ASX Announcement 19 June 2017

ASX: BOE

HONEYMOON FIELD LEACH TRIAL

HIGHLIGHTS

- Positioning Honeymoon to be Australia's next uranium producer as underlying prices rise
- Technical validation step for the Honeymoon Project
  - Demonstrate improved leaching chemistry, resin selection and uranium recovery
  - Verify ion exchange performance on real leach liquor
  - Confirm pregnant liquor tenors and production rates
  - Generate information for improved design and cost estimates
- Provide necessary plant and wellfield technical data for the Definitive Feasibility Study

Boss Resources Limited (ASX: BOE) ("**Boss**" or the "**Company**") is pleased to announce that it has completed the planning and design activities for the Field Leach Trial ("**FLT**") at its Honeymoon Uranium Project ("**Project**") in South Australia. The FLT forms an important part of the Definitive Feasibility Study ("**DFS**") and includes, along with the leach trial, an ion exchange pilot plant, all on the Honeymoon Mining Licence.

Boss CEO, Mr Duncan Craib, stated the commencement of the Field Leach Trial represents another key milestone in the endorsement of the Honeymoon Project as the Company advances towards production. *"A Field Leach Trial is the next logical step in the restart strategy of Honeymoon and allows us to optimise the wellfield operations and process.*

"Despite producing over 670,000lbs of uranium during the 18 months of commissioning the plant, several factors influenced Honeymoon transitioning into care and maintenance in the summer of 2013/14, primary of which was a decline in uranium price. Boss's assessment also identified:

- *The existing plant is constrained by volume, and production rates are driven by the uranium tenor in the feed solution to the plant; and*
- *The uranium tenor in the feed solution is dependent on wellfield performance and this is where the previous operator encountered their key issue.*

"During the previous operating period an average tenor (on a continuous basis) of only 53mg/l U_3O_8 was achieved, compared to the designed specification of 75mg/l U_3O_8. As the flowrate cannot be increased to compensate (plant being volumetrically constrained), this inability to maintain the required uranium tenor meant 30 percent lower production and concurrent impact on operating costs. The reason for the low tenor was due to: wellfield design and well construction / installation; gypsum precipitation; and leaching chemistry.

"Accordingly, Boss has taken the considered approach that:

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- *A minimum production rate of 2Mlbs/annum is required to be competitive;*
- *The 2Mlb/annum process plant has been designed with a lower feed tenor of 47mg/l compared the previous 53mg/l so that the new plant will not be volumetrically constrained ;*
- *A dedicated process for managing gypsum has been included in the process design, and recent results (announced May 2017) demonstrate that the calcium (gypsum) can be successfully managed; and*
- *Any upside in feed tenors achieved from the improved leaching and/or wellfield performance should result in higher production rates and therefore even lower costs.*

"Endorsed restart plans are now firmly in place following the successful development work undertaken in the Expansion Study (September 2016) and PFS (May 2017). Final technical confirmation will be provided by the FLT to validate assumptions made with regard to wellfield production rates and production profiles to attain the planned 2 Mlbs U_3O_8 /annum and 3.2 Mlbs U_3O_8 /annum considered in the PFS.

"These staged developmental steps are to ensure Honeymoon can operate in the lowest cost quartile of competitive global producers. As underlying uranium prices rise Honeymoon is being positioned to be Australia's next uranium producer."

Background

Following the staged development approach the Board has approved the commencement of the FLT to optimise the wellfield design and technically ensure a viable sustaining operation of the Honeymoon Project. Specifically, the FLT has been designed to provide data to address the following:

- Detailed understanding of the geological settings in which the wellfield is operated
- Correct borehole design and location of screens within the mineralised zone
- Correct understanding of "flaring" and the impact on recovery and dilution
- Obtaining the necessary pumping pressure in the injection lines to ensure as far as possible that the maximum amount of solution is in contact with the ore
- Controlling gypsum precipitation within the orebody and screens/pipes
- Understanding leach kinetics and their impact on historical recoveries and generally low-grade solutions produced

The FLT will be run in a previously designed, but not operated, wellfield from the Uranium One production plan. The trial will be ~1:10 scale of a normal production wellfield, and will use a similar a set-up but with a modified leach chemistry (pH & ORP levels). The pregnant leach solution ("PLS") produced from the wellfields will be used to feed the ion-exchange ("IX") pilot plant that will confirm the long-term performance of the selected resin over multiple load-elute cycles.

