

Research Associate

Department	Civil and Environmental Engineering (www.strath.ac.uk/civeng/)		
Faculty	Faculty of Engineering (www.strath.ac.uk/engineering/)		
Staff Category	Research	Reference No	534093
Reports To	Prof Zoe Shipton	Grade:	7
Salary Range:	£35,308 - £37,386	Contract Type:	Fixed Term (18 months)
FTE:	1 (35 hours/week)	Closing Date	19/06/2023

Job Advert

We are seeking to appoint a Research Associate for the EPSRC funded GigaWatt-Hour Subsurface Thermal Energy Storage: Engineered structures and legacy Mine shafts: STEaM. The STEaM project brings together expertise in civil engineering, geomechanics, geochemistry and energy systems, from University of Strathclyde, the University of Edinburgh and 9 project partners. STEaM seeks to explore the use of flooded, abandoned mineshafts for short term, interseasonal and multi-year thermal storage. For safe and reliable heat storage, it is important to determine the hydrogeological and thermal characteristics of the flooded shaft, the wider mine system it is connected to, and the surrounding Carboniferous Coal Measures which play host to the mined void spaces. STEaM will design and delivers a set of experiments to inject heat into a shaft in collaboration with local area and supply chain industry partners.

The Research Associate will carry out baseline hydrogeological and geochemical sampling, develop geochemical and hydrogeological site monitoring during the experiments: including isotope analysis; analysis and integration of the data from the baseline and during heat injections. You will perform lab analyses of fluid flow and thermal properties of the wall rocks; assessment of mineral composition and sulfide mineral isotopic signatures to inform hydrochemical risk assessment. You will conduct PHREEQC modelling to assess water-rock and water-shaft lining interactions for likely heat scenarios. You will assist the PI in the management of the field trial research, installation and operations; liaise with experimental equipment subcontractors and other stakeholders (landowner, regulatory liaison); and help with development and delivery of stakeholder workshops and demonstrator days. You will also help in development of best practice technical guidance for mineshaft thermal energy storage site appraisal

You should be able to work both independently and collaboratively. Research will be written up for publication in collaboration with colleagues, and results disseminated via peer reviewed journal publications and presentation at conferences. You will join external networks to share information and ideas, inform the development of research objectives and to identify potential sources of funding. You would join the highly multidisciplinary and collegiate Civil and Environmental Engineering department and work with STEaM delivery team colleagues in Strathclyde's Energy Systems Research Unit and Edinburgh's School of Geoscience.

To be considered for the role, you will be educated to a minimum of PhD level in an appropriate discipline, e.g., Geology, Earth Sciences, Hydrogeology, or cognate discipline. You will have sufficient breadth or depth of knowledge in groundwater resources, thermogeology, applied geochemistry, and geological engineering and be developing the capacity to conduct individual research work, to disseminate results and to prepare research proposals. You will have an ability to plan and organise your own workload effectively and an ability to work within a team environment. You will have excellent interpersonal and communication skills, with the ability to listen, engage and persuade, and to present complex information in an accessible way to a range of audiences.

Job Description

Brief Outline of Job:

The Research Associate will carry out baseline hydrogeological and geochemical sampling, develop geochemical and hydrogeological site monitoring during the experiments: including isotope analysis; analysis and integration of the data from the baseline and during heat injections. You will perform lab analyses to determine site-specific fluid flow (porosity, permeability) and thermal (conductivity, diffusivity, specific capacity) properties of the wall rocks; assessment of mineral composition and sulfide mineral isotopic signatures (the source of mine water iron and sulfate) to inform hydrochemical risk assessment; PHREEQC modelling to assess water-rock and water-shaft lining interactions for likely heat scenarios. Your field test characterisation, data acquisition, integration, and analysis, will provide input to predictive models in other STEaM work packages. You will assist the PI in the management of the field trial research, installation and operations; liaise with experimental equipment subcontractors and other stakeholders (landowner, regulatory liaison); and help with development and delivery of stakeholder workshops and demonstrator days. You will establish a personal research portfolio and write research proposals as advised by the team leader; engage with industrial partners of this project for professional and knowledge exchange activities.

