

# Largo's plans to expand vanadium production capacity by 25% garners more interest

Largo Resources Ltd. (TSX: LGO | OTCQX: LGORF) is a Toronto-based strategic mineral company focused on the production of vanadium flake, high purity vanadium flake and high purity vanadium powder. The Company's focus is on their 99.84% owned open pit Maracás Menchen Mine located in Bahia State, Brazil. The property totals 17,690 hectares and has excellent access to the national electricity grid and access from Salvador via a paved 405 km secondary road connected to the main coastal highway. The town of Maracás has a population of approximately 25,000.

Vanadium is traditionally used to harden steel. China's recent regulations that require stronger steel rebar, is pushing the demand for vanadium required in the hardening process. CEO Mark A Smith explains: "I think the best thing to think about vanadium is rebar, because that's where 50% of the vanadium is used today. Rebar is of course used to strengthen buildings, roads and bridges, and give them much better seismic strength." The trends in the steel industry, are now demanding increasingly stronger and lighter products for advanced applications. Vanadium demand has a compound annual growth rate of over 6% for the past several years; however recently vanadium has become a burgeoning commodity.

Additionally, Vanadium Redox Batteries (VRB) are becoming increasingly popular especially for large scale commercial energy storage in China. China has an enormous amount of solar and wind capacity that blend perfectly with this type of energy storage. In terms of green energy these batteries are very efficient as they can absorb energy, as well as release the energy simultaneously and very quickly. The type of

vanadium used in energy storage applications is vanadium pentoxide (V2O5).



Largo Resources Processing plant at their Maracás Menchen Mine in Brazil

According to the Company, Largo's Maracás Menchen Mine boasts the highest grade (1.15% V2O5, or 3.4% concentrate grade) vanadium deposit yet discovered and has accomplished a unique feat in the mining industry, by successfully financing, building and bringing a project to production in a trying market environment and in a unique commodity. V2O5 cost of production is US\$4.11/lb. The Company states: "Our vision is to be the lowest cost, highest grade vanadium producer in the world, while maximizing overall shareholder value and continually maintaining the respect of our employees, communities we operate in and with all relevant stakeholders."

Largo has contracted a take-or-pay, off-take agreement with Glencore International Plc. for 100% of its vanadium material. The mine is projected to produce between 8,950 and 9,950 tonnes of vanadium pentoxide in 2018. On July 10 the Company announced: "Largo Resources reports second quarter 2018 production results. Total production of 2,458 tonnes of V2O5

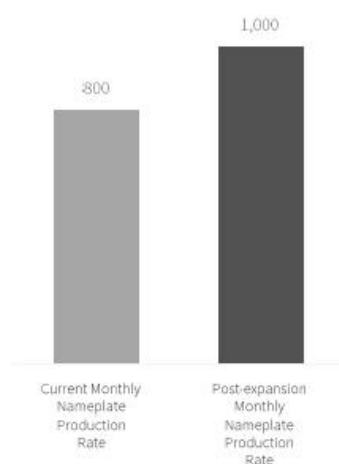
in Q2 2018, a 13% increase over Q2 2017 and a 11% increase over Q1 2018. New average daily production record for June of 29.4 tonnes of V<sub>2</sub>O<sub>5</sub> produced per day. Overall V<sub>2</sub>O<sub>5</sub> recovery rate of 79.2% achieved in Q2 2018.” President and Chief Executive Officer Mark A Smith stated: “V<sub>2</sub>O<sub>5</sub> prices continued to edge higher with the latest European Metal Bulletin price range posted during the week of July 6 being US \$18.50-\$19.00/lb, which puts us in a good starting position for the third quarter.”

## Maracás Menchen Mine Expansion Plan

Increasing nameplate production capacity by 25%

### Nameplate V<sub>2</sub>O<sub>5</sub> Production

(tpm)



- ✓ Production capacity to increase from the nameplate rate of approximately 800 tonnes per month of V<sub>2</sub>O<sub>5</sub> to 1,000 tonnes per month, an increase of 25%.
- ✓ Capital expenditures for the plan are anticipated to total approximately US\$15.5 million using current exchange rates.
- ✓ The expansion plan focuses on increasing the production capacity of the milling, fusion (deammoniator, furnace and flaking wheel), leaching and filtering areas.
- ✓ Total production capacity could be further increased by an additional **100 tonnes per month** to an aggregate total of 1,100 tonnes of V<sub>2</sub>O<sub>5</sub> per month if certain other upgrades and improvements are made to the kiln refractory. Studies to evaluate this opportunity are underway.



