High Purity Battery Grade Lithium Produced from Ewoyaa Spodumene Concentrate
Lithium Carbonate 99.92% & Lithium Hydroxide 56.5%
Ewoyaa Project - Cape Coast Lithium Portfolio
Ghana, West Africa

IronRidge Resources Limited (AIM: IRR, ‘IronRidge’ or the ‘Company’), the African focussed minerals exploration company, is pleased to announce that successful battery grade lithium conversion trials were conducted on coarse spodumene concentrate samples taken from the Ewoyaa Lithium Project within the Cape Coast Lithium Portfolio in Ghana, West Africa (refer RNS of 20 August 2019).

HIGHLIGHTS:

- Coarse spodumene concentrate containing 6.3% Lithium Oxide (‘Li₂O’) from preliminary beneficiation testing sent to ANSTO for sighter conversion tests
- Greater than 99% conversion of alpha spodumene to acid soluble beta spodumene was achieved in the critical calcination stage
- Lithium carbonate at a grade of 99.92% Lithium Carbonate (‘Li₂CO₃’) was produced, which exceeds most published specifications for battery grade quality
- High purity battery grade lithium hydroxide containing 56.5% Lithium Hydroxide (‘LiOH·H₂O’) was produced from the carbonate via the conventional hybrid route

Commenting on the Company’s latest progress, Noel O’Brien, Consulting Metallurgist to IronRidge, said:

“These results very clearly demonstrate that, due to the coarse size and low impurity content of the concentrate, the Ewoyaa Lithium Project is a world class asset and is a premium feedstock for converters around the world.”

Adding to this, Vincent Mascolo, CEO/MD of IronRidge Resources said:

“We are very pleased to have achieved these conversion test work results which demonstrate the Ewoyaa Project’s ability to generate battery grade lithium products from premium feedstock.

“These results are another significant milestone which underscore the commercial potential of the Project, which also boasts exceptional logistics; adjacent multiple high-voltage power lines, sealed roads and lies within 110km of the operating deep sea port of Takoradi, all within a the pro-mining jurisdiction of Ghana”.

“Whilst the Ewoyaa Project continues to deliver encouraging results, the Company is working towards releasing its Maiden Resource Estimate for Q1 2020, and will continue with project studies and regional exploration programmes.”
Conversion Tests

The initial calcination tests were very successful with over 99% conversion of alpha to the acid soluble beta form of spodumene being achieved, from which high quality 99.92% lithium carbonate and 56.5% lithium hydroxide monohydrate were formed.

A 9.5 kg sample of concentrate was sent to the laboratories of the Minerals Division of Australian Nuclear Science and Technology Organisation, (‘ANSTO’), in Sydney, for the sighter conversion tests. ANSTO were commissioned by IronRidge to complete a sighter programme that would demonstrate that the Ewoyaa concentrate could be converted to lithium hydroxide using a conventional hybrid process flowsheet, based on the conversion of refined lithium carbonate to hydroxide (refer Figure 1).

The concentrate sample had a size of 6.3 to 0.5mm and contained 6.29% Li₂O, 1.07% Iron (III) Oxide (‘Fe₂O₃’), 0.83% Potassium Oxide (‘K₂O’) and 0.65% Sodium Oxide (‘Na₂O’).

Figure 1: Process flowsheet for conversion of Ewoyaa spodumene concentrate to lithium carbonate and lithium hydroxide
Outcomes:

Calcining

The first phase of the conversion process involves calcining the concentrate to affect a solid state change of alpha spodumene to the acid soluble form, beta spodumene. The concentrate was calcined at 1050°C for 2 hours and cooled to 150°C. At this stage no signs of fusion were observed.

Subsequent X-Ray Diffraction (‘XRD’) analysis, after milling to p100 = 250 microns, showed virtually complete conversion of alpha to beta phase under laboratory conditions. This is the most critical phase of the conversion process and the result demonstrated that Ewoyaa concentrate would be preferred by downstream processors because of coarse size of concentrate and low levels of impurities.

![Figure 2: Calcination of Ewoyaa spodumene concentrate (before on LHS, after on RHS)](image)

Carbonate

The calcined material was roasted in sulphuric acid, leached in water, purified and converted to lithium carbonate using sodium carbonate (refer Figure 3). The primary carbonate was dissolved as lithium bicarbonate and further refined by recrystallisation.

The resulting refined carbonate product exceeded most commercial specifications for battery grade carbonate and would therefore be an excellent feedstock for the preparation of lithium hydroxide via the hybrid route (refer Table 1).

