ASX Announcement 27 April 2017

ASX: BOE

HONEYMOON URANIUM PROJECT
METALLURGICAL TESTWORK PROGRESS UPDATE

HIGHLIGHTS

- Ongoing ion exchange testwork has identified a resin, with over 100% higher loading capacity than previously tested resins, appropriate for Honeymoon type liquors with high chloride
- Preliminary bench scale leach testwork shows a modified leach liquor improves recovery in the Honeymoon ores
- Metallurgical testwork confirms conventional processing for recovery of uranium at Honeymoon
- The Pre-feasibility Study, scheduled for release in H2 2017, will incorporate improvements as demonstrated from the testwork
- Preparatory works now underway for a Field Leach Trial to validate leach and ion exchange processes

Boss Chief Executive Officer, Mr Duncan Craib, said: "*Initial metallurgical results derived from the ANSTO program and its application of new resins as part of the Pre-Feasibility Study are very encouraging as highlighted by the substantial increase in recoverability of uranium. The suggested impact from these results indicates a lowering of upfront project CAPEX and reduction in key reagent consumptions. This is an important validation step, of which there are several, in de-risking the Honeymoon Project. Accordingly, preparatory work for a Field Leach Trial utilising the preferred resin and leach chemistry has now commenced.*"

Boss Resources Limited (ASX: BOE) (**Boss** or the **Company**) is pleased to announce interim results from the metallurgical testwork program being undertaken with the Australian Nuclear Science and Technology Organisation (**ANSTO**) as part of the Pre-Feasibility Study (**PFS**). As announced previously, the metallurgical program is to further define and optimise the selected flowsheet, with such work focussing on:

- Leaching test work on drill core samples (batch and continuous column leaches);
- Water quality assessments;
- Ion exchange test work; and
- Solvent extraction test work.

The selected flowsheet is based on the work of the Expansion Study which identified an expanded processing plant facility based on ion exchange technology as the most viable option to pursue for the project (see ASX: 28 September 2016). The process considers operating the existing solvent extraction plant in parallel with the new ion exchange plant and combining products post uranium precipitation. This configuration allows the maximum benefits of the ion exchange process to be realised. In addition,

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any improvements in pregnant leach solution (PLS) tenors that may be achieved as a result of the leaching optimisation can be easily managed within the process plant.

Ion Exchange Testwork

Five resins were tested as part of this program, two weak based anionic resins, two strong based anionic resins, and a chelating type resin. Each resin was submitted to a program of tests with a series of established decision gates included at key stages to help narrow down the selection. Based on this process two resins were selected as the best performing resins for the project, one of which is a stand-out option (preferred resin).

The testwork undertaken on the resins included:

- Column loading curves;
- Extraction kinetics;
- Column and batch elution tests;
- Elution kinetics; and
- Hydrodynamic tests.

A selection of the loading testwork results are highlighted in the figures below.

Figure 1 shows the loading breakthrough curve with the preferred resin demonstrating a higher uranium loading capacity than previously achieved on other resins. This type of test indicates the volume of PLS that can be treated prior to the resin being fully loaded, and uranium not being recovered from the liquor. The preferred resin shows in excess of 300 bed volumes (BVs) can be treated before this occurs, whereas standard resins show breakthroughs occurring once 50 to 100 BV have been passed.