Early stages of construction began in June 2018 with and has an expected timetable for completion of approximately 12 months, including the required permitting and commissioning. Current operations at the Maracás Menchen Mine will not be affected by the expansion plans.

Proposed production increase from 800 to 1,000 tonnes per month from June 2019 onward

Largo Resources has a market cap of CAD\$992M, and an analyst target price of C\$3.60.

Largo announced in April 2018 its plans to expand production capacity by 25% at the mine with construction beginning in June 2018. The 25% increase in capacity translate to 200 tonnes of additional vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) being produced per month from June 2019, thereby lifting the Company's total

to 1,000t per month. As Largo continues to ramp up production at its Maracás Menchen Mine and generates strong cash-flows, it will present an excellent opportunity for investors to gain exposure to the vanadium market.

In conclusion, Largo Resources offers investors a high grade, low cost, well valued pure play vanadium producer with growing production in a hot sector.

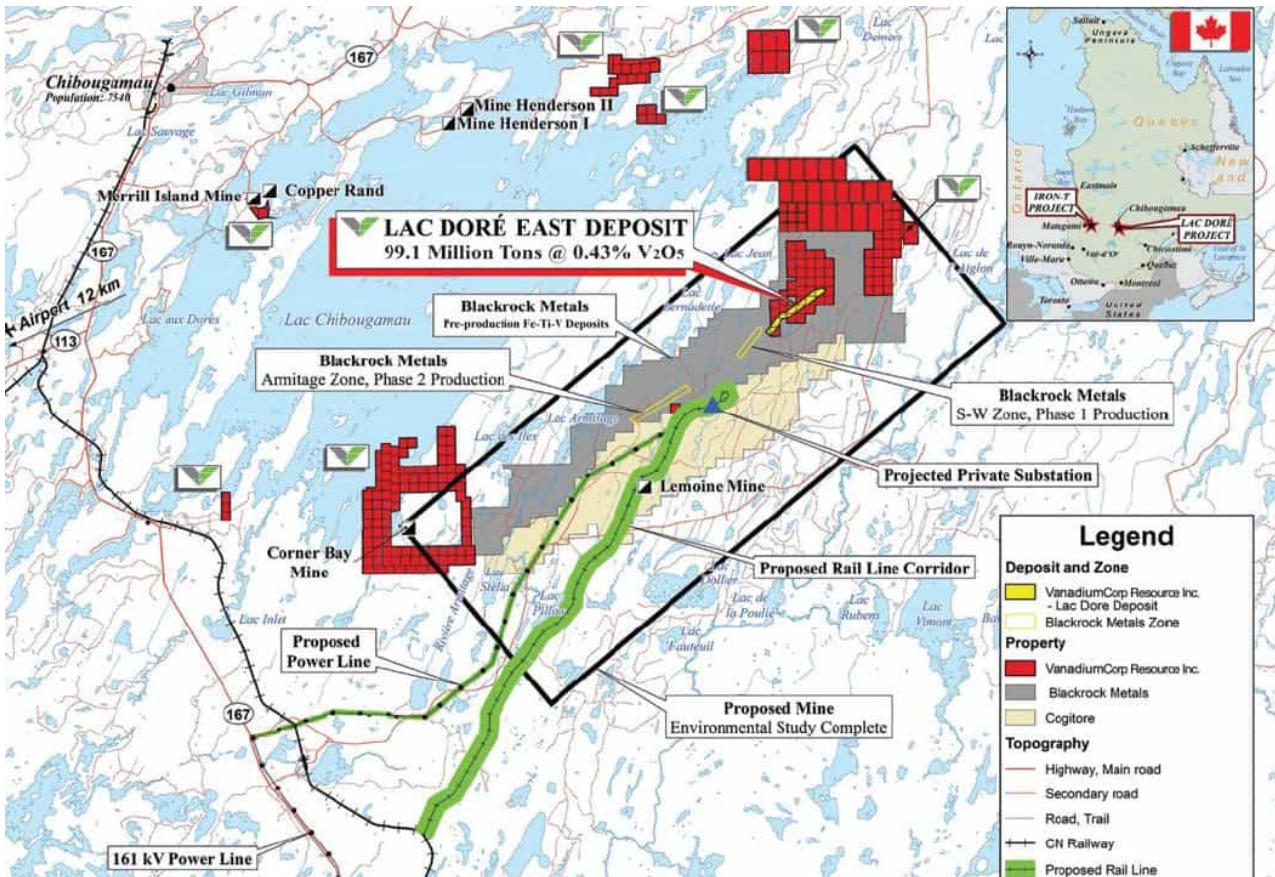
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## **New processing technology recovers 95%+ of VanadiumCorp's metal value**