It was particularly pleasing to note that the critical impurity levels of Silica (‘Si’) and Calcium (‘Ca’) in the carbonate were already below the hydroxide requirements of 30ppm and 15 ppm respectively.
Table 1: Ewoyaa Lithium Carbonate specification

<table>
<thead>
<tr>
<th>Element/Species</th>
<th>Units</th>
<th>Primary Li$_2$CO$_3$</th>
<th>Refined Li$_2$CO$_3$</th>
<th>Albermarle*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li$_2$CO$_3$ (Lithium Carbonate)</td>
<td>wt% min</td>
<td>99.81</td>
<td>99.92</td>
<td>99.8</td>
</tr>
<tr>
<td>H$_2$O (Water)</td>
<td>wt% max</td>
<td>0</td>
<td>0</td>
<td>0.35</td>
</tr>
<tr>
<td>Na (Potassium)</td>
<td>wt% max</td>
<td>0.09</td>
<td>0.033</td>
<td>0.065</td>
</tr>
<tr>
<td>SO$_4$ (Sulfate)</td>
<td>wt% max</td>
<td>0.12</td>
<td>0.005</td>
<td>0.050</td>
</tr>
<tr>
<td>Ca (Calcium)</td>
<td>ppm max</td>
<td>20</td>
<td>3</td>
<td>160</td>
</tr>
<tr>
<td>Si (Silica)</td>
<td>ppm max</td>
<td>&lt;15</td>
<td>&lt;15</td>
<td></td>
</tr>
<tr>
<td>Fe (Iron)</td>
<td>ppm max</td>
<td>5.9</td>
<td>&lt;3</td>
<td>10</td>
</tr>
<tr>
<td>Al (Aluminium)</td>
<td>ppm max</td>
<td>&lt;3</td>
<td>&lt;3</td>
<td></td>
</tr>
<tr>
<td>Cu (Copper)</td>
<td>ppm max</td>
<td>&lt;3</td>
<td>&lt;3</td>
<td></td>
</tr>
<tr>
<td>Ni (Nickel)</td>
<td>ppm max</td>
<td>&lt;3</td>
<td>&lt;3</td>
<td></td>
</tr>
<tr>
<td>Zn (Zinc)</td>
<td>ppm max</td>
<td>&lt;3</td>
<td>&lt;3</td>
<td></td>
</tr>
<tr>
<td>Cl (Chlorine)</td>
<td>wt% max</td>
<td>0.002</td>
<td>0.002</td>
<td>0.015</td>
</tr>
</tbody>
</table>

*Albemarle Specifications for Battery Grade Lithium Carbonate issued 12 December 2017
Hydroxide

The remaining mass of refined lithium carbonate was used to test the production of lithium hydroxide. Due to the limited amount of sample available, a single batch test was done without final refinement by ion exchange (IX) and lithium hydroxide monohydrate with a high purity and grade of 56.5% was produced (refer Figure 4).

This will be the focus of larger scale testing in the future as more definitive metallurgical testing progresses, but the testing to date has highlighted the:

- Superior quality of Ewoyaa concentrate and its suitability for the critical calcination step in the conversion process
- Production of lithium carbonate of very high quality that exceeds all impurity limits in terms of hydroxide production.

![Figure 4: Lithium Hydroxide Product – Primary (not recrystallised)](image)

Next Steps

The Company is working towards releasing its Maiden Resource Estimate for Q1 2020 and will continue with project studies and regional exploration programmes.

The Board is delighted with the progress that the Company has made in 2020 to date and looks forward to keeping shareholders updated as further news becomes available.

*Certain information contained in this announcement would have been deemed inside information for the purposes of Article 7 of Regulation (EU) No 596/2014 until the release of this announcement.*
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**Competent Person Statement:**
Information in this report relating to the exploration results is based on data reviewed by Mr Lennard Kolff (MEcon. Geol., BSc. Hons ARSM), Chief Geologist of the Company. Mr Kolff is a Member of the Australian Institute of Geoscientists who has in excess of 20 years’ experience in mineral exploration and is a Qualified Person under the AIM Rules. Mr Kolff consents to the inclusion of the information in the form and context in which it appears.

The information in this announcement that relates to metallurgical results is based on information compiled by Mr Noel O’Brien, Director of Trinol Pty. Limited. Mr O’Brien is a Fellow of the Australasian Institute of Mining and Metallurgy (AusIMM) and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the December 2012 edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves” (JORC Code). Mr O’Brien consents to the inclusion in the report of the matters based upon the information in the form and context in which it appears.