Main Activities/Responsibilities:

1.	Conduct independent and collaborative research in the resource assessment of flooded mine shafts, including determining appropriate research methods and contributing to the development of new analytical and modelling approaches.
2.	Plan and manage own workload, with guidance from the team leader as required.
3.	Inform the development of research objectives within the wider research consortium.
4.	Write up research work for publication, individually or in collaboration with colleagues, and disseminate results as appropriate to the discipline by, for example, peer reviewed journal publications and presentation at conferences.
5.	Collaborate with the wider consortium on the development of knowledge exchange activities by, for example, commercialisation of outputs.
6.	Identify sources of funding and contribute to the securing of funds for research, including planning for future proposals.
7.	Join external networks to share information and ideas, inform the development of research objectives and to identify potential sources of funding.
8.	Plan and manage own workload, with guidance from the team leader as required.
9.	Contribute in a developing capacity to Department/School, Faculty and/or University administrative and management functions and committees.
10.	Engage in continuous professional development

Person Specification

Educational and/or Professional Qualifications

(E=Essential, i.e. a candidate must meet all essential criteria to be considered for selection, D=Desirable)

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| E1 | PhD (or equivalent professional experience) in appropriate discipline e.g civil engineering, engineering mechanics, material sciences or cognate discipline. |
| E2 | Good honours degree in civil engineering, engineering mechanics, mining engineering or cognate discipline |

Experience

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| E3 | Sufficient breadth or depth of knowledge across the disciplines of Hydrogeology and Applied Geochemistry to contribute to the development of research activities. |
| E4 | Experience in lab-based geochemical, isotopic or petrophysical analysis |
| D1 | Operational experience of well sites (e.g. CO ₂ storage or geothermal) or other complex field sampling (e.g. volcanic springs) |
| D2 | Experience of knowledge exchange related activities |

Job Related Skills and Achievements

E5 Developing ability to conduct individual research work, to disseminate results and to prepare research proposals.

E6 Ability to plan and organise own workload effectively

E7 Track record of integrating datasets from different aspects of geoscience and engineering

Personal Attributes

E8 Excellent interpersonal and communication skills, with the ability to listen, engage and persuade, and to present complex information in an accessible way to a range of audiences

Other Relevant Factors

E9 Ability to work both independently and as part of a team

E10 Confident, with enthusiasm for the project

Application Procedure

Applicants are required to complete an application form including the name of three referees who will be contacted before interview without further permission, unless you indicate that you would prefer otherwise. Applicants should also submit a Curriculum Vitae and a covering letter detailing the knowledge, skills and experience you think make you the right candidate for the job. Applicants should also complete the Equal Opportunities Monitoring Form.

Other Information

Further information on the application process and working at Strathclyde can be found on our website (<http://www.strath.ac.uk/hr/workforus>).

Informal enquiries about the post can be directed to Prof Zoe Shipton, (zoe.shipton@strath.ac.uk).

Conditions of Employment

Conditions of employment relating to the Research staff category can be found at: [Conditions of Employment](#).

Rewards and Benefits

Our staff have access to a wide range of outstanding benefits that include financial rewards, family friendly and wellbeing benefits and career development opportunities, details of which can be found [here](#).

Probation

Where applicable, the successful applicant will be required to serve a 9 month probationary period.

Pension

The successful applicant will be eligible to join the Universities' Superannuation Scheme. Further information regarding this scheme is available from [Payroll and Pensions](#).

Interviews

Formal interviews for this post will be held in July 2023.

Equality and Diversity

We value diversity and welcome applications from all sections of the community.

The University currently holds a Bronze Athena SWAN award, recognising our commitment to advancing women's careers in science, technology, engineering, maths and medicine (STEMM) employment in academia.

University Values

The University's Values capture what we're all about: who we are, what we believe in and what we stand for. [Our Values](#) have been derived from how we act and how we expect to be treated as part of Strathclyde.