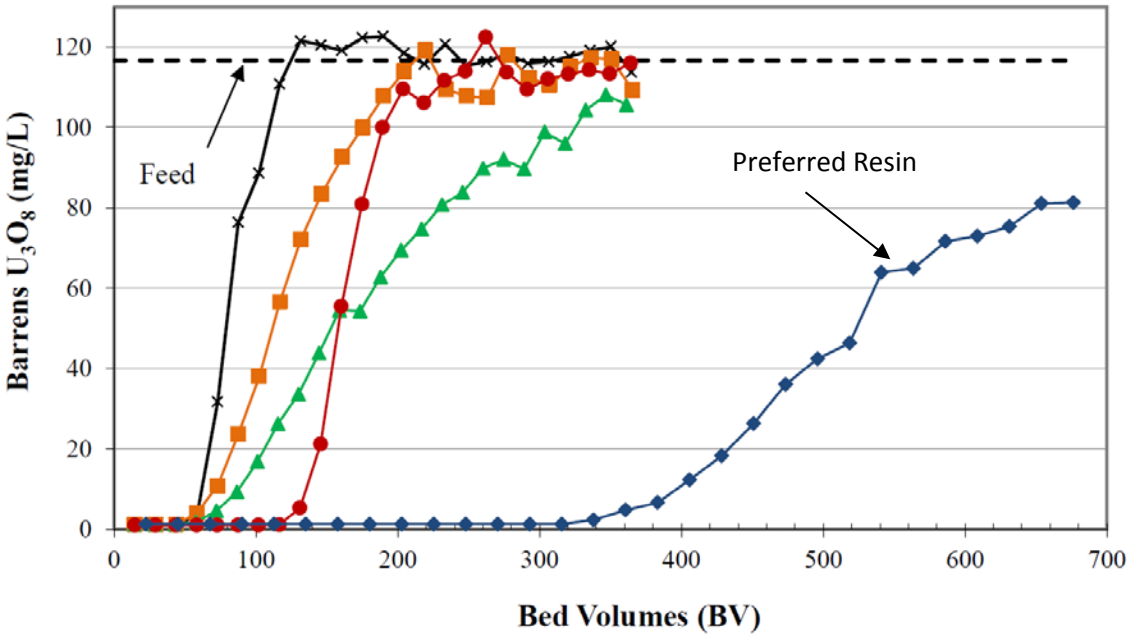

Figure 1: Uranium Breakthrough Curves
(4.0-4.6 BV/hr, 30 deg C, pH 1.8, 8,8g/l Cl)

Figure 2 confirms the high uranium loading potential of this resin. Indications are that the resin loading capacity is over 100% higher than any of the other standard resins tested.

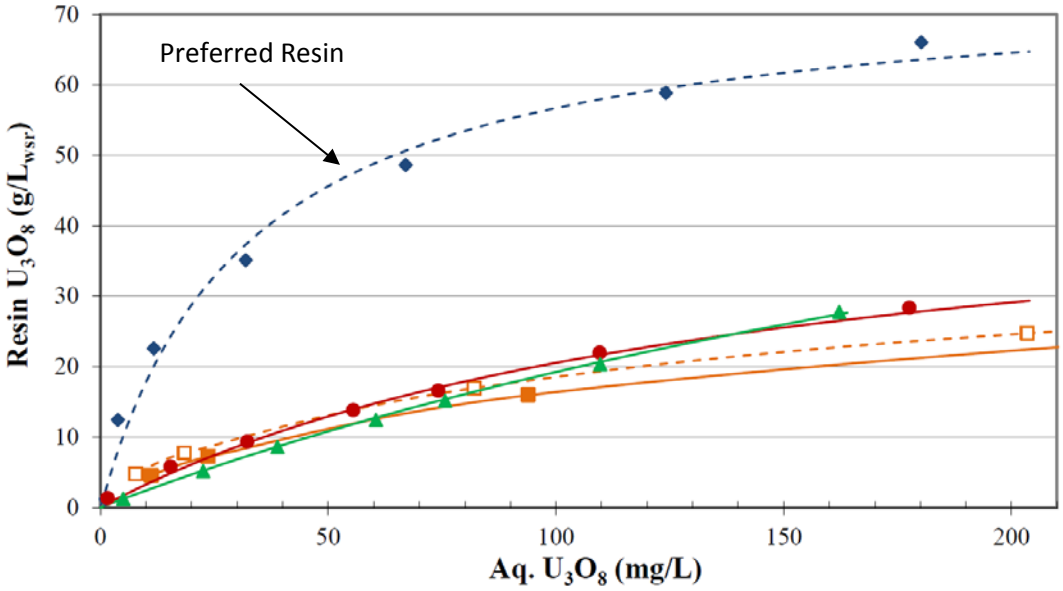

Figure 2: Uranium Loading Curves
(30 deg C, pH 1.7-1.8, 8,8g/l Cl)

Furthermore, the selectivity of the preferred resin for uranium over iron and other base metals should simplify the upfront recovery section of the process plant, and as such the ion exchange eluate will now be sent directly to precipitation without any further impurity removal stages.

The elution testwork on this resin showed it is not as efficient in stripping, however the higher loading capacity more than compensates.

From a project perspective, these ion exchange results suggest that the quantity of resin and therefore the size / number of the ion exchange columns required for a specified production is likely to be reduced thereby lowering initial project capital expenditure. This will be confirmed as part of the PFS process design and costing exercise.

To account for the possible increase in PLS acidity and elevated iron tenors which may occur as a result of the leaching program, a series of isotherms and stripping curves were performed for the existing solvent extraction circuit to confirm the applicability of the organic extractant and validate the design basis under the new conditions. No issues were identified and the existing solvent extraction circuit will remain unchanged.

To complete the current program the testwork results from both the ion exchange and solvent extraction work will be used to develop a predictive model for the performance of the two circuits under varying operating regimes such that the process design can be confirmed and the preferred operating strategy selected. This work will be completed within the next few weeks.

To further minimise project risk, the impact of using the other resin with lower loading capacity will also be considered such that an alternate option exists should it be required.

Leaching Testwork

Leaching testwork is also underway at ANSTO using core collected from Honeymoon during the sonic drilling program completed as part of the recent drilling program. Two sample types were generated from the recovered core; one being a low clay sample with coarse sands but relatively high pyrite content, and the other being a high clay sample with finer materials and again higher pyrite content. The low clay sample is considered ideal for in-situ recovery (ISR) from a physical perspective.

