

21 September 2015

# **ASX / TSX ANNOUNCEMENT**

# **Olaroz Lithium Facility Operations Update**

- Production ramp up continues with lithium carbonate production of 93 tonnes in July and 143 tonnes in August
- Production planned for September is 250 tonnes
- Monthly nameplate production targeted for December 2015
- Work continuing on removing bottlenecks and improving operating practice
- FMC Corporation (NYSE:FMC) announces a 15% price increase for lithium products effective 1st October 2015



Lithium Carbonate 1 Tonne Bag Inventory

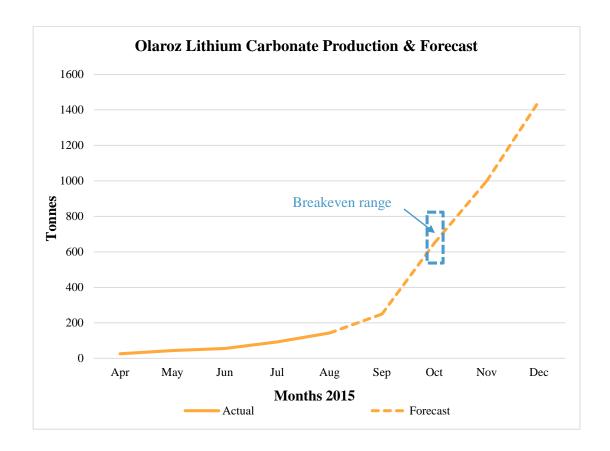
Orocobre Limited (ORE:ASX ORL:TSX) (**Orocobre** or the **Company**) wishes to advise on progress at the Olaroz Lithium Facility.

# **Production update and forecast**

Over the past months, priority has been given to the identification and implementation of long term solutions for operational challenges, debottlenecking and equipment rectifications rather than maximizing daily production. This approach has necessitated numerous periods of testwork and equipment trials with consequent reduced flowrates through the Facility, which in turn has had a direct impact on the production performance of the plant versus forecast.

Production ramp up at the Olaroz Lithium Facility has continued to improve, with 93 tonnes produced in July, 143 tonnes produced in August and 250 tonnes scheduled to be produced in September. Nameplate production run rate is planned to be achieved in December 2015.

The Olaroz Lithium Facility will reach breakeven point on an operating cost basis (net of taxes paid or reimbursed), when production reaches approximately 650 tonnes per month, subject to variability in sales price. This level of production is expected to be achieved in October 2015.



## **De-bottlenecking progress**

Significant progress has been made in the de-bottlenecking program.

- **Heat Exchangers:** Elevated temperatures in the return solutions had made the absorption part of the purification circuit approximately 10 degrees higher than target, thus limiting lithium carbonate dissolution. Design engineering work for the required cooling system in the purification circuit has been completed and consequent modifications to the plant will be completed in the week commencing 21 September. Modifications to the circuit were effected using existing heat exchangers rather than using cooling towers as originally considered.
- Polishing Filters and Centrifuges: Work undertaken to improve the operational performance of the polishing filters in the primary circuit, which remove calcium and magnesium precipitates, did not increase the filtering capacity to a sufficient level. Flow rates were being further reduced by higher crystal loads caused by colder weather restricting flow rates through the plant. A solution to this capacity constraint was found with the successful trialing of a centrifuge sourced from Borax Argentina's Tincalyu plant, which has the capacity to separate lithium solids from liquids by its rapid spinning and use of centrifugal force without clogging. This centrifuge has a capacity of 40m³/hr and was quickly installed on an existing platform. To reach the nameplate flowrate a second centrifuge, which is already on site, will be installed in October.

The installation of both centrifuges will allow the flow rates through the Facility to reach nameplate capacity and require far less maintenance than the previous filter solution.

The Outotec polishing filters are being reassigned to provide additional filtering capacity in the recovery of lithium carbonate solids remaining in the circuit prior to their discharge from the plant, thus improving overall recovery rates for the Facility. This modification to the plant will also be completed the week commencing 21 September.

• **Boiler Increase:** Engineering studies undertaken during the design of the cooling requirements in the absorption part of the purification circuit discussed above have identified a new heat deficiency on the crystallizer end of the circuit. Additional boiler capacity will be added during November to address this deficiency. The increase in boiler capacity will permit the crystallizers to meet full capacity.

The centrifuges and additional boiler will cost approximately US\$1m.

