

PRESS RELEASE

# BGS release borehole information packs for the Glasgow Observatory

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The British Geological Survey (BGS) is laying the foundations for future mine water heat energy research, releasing [detailed information packs](#) including drilling logs, borehole construction details and overview hydraulic test data from the new geenergy observatory in Glasgow.

Across the UK, mine water energy systems are being investigated as a potential energy source for [low carbon heating and cooling of buildings, to help us to meet net zero carbon targets](#).

The Glasgow Observatory is being delivered by the BGS to provide complementary, at-scale, flexible infrastructure for fundamental and applied science and innovation in this emerging area.

As construction work on the boreholes, research infrastructure and monitoring equipment at the Glasgow Observatory nears completion, BGS are releasing comprehensive information packs on the mine water and environmental baseline boreholes.

The research community can now access this uniquely well characterised, at-scale mine water heat research facility to undertake a wide range of experimental investigations.

Given its 15-year+ lifespan, the growing number of open data sets and the promising results of borehole drilling and testing, the Observatory offers diverse opportunities to academic and commercial researchers and innovators across geenergy, environmental monitoring, geoengineering and data science.

## Accessing the observatories

The Glasgow Observatory is now open for applications to the UK and international science communities. Researchers can contact [ukgeosenquiries@bgs.ac.uk](mailto:ukgeosenquiries@bgs.ac.uk) in the first instance to discuss the opportunities available and to find out more about the suitability of the site for future research studies and ideas.

## Borehole infrastructure

The Glasgow Observatory borehole information packs contains reports, BGS and Drillers' logs, wireline logs and optical camera data. Further datasets including hydrogeological pump test results, ground water chemistry, and infrastructure reports for each borehole site are planned for future release.

Five boreholes penetrate the abandoned and flooded mine workings at depths of 50 – 90 m. These boreholes are screened in the fractured rock mass, and in the flooded, waste-filled and open workings (e.g. Figure 3).

BGS have test pumped all of the boreholes, proving high flow rates of 20 l/s for 5 hours with < 5 m drawdown and steady temperatures of around 12 °C in four of the mine water boreholes. This pumping has demonstrated good connectivity within both the Glasgow Upper and Glasgow Main mine workings, and some connectivity between the Glasgow Upper and Glasgow Main mine workings.

Additional infrastructure is being designed, and subject to planning and permitting permissions being granted, Observatory users will be able to investigate the response of the Glasgow Upper and Glasgow Main mine workings to heat abstraction and storage (expected 2021).

They will also be able to monitor for effects in the adjacent bedrock using in-situ sensor systems and dedicated monitoring wells: two environmental baseline characterisation and monitoring boreholes are screened in sandstone above the Glasgow Upper mine working, and three are screened in sand and gravel in the upper part of the superficial deposits.

The mine water boreholes are equipped with downhole electrical resistivity tomography sensors, fibre-optic cables for distributed temperature sensing (DTS) and hydrogeological data loggers.

These sensors will provide continuous monitoring of baseline variation in mine water temperature, pressure and chemistry. When the permanent abstraction and re-injection infrastructure is in place these same sensors can be used to monitor the flow of heated or cooled waters. In parallel, samples of groundwater can be collected for chemical and microbiological analysis to better understand the effect of temperature variation on the subsurface environment.

Environmental monitoring equipment, including ground gas probes and near-surface scanning lasers and reflectors for InSAR studies of ground motion will be installed at the Observatory later this year.

Users will be able to combine environmental monitoring together with the environmental baseline surveys (pre-drill soil chemistry, soil/ground gas surveys, surface water geochemistry and the live seismic monitoring data available as open releases) to provide a comprehensive, interdisciplinary evidence base for subsurface-surface environmental change and environmental management.

Novel geochemical and geomicrobiological research is well underway using the hundreds of rock and fluid samples collected during drilling and borehole testing. These were distributed to University researchers in 2019. Topics include resolving challenges for mine water heat implementation, such as the connectivity, response and sustainability of the resource, and new ways of monitoring any subsurface environmental impacts.

Find out more about the Glasgow observatory.

Find out how to access the UK Geoenergy Observatories for research.

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For further information, contact [bgspress@bgs.ac.uk](mailto:bgspress@bgs.ac.uk)