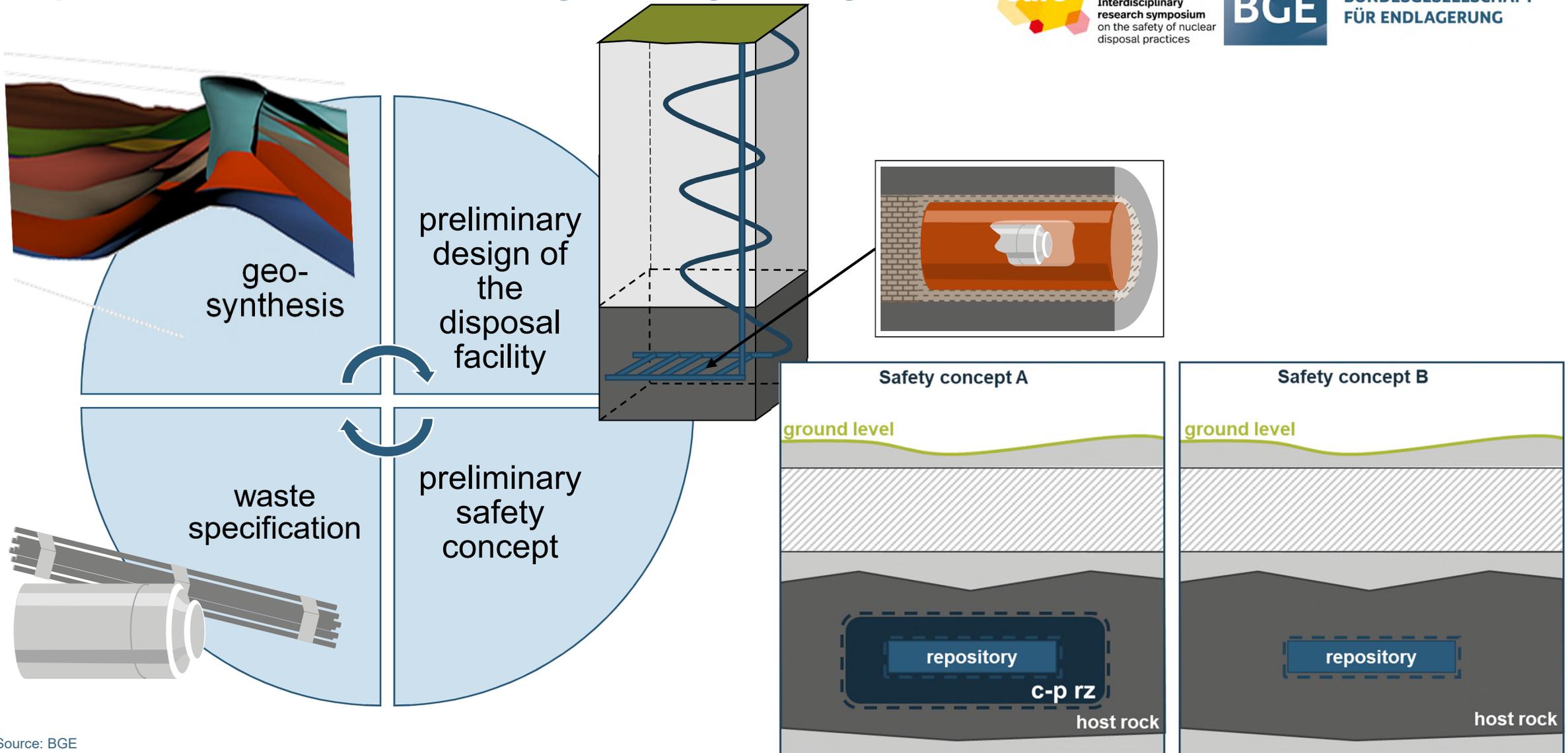
Representative Preliminary Safety Analysis



