



STORAGE RESEARCH INFRASTRUCTURE ECO-SYSTEM

RI Information sheet 2022

British Geological Survey, GeoMicrobiology Laboratory

Technology(ies) of Energy Storage: Microbiological activities in subsurface reservoirs and infrastructure associated with gas or heat storage; Chemical and Thermal

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| Project Acronym | StoRIES |
| Call | H2020-LC-GD-2020 |
| Grant Agreement No. | 101036910 |
| Project Start Date | 01-11-2021 |
| Project End Date | 31-10-2025 |
| Duration | 48 months |

1. Photo



Operation of the biological flow apparatus designed to monitor the interactions of microorganisms, geological/engineered materials, fluids and gases

2. Geographical coordinates

(52.871731°N, -1.090060 °E)

3. Description of the research infrastructure for the webpage

A fully equipped Containment Level 2 microbiology laboratory with the capability of handling geological materials (core materials and groundwaters/formation waters). The Facility specialises in evaluating the impacts of energy storage on deep subsurface microbial communities and the effects of those organisms on the movement and composition of gas, solutes and contaminants, focussing on potential impacts on industrial operation.

Equipment and techniques include:

- **Biological Flow Apparatus** – bespoke flow-through equipment investigating microbial effects on transport properties in intact/fractured rock cores under in-situ conditions.
- **Range of incubators** for handling, cultivating and isolating microorganisms under geologically relevant temperatures and pressures. Microaerophilic



/Anaerobic Chamber – a variable atmosphere workstation to study O₂ sensitive microbes.

- **Molecular microbiology laboratory** - for DNA extraction and amplification (PCR) for identification and quantification of microbial isolates and characterisation of microbial communities using Oxford Nanopore DNA sequencing
- **Epifluorescence microscopy** for the assessment of bacterial numbers.

The Facility examines the impacts of injection of a range of gases on deep subsurface microbial populations and the impacts of those organisms on the operation of gas storage including

- Environmental issues and the geological storage of carbon dioxide – extensive research has been undertaken in the UK and overseas into the effects of carbon dioxide leakage on marine and terrestrial ecosystems, and more recently on methane leakage
- The influences of microbes and biofilms on mass transport properties through geological media. Interactions with engineered materials (e.g. microbiologically influenced corrosion)
- Microbial effects on mineral dissolution and precipitation (e.g. fracture and pathway sealing) Microbiologically induced carbonate precipitation
- Impacts of stored gas (e.g. CO₂ and H₂) on microbial diversity and activity
- Development of imaging to assess distribution and enumeration of microorganisms in geological materials

4. Availability of the research infrastructure

(Please indicate time periods in which infrastructure will not be available for StoRIES in the next 2 years – if already known)

Available for use after discussion with the laboratory manager (Simon Gregory)

5. Special considerations (confidentiality / NDA agreements, insurance requirement, special training, HSE training)

Training and health and safety induction will be provided for all users

6. Energy storage technology that can be analysed/studied by using the research infrastructure

- Electrochemical
- Chemical
- Thermal
- Mechanical
- Superconducting Magnetic
- Cross-cutting (Specifically: ...)

7. Key words for the webpage

[Geomicrobiology, biofilms, microbiologically influenced corrosion,](#)

8. TRL level (if applicable):

- 1-3
- 4-6
- Above