



page Collier says permitting process7 is best place to evaluate Pebble

Week of December 31, 2017



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Rare earth element salts derived from a solution sourced from Ucore Rare Metals' Bokan Mountain project in Southeast Alaska.

### Ucore hails critical minerals EO

Ucore Rare Metals Inc. Dec. 22 said President Donald Trump's executive order to ensure reliable supplies of critical minerals is a fundamental policy shift that is important to the company and its Bokan Mountain rare earth elements project in Southeast Alaska.

The executive order signed by Trump on Dec. 20 instructs federal agencies to identify and publish a list of critical minerals, and develop a strategy to reduce the United States' reliance on other countries to supply them. The order acknowledges that continued reliance on foreign nations such as China for a critical supply of minerals is dangerous and jeopardizes the United States' technological superiority and military readiness.

"This EO represents a turning point in US critical mineral policy, and a sea change in thinking from the past 30 years," said Ucore President and CEO Jim McKenzie. "It portends the dropping of unnecessary and duplicative regulatory barriers, the opening of capital markets to mining investment, and the US government finally embracing the link between critical materials and national security."

The U.S. Geological Survey Dec. 19 published a report that identifies 23 critical minerals. Rare earth elements are included on this list of minerals considered essential to the economic and national security of the United States.

While their high-tech applications make them vital to the wellbeing of the United States, the fact that more than 90 percent of the nation's rare earths come from China elevates their status to critical.

Ucore's Bokan Mountain project at the southern tip of Prince of Wales Island in Southeast Alaska has been identified as a potential domestic source of rare earths.

A preliminary economic assessment completed for Bokan envisions a 1,500-metric-ton-per-day mining operation that would churn out 2,250 metric tons of rare earth oxides annually during the first five years of full production. This yearly supply included some of the more critical REEs such as 95 metric tons of dysprosium oxide, 14 metric tons of terbium oxide and 515 metric tons of yttrium oxide.

With the technical expertise of Utah-based IBC Advanced Technologies Inc., Ucore is also pioneering the use of molecular recognition technology to separate the 16 individual REEs, elements usually found together but are notoriously hard to separate.

SuperLig-One, a pilot plant using this technology, a successfully separated rare earths from a solution derived from Bokan Mountain and is being applied to non-conventional sources

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## Critical minerals order

Trump executive order calls for an American critical minerals strategy

#### By SHANE LASLEY Mining News

The weekly mining newspaper for Alaska and Canada's North

Following a U.S. Geological Survey report that identifies 23 minerals critical to the economic wellbeing and security of the United States, President Donald Trump issued an executive order calling on federal agencies to devise a strategy to ensure America has reliable supply of these critical minerals.

"It shall be the policy of the federal government to reduce the nation's vulnerability to disruptions in the supply of critical minerals, which constitutes a strategic vulnerability for the security and prosperity of the United States," reads the executive order signed by Trump on Dec. 20.

Interior Secretary Ryan

Zinke welcomed the focus on domestically sourcing critical minerals and the added tasks the executive order puts on Interior agencies, such as the USGS.

"The nation was largely built on the products produced from its mineral deposits," he said. "The future will also be **RYAN ZINKE** 

built on a foundation of minerals, many of which will continue to be discovered and produced from across the country."

#### **Critical minerals defined**

The terms critical minerals and strategic minerals were first used in the United States during World War I. Over the ensuing century, however, the definitions of these overlapping terms have been somewhat subjective and has been interpreted differently by various agencies and individuals depending on their individual priorities.

USGS now considers strategic minerals a subset of critical minerals and has established criteria to determine which minerals should be considered critical.

In an 862-page report, "Critical Mineral Resources of the United States – Economic and Environmental Geology and Prospects for Future Supply", the federal geological department defines critical minerals as non-fuel minerals or mineral materials essential to the economic and national security of the United States; vulnerable to supply chain disruptions; and serve an essential function in the manufacturing of a product, the absence of which would have significant consequences for the U.S. economy or security.

