

# COBALT'S NEXT GENERATION

Despite an extended period of low prices, cobalt has spiked in the last 12 months and once again attention is on the lithium ion cathode mineral.

**Benchmark Mineral Intelligence** spoke to **Robin Goad**, CEO of Fortune Minerals about NICO - one of the few late stage development cobalt projects in North America seeking to tap into the rapidly evolving battery market.

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**Caspar Rawles:** Can you give us an introduction to the NICO project and its vital statistics please?

**Robin Goad:** Fortune Minerals Limited (TSX: FT; OTCQX: FTMDF) is developing its 100% owned NICO Project, comprised of a proposed mine and mill in Canada's Northwest Territories and refinery in Saskatchewan, to become a vertically integrated producer of cobalt chemicals for the lithium-ion battery industry with gold and bismuth co-products. NICO will be a North American cobalt chemical producer in a market that is dominated by Congolese mine production, by-product copper and nickel cobalt sources, and Chinese refining capacity.

NICO has Proven and Probable Mineral Reserves of more than 33m tonnes containing 82.3m lbs (37,300 MT) of cobalt, 1.11m Oz's of gold, 102.1m lbs (46,300MT) of bismuth, and 27.2m lbs (12,300 MT) of copper to support a 21-year open pit mine life at a mill rate of 4,650 tonnes of ore per day. A simple flotation process reduces the ore from the mine to 180 tonnes per day of concentrate for transportation to Saskatchewan for processing to the final chemical and metal products.

The refinery will have life of mine average annual production of 1615 tonnes of cobalt contained in a cobalt sulphate heptahydrate, 41,300 ounces of gold, 1750 tonnes of bismuth in ingots, needles and oxide and minor by-product copper. The refinery is also designed with flexibility to allow for toll processing of concentrates from other mines and we envision diversifying into the battery and metals recycling business in the future.

**CR:** There has already been C\$116m (US\$88.2m) investment in the project, does this mean some of the mine infrastructure is completed?

**RG:** Yes – Approximately C\$20m (US\$15.2m) of underground pre-production development work comprised of 2km of excavations and a ventilation shaft have already been completed to support combined open pit and underground mining operations in the first two years of the mine life. This work was done for the underground test mining that was done in 2006 and 2007 to validate the deposit grade and geometry and to collect large fresh samples for pilot plant tests. The underground operations will be focussed on the gold-rich, high-grade



**Irrespective of the supply chain concerns, new deposits will be required just to satisfy the growth in demand**



core in the early years of production to accelerate the payback. Additionally, there is a small camp and shop facility and a network of roads.

Our investment of C\$116m (US\$88.2m) has advanced NICO through several resource cycles, from an in-house discovery in 1996 to the point we are now working with PwC to secure project financing for construction. The work includes positive Feasibility and Front-End Engineering and Design studies with sufficient



detailed engineering for procurement. The mineral reserves have been drilled in detail and validated in test mining. Development risks have been mitigated by pilot plant tests proving the process methods, metal recoveries and products we will produce. At this point, NICO is essentially shovel-ready with Environmental Assessment approvals completed in both jurisdictions and the major mine permits already in place.

**With C\$116m of investment already spent on Fortune's cobalt project in Canada's Northwest Territories, the company is in a more advanced stage of development than most players**

**CR: What significant milestones for the project do you hope to achieve over the next 12 months?**

**RG:** The announcement of federal funding for the construction of the Tlicho All-Season Road (TASR) in the Northwest Territories is an essential enabler for the NICO mine to proceed. The TASR will connect the community of Whati to the Northwest Territories public highway system.

► Fortune is already permitted for, and will assume the cost of extending a spur road to the mine site allowing for the transportation of metal concentrates to southern Canada for processing. The TASR is in the late stages of environmental assessment and is expected to be completed this summer. Confirmation that funding is available will inform the environmental assessment process in terms of timing for construction.

The road certainty and growing demand for cobalt in lithium-ion batteries were important milestones that will increase the confidence for securing the approximately C\$600m (US\$456m) needed for project financing and construction. Fortune recently announced that it has engaged PwC to help arrange the project financing that will likely entail a combination of strategic partnerships, conventional and supplier debt, product off-take and/or forward sales of a portion of the contained gold. The key to realizing full value for any one component will be to close on the entire project financing at the same time.

**CR: The project is looking to secure financing, how much are you currently looking to raise and what are you looking to do with that investment?**

**RG:** The capital cost for the construction of the NICO Project is C\$589m (US\$447.6m) plus working capital - C\$242m (US\$183.9m) is for the refinery in Saskatchewan and the remaining C\$347m (US\$263.7m) for the mine site and access road in the Northwest Territories. Upon receipt of the approximately C\$600m (US\$447.6m) needed to build the mine and refinery construction can begin and is anticipated to take 2 to 2.5 years to complete.