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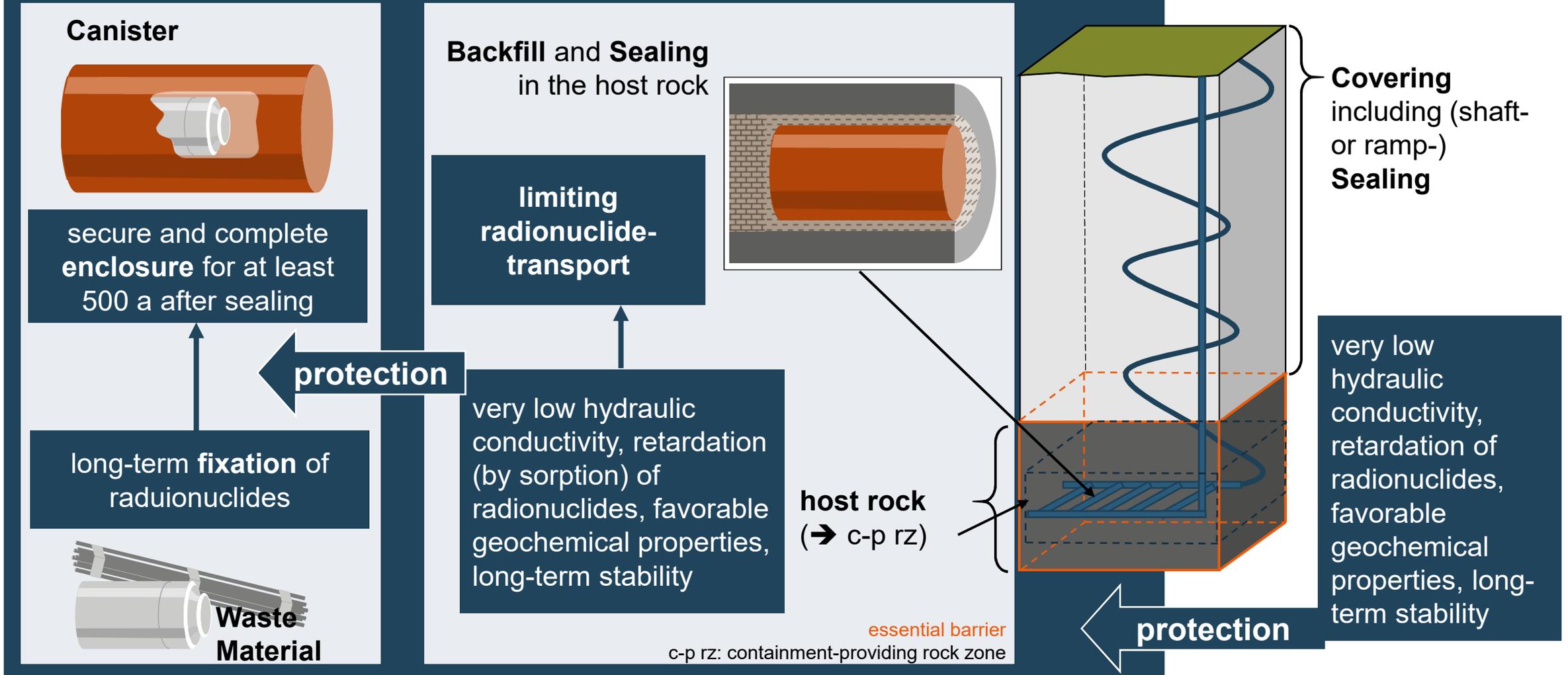
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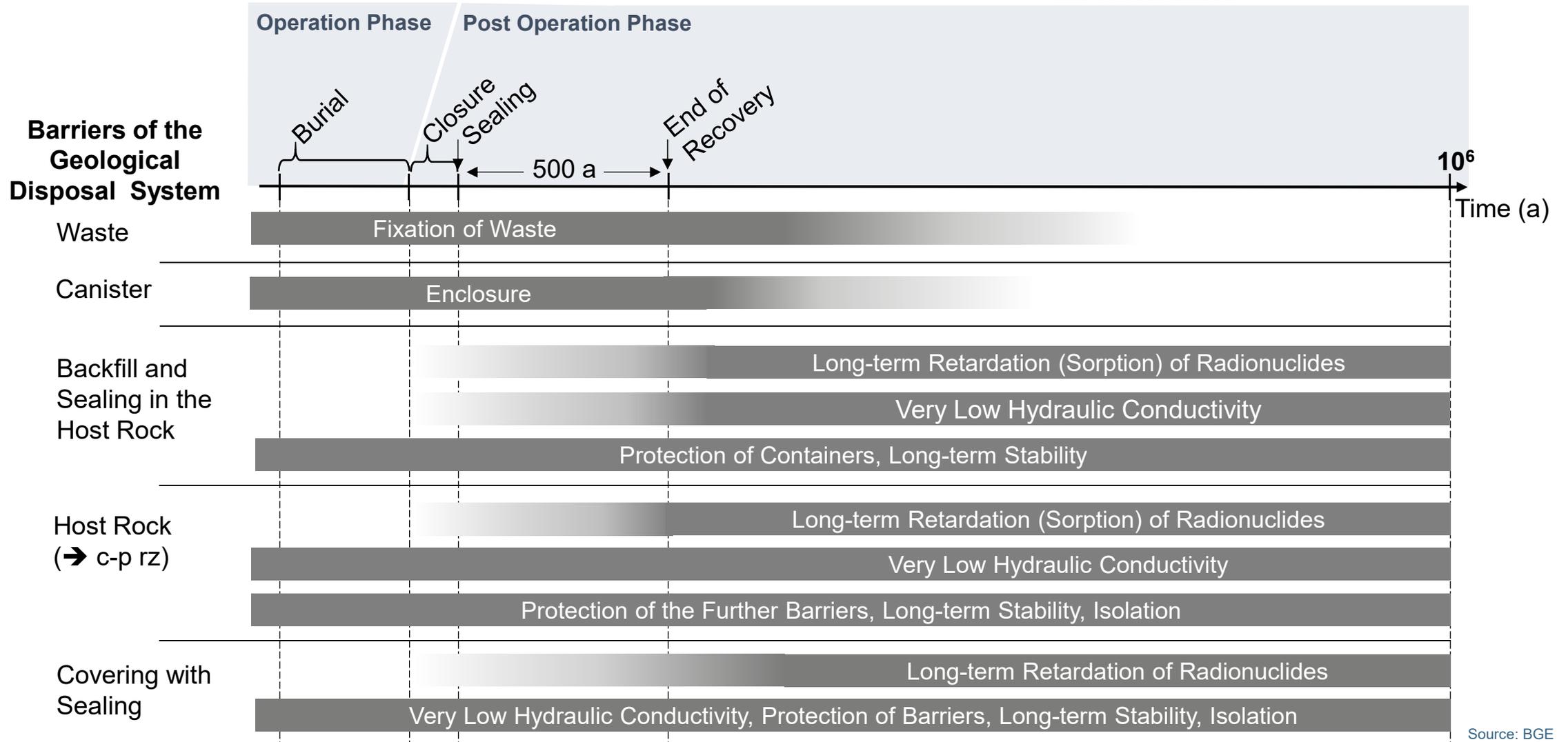
Source: BGE