With this definition, the USGS has identified 23 critical minerals – antimony, barite, beryllium, cobalt, fluorite or fluorspar, gallium, germanium, graphite, hafnium, indium, lithium, manganese, niobium, plat-



DONALD TRUMP



ILCORE BREE METALIC EN

Thick rare earth element bearing veins at Ucore Rare Metals' Bokan Mountain project in Southeast Alaska.

### Alaska's critical mineral potential

The Trump Administration's focus on securing domestic sources of critical minerals could help re-invigorate mineral exploration and mine development in Alaska.

At least 15 of the 23 critical minerals identified by the U.S. Geological Survey – antimony, barite, beryllium, cobalt, fluorspar, gallium, germanium, graphite, indium, platinum group elements, rare earth elements, rhenium, tantalum, tellurium, tin and vanadium – are found across the Far North state.

Working alongside the Alaska Division of Geological & Geophysical Surveys, USGS

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inum group elements, rare earth elements, rhenium, selenium, tantalum, tellurium, tin, titanium, vanadium, and zirconium.

"For a number of these commodities – for example, graphite, manganese, niobium, and tantalum – the United States is currently wholly dependent on imports to meet its needs," according to the USGS report.

#### Critical minerals strategy ordered

Trump's critical minerals executive order instructs Secretary Zinke, in coordination with Secretary of Defense James Mattis, to identify and publish a list of critical minerals, and develop a strategy to reduce the United States' import reliance for these increasingly important ingredients to modern personal and military devices.

Within six months of establishing the critical minerals lists Trump wants a report that includes:

• a strategy to reduce the Nation's reliance on critical minerals;

• an assessment of progress toward developing critical minerals recycling and reprocessing technologies, and technological alternatives to critical minerals:

· options for accessing and developing critical



Achieving commercial production at its Brucejack Mine in July, Pretium Resources has now applied to increase the capacity of the northwestern B.C. high-grade gold operation roughly 40 percent.

### **Pretium applies for Brucejack expansion**

Pretium Resources Inc. Dec. 21 announced plans to increase the production at its Brucejack gold mine in northwestern British Columbia by roughly 40 percent. The company has submitted an application to BC regulatory agencies to increase the mine's production rate to 3,800 metric tons per day.

The mill at Brucejack has a nameplate capacity of 2,700 metric tons per day. However, it has outperformed that capacity since the mine reached commercial production in July. During the third quarter, the mill processed 261,262 metric tons of ore, which equates to roughly 2,840 metric tons per day. The material processed averaged 10.5 grams per metric ton gold and recovery was 96.5 percent. As a result, the operation produced 82,203 ounces of gold and 83,233 oz of silver during the third quarter.

The application submitted by Pretium on Dec. 20, 2017 reflects a production rate increase to an annual average of 1.387 million metric tons from the currently approved 0.99 million metric tons. The approval process is expected to take approximately six to twelve months.

Pretium is currently assessing the mill upgrades required to increase the production rate. Based on preliminary engineering, the capital cost to increase the mill capacity is estimated to be less than US\$25 million and will be updated when the engineering process is complete.

#### Back River gold gets review board okay

Sabina Gold & Silver Corp. Dec. 20 reported that the Nunavut Impact Review Board has issued the final project certificate for Back River, allowing the company to advance the gold mine project through the final licensing and permitting stage.

Sabina submitted the original environmental impact statement for a 3,000metric-ton-per-day mine at Back River project late in 2015. NIRB recommended to the Minister of Indigenous and Northern Affairs Canada not to advance the project through permitting. After reviewing the recommendation, the federal regulators returned the project to NIRB for further consideration.

Answering a call for further information, Sabina provided the review board an addendum early in 2017, which led to the eventual issuance of the project certificate.

PUBLISHER & NEWS EDITOR

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### Petroleum

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recently developed a geospatial tool that integrated and analyzed a massive load of geologic information and used this data to estimate the resource potential for six deposit types that host a large array of minerals, including most of those now deemed critical.

