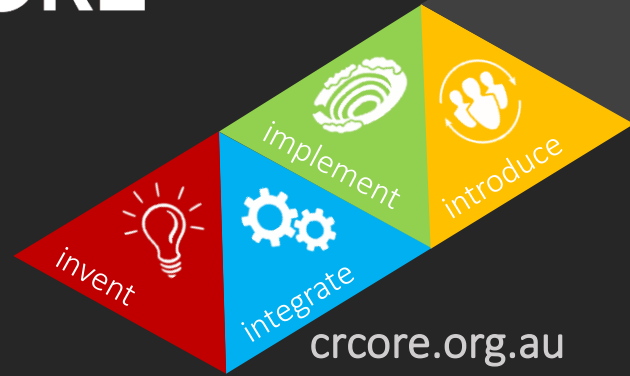


**Integration of Enhanced Grade Engineering®  
Grade by Size Gangue Liberation and More  
Energy Efficient Comminution**

Project number: P3-008  
 Program Coordinator: Paul Revell  
 Project Leader: Vladimir Jokovic  
 Timing: March 2018 to March 2021  
 Participants: JKMRC, The University of Queensland, CRC ORE and Gekko



**PROJECT OUTCOMES**

Laboratory testing has demonstrated that the progressive (multi-stage) impact breakage of coarse material (+19mm) can enhance the Grade Engineering (GE) response for tested ore samples.

The results indicate that more metal was recovered at similar mass recoveries using a laboratory scale Vertical Shaft Impact (VSI) breakage device compared to conventional crushing demonstrating the potential of using the equipment to improve GE outcomes.

For the tested ore samples, more silver was located near the surface of the particles than in the inner core which could be recovered by abrasion.

**BACKGROUND TO THE PROJECT**

Extensive work by CRC ORE and the Sustainable Minerals Institute (SMI) to-date has shown that natural grade by size department during coarse rock breakage followed by screening is a key lever for generating high-value coarse separation in Grade Engineering applications.

Exploiting inherent rock-properties to control mineral department through the application of more selective and energy efficient breakage mechanisms offers the opportunity to enhance the benefits of screening-based Grade Engineering outcomes further.

Existing Grade Engineering protocols do not consider the opportunity to enhance grade by size responses using more selective breakage mechanisms (more controlled impact breakage and the abrasion processes) and this was the focus of the project.

**RESEARCH COLLABORATION**

The project draws on the research expertise of The University of Queensland and the site implementation expertise of CRC ORE.

During this project, CRC ORE and JKMRC teams collaborated with METS organisation Gekko Systems to test a laboratory scale VSI device and its potential benefit to the GE approach.

