# Research Scientist/Engineer – CSOF5

Role summary for potential applicants

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| Advertised Job Title**:** | Research Scientist – Blasting Geomechanics |
| Reference Number**:** | 58217 |
| Classification**:** | CSOF5 |
| Salary Range: | AU $97,276 to AU $105,269 plus up to 15.4% superannuation |
| Location**:** | Pullenvale, QLD |
| Tenure: | Specified Term of 3 years |
| Relocation assistance**:** | Will be provided to the successful candidate if required. |
| Applications are open to: | Australian/New Zealand Citizens and Permanents Residents Only |
| Functional Area**:** | Research Scientist / Engineer |
| % Client Focus - Internal: | 0% |
| % Client Focus - External: | 100% |
| Reports to the: | Team Leader |
| Number of Direct Reports: | 0 |

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| **Role Overview:** |
| The role of Research Scientist Staff in CSIRO is to conduct innovative research leading to scientific achievements that are aligned with CSIRO's strategies. You may be engaged in scientific activity ranging from fundamental research to the investigation of specific industry or community problems. You 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.  In this role as a Research Scientist you will work in collaboration with Mining3 researchers to develop and apply numerical and theoretical techniques to improve blast design with application to Grade Engineering, high energy and novel wall control applications. You will require knowledge and experience of explosives and mechanical rock mass fragmentation processes, numerical modelling to apply theoretical models to provide practical solutions to current mining challenges such as excessive backbreak. To be successful you must have a good background in both geotechnical engineering and the drilling and blasting of rocks. In particular, knowledge on the concepts of differential/selective blasting for Grade Engineering is highly desired. A good background in geophysical techniques and their applications in geotechnical engineering is also needed as part of the role. |

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| **Duties and Key Result Areas:** |
| * Incorporate novel approaches to scientific investigations by adapting and/or developing original concepts and ideas for new, existing and further research. * Numerical and theoretical model developments and scripting for rock blast modelling * Research in rock mechanics, theories of blasting, effect of mining on rock mass deformation (e.g., in cave mining) * Numerical modelling for assessing the procedure of rock fragmentation by blasting and for analysing the effects of blast induced movement/vibration on the stability of surface and underground mining excavations * Communicate effectively and respectfully in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation. * Produce high quality scientific and/or engineering papers suitable for publication in quality journals and for presentation at national and international conferences. * Work effectively as part of a multi-disciplinary, often regionally dispersed research team, to undertake independent scientific investigations and carry out associated tasks under the guidance of more senior Research Scientists/Engineers. * Under the guidance of Senior Research Scientists/ Engineers, work collaboratively and honestly with internal and external colleagues, clients and partners to help define and satisfy objectives for small to medium research projects. * Assist in leading small research projects, including the negotiation of resource requirements. * Provide coaching and on-the-job training to technical staff and students to ensure experiments are established in accordance with research design. * Adhere to the spirit and practice of CSIRO’s Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals. * Other duties as directed. |

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| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed*  ***Pre-Requisites:***   1. **Education/Qualifications:** A doctorate and or equivalent research experience in a relevant discipline area, such as Geomechanics 2. **Communication:** Strong written and oral communication skills including the ability to publish research results, prepare reports and present the results of scientific investigations at national and international conferences and stakeholder meetings. 3. **Publications: A solid record of publication in quality, peer reviewed journals.** 4. **Behaviours: A history of professional and respectful behaviours and attitudes in a collaborative environment.**   ***Essential Criteria:***   1. Site experience in tunnelling, surface and underground mining using mechanical and blast excavation. 2. Experience in numerical model development and scripting for blast modelling. 3. Extensive understanding of rock mechanics theory of blasting, rock excavation, and effect of mining on rock mass deformation. Hands on experience in rock mass classification and characterisation methods. 4. Extensive understanding of the concepts of selective blast design for Grade Engineering. 5. Experience in numerical modelling of discontinuous media for stability analysis of underground mine excavations, assessing the impacts of discontinuities on backbreak/underbreak, and the mechanism of dynamic rock fragmentation. 6. Experience in preparing and writing quality journal papers related to mining and geotechnical engineering. 7. The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, plus the motivation and discipline to carry out autonomous research. 8. A good track record of preparing and delivering technical reports to mining clients. 9. A record of science innovation and creativity, plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.   **Desirable Criteria:**   1. Experience in other aspects of geotechnical engineering e.g. slope stability or mining subsidence (e.g., cave mining subsidence) 2. Experience in modelling of fluid flow in rock masses 3. Experience in Python programming for geotechnical and rock blast engineering 4. Knowledge in geophysical techniques and geostatistical analysis for geotechnical applications 5. A proper knowledge related to excavation in complex ground conditions (fault and shear zones, squeezing and creeping rocks, and water bearing grounds)   **As Australia’s Innovation Catalyst, CSIRO has strategic actions underpinned by behaviours aligned to**:   * Excellent science * Inclusion, trust & respect * Health, safety & environment * Delivery on commitments.   **In your application and at interview you will need to demonstrate alignment with these behaviours.** |

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| **Other Information:** |
| **How to Apply**  Please apply for this position online at <https://jobs.csiro.au/> and enter requisition number **58217**. Internal applicants please apply via ‘Jobs Central’ in SAP (click ‘Recruitment’)  Your application should comprise **one document** which incorporates the latest version of your CV plus a covering letter and addressing the selection criteria.  **We require that you address the selection criteria in writing providing evidential examples of your experience in terms of desirable and essential selection criteria.** (All of the latter to be uploaded under “Resume/Cover Letter”). **Please ensure your application does not exceed 2MB.**  Applicants who do not provide the information when requested may not be considered.  If you experience difficulties applying online call 1300 301 509 and someone will be able to assist you. Outside business hours please email: [csiro-careers@csiro.au](mailto:csiro-careers@csiro.au).  **Contact:** If after reading the selection documentation you require further information please contact:  Dr Sevda Dehkhodavia email: [Sevda.Dehkhoda@csiro.au](mailto:Sevda.Dehkhoda@csiro.au) or phone: +61 07 3327 4156.  Please do not email your application directly to Dr Dehkhoda. Applications received via this method will not be considered.  **About CSIRO**  Australia is founding its future on science and innovation. Its national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.  Find out more! [www.csiro.au](http://www.csiro.au).  We work flexibly at CSIRO, offering a range of options for how, when and where you work. Talk to us about how this role could be flexible for you.  Find out more! [CSIRO Balance](https://www.csiro.au/en/Careers/A-great-place-to-work/Work-life-balance)  **CSIRO Mineral Resources** Working closely with our partners, we deliver innovation to grow Australia's resource base, increase mining productivity and drive the industry's social and environmental performance for the benefit of the nation. |