The IX pilot plant has been selected so as to provide confirmatory data for the processing assumptions made in the PFS and furthermore verify the stability and ongoing performance of the resin. Both the leach trial and the IX pilot plant will further confirm the potential to restart the Honeymoon Uranium Project and help ensure the Company's capacity to be a first mover to development in a rising uranium price environment.

Current Activities

- Re-logging and assessing existing drill hole data from the area
- Sonic core drilling in the selected FLT area to obtain samples for confirmatory assaying and testwork
- Bench scale ore leaching testwork
- Additional confirmatory resin testwork
- Design work on the boreholes location and well design
- Well pattern drilling
- Design work on the required process circuit
- Set-up of the containerised IX pilot plant
- Permitting and approvals
- Manning, supply and logistics planning

Figure 1: Aerial view of Honeymoon Plant and location of FLT

Planning and Design

The area of the previously defined Wellfield E has been selected for the FLT. This area falls within the approved operational area of the existing PEPR and has been well delineated by Uranium One during their wellfield design work.

Operation of wellfield and IX pilot plant are expected to commence in late July for completion in October 2017. The wellfield will be operated for a minimum period of 3 months, with the IX plant running for a shorter ~7-week period. The timeframe may be extended depending on results, but will be sufficient to enable the demonstration of the process at the larger scale and provide the required input data for the detailed engineering of the wellfields, processing plant and production profiles.

Drilling

Drilling activities commenced in May 2017 with 2 sonic core holes drilled at the site of the FLT to confirm ore grade, host lithology and detailed mineralogy.

The wellfield drilling and screen placements are being done by a contract driller experienced in this type of work. Watsons Drilling who carried out the PFS drilling program are contracted to undertake this work.

Contracts & Procurement

The Company has awarded the contracts to construct and operate the Field Leach Trial to Inception Group and Groundwater Science, both reputable and experienced consultancy groups based in Adelaide. These consultancy's have experience in uranium ISR at Beverly, Four Mile and Honeymoon, as well as other non-uranium ISR projects. Together they will undertake the design work for the wellfield, the surface infrastructure required to operate the FLT. The IX pilot plant will be hired from ANSTO, who will also provide the necessary training and ongoing support to operate the IX process.

Resources

The parties involved both directly and indirectly with the wellfield trial and their respective areas of input are as follows:

- ANSTO – laboratory leaching testwork on core samples, selection and sourcing of resin for IX piloting, provision of IX pilot plant unit including commissioning and training of personal
- Inception Group – design of FLT surface infrastructure, development of operating procedures and support during wellfield trial operations
- Groundwater Science – hydrogeological and geological support for locating, designing and developing wellfield pattern for the trial.

The operating team will be a combination of personnel from Inception Group, ANSTO personnel for the IX piloting, a number of consultants who have been involved since the PFS and the Honeymoon care and maintenance team.

Approvals

Formal notification has been submitted to the South Australian Government which clarifies the intent of the FLT and the IX pilot plant and demonstrates that the proposed activities will not result in changes to existing outcomes and measurement criteria. It is acknowledged that the South Australian Government (DPC and EPA) requires sufficient time to assess such a submission and the submission will require endorsement from the South Australian Government prior to operations commencing.

2017 Field Leach Trial Schedule

The proposed schedule for the FLT is shown in Figure 2 below. The schedule is dependent on the FLT approvals process, which is currently underway with the South Australian State Government, and the delivery times for some of the process equipment.

First results from the trial are expected in August 2017, with final results and reporting planned for early December.

