**Integration Group for the Safety Case (IGSC) Symposium 2024***MOVING TOWARDS THE CONSTRUCTION OF A SAFE DGR – GETTING REAL*

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| **Abstract Title:**  Post-closure safety in site evaluation - UK GDF programme  [proposed for presentation] | |
| **Abstract (300-500 words):**  The UK’s approach to finding a suitable site for a Geological Disposal Facility (GDF) is laid out in the “Implementing geological disposal – working with communities: long term management of higher activity radioactive waste” policy. As part of this policy a suitable location for a GDF will be identified through a consent-based process with the UK Government and its agencies working in partnership with communities. Safety is a key factor in how we will site, construct, and operate a GDF in the UK. In the Nuclear Waste Services (NWS) document “How we will evaluate sites in England”, there are various ‘safety considerations’, including long-term safety after closure of the GDF. In this paper, we will describe how we will evaluate the feasibility of developing a post-closure safety case in these early stages of site selection in the absence of extensive site characterisation information.  To understand the feasibility of developing a post-closure safety case, we will consider available data on the geological environment and use it to draw, where possible, conclusions regarding the ability of a GDF to isolate the wastes from people and the environment, to contain the wastes, and to protect the natural and engineered barriers. In practice this is broken down into topics including: the potential for contaminant (groundwater and gas) pathways in the geosphere; the evolution of the geosphere and biosphere; the potential for inadvertent human intrusion into the GDF; and the range of safety disposal concepts that may be applicable and their maturity. See Figure 1 below.  A diagram of a construction safety activity  Description automatically generated  Figure 1. How we evaluate safety in the UK GDF siting process.  To account for the large geological uncertainties that exist in the early stages of the siting process, we use our site descriptive model to consider potential alternative conceptualisations for the geosphere. For example, to develop alternative conceptualisations for the groundwater pathway, we need to consider: the possibility the GDF is completely capped by impermeable layers so as to preclude transport in groundwater; the potential for significant hydraulic driving force at GDF depths; the intrinsic permeability of the intact geology; whether the GDF could be isolated from transmissive faults and features; and the anticipated groundwater travel time for any advective pathways from the GDF. In this paper, we will present some examples of how this approach has been used in practice to support siting decisions. | |