NORTH OF 60 MINING news

page 10 Freeman cheers Alaska mining as momentum shifts in its favor

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NEWS NUGGETS

Compiled by Shane Lasley

NOVACOPPER INC.

A preliminary economic assessment completed in 2013 outlined the initial plans for an open-pit mine at the Arctic volcanogenic massive deposit that would produce roughly 1.5 billion pounds of copper, 1.8 billion lbs. of zinc, 289 million lbs. of lead, 30.5 million ounces of silver and 349,000 oz. of gold over a 12-year mine life.

NovaCopper focuses on studies needed for Arctic pre-feasibility

NovaCopper Inc. June 22 said the Bornite Camp is being prepared for the 2016 field program at the Upper Kobuk Mineral Projects located in Northwest Alaska. The majority of this year's project budget of US$5.5 million is planned to be spent on roughly 3,000 meters of drilling at the Arctic project. The program will include drilling for geotechnical, hydrological, waste rock characterization and metallurgical studies as well as further resource definition. The company is also planning a series of environmental studies that include an aquatic survey, avian and large mammal habitat survey, and a continuation of baseline environmental information collection. The LiDAR survey that was incomplete last year due to weather conditions will be finished this season, while the wetlands delineation and surface water quality work is to be expanded. This site investigation work will form the basis for completing a future pre-feasibility study on the Arctic deposit. The exploration camp will host 40 to 50 staff and contractors with the majority of the work force hired locally and most of the work occurring from mid-June through mid-August. "While the majority of this year's site investigation program will focus on the Arctic project, the company also will continue to improve our geological understanding of the regional exploration potential of the Ambler mining district through low-cost bedrock mapping within the Ambler schist belt and a deep penetrating soil geochemistry survey located immediately north and east of the current Bornite multibillion-pound copper resource," said NovaCopper President and CEO Rick Van Nieuwenhuyse. "We also look forward to continuing to work closely with our partners at NANA to support training and hiring of the local work force and with (the Alaska Industrial Development and Export Authority) to support (its) effort to build access to the Ambler mining district." NovaCopper also said AIDEA has changed the name of the roughly 200-mile industrial access road proposed from the Dalton Highway to the Ambler mining district to the Ambler Mining District Industrial Access Project. At the end of 2015, AIDEA initiated an environmental impact statement process for the access road by filing a consolidated right-of-way permit application with a half-dozen relevant federal agencies, including the National Park Service, the U.S. Army Corp of Engineers, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Coast Guard, and the Federal Highway Administration. AIDEA's project team is working with residents and communities to address their concerns and will be thoroughly investigating all potential impacts on local communities and subsistence resources. NovaCopper shareholders have approved changing the company's name to Trilogy Metals Inc. and implementation of the new name is expected around Sept. 1.

TECHNOLOGY MINERALS

Battery of tests

Graphite Creek's STAX material excels as anode in lithium-ion batteries

By SHANE LASLEY
Mining News

The more that is known about Graphite Creek, the more this enormous deposit in western Alaska seems ideally suited to fill the growing need for graphite in electric vehicle batteries and other technology applications.

Though Graphite One Resources Inc. has only systematically drilled a small section of the 11 miles of known near-surface mineralization at Graphite Creek, the Vancouver B.C.-based company has already outlined 17.95 million metric tons of indicated resource grading 6.3 percent graphitic carbon and 154.36 million metric tons of inferred resource at 5.7 percent at this deposit located about 35 miles north of Nome.

Establishing that the Graphite Creek deposit is so massive that a mine could ship out 50,000 metric tons of graphite per year for centuries, Graphite One is working with TRU Group Inc. – a technology metals consultant with expertise along the entire graphite-graphene supply chain – to find out if this massive store of graphite could efficiently be transformed into carbon-coated spherical graphite needed for the anodes of lithium-ion batteries used in electric vehicles.

Graphite One and TRU Group has just released the final results from a five-phase program that indicates the graphite not only meets the criteria but has unique characteristics that sets it above any known deposit of natural graphite on the planet.