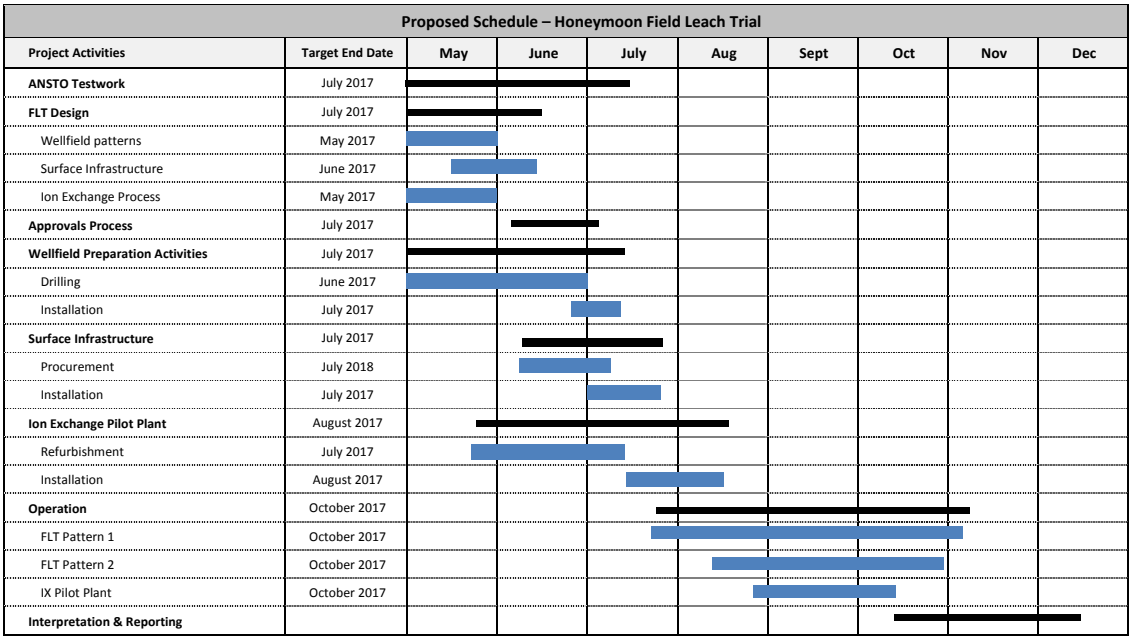

Figure 2: FLT Proposed Schedule

Leaching

Leaching testwork is continuing at ANSTO with samples collected from the latest sonic drilling program added to the test program. These samples were taken within the defined FLT leach patterns to provide baseline information on leach performance. The work includes simple stirred reactor tests as well as column leach work.

The preferred leaching conditions from the laboratory testwork will be the baseline conditions with which the field leach trial will start. The feed liquor may be adjusted depending on the results seen. The purpose of the leach trial will be to:

- Validate optimal leaching conditions (pH, Redox, Fe levels)
- Confirm calcium leaching and gypsum control measures
- Confirm initial leach kinetics
- Define the initial part of the recovery curve (uranium tenor vs. time)
- Assess reagent consumptions
- Check wellfield construction procedures

The FLT will also investigate the concept of recirculating PLS back into a wellfield (solution stacking). This is a means for increasing the uranium solution grades as the feed liquor now contains an appreciable uranium tenor which is further increased through a second leach step. This has not been tested at Honeymoon before, but has been used extensively, and successfully, in Kazakhstan.

Ion Exchange Piloting

The IX process proposed in the PFS will be verified on a pilot scale onsite using real solutions generated from the wellfields. The resin used for this work is the preferred resin identified in the ANSTO work. No final uranium recovery is planned, but a uranium loaded elute will be produced to complete the IX process step. The main purpose of the IX piloting is to:

- allow multiple load-elute cycles to be completed so as to verify the stability and ongoing performance of the resin
- test various eluents on elution kinetics and efficiency
- resin loadings at various PLS grades
- investigate effect of dissolved silica on performance
- to determine if calcium levels are problematic for the IX performance

Well Pattern Operation

The trial concept is to operate 2 well patterns in a standard 5-hole pattern i.e. 10 developed boreholes consisting of 8 injection wells and 2 extraction/production wells. The two patterns are separated from each other. This will provide flexibility during the operation for testing leach performance and allow the solution stacking concept to be investigated.

