

OVERLINEE

Big focus on minor elements

A SERIES of projects coordinated by the Centre for Sustainable Resource Processing and AMIRA International aims to exploit the major influences that minor elements have on product quality.

CSIRO Minerals is a key participant in the projects, along with nine other research and commercial organisations including the JKMRC, the Australian Nuclear Science and Technology Organisation, Mintek and Impala Platinum. Expected outcomes from these large-scale collaborations range from safe disposal strategies and the sale of previously unrecovered materials to enabling industry operators to

process a wider range of feeds.

“The behaviour of minor elements and contaminant materials plays a key role in the economic and environmental performances of mineral extraction and refining processes,” says CSIRO Minerals Program Manager Sharif Jahanshahi. “Better control and management of these elements offers the industry significant opportunities.”

CSIRO Minerals is working on two collaborative projects with these goals in mind.

The first of these projects focuses on increasing understanding of minor elements – including heavy metals

– through improving sampling, assay methods and analytical techniques on a suite of trace-level elements in materials.

According to Dr Jahanshahi, the immediate priority will be to identify ways to minimise toxic emissions by adjusting process conditions and making process technology changes.

“Our work will build upon the AMIRA P671 project, extending the scope to include a broader range of materials,” he says. “We will also be exploring options for upstream and downstream processing of feedstock and product, the safe disposal of waste and possible on-use of non-product lines.”

In a related project, CSIRO researchers are working to quantify the movement of various minor elements between phases during mineral and downstream processing of concentrates.

“We will use this knowledge to develop predictive models for assessing the leaching behaviour of mineral phases and waste products within the natural environment,” explains Dr Jahanshahi. “Industry can then better assess the stability of toxic and hazardous elements in tailings and slags with a view to developing strategies to minimise them.”

The researchers will focus initially on the processing of copper and nickel sulfide ores, before extending the work to lead-zinc ores



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