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Metallurgical testwork to support development of the Kintyre Project

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The Kintyre uranium deposit is located in the Pilbara region of Western Australia and is jointly owned by Cameco and Mitsubishi. The current indicated resource estimate is approximately 55 million pounds of uranium (as U3O8 equivalent) at an average grade of 0.58%. Due to the high levels of carbonate minerals in the deposit, alkaline leaching was strongly considered as an option to the usually preferred acid route. Following a detailed assessment, the acid option was chosen, with the preferred flowsheet involving an acid leach, followed by solvent extraction and precipitation.

As part of the Kintyre metallurgical investigations, ANSTO Minerals performed an extensive work program, examining numerous aspects of the proposed flowsheet. This included a leach optimisation program, followed by a study determining the effects of sample variability in leaching. Settling, filtration and rheology work on slurries and tailings was performed, as well as testwork to determine the effect of neutralisation conditions on metal precipitation and radionuclide deportment.

In addition, an extensive laboratory and solvent extraction mixer-settler mini-pilot plan campaign was performed to compare the performance of conventional ammonia/ammonium sulphate strip and the non-conventional strong acid strip (400 g/L H2SO4) using leach liquor generated from Kintyre ore. The pilot plant involved two campaigns of three days continuous operation using each stripping system, with >99.5% uranium recovery achieved in each campaign.

This paper will present an overview of the key results from the Kintyre leaching and neutralisation testwork undertaken at ANSTO Minerals, and will also outline the performance of the solvent extraction mini pilot plant.

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