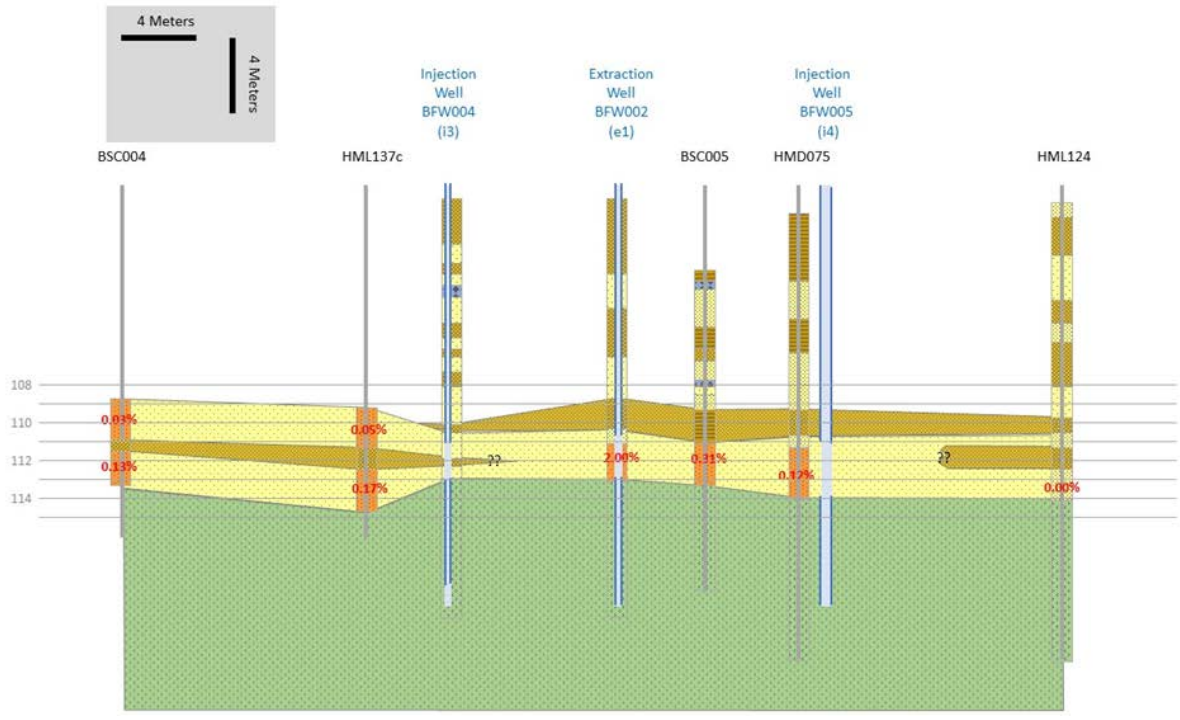

Figure 3: FLT Test Pattern Cross Section

A grade x thickness ("GT") minimum value of 1200 m x ppm has been used to locate the wellfields, along with the requirement that the mineralisation is hosted in permeable sands (as opposed to less permeable clays and silts). The pattern design characteristics are (Refer Figure 3):

- The borehole spacing is 15 metres
- The ore zone is located between ~112 and 114m below surface
- The ore thickness varies from ~1.5m to ~3m with average ore interval grade ranging from 500 to 2,500 ppm.
- Injector pumping rates from 1.0 to 1.5 l/sec

The wells will be constructed using a specialist ISR well design. The well design incorporates a very precise production zone that directs the injected leach solution into contact with the target ore horizons. The opening between the well and the ore horizon is precisely cut (under-reamed) out of a sealed PVC bore casing. This well design is standard ISR technology.

In-Situ Recovery (ISR)

ISR is a type of mining whereby the valuable mineral (or metal) is recovered directly from the orebody while still in the ground through a system of wells. The leaching solution is injected through these wells and flows through the orebody dissolving the minerals as it migrates. The solution containing the valuable minerals (metals) are subsequently recovered in the production wells and pumped as PLS to the surface for further processing and recovery. ISR consequently results in minimal surface disturbance, with no tailings or waste rock is generated.

Over half the world's uranium production is from ISR operations as it is seen to be the most cost-effective process when compared to conventional mining, with the added advantage of being environmentally friendly. ISR's low capital cost, low labour requirements, and a short production development time are some of the key advantages to this mining method.

In Australia, ISR uranium mines (Honeymoon, Beverley and Four Mile) generally use an acid leach approach, with sulphuric acid added to lower pH and hydrogen peroxide added as an oxidant to recover the uranium into solution which is then pumped to the surface and the uranium recovered in much the same way as in any other uranium processing plant.

The major factors affecting wellfield hole patterns and hole spacing are rock-type characteristics, such as permeability, orebody configuration, stratigraphy, and depth of orebody. Different well configuration such as 5-spot, 7-spot or line-drives are the typical wellfield patterns used worldwide and these are the configurations proposed for Honeymoon. Well spacing commonly used between injection wells and is 10 to 35 metres for 5-spot and 7-spot patterns, and 5 to 10 metres for line-drive patterns. Typical production rates are 4 to 8 litres per second per production well.

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