**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:** ‘Microbial Consumption of Geological Disposal Facility (GDF) in Lower Strength Sedimentary Rocks and Implications for Long-Term GDF Performance’ | |
| **Abstract (300-500 words):** A Geological Disposal Facility (GDF) will be designed to contain and limit the release of radionuclides to the environment over the long-term. As a result, understanding the environmental processes that could occur over the GDF’s life span, and the implications of these on containment, is critically important. During the operational and post-closure phases of the GDF, gases will be produced through corrosion of metals, radiolysis of groundwater, and microbial degradation of organic materials. Gas production may over-pressurise the GDF, posing a significant risk to Engineered Barrier System (EBS) integrity and providing release pathways for gaseous radionuclides. Gas consumption processes are expected to reduce the pressure of GDF gases through a series of complex microbial, chemical, and physical reactions. This project aims to elucidate the role of microbial activity in consuming GDF gases and the subsequent impact on the containment function of GDF components. The implications of microbial gas consumption on long-term GDF performance will be assessed via a series of laboratory experiments and computer modelling. | |