The progress in debottlenecking through the quarter to date has been very pleasing and the Company is now confident that all significant issues have been identified with solutions to the problem either complete or in the process of being implemented.

## **Reaching Nameplate Production**

The following key factors will enable the planned ramp-up in the production profile to be achieved:

- Completion of debottlenecking activities which will allow the Facility to operate at its design flow rates.
- Brine profile as disclosed in the June quarterly report it is expected that by October 2015 there will be sufficient quantities of concentrated brine to supply the Facility at full capacity. In particular, during October, the brine feeding the plant is forecast to reach the design grade of approximately 0.7%,

enhanced by increasing evaporation rates. Recoveries of lithium carbonate from the plant are directly proportional to the feed grade. Consequently, lithium recovery in the plant will improve as grades rise to the design specification.

• Ongoing operational improvements being achieved from a workforce becoming increasingly experienced and knowledgeable in plant processes.

Taking into account the aforementioned drivers, ramp up will continue to accelerate to reach nameplate run rate in December.



Recently commissioned secondary liming plant

### **Financing**

The Joint Venture SDJ SA paid US\$7.0m in September 2015 as the first principal and interest payment on the US\$191.9m debt facility. The next principal and interest payment obligation for the joint venture company SDJ SA is approximately US\$13.5m, due in March 2016.

# **Sales Orders**

Commercial shipments of lithium carbonate have continued to be dispatched from the Olaroz Lithium Facility to Europe, Japan and the USA. As previously advised samples have been sent to 19 battery and 13 industrial sector customers as the final stage of product qualification with positive initial responses already received from a number of these customers. All forecast production for CY2015 has now been fully committed and customers are awaiting delivery.

Given the very tight market conditions the main customer concern remains the long term security of quality supply. The Olaroz Lithium Facility should substantially fulfil this need.

#### **Market Conditions**

FMC Corporation, one of the world's largest producers of lithium products, has announced a 15% price increase effective from 1 October 2015, noting that "continued market growth is outpacing current industry supply capabilities for most of our product lines". The price increase will apply to lithium carbonate, lithium chloride, lithium hydroxide and all other lithium products with the exception of specialty organics. FMC attributed the price hikes to demand-supply discrepancies and a desire to reinvest in facilities.

Lithium market conditions continue to tighten. Supply side constraints coupled with strong market demand is resulting in upward pressure on market prices for lithium carbonate. Prices in recent times have been steadily increasing over US\$6,000/tonne. The traditional annual fixed price contracts are now being replaced by shorter bi-annual, quarterly and even monthly (load by load) pricing arrangements.

The market growth rate projected by independent consultants is ~10% year on year for at least the next few years (Roskill forecast to 2017, IHS forecast to 2025). These market growth rate projections were published prior to announcements by Tesla, Foxconn, Samsung LG and BYD for new and expanded battery factories.

There is increasing momentum in the electric vehicle (EV) sector with increasing participation by mainstream brands, a growing focus on grid power storage at a commercial and residential scale, improving viability of solar-lithium battery systems and continued growth in the demand for portable electronic devices, underpinned by the growth in emerging markets.



# **Managing Director Comments**

Managing Director, Richard Seville, said, "We remain positive about our progress at the Olaroz Lithium Facility despite falling short of our previously announced production forecast. We have continued to make rapid advances in removing bottlenecks and we improve our "know how" and operating practices on a daily basis. In particular, we are very pleased with the solutions we found to excess crystal loading on the polishing filters by finding a better technology using centrifuges and releasing the existing filters to recover additional lithium carbonate from tailings streams.

We will continue to work hard to deliver the outcomes necessary to reach nameplate capacity by year's end and finish establishing Olaroz as a premier production site of high quality product for the battery and industrial sectors."



Olaroz Lithium Facility brine ponds

## For more information please contact:

#### **Australia and Asia**

### **Richard Seville**

Managing Director T: +61 7 3871 3985 M:-+61 419 916 338 E: resville@orocobre.com

## **David Hall**

Business Development Manager T: +61 7 3871 3985 M: +61 407 845 052 E: dhall@orocobre.com

### **North America**

James Calaway Chairman

M: +1 (713) 818 1457 E: jcalaway@orocobre.com

#### **About Orocobre Limited**

Orocobre Limited is listed on the Australian Securities Exchange and Toronto Stock Exchange (ASX:ORE) (TSX:ORL), and is building a substantial Argentinian-based industrial chemicals and minerals company through the construction and operation of its portfolio of lithium, potash and boron projects and facilities in the Puna region of northern Argentina. The Company has built, in partnership with Toyota Tsusho Corporation and JEMSE, the first large-scale, greenfield brine based lithium project in approximately 20 years at the Salar de Olaroz with planned production of 17,500 tonnes per annum of low-cost battery grade lithium carbonate. The full monthly nameplate production rate is expected to be reached by the end of calendar year 2015.

