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Companies Announcement Office
Via Electronic Lodgement

Lance Project Low-pH Field Demonstration and Company Update

HIGHLIGHTS

- The Field Demonstration has been operating for over one year
 - Target flow and solution chemistry achieved and maintained
 - Delivering meaningful and valuable results
 - Key learnings include well pattern configuration criteria
- Operations yielding improving uranium grades
 - Composite grade of 50 ppm
 - One production well now yielding 80 to 100 ppm
 - Uranium grades indicate that Lance is better suited to the planned low-pH solutions than the previous alkaline based solution
- Pilot scale ion-exchange system yields produced uranium
- Bench-scale evaluation of advanced uranium recovery technology completed
- Permitting enhancements and modifications progressed

Peninsula Energy Limited ("**Peninsula**" or "**the Company**") (ASX:PEN, OTCQB:PENMF) is pleased to provide the following update on the MU1A low-pH field demonstration at the Company's flagship, 100% owned Lance Project ("**Lance**") located in Wyoming, USA. The field demonstration of low-pH In-Situ Recovery ("**ISR**") of uranium has been operating for more than one year and has yielded significant additional results since the last update on 1 July 2021.

Previously the Company highlighted the achievement of the targeted solution chemistry (principally pH level and oxidant concentration) for the demonstration and corresponding elevated uranium production grades. Since then, the field operations have run consistently and the improvement trend of uranium grade has continued. The project team has continued to focus on technical and operational concepts that hold potential to enhance future performance, particularly changes to the configuration of the injection and recovery well patterns. The Company is now planning on expanding the scope of the field demonstration with the installation of a new small scale pattern that is not expected to extend the duration of the demonstration.

Commenting on the continuing progress of the field demonstration, Peninsula Managing Director and Chief Executive Officer Wayne Heili said "*The current results of the field demonstration suggest that the targeted chemistry is effective in dissolving and recovering uranium from the Lance deposit. The production stream grades continue to improve while the variation of uranium grade among the recovery wells has highlighted the importance of precise well placement in achieving targeted levels of grade and recovery performance from the resource. With continued higher grades, the Company has now successfully produced uranium from the pilot ion exchange system. Information gained during the demonstration operations will be applied to optimising the commercial low-pH approach as the Company progresses the Lance Project toward a decision to finance the resumption of commercial production.*"

OPERATIONAL PERFORMANCE OVERVIEW

At the time of the July 2021 progress update, the composite production stream of the field demonstration operation had reached the approximate target levels for pH, free acid concentration and Oxygen Reduction Potential (“ORP”). Further, the composite stream uranium grade was trending upward and had reached approximately 40 ppm. In the period following, the pH and ORP levels have been maintained. The ongoing operational activities completed and detailed below have resulted in the uranium composite grade increasing to over 50 ppm, with one production well consistently yielding solution grades of 80 to 100 ppm. Importantly, the combined flow rate of the field demonstration production wells has been maintained over the duration of the the first year of operations. The flow rate started around 75 gallons per minute (“GPM”) and the patterns are currently running at approximately 80 GPM.

Approximately 5 pore volumes of solution have been displaced within the MU1A area. The uranium grade trend has mirrored the 2018 Feasibility Study model to date, see Figure-1. The observable dip in the grade that occurred after approximately 4 pore volumes was the temporary result of pattern changes implemented by the project team (see below).

