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The site selection procedure for a high-level radioactive waste repository in Germany: an overview of the process and upcoming exploration activities

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According to the 'Repository Site Selection Act' (a governmental law, called in German the Standortauswahlgesetz – StandAG), the German National Waste Management Organisation (BGE) has been assigned to be the implementer for the German site selection procedure. As such, the BGE is responsible to identify a site for a high-level radioactive waste repository in a deep geological formation with best possible safety conditions for a period of at least one million years.

The German site selection procedure is an iterative process and consists of three phases with an increasing level of detail while the survey area becomes smaller during the process. An immanent part is the repetitive application of exclusion criteria, minimum requirements and the geoscientific weighting criteria (Sections 22 – 24 StandAG) during each phase. Starting with an empty, so-called white map of Germany, the BGE completed Step 1 of Phase I in September 2020 with the submission of the sub-areas interim report. Therein, 90 individual sub-areas were identified, where a favourable geological condition for the safe disposal of radioactive waste is possible. According to the site selection act the host rocks claystone, rock salt and crystalline rock are considered. In the current Step 2 of Phase I, both the representative preliminary safety assessments (Section 27 StandAG) and the repeated application of the above-mentioned criteria and requirements as well as the planning-scientific weighing criteria according to Section 25 StandAG are applied to localise siting regions within the 90 sub-areas.

Surface exploration, including geophysical surveys, geological mapping, hydrogeological investigation and drilling of boreholes, will take place within these siting regions in the scope of Phase II. Currently, exploration targets are defined, which arise from the safety assessments and the mentioned requirements and criteria. Existing data from former exploration activities such as seismic and borehole data, but also other geoscientific data are considered. These data have to be selected, procured and possibly reprocessed with a new focus on a high-level radioactive waste repository. After comparison of the principal demand of information as mentioned above and the already existing data, the exploration demand for every siting region will be derived by a thorough gap analysis. Based on that, the surface exploration programs will be developed.

Phase III is characterized by higher-grade, more detailed subsurface exploration activities, which again provide the base for preliminary safety assessments. Phase III ends with a proposal for a site

for a high-level radioactive waste repository.