**Abstract for AUSIMM Conference 2024**

**Future mining: At the forefront of emerging trends, processes, and sustainable methodologies**

**300 word limit.**

**Little, green, autonomous trucks**

The main objective of the Right Sized Autonomous Truck – Electric (RSATe) project is to develop a small electric autonomous haul trucks solution that will deliver substantial cost savings, emissions reductions and reduced environmental impact.

Enabled by smaller, ‘right size autonomous trucks’ (RSATs), autonomous ancillary equipment and electrification, Agile Mining is expected to realise several key benefits:

* Accelerated decarbonisation due do earlier availability of EV and access to sustainable energy platforms.
* Increased resource recovery due to higher mining selectivity and longer haulage distances (access to previously uneconomic deposits).
* Reduced environmental footprint from less ground disturbance, 20-30% less energy usage and fuel economy / electrification potential.
* Reduced costs due to smaller equipment and infrastructure, improved production resilience and maintenance, and labour automation.
* Improved safety due to smaller equipment and kinetic energy hazard reduction.

Provide a glimpse into the long-term vision surrounding your work. Where do you see it going in 5, 10, or even 20 years?

*This project will will trigger a fundamental change to the traditional approach to mining that “bigger is better”. Smaller haul trucks will see changes to orebody knowledge, mine planning, drill & blast, loading, and processing and deliver significant benefits across the board.*

Address the current challenges and limitations of your technology/approach/idea and how you envision overcoming them

*There is significant technical risk in developing a new autonomous technology that is ultimately designed for public roads and has some key architectural differences. There is also a lot to learn about safely operating and maintaining electric trucks on our site. Through the collaborative partnership established with our vendors we can work through these challenges to develop a fit-for-purpose solution.*

Summarise the significance of your findings. Why are your results important? How do they contribute to the future of mining?

* Established first FMS-AHS integration which has accelerated the program delivery and established a proven case study to promote interoperable mining solutions
* Significant progress in maturing the autonomous solution, with increased on-board safety functions and use of vehicle-to-vehicle communication technology, which can also deliver significant safety improvement to other collision avoidance applications
* A great deal of learning from running the first battery-electric truck in the Pilbara, in terms of safety, maintenance, operation, performance and energy flow.