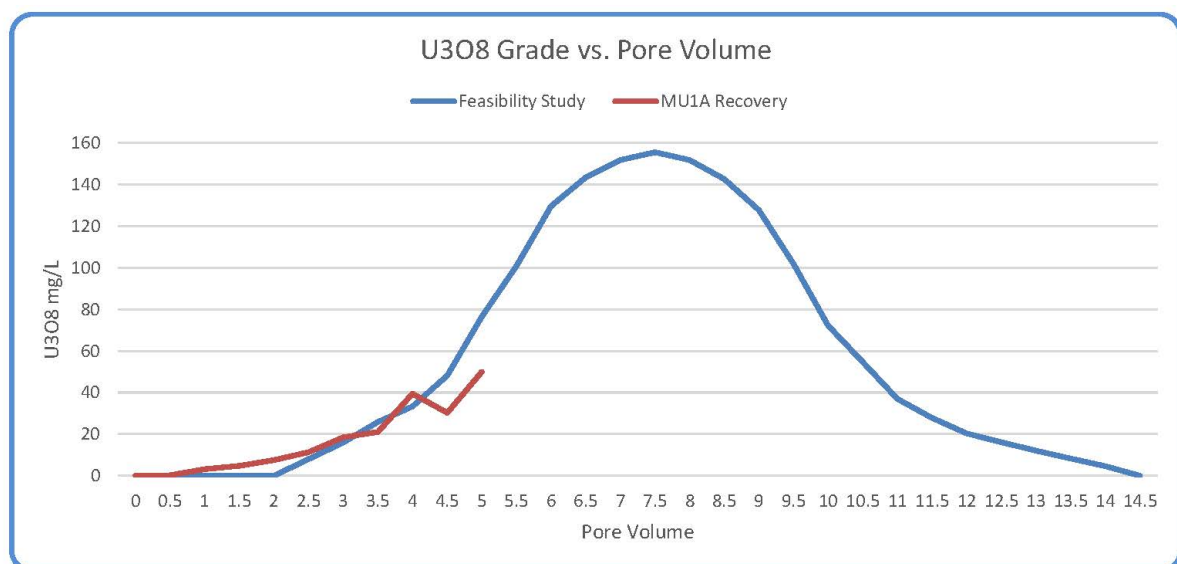


Figure -1: Field Demonstration Uranium Grade comparison to 2018 FS model

ISR PATTERN CONFIGURATION MODIFICATIONS

The Company has utilised the Field Demonstration to evaluate multiple ISR pattern configurations with an objective to identify the optimal design considerations for Lance. The Company recently commissioned the preparation of a hydrogeologic model to simulate the solution flow paths and the extent that the injected solution has been sweeping across the full orebody. The modelling exercise revealed the possibility that under the initial pattern design concept, injected solution was not sweeping the full pattern area and therefore mineralised portions of the orebody were potentially not being addressed with lixiviant. This inefficiency is now regarded as a significant contributing factor in the variability in the individual production well results that have been realised.

As a corrective measure, the Company installed two additional wells located within potentially unaddressed zones of the pattern area. **Figure-2** illustrates the modified pattern configuration with the addition of wells MU1-OZ345 and MU1-OZ347. Located in-between the recovery wells, the two new wells were placed into service as injection wells that had a much shorter direct flow path to the recovery wells. The effect of the two wells was to drive the composite recovery grade higher soon after activation.

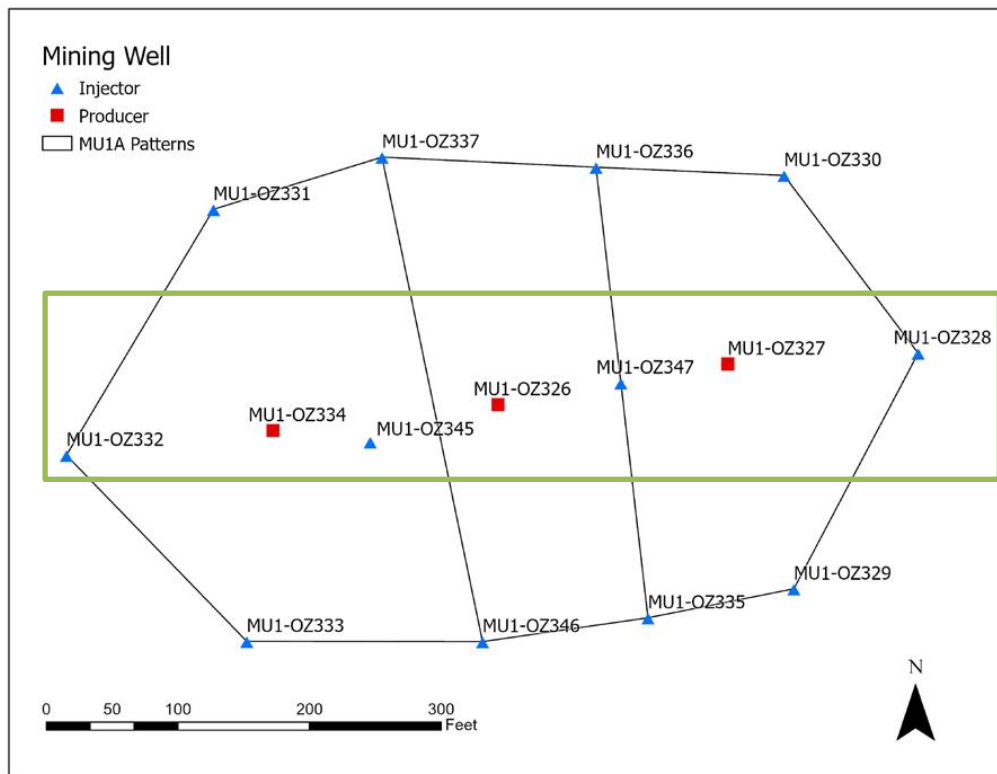


Figure-2: Modified Pattern Configuration of MU1A
 [Includes green box to indicate the line drive in operation since July 2021 – refer below]

