

**22 November 2018**

## **ASX ANNOUNCEMENT**

### **LITHIUM AUSTRALIA PRODUCES LI-ION BATTERIES FROM MINE WASTE**

#### **HIGHLIGHTS**

- **High quality tri-lithium phosphate produced from mine waste**
- **Cathode powder produced directly from tri-lithium phosphate product**
- **Li-ion batteries manufactured and successfully tested**
- **Battery performance compares very favourably with batteries using standard lithium carbonate**

#### **LI-ION BATTERIES FROM MINE WASTE**

Lithium Australia NL (ASX: LIT) advises that its wholly owned subsidiary, VSPC Ltd (VSPC) has successfully produced Li-ion battery ("LIB") cathode material, and Li-ion batteries, from tri-lithium phosphate produced directly from mine waste using the SiLeach<sup>®</sup> process. This groundbreaking process, removes the requirement for generation of high-purity lithium hydroxide or carbonate which has long been one of the most cost-intensive, and challenging steps in the manufacture of LIBs.

#### **DIRECT CONVERSION**

The tri-lithium phosphate was converted to lithium-iron-phosphate (LFP) cathode material at the advanced electrochemical laboratory and pilot plant facility in Brisbane, Queensland operated by VSPC. The proprietary processes used to generate the LFP nanoparticles is covered by patents granted to VSPC.

The cathode material was characterised by XRD and SEM (see Figure 1), and determined to be of similar quality to VSPC standard LFP material.

**Figure 1 – VSPC LFP SEM image    Figure 2 – Cell-making in the VSPC lab    Figure 3 – coin cells**



LIBs (2032 coin cells) were subsequently produced (see Figures 2 & 3) and tested under a range of charge and discharge conditions and the cells achieved equivalent performance to VSPC's advanced cathode powders which use lithium carbonate as the manufacturing feed. Battery performance compares very favourably against cells using standard VSPC cathode material produced with industry standard lithium carbonate.

## **FUTURE POTENTIAL**

The demonstrated ability to bypass lithium carbonate and lithium hydroxide as battery precursors, provides potential to significantly reduce the cost battery manufacture. Not only that, the use of mine waste in the battery production cycle can provide greater sustainability to global lithium resources.

Lithium Australia is also developing the process for direct production of cathode powders from lithium brines, to not only eliminate the requirement to produce high-purity lithium hydroxide or carbonate but to reduce the requirement for evaporation ponds.

## **A WORLD FIRST**

Mine waste, to LIB without the requirement to produce a lithium hydroxide or lithium carbonate precursor is a world first. This has the potential to provide a commercial outcome to many stranded resources creating ethical and sustainable supply in the process.

## **COMMENT FROM LITHIUM AUSTRALIA MANAGING DIRECTOR ADRIAN GRIFFIN**

“The remarkable outcome is a credit to our development team. The most notable aspect of this achievement is its simplicity, and ability to streamline the processes and cost required to produce LIB cathode materials. The broader application to lithium brine exploitation provides enormous potential for that part of the lithium industry, by removing the cost intensive route to lithium hydroxide – the direct use of lithium phosphate to produce cathode powders may do that.”

### **Adrian Griffin – Managing Director**

Mobile +61 (0) 418 927 658

[Adrian.Griffin@lithium-au.com](mailto:Adrian.Griffin@lithium-au.com)

## **ABOUT LITHIUM AUSTRALIA NL**

Lithium Australia aspires to 'close the loop' on the energy-metal cycle in an ethical and sustainable manner. To that end, it has amassed a portfolio of projects and alliances and developed innovative extraction processes to convert *all* lithium silicates (including mine waste) to lithium chemicals. From these, the company plans to produce advanced components for the lithium-ion battery industry. The final step for Lithium Australia involves recycling of spent batteries and e-waste. By uniting resources and the best available technology, Lithium Australia seeks to establish a vertically integrated lithium processing business.

For more information, visit [www.lithium-au.com](http://www.lithium-au.com) and [www.vspc.com](http://www.vspc.com)

## **MEDIA CONTACTS**

Adrian Griffin, Lithium Australia NL

08 6145 0288 | 0418 927 658

John Field, Field Public Relations

08 8234 9555 | 0418 819 527