The testwork program was designed to optimise leaching conditions for Honeymoon ore and to examine the effect of liquor recycle on uranium extraction, the dissolution of calcium, iron and chloride from minerals in the ore, as well as the factors controlling gypsum solubility.

The program commenced with the low clay sample which indicated high uranium extractions under moderate conditions are achievable. Mineralogy identified the presence of uranium phosphate minerals, which although known to be present in the ore body are not believed to be as abundant as seen is this specific sample, and therefore further representative work is required.

Further optimisation was undertaken on the high clay sample which included a more representative uranium mineralogy. Figure 3 shows the effect of pH (acidity) on uranium extraction and confirm the expected trend of increasing extraction with increasing acidity (lower pH). Acid consumptions did not increase significantly with lower pH and targeting this higher acidity will not necessarily increase operating costs.

For comparison, Figure 3 also shows the approximate operating conditions utilised by Honeymoon prior to the shutdown, along with the possible conditions that could be used by Boss during the restart.

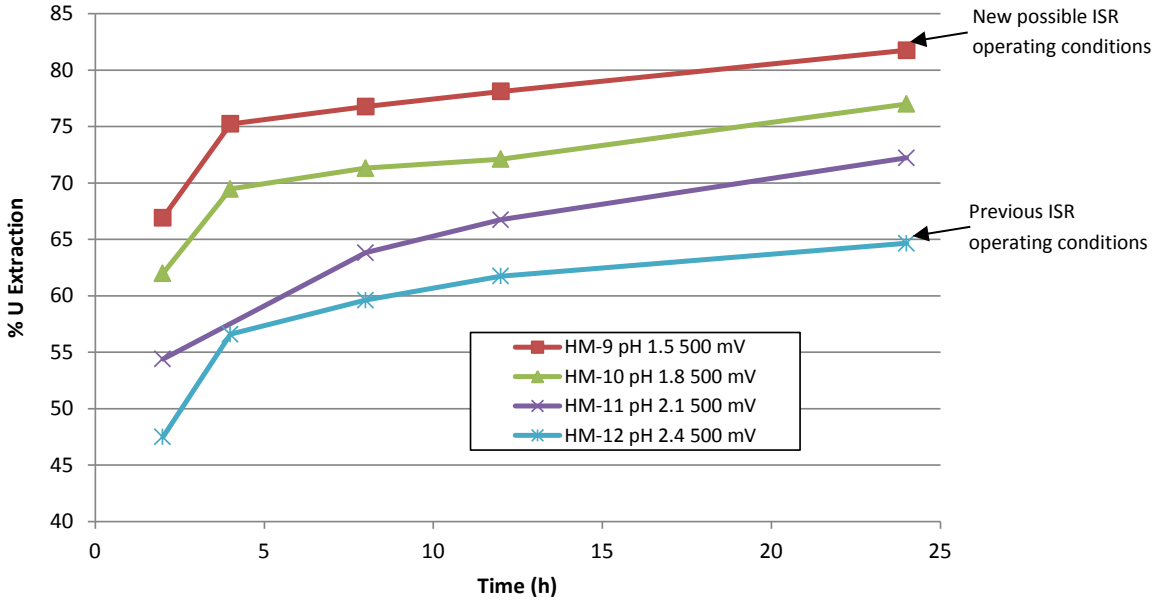

Figure 3: Effect of pH on Uranium Extraction from High Clay Sample

Outstanding work at this stage includes column leach tests with uranium recycling to ensure re-precipitation of leached uranium is not problematic and the gypsum solubility work in conjunction with the impact of water quality. This work is expected to be completed in June 2017 prior to operating the Field Leach Trial.

Next Steps

The results from the testwork is being used by GR Engineering Services for the PFS process design criteria on which the plant design, sizing and costing are based. Such work is well progressed and the preliminary results are expected shortly.

Other major activities associated with the PFS, most noticeably the updated resource and the wellfield design, are either complete or nearing completion. All inputs required for the study will be available in the next few weeks with the final reporting to occur shortly thereafter.

The information generated in the PFS will form the basis for the licence and permit applications for the increased production at Honeymoon and the mining licence for Jasons. The documentation, meetings and approvals for these applications will be undertaken through to H1 2018 so as to be completed in time for the proposed Definitive Feasibility.

As the next step in the development of the Honeymoon Project it has been agreed that a Field Leach Trial (FLT) will be undertaken at Honeymoon. The FLT will consider running two leach patterns over a number of months to validate the leaching process and produce “real” PLS for testing in an onsite ion-exchange pilot plant that will run in parallel with the FLT. Planning for this is underway and it is anticipated that the onsite work could start as early as June, running until September/October 2017.

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