The Olaroz Lithium Facility has a low environmental footprint because of the following aspects of the process:

- The process is designed to have a high processing recovery of lithium. With its low unit costs, the process will result in low cut-off grades, which will maximise resource recovery.
- The process route is designed with a zero liquid discharge design. All waste products are stored in permanent impoundments (the lined evaporation ponds). At the end of the project life the ponds will be capped and returned to a similar profile following soil placement and planting of original vegetation types.
- Brine is extracted from wells with minimum impact on freshwater resources outside the salar. Because
  the lithium is in sedimentary aquifers with relatively low permeability, drawdowns are limited to the
  salar itself. This is different from halite hosted deposits such as Salar de Atacama, Salar de Hombre
  Muerto and Salar de Rincon where the halite bodies have very high near surface permeability and the
  drawdown cones can impact on water resources around the Salar affecting the local environment.
- Energy used to concentrate the lithium in the brine is solar energy. The carbon footprint is lower than other processes.
- The technology developed has a very low maximum fresh water consumption of <20 l/s, which is low by industry standards.
- Sales de Jujuy S.A. is also committed to the ten principles of the sustainable development framework as developed by The International Council on Mining and Metals. The company has an active and well-funded "Shared Value" program aimed at the long term development of the local people.

The Company continues to follow the community and shared value policy to successfully work with suppliers and the employment bureau to focus on the hiring of local people from the communities of Olaroz, Huancar, Puesto Sey, Pastos Chicos, Catua, Susques, Jama, El Toro, Coranzulí, San Juan and Abrapampa. The project implementation is through EPCM (Engineering, Procurement and Construction Management) with a high proportion of local involvement through construction and supply contracts and local employment. The community and shared value policy continues to be a key success factor, training local people under the supervision of high quality experienced professionals.

The Company also wholly-owns Borax Argentina, an important regional borate producer.

For further information, please visit www.orocobre.com

## Caution Regarding Forward-Looking Information

This news release contains "forward-looking information" within the meaning of applicable securities legislation. Forward-looking information contained in this release may include, but is not limited to, the commencement of commercial production and ramp up at the Olaroz Lithium Facility and the timing thereof, the cost of construction relative to the estimated capital cost of the Olaroz Lithium Facility, the design production rate for lithium carbonate at the Olaroz Lithium Facility, the expected brine grade at the Olaroz Project, the expected operating costs at the Olaroz Lithium Facility and the comparison of such expected costs to expected global operating costs, and the ongoing working relationship between Orocobre and the Province of Jujuy.

Such forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause actual results to be materially different from those expressed or implied by such forward-looking information, including but not limited to the risk of further changes in government regulations, policies or legislation; the possibility that required concessions may not be obtained, or may be obtained only on terms and conditions that are materially worse than anticipated; that further funding may be required, but unavailable, for the ongoing development of the Company's projects; fluctuations or decreases in commodity prices and market demand for product; uncertainty in the estimation, economic viability, recoverability and processing of mineral resources; risks associated with weather patterns and impact on production rate; risks associated with commissioning and ramp up of the Olaroz Lithium Facility to full capacity; unexpected capital or operating cost increases; uncertainty of meeting anticipated program milestones at the Olaroz Lithium Facility; general risks associated with the further development of the Olaroz Lithium Facility; as well as those factors disclosed in the Company's Annual Report for the year ended June 30, 2014 filed at <a href="https://www.sedar.com">www.sedar.com</a>.

The Company believes that the assumptions and expectations reflected in such forward-looking information are reasonable. Assumptions have been made regarding, among other things: the timely receipt of required approvals and completion of agreements on reasonable terms and conditions; the ability of the Company to obtain financing as and when required and on reasonable terms and conditions; the prices of lithium and borates; market demand for product and the ability of the Company to operate in a safe, efficient and effective manner. Readers are cautioned that the foregoing list is not exhaustive of all factors and assumptions which may have been used. There can be no assurance that forward-looking information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such information. Accordingly, readers should not place undue reliance on forward-looking information. The Company does not undertake to update any forward-looking information, except in accordance with applicable securities laws.