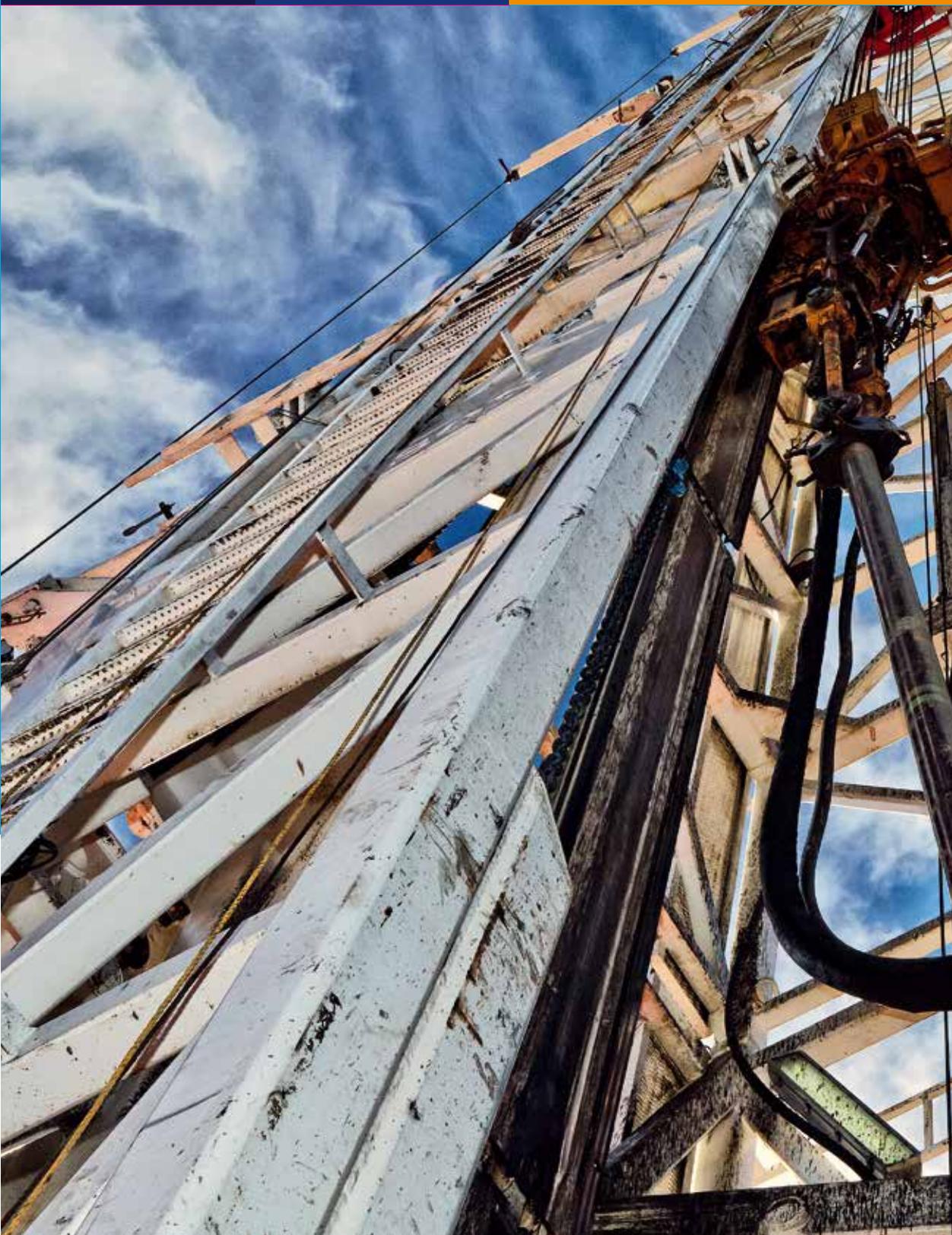


THE GEOENERGY
TEST BED

GEOENERGY



THE GEOENERGY TEST BED

The GeoEnergy Test Bed has received **£1.4m of funding** FROM THE ENERGY RESEARCH ACCELERATOR

Carbon dioxide Capture and Storage (CCS) is vitally important to tackle climate change. Demonstrating that the carbon dioxide (CO₂) has been safely stored deep underground is essential to meeting regulatory requirements.