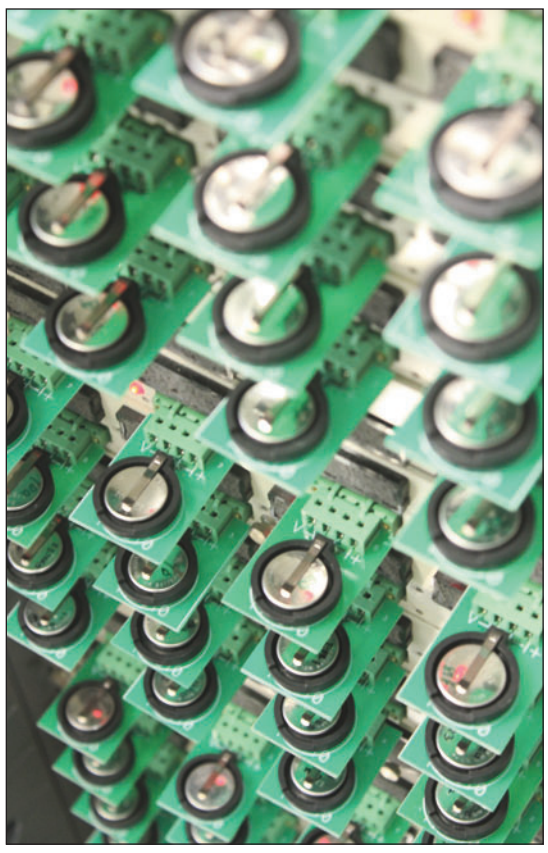

PHOTO BY O. USHER, COURTESY OF CREATIVE COMMONS

In recent tests conducted by TRU Group, STAX graphite demonstrated superior performance as an anode in lithium-ion coin cells.

STAX advantage

When TRU Group first began examining Graphite Creek material late in 2014, its technicians immediately recognized it was different. These distinguishing features can be described as spheroidal, thin, aggregate and expanded. The graphite specializing consultant postulated that these distinctive characteristics could lend to different specialized applications with minimal processing.

These unique and naturally occurring properties have prompted Graphite One to apply for the trademark, STAX, an acronym to describe Graphite Creek graphite.

"From the time we identified the unique mineralization of our STAX graphite, we've observed a number of potential performance advantages," said Huston.

During the initial phases of the exploratory program designed to confirm these advantages, TRU tested various means of milling and purifying Graphite Creek STAX material, all of which resulted in creating graphite purities above the 99.95 percent requirement for battery quality graphite.

John Roumeliotis, TRU Group Vice President and manager of the Graphite Creek tests, said the material was really easy to air mill, requiring about one-third of the air pressure typically needed.

To efficiently pack graphite into the anodes of lithium-ion batteries, it first must be transformed into roughly potato-shaped spheroids. This seems to be where the STAX graphite really stands above any other of its competitors.

TRU found that more than 74 percent of the STAX flake graphite could be turned into spherical graphite without milling. This is a monumental achievement considering that only about 40 percent of the best-performing flake graphite found in any other known deposit can be converted to spherical graphite, even using high-end equipment.

"This is another unique result that we can attribute to the STAX graphite," Roumeliotis explained.

Battery tests

In the final two phases of testing, TRU Group measured the performance of the spheroidized graphite produced from STAX material in coin cells typically used in watches and similar devices.

During the fourth phase, uncoated spherical graphite produced during the testing was used as the anode in five battery cells.

Three of the cells demonstrated a first discharge capacity that approached natural graphite's theoretical maximum of 372 ampere hours per kilogram.

Discharge capacity is a measure of a battery's energy storage capability once first charged.

The top three performing cells – 1203, 1207 and 1208 – used air-milled and spheroidized graphite.

The first-discharge capacity of the best-performing cell, 1203, equaled the theoretical maximum for natural graphite.

Cell 1209, which was loaded with un-milled but spheroidized graphite, had a first-discharge capacity of 369.1, still within 1 percent of the theoretical maximum.

The lowest performing coin cell, 1211, had a first discharge capacity of 361 ah/kg, or about 3 percent below the theoretical maximum. Even this

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