# Position Details

## Research Scientist/Engineer- CSOF5

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| The following information is for applicants |
| Advertised Job Title | Geomechanics Engineer -novel mines |
| Job Reference | 83483 |
| Tenure | Specified Term of 3 years Full-time |
| Salary Range | AU$102,724 - AU$111,165 per annum (pro-rata for part-time)plus up to 15.4% superannuation |
| Location(s) | Pullenvale, Brisbane, QLD |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens and Australian Permanent Residents
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| Position reports to the | Team Leader |
| Client Focus – Internal | 50% |
| Client Focus – External | 50% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Ebrahim Fathi Salmi via email at Ebrahim.Fathisalmi@csiro.au  |
| How to apply | Apply online at <https://jobs.csiro.au/> Internal applicants please apply via **Jobs Central**If you experience difficulties when applying, please email careers.online@csiro.au or call 1300 984 220. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the areas that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### Role Overview

CSIRO Mineral Resources (CMR) is one of the largest minerals research and development groups globally, with a proud track record in delivering innovation and solutions across the mineral resources value chain. We thrive on innovation harnessed by the diversity of the minds and lived experiences of our team and apply our expert knowledge and specialised research to provide innovation that solves the complex problems faced by minerals companies, mining equipment, technology, and services (METS) companies, government, and other industry stakeholders.

The Mineral Resources Business Unit is performing fundamental research related to sustainable hard rock mining. The main areas of research include developing sensors for stress-strain measurements, cutting for selective mining, measurement while drilling, numerical modelling for deep level caving, and innovative mining methods (e.g., in-situ mining, in-mine recovery, and in-line mining). The research team also works on developing new energetic materials for surface and underground mining applications to improve the drawbacks of the conventional products and perform advanced numerical modellings to improve the understanding of the interaction between the rock masses and charges for dynamic rock fragmentation.

The role of Research Engineer staff is to conduct innovative research leading to scientific achievements that are aligned with the CSIRO Minerals impact in creating new mines that have reduced footprint on the landscape, improved environmental sustainability, lower energy and reduced water consumption and pollution. The main duty of this research scientist role is to provide numerical and experimental inputs to the re-imagination of mine design. The mine of the future is likely to be underground, look different and have new challenges. Key to the change to sustainable mine design is the consideration of Environmental, Sustainability and Governance factors in the value proposition. This provides plenty of difficult problems to solve, including the effect of new designs on induced stresses, fluid flow and other multi physics considerations

The Research Scientist/Engineer will have the opportunity to build and maintain networks, play a lead role in securing project funds, provide scientific leadership and pursue new ideas and approaches that create new concepts.

It is expected that the candidate will be working with a multi-disciplinary team of scientists, engineers, and graduate and post-graduate students from CSIRO, Mining3, and different local and international universities to deliver industry-funded applications projects and research and development projects. The candidate should also be capable of supporting the team in developing proposals for both the mining industry and research institutes and organisations such as Caving2040, MRIWA, and CRCs.

### Duties and Key Result Areas

* Conduct advanced 3D, Multiphysics, numerical modelling for novel mining approaches.
* Work under supervision from senior researchers to design experiments and conduct tests related to Multiphysics challenges in mines
* Communicate with mining industry stakeholders to initiate, and manage innovative projects providing their technical input related to applied Mining Geomechanics
* Co-supervise post-graduate and undergraduate students with partner universities
* Prepare research publications, reports, publish in conferences and journals
* Travel to sites and manage the implementation of research projects, when required
* Select the most profitable line of attack upon a problem, prepare detailed design proposals and experimental protocols.
* Draw on professional expertise, knowledge of other disciplines and research experience to recognise opportunities for innovation and generate new theoretical perspectives by pursuing new ideas/approaches and networking with scientific colleagues across a range of disciplines.
* Participate in identification of further opportunities which arise from research and initiate new lines of research and undertake activities focused on one or more elements of larger research projects.
* Provide supervision and coaching to students and technical staff.
* Communicate openly, effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Work collaboratively as part of a multi-disciplinary, regionally dispersed research team to carry out tasks in support of CSIRO’s scientific objectives.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A PhD (or an equivalent combination of qualifications and research experience) in a relevant field such as Geomechanics and Geotechnical Engineering providing a background in geomechanics numerical modelling, specifically using developing and coding large scale models, with a very good understanding of fluid flow in geo-materials and coupled processes in rock masses.
2. A valid Australian C Class Drivers’ licence
3. Demonstrated ability to undertake original, creative and innovative research by generating and pursuing novel ideas and solutions to scientific research problems.
4. A demonstrated publication history of authorship on scientific papers in peer reviewed journals and/or reports, grant applications or inventorship on patent applications.
5. Programming with C++ and Python

## Experience in conducting geotechnical and petro-physical laboratory experiments

## Sound understanding and implementation of safety requirements

## Ability to carry out independent high-quality research, to achieve organisational goals

## A significant record of science innovation and creativity plus the ability to apply well-developed research skills to scientific investigations.

## Willingness and ability to travel to mine locations and stay on site for extended periods.

## **Desirable**

1. Experienced in performing feasibility studies for projects related to geoscience and geo-engineering
2. Demonstrated knowledge in the field of geological sciences and engineering, (e.g., petroleum and reservoir engineering) and their applications in in-place mining
3. Knowledge of continuum damage mechanics and its application in rock mechanics and rock engineering
4. Experience in developing research proposals
5. The ability to work effectively as a team member and manage a multi-disciplinary, regionally dispersed research team of undergraduate and post-graduate students
6. Lab and potential field experience and ability to communicate with personnel at different operational levels
7. Demonstrated interpersonal and management skills

## **Required Competencies**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for others’ reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate responses by adapting/creating and testing alternative solutions.
* **Independence:** Plans, sets and works to meet challenging standards and goals for self and/or others. Recognises where endeavours will make the most impact or difference, decides on desired outcome and sets realistic goals to reach this target.
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of change.

Special Requirements

* The successful candidate will be asked to obtain and provide evidence of a National Police Clearance or equivalent. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* The successful candidate will be required to undertake a pre-employment medical examination prior to commencement or site visits and be assessed as fit to work on mines.

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and CSIRO [Mineral Resources](https://www.csiro.au/en/Research/MRF) for more information.

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* People First
* Further Together
* Making it Real
* Trusted