**Notes to Editors:**
IronRidge Resources is an AIM-listed, Africa focussed minerals exploration company with a lithium pegmatite discovery in Ghana, extensive grassroots gold portfolio in Cote d’Ivoire and a potential new gold province discovery in Chad. The Company holds legacy iron ore assets in Gabon and a bauxite resource in Australia. IronRidge’s strategy is to create and sustain shareholder value through the discovery and development of significant and globally demanded commodities.

**Ghana**
The Company entered into earn-in arrangements with Obotan Minerals Limited, Merlink Resources Limited, Barari Developments Limited and Joy Transporters Limited of Ghana, West Africa, securing the first access rights to acquire the historical Egyasimanku Hill spodumene rich lithium deposit, estimated to be in the order of 1.48Mt at 1.67% Li2O and surrounding tenements. The portfolio covers some 684km² with the newly discovered Ewoyaa project including drill intersections of 128m @ 1.21% Li2O from 3m and 111m @ 1.35%
Li2O from 37m, and a further identified 20km strike of pegmatite vein swarms. The tenure package is also highly prospective for tin, tantalum, niobium, caesium and gold, which occur as accessory minerals within the pegmatites and host formations.

**Chad**
The Company entered into an agreement with Tekton Minerals Pte Ltd of Singapore concerning its portfolio covering 900km² of highly prospective gold and other mineral projects in Chad, Central Africa. IronRidge acquired 100% of Tekton including its projects and team to advance the Dorothe, Echbara, Am Ouchar, Nabagay and Kalaka licenses, which host multiple, large scale gold projects. Trenching results at Dorothe, including 84m @ 1.66g/t Au (including 6m @ 5.49g/t & 8m @ 6.23g/t), 4m @ 18.77g/t Au (including 2m @ 36.2g/t), 32m @ 2.02g/t Au (including 18m @ 3.22g/t), 24m @ 2.53g/t Au (including 6m @ 4.1g/t (including 2m @ 6.2g/t) and 2m @ 6.14g/t), 14.12g/t Au over 4m, 34.1g/t over 2m and 63.2g/t over 1m, have defined significant gold mineralised quartz veining zones over a 3km by 1km area including the steep dipping ‘Main Vein’ and shallow dipping ‘Sheeted Vein’ zones.

**Côte d’Ivoire**
The Company entered into conditional earn-in arrangements in Côte d’Ivoire, West Africa; securing access rights to highly prospective gold mineralised structures and pegmatite occurrences covering a combined 3,584km² and 1,172km² area respectively. The projects are well located within access of an extensive bitumen road network and along strike from multi-million-ounce gold projects and mines.

**Australia**
Monogorilby is prospective for province scale titanium and bauxite, with an initial maiden resource of 54.9MT of premium DSO bauxite. Monogorilby is located in central Queensland, within a short trucking distance of the rail system leading north to the Port of Bundaberg. It is also located within close proximity of the active Queensland Rail network heading south towards the Port of Brisbane.

May Queen is located in Central Queensland within IRR’s wholly owned Monogorilby license package and is highly prospective for gold. Historic drilling completed during the 1980s intersected multiple high-grade gold intervals, including 2m @ 73.4 g/t Au (including 1m at 145g/t), 4m @ 38.8g/t Au (at end of hole) and 3m @ 18.9g/t Au, over an approximate 100m strike hosting numerous parallel vein systems, open to the north-west and south-east.

**Gabon**
Tchibanga is located in south-western Gabon, in the Nyanga Province, within 10-60km of the Atlantic coastline. This project comprises two exploration licenses, Tchibanga and Tchibanga Nord, which cover a combined area of 3,396km² and include over 90km of prospective lithologies and the historic Mont Pele iron occurrence.

Belinga Sud is Located in the north east of Gabon in the Ogooue-Ivindo Province, approximately 400km east of the capital city of Libreville. IRR’s licence lies between the main Belinga Iron Ore Deposit, believed to be one of the world’s largest untapped reserves of iron ore with an estimated 1bt of iron ore at a grade >60% Fe, and the route of the Trans Gabonese railway, which currently carries manganese ore and timber from Franceville to the Port of Owendo in Libreville.

**Corporate**
IronRidge made its AIM debut in February 2015, successfully securing strategic alliances with three international companies: Assore Limited of South Africa, Sumitomo Corporation of Japan and DGR Global Limited of Australia. Assore is a high-grade iron, chrome and manganese mining specialist. Sumitomo Corporation is a global resources, mining marketing and trading conglomerate. DGR Global is a project generation and exploration specialist.