Safety Concept (Claystone)

Safe Containment (§ 4 EndlSiAnfV)



Interaction of Barriers during Time (Claystone)



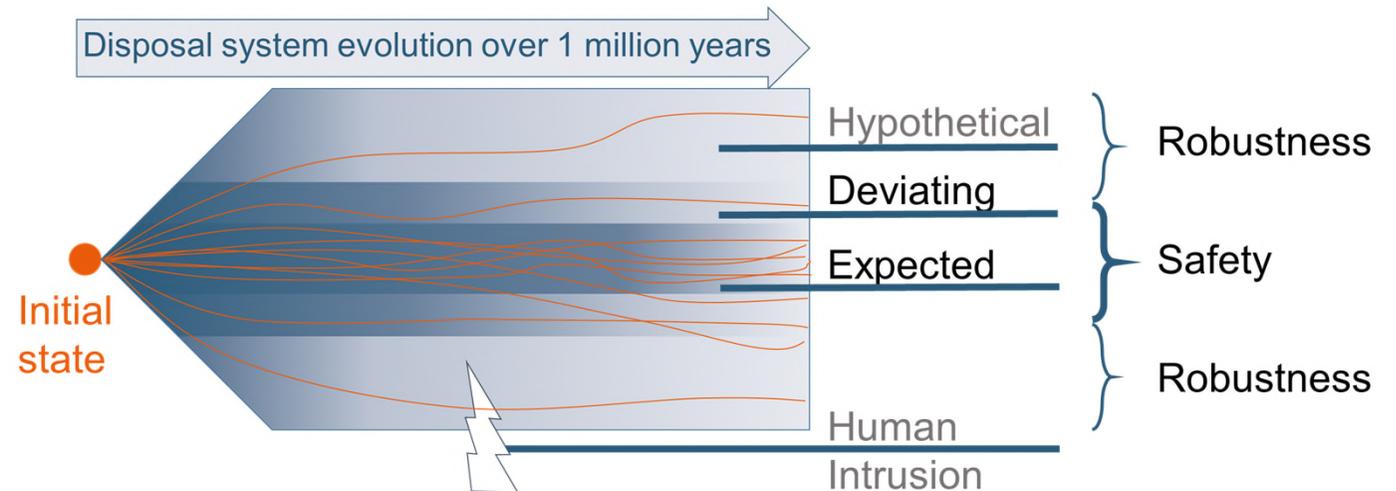
Source: BGE

Representative Preliminary Safety Analysis – Analysis of the disposal system (1/2)



Includes among others:

- Consideration of the **future evolutions** of the repository system (utilizing **Features, Events & Processes**-catalogs, scenario development)