**CR: Once the mine is in operation, what will be the key markets you will be looking to serve? I note that you will be producing cobalt sulphate heptahydrate at the Hydrometallurgical facility, does this mean you will be targeting the battery market?**

**RG:** Yes, Fortune is targeting the battery market, which has had significant growth and now represents approximately 50% of the cobalt market. The company has already produced cobalt sulphate heptahydrate exceeding the specifications received from several large manufacturers of lithium-ion batteries. Fortune



## The battery market now represents 50% of demand for cobalt

recognised this opportunity early through its dialogue with potential Asian off-take customers and the company produced its first cobalt sulphate samples in 2012 - well in advance of the current market interest.

Fortune is uniquely positioned with the NICO Project to become a producer of two of the world's critical minerals – cobalt and bismuth. Both metals are identified as “Critical Minerals” by the US and UK – defined as, “those minerals that have a supply chain that is vulnerable to disruption, and that serve an essential function in the manufacture of a product, the absence of which would cause significant economic or security consequence”. NICO also contains more than 1.11m ounces of gold in its mineral reserves that is a highly liquid co-product whose price is commonly countercyclical to the other contained metals to mitigate cobalt and bismuth price volatility.

Cobalt is used in a variety of metal and chemical applications with annual consumption of more than 100,000 metric tonnes. The market has had 20-year approximate 6% compounded annual growth, primarily due to its use in high performance rechargeable batteries (50% of current demand). Cobalt delivers superior energy density for power, performance and charge life and cobalt-bearing lithium-ion batteries are expected to remain the industry standard for the foreseeable future.

Bismuth is also a critical metal that has supply chain concerns from its dominant Chinese production (about 80% of refined supply) and consumption is growing for its unique physical properties and as an environmentally friendly and non-toxic replacement for lead. Fortune's NICO deposit contains 12% of global bismuth reserves and is positioned to become a reliable North American supplier of bismuth in a market where China supplies 80% of the world's refined production.

**CR: As you are targeting the battery market, do you have any plans to partner with either cathode or battery end user companies for product development, or are you working towards an offtake agreement?**

**RG:** We have been in discussions with a number of parties, including battery manufacturers and automotive companies for potential off-take. Following up on the funding announcement for the all-season road to Whati that enables NICO's operations and the strong market and forecast



**CGI of Fortune's cobalt expansion plans in Northwest Territories and Saskatchewan**

prices for cobalt and gold, Fortune engaged PwC to arrange the Project Financing for NICO in anticipation of the strong interest from cobalt users.

**CR: What is your expected production cost? Will this allow you to compete with Chinese refiners?**

**RG:** At the base case assumptions in our 2014 Feasibility Study, our cash cost for cobalt net of credits from the other metals is negative US\$5.03/lb (US\$11,100/tonne). NICO will also benefit for lower transportation costs to North American consumers and come with transparent custody of raw material from the NICO mine in Canada's Northwest Territories to the final chemical products produced at our proposed refinery in Saskatchewan.

**CR: With responsible sourcing issue on the rise for end users of cobalt and political problems in the Democratic Republic of Congo (DRC) have you seen increased interest from those concerned over ethical and reliable supply?**

**RG:** There is definitely increased scrutiny of the cobalt supply chain, particularly from electronics companies that are members of the Electronics Industry Citizens Coalition (EICC). Electronics companies and battery manufacturers are taking this issue very seriously, including in Asia due to push back from consumers and laws such as U.S. Dodd Frank and European Conflict Minerals legislation. In terms of traceability of material, NICO is ideally positioned as a fully vertically integrated North American source with supply chain transparency and custody control of metals from ore right through to the production of value add battery chemicals.

**CR: How critical do you think it is that a secure supply of cobalt needs to be located in North America?**

**RG:** Diversifying the supply chain with the addition of new cobalt chemical sources from North America will provide the stability required by the electronics and automotive industries to see the continued expansion of vehicle electrification underway. Irrespective of the supply chain concerns, new deposits will be required just to satisfy the growth in demand. A historical ~6% CAGR of a greater than 100,000tpa cobalt market implies more than 6,000 new tones of production will be required just to satisfy the growth next year. That is equivalent to more than three NICO's per year.

Any disruption of supply from the DRC would be a serious problem for the lithium-ion battery industry. Additionally, with 85% of cobalt supply produced as a by-product of copper or nickel mining, new deposits independent of these metals will be required.



*Robin Goad is the President and CEO of Fortune Minerals Limited*