VanadiumCorp Resource Inc. (TSXV: VRB) 100% owns the Lac Dore Vanadium-Iron-Titanium project in Quebec, Canada. The Company also has another smaller project known as the Iron-T Vanadium Project also in Quebec, and royalties on the Raglan Nickel-PGM mine.

The Company is looking to take a vertically integrated approach. They are also developing leading process technologies 'VanadiumCorp-Electrochem Processing Technology' and 'Electrochem globally patented Electrowinning' technology.

The Lac Dore project spans over 45<sup>2</sup> km as shown below.



Lac Dore location map

The NI 43-101 vanadium resource estimate is 99.1Mt @ 0.43% V<sub>2</sub>O<sub>5</sub> (Inferred), or 1.08% V<sub>2</sub>O<sub>5</sub> in magnetite concentrate. Mineralization is at surface and open at depth and along strike. The contained vanadium resource is 282,370 tonnes V<sub>2</sub>O<sub>5</sub> in magnetite concentrate. Vanadium recovery from magnetite concentrate is 95% indicating favorable metallurgy.

VanadiumCorp's 100% owned Vanadiferous titanomagnetite ('VTM') resource at the Lac Dore Project represents ideal feed stock for the new carbon free and efficient process developed by VanadiumCorp & Electrochem. Of significance, the conventional primary process recovery from magnetite concentrate averages 1.0% V<sub>2</sub>O<sub>5</sub>, and the new process recovers 95%+ of ALL metal value including titanium and iron. Clearly this is very helpful towards the project's economics.



Adriaan Bakker, CEO of VanadiumCorp states, “The advantage of monetizing all three metals from VTM provides a distinct advantage for our 100% owned VTM resources in Quebec and joint licensing opportunity of the technologies worldwide. Our collaboration with Electrochem first began by addressing the industry need for a better process method for vanadium electrolyte. Utilizing a custom reactor and combining technologies, Phase II testing and trial production subsequently confirmed the ability to process magnetite regardless of origin and various feed stocks that many companies had considered waste until now.”

The November 2017 PEA resulted in an after-tax Net Present Value (NPV) of C\$814M, post inflation but not discounted. The after-tax Internal Rate of Return (IRR) is 15.42%. Life of Mine (LOM) is 20 years, requiring 64% of the presently known inferred resources with an after-tax payback period of 6 years after start-up. CapEx is estimated at C\$321m. The Company plans re-filing an amended PEA technical report for its Lac Dore Project by early June 2018.

The Lac Dore project is close to all infrastructure (road, rail, 161Kv power, workforce, water, and airport). It is also close to the mining town of Chibougamau, located in mining friendly Quebec, Canada.

Near term catalysts include the amended PEA, further developments with Ultra Power Systems Limited to pursue the joint interest of commercializing and deploying Vanadium Redox Flow Batteries (VRFB) for microgrid applications. Other

possible catalysts would include any off-take announcements or project financing as well as any licensing agreements.

Market Cap is currently C\$23m. The resource size is good, with exploration upside and the PEA is currently being amended. For now the market is not really giving any value for their patented technology, which once proven successful at scale will add significant value.

In conclusion, VanadiumCorp has an excellent growing resource in the safe and mining friendly jurisdiction of Quebec Canada. Additionally, VanadiumCorp offers a new processing technology that recovers 95%+ of all the metal value in their ore, and has potential for licensing revenues. All eyes will be on the updated PEA to be out very soon.