The GeoEnergy Test Bed (GTB) is an ERA funded facility designed primarily for the development and testing of new types of surface and subsurface sensors and geological modelling software. The project, which involves British Geological Survey (BGS), the University of Leicester and the University of Nottingham, has the infrastructure available to support research and development of monitoring technologies applicable to geo-energy sector industries, including CO₂ storage.

WHAT ERA IS DOING

The GeoEnergy Test Bed (GTB), will be a national facility that will support collaboration between researchers, technology developers and industrial companies. It will enable development and testing of innovative monitoring technologies, improve understanding of impacts and processes in the shallow subsurface and provide data for ground truthing of advanced simulation software.

Eleven boreholes of differing depths have been drilled at the GTB near Sutton Bonington in Leicestershire. The geology of the site is similar to that of the North Sea, albeit at a much more accessible depth. The boreholes include deep and shallow injection wells which can be used to monitor the motion of gases and liquids through natural pathways in the subsurface after injection. The GTB is also intended to be used for remote sensing technologies and assessment of the effects of gas injection on microbiological activity.

The multi-borehole array test site facility currently has the following infrastructure:

- 11 boreholes with casings of steel and plastic varying in depth between 21m and 285m with slotted sections giving access to the two primary sandstone aquifers
- On-site containerised laboratory and office facilities with chemical handling and vented solvents storage and fume hood areas
- 2 data capture PCs with 4Tb storage and 10Mbit/s fibre data link to the main campus network to a backed up and externally accessible 100Tb project data store

- Fully Wi-Fi enabled laboratory, office and field areas
- UAV with CO₂ and CH₄ gas sensor pods for wide area detection of gas leakage
- Micro Seismic Array
- Full depth 282m core and geo-logging data from boreholes
- Academic Licenses to Schlumberger's commercial reservoir simulation software
- Injection capability, water, tracers and gases

The GTB is fully instrumented with surface and down-hole sensors and thoroughly characterised. Data from these sensors, alongside the physical materials collected to date, offer a dataset against which future measurements can be compared. The GTB has undergone a range of hydrogeological testing, electrical resistivity tomography surveying and a full depth rock core has been extracted for analysis.

Research interest areas include:

- Gas monitoring; migration, attenuation and remediation
- Geophysical data collection including micro-seismic monitoring
- Gas emission soil and atmospheric monitoring
- Next generation quantum gravity sensors
- Volatile Organic Compounds (VOC) downhole and surface gas monitoring
- VOC fingerprinting



The GTB has
11 boreholes

DRILLED
TO DEPTHS
BETWEEN 21M
AND 285M

THE IMPACT

The potential impact of the GTB is wide reaching.

Organisations working in subsurface energy sectors (e.g. oil and gas) may be interested in validating sensors that offer new and more effective ways of monitoring the impact of fluid injection, whether gases or liquid, in rocks.

In addition, the GTB test-bed can also be used by:

- Universities or companies who wish to access extracted core or geological records for the site to conduct experiments or create predictive models which can be validated empirically
- Companies developing instrumentation intended to be deployed down boreholes
- Organisations offering or developing new geophysical surveying techniques
- Businesses with an interest in developing new geological simulation software
- Universities and companies offering training in geoscience techniques or field surveying techniques
- Businesses or universities with potentially new drilling hardware or techniques that need testing (for example automated or data driven drilling)
- Other test sites which may want to partner or twin and do complementary experiments or share data

The GTB provides a unique opportunity to validate innovative sensors



ABOUT US

ERA is an Innovate UK funded programme within Midlands Innovation. ERA involves a consortium of six midlands based research intensive universities, together with the British Geological Survey, who are harnessing the Midlands' combined research excellence and industry expertise to play a critical role in tackling some of the biggest energy challenges facing the UK.

CONTACT US

ERA welcomes engagement with research, industry and policy-makers across the energy sector.

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