



Boosting productivity and savings in mineral exploration

CSIRO-led innovation that enables fast automated analysis of rock materials directly from drill sites.

The challenge

Mining and exploration companies have not been able to access real-time information about the mineralogy and chemistry in the drill hole using traditional coring and sampling methods. This lack of real-time information means a reduced ability to decide what to do next; whether to drill deeper, drill further holes, try elsewhere or to stop.

Also, costs associated with setting up and moving drill equipment, plus the time required to send drill hole samples off to a lab for manual characterisation and analysis, makes exploration surveillance for new mineable resources a time consuming and high cost endeavour. The current core testing process can take as long as six months.

The response

In partnership with Imdex and Olympus Scientific Solutions Americas, under the Deep Exploration Technologies Cooperative Research Centre (DET CRC), CSIRO has developed Lab-at-Rig®

There are 5000 to 6000 diamond drill rigs operating worldwide – approximately 75 per cent of these are above ground rigs which could potentially benefit from Lab-at-Rig®.

technology which can deliver onsite results from drillhole samples in a one-hour cycle.

Lab-at-Rig® features automated analysis of mineralogy and geochemistry of drill hole cuttings direct from the drill site, along with the relevant sampling methods and quality control. The system is fitted to a diamond drill rig and a solid recovery unit, and includes:

- a sample preparation unit that collects solids from drill cuttings and dries them;
- X-ray fluorescence and X-ray diffraction sensors to provide chemistry and mineralogy of the sample respectively; and
- the ability to upload data to a cloud-based storage platform where it can be analysed and provided back to the explorer.

The impact

Lab-at-Rig® will lead to improved decision making and productivity for mineral resource operations, with the potential to deliver massive cost savings in drilling, exploration and overall mining operations.

The technology significantly reduces lengthy time frames of onsite mineral analysis, removing the need to dismantle and reassemble, and its associated cost. Time savings will also increase discovery rates and speed up the development of key mining areas. Environmentally, there will be a reduction in the number of drill holes and the amount of emissions associated with the transportation of samples between laboratories.

An economic assessment estimates the net present value (NPV) of Lab-at-Rig® to be \$546 million with a benefit-cost ratio estimated at 17.63¹.

1 ACIL Allen Consulting. 2018. Lab-at-Rig® – An Independent Assessment. ACIL Allen Consulting: Canberra.

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FOR FURTHER INFORMATION

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