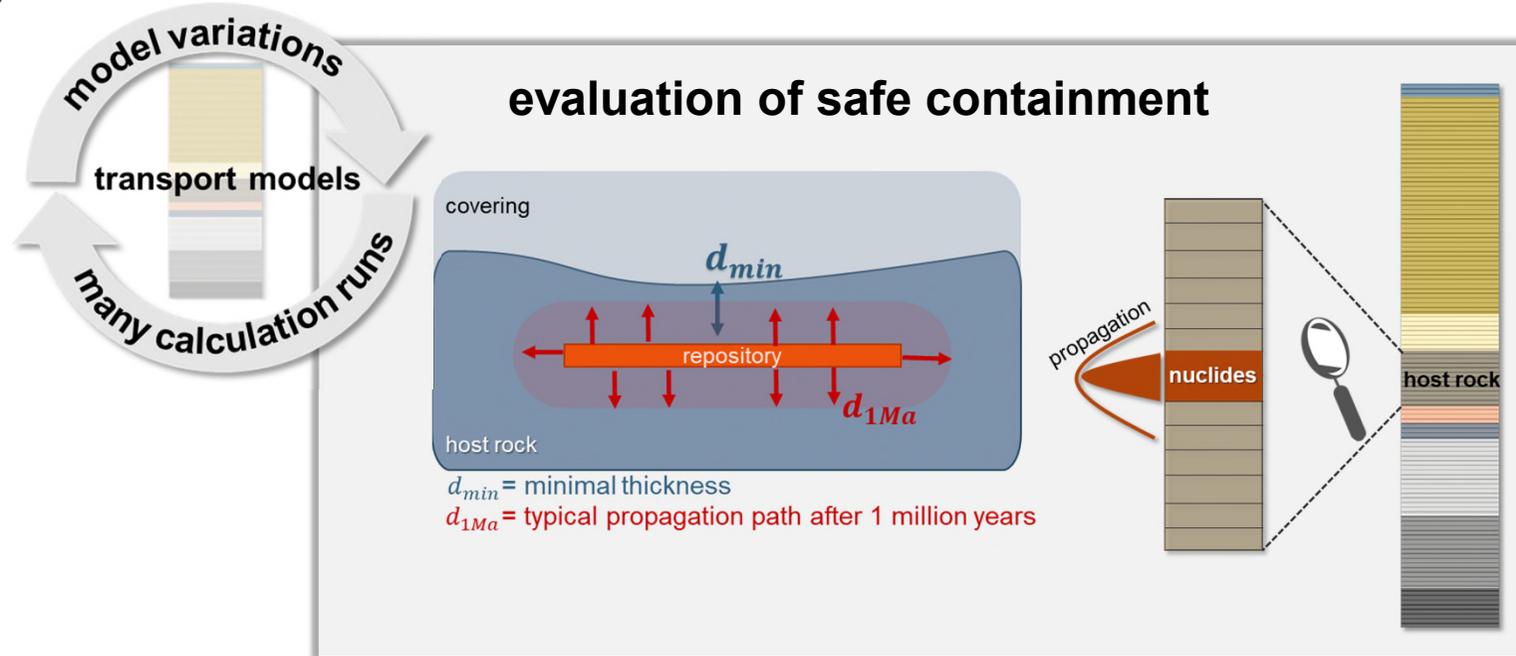
Source: BGE

➤ Please visit our poster: Development of a database for the Analysis of the disposal system

Representative Preliminary Safety Analysis – Analysis of the Disposal System (2/2)

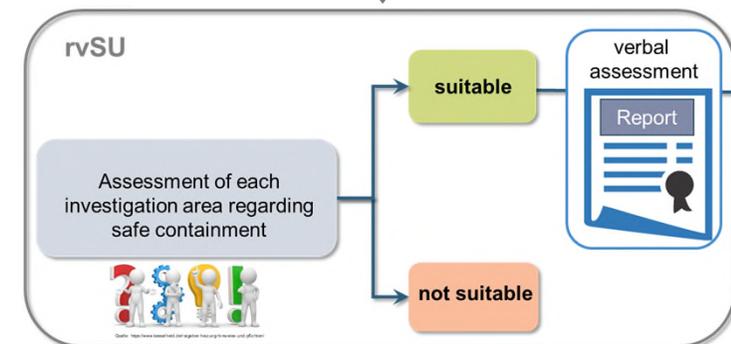
Includes among others:

- Consideration of the **future evolutions** of the repository system - utilizing catalogs of features & processes for a scenario development
- Evaluation of the disposal system with regards to the **safe containment** of the radionuclides (compliance of the mass and the number of atoms criterion)
- Evaluation and prioritization of the **geoscientific weighting criteria**



Source: BGE

Requirement for likely evolutions: in total less than 10^{-4} and per year less than 10^{-9} of both mass and number of radionuclides is allowed to leave the essential barrier.



Source: BGE

Specific challenges are for instance

- Combination of geoscientific and technical related aspects with respect to safety
- Detailed inventory of the radioactive waste
- Repository design (which level of detail is the right one?)
- Planning of the additional MAW/LAW repository
- Specification of the allowed maximum canister temperatures
- Canister development
- Derivation of the numerical model cases
- Numerous tasks are highly connect among themselves



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