The availability of the two new interior wells presented the opportunity to evaluate additional pattern configurations with shorter expected overall response times. In mid-July 2021, the Company discontinued regular injection into the Northernmost and Southernmost wells (8 wells in total) and started operating MU1A in a line drive configuration with four injection wells and three production wells (from West to East including the wells crossing from MU1-OZ332 to MU1-OZ328). Flow model simulations indicated that the flow paths within the line drive would be focused in a discrete area and would cross significant ore. The line drive configuration also allows for simple pattern reversals where the function of the wells is switched between injection and recovery. Following the change to a line drive configuration, the production composite grade has increased to 50 ppm U₃O₈, with one production well consistently yielding 80 to 100 ppm solution grades.

In August 2021, the Company commenced preparation of an additional test pattern based on learnings from the field demonstration thus far. The new pattern will provide further valuable operational information on the performance of well patterns tightly placed on a delineated uranium resource. This will inform the parameters to be used in an updated feasibility study and future commercial operations. The new pattern will feature three new wells with close spacing to facilitate rapid response times. The small-scale test pattern is expected to be commissioned in September 2021. As the additional well pattern will be scaled down for relatively prompt response times, there is no anticipated change to the remaining 6 to 10 month duration of the field demonstration.

URANIUM CAPTURE - ION EXCHANGE

Concurrent with the rising uranium grade, the Company activated the pilot ion exchange system. Fresh ion exchange resins have been loaded to capacity and shipped off site for elution and yellowcake production. While not a commercial scale operation, the field demonstration will result in the Company reporting a small quantity of produced uranium in the September 2021 quarter, the first time since the

operations were idled in 2019. The loaded resins have been demonstrated to contain uranium in quantities consistent with industry standards.

The Company utilised the opportunity presented by having production solutions derived from the Field Demonstration to complete a bench scale study of an alternative plant uranium recovery circuit in July 2021. The Company expects receipt of a comprehensive evaluation report in the near future. If deemed successful, testing may be advanced to pilot scale demonstrations that could be run in conjunction with the current Field Demonstration. Identified advanced technologies have the potential to significantly enhance downstream processing performance while reducing operating costs.

PERMITTING

The Company continues to progress permitting enhancements and modifications in advance of the restart of operations.

The application for an expanded list of oxidants, including hydrogen peroxide presently being used in the field demonstration, has progressed through the Wyoming Department of Environmental Quality (WDEQ) process and a draft permit revision is expected to be published for public comment shortly.

A permit amendment requesting authorization for the use of ponds for the purpose of fine solids management, as trialled in the field demonstration, is in the process of being drafted for submission.

US URANIUM RESERVE


The transition to the Biden Administration in 2021, and consequential changes to the leadership at the US Department of Energy ("DOE"), has slowed the implementation of the US\$75 million Uranium Reserve established by Congress in 2020. In August 2021 the DOE published a request for information for the Uranium Reserve with responses required to be submitted in September 2021. The Company appreciates the opportunity to participate in this DOE initiative and is in the process of preparing its response for submission. Ultimately the Uranium Reserve is expected to be implemented through DOE issuing requests for proposals which will provide US uranium production projects, including the Lance Project, with the opportunity to bid for new uranium sales contracts.

SEPTEMBER 2021 SALE

Early in September 2021, the Company completed a sale of 200,000 pounds of U_3O_8 pursuant to a long-term contract. The uranium was sourced from the existing portfolio of binding purchase agreements. A net cash margin of US\$3.8 million will be generated from this sale and is scheduled for receipt in early October 2021.

Peninsula will provide further updates on the MU1A low-pH field demonstration as additional meaningful results become available.

Sincerely Yours,



Wayne Heili
Managing Director / CEO

This release has been approved by the Board of Directors.

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ABOUT PENINSULA ENERGY LIMITED

Peninsula Energy Limited (PEN) is an ASX listed uranium mining company which commenced in-situ recovery operations in 2015 at its 100% owned Lance Projects in Wyoming, USA. Following a positive feasibility study, Peninsula is embarking on a project transformation initiative at the Lance Projects to change from an alkaline ISR operation to a low-pH ISR operation with the aim of aligning the operating performance and cost profile of the project with industry leading global uranium production projects.