Geological disposal of radioactive waste in the UK

Jonathan P Turner - Radioactive Waste Management - 8/5/18

Abstract

Preparations are being made to deliver one of Britain's largest environmental projects. Radioactive Waste Management (RWM) is a public sector delivery body tasked with disposing of Britain's higher activity radioactive waste. A complex 70-year legacy of radioactive waste needs to be dealt with to protect humans and the environment. It is internationally accepted that the safest and most sustainable way to deal with higher activity waste is geological disposal, emplacing the waste in a geological disposal facility (GDF) so that people and the environment are protected from the harmful properties of the waste. Geological disposal combines engineered and natural barriers to isolate a GDF from humans and surface processes, and to prevent migration of radionuclides toward the surface. Natural barriers are provided by the geology in which the GDF will be hosted, and any overlying low-permeability sedimentary layers. Conceptual designs have been developed for geological disposal in three broad categories of host rock type: fractured Higher Strength Rock (HSR), very low-permeability Lower Strength Sedimentary Rock (LSSR) and Rock Salt. Examples from overseas include Finland and Sweden where granitic HSR is the host rock for GDFs they are developing, Mesozoic LSSRs are the host in France and Switzerland, and the WIPP facility in New Mexico is constructed in Permian rock salt. Site selection is consent-based and RWM will work in partnership with local communities over a period of many decades through the site selection, site investigation and construction stages of this 100+ year programme. This talk will include a description of several of the projects underway in RWM as it prepares for the launch of the site selection process, and builds capability in readiness for detailed site investigations.

Jonathan Turner

Jonathan Turner is a Chartered Geologist who has spent most of his career in oil and gas exploration, both in industry (Shell, BG Group) and academia (Birmingham University). He has published widely on applications of structural geology and geomechanics, and his roles at BG Group included deputy chief geologist during delivery of the major Santos basin (Brazil) and Surat basin (Queensland) development projects. Through his work with the Geological Society and as a visiting professor at Manchester University, Jonathan particularly enjoys working with early-career geoscientists.

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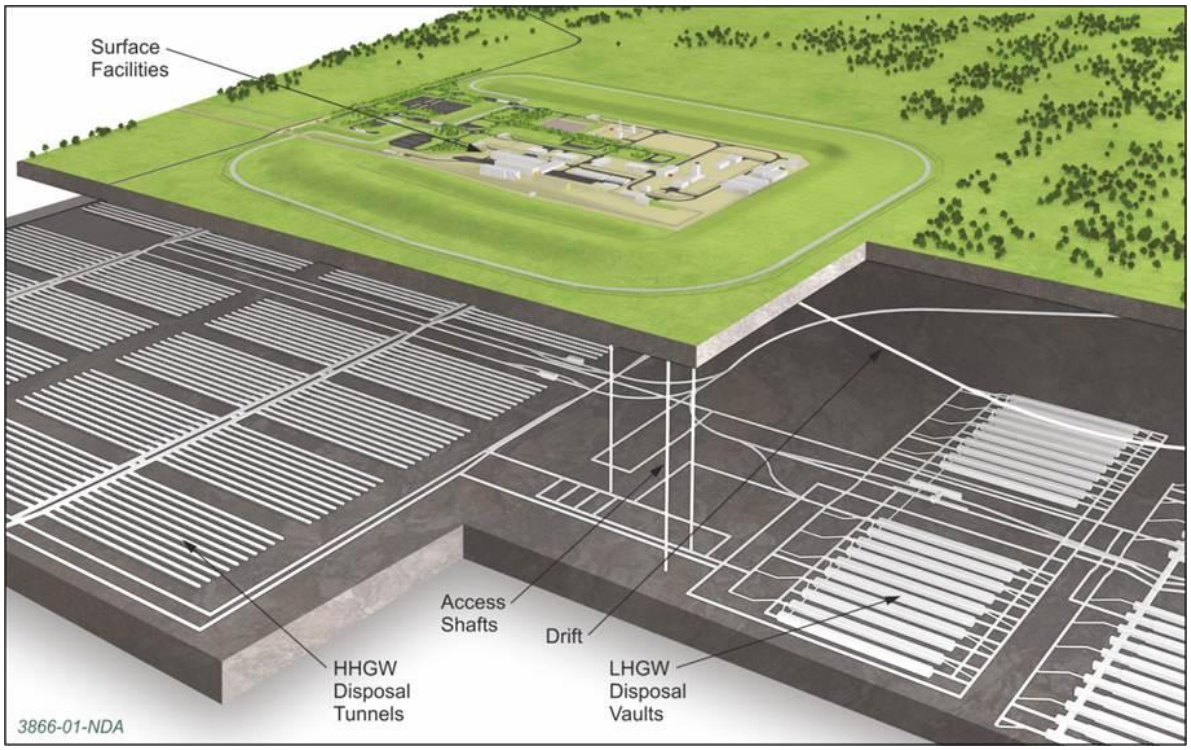

CAPTION: Conceptual layout of surface and subsurface facilities for a geological disposal facility. Note the separation of high- and low-heat-generating wastes (HHGW, LHGW).