After crunching all the data, this tool turned up new and expanded areas of Alaska with the potential for these minerals that are vital to modern living but that the United States depends upon foreign countries for more than half of its supply.

"Some of the areas that showed high potential were already known, but many of these areas had not previously been recognized," explained Sue Karl, an Alaska-based USGS research geologist and lead author of the study. "Areas identified by this method that have high resource potential based on limited data indicate both understudied and underexplored areas that are important targets for future data collection, research investigations and exploration."

#### **Critical minerals Alaska**

The geospatial tool worked particularly well for identifying new areas of Alaska to explore for rare earth elements, or REEs, a group of 16 minerals that possess unique characteristics that make them important ingredients to many hightechnology devises used by both civilians and the military.

While their high-tech applications make them vital to the wellbeing of the United States, the fact that more than 90 percent of these metals come from China elevates their status to critical.

Ucore Rare Metals' Bokan Mountain project in Southeast Alaska has already been identified as one potential domestic source of rare earths and a swath of Southeast Alaska extending 200 miles northwest from Bokan is known to host additional REE prospects.

While Southeast Alaska is the best known REE hunting grounds in Alaska, USGS' geospatial tool identified eight large swaths across the northern part of the state worth checking out.

The federal and state geological agencies found that, for the most part, specialized granites containing tin, indium, tungsten, titanium, tantalum and fluorspar can be found in the same regions of Alaska that are prospective for REEs. Tin and indium are important ingredients for architectural glass, flat screens, solar cells, semiconductors, smartphones and superconductors.

Tungsten and titanium are primarily used for high-strength metal alloys.

Tantalum is an important ingredient for automotive electronics, mobile phones, computers, and high-performance glass lenses.

Fluorspar is used to make specialty glass, ceramics, and enamelware.

Beyond the REE prospective areas, USGS' geospatial tool identified the Lost River-Kougarok region on the Seward Peninsula and a stretch of the central Brooks Range as other good places to look for the granites that host this group of critical minerals.

The geospatial tool also proved to be effective in turning up new areas of Alaska to explore for the elusive platinum group metals – platinum, palladium, rhodium, iridium and ruthenium.

The largest use for this suite of metals, especially palladium and platinum, is as a catalyst to help scrub harmful emissions from petroleum burning automobiles and petroleum refineries. These metals are also used in modern electronics, such as increasing storage on computer hard disks and as an alloy for restorative dentistry.

Platinum, palladium and rhodium are used as investments and are commonly minted into physical bars and coins.

The United States currently relies on foreign sources for about 90 percent of these critical metals.

Though an economic lode-source of PGMs has yet to be discovered in Alaska, about 650,000 ounces of these obscure metals have historically been mined from Salmon River placer deposits in the Goodnews Bay area. This region of Southwest Alaska continues to be an intriguing place to look for PGMs, according to USGS' geospatial tool.

Other areas of the state, however, show higher potential. The best known of these is the Wrangellia terrane, a distinct belt of rocks along much of the southern slopes of the Alaska Range eastward through southern Yukon and into western British Columbia.

While intriguing signs of rich deposits of PGMs are found in the Alaska portion of the Wrangellia, such as the Man property about 165 miles southeast of Fairbanks, an economic deposit has yet to

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such as REE bearing coal tailing "With our plans for strategic metals production capabilities in Southeast Alaska and with significant strategic minerals resources at hand, Ucore is well positioned to take advantage of this executive order and its benefits," said McKenzie.

### Pebble Mine permits submitted

The Pebble Partnership Dec. 22 submitted permit applications for the Pebble Mine project to U.S. Army Corps of Engineers, initiating the project review process under the National Environmental Policy Act.

With roughly 56.8 billion pounds copper, 70.4 million ounces gold, 3.4 billion lb molybdenum and 343.6 million oz silver in measured and indicated resource, Pebble hosts both the largest undeveloped copper and undeveloped gold resource on Earth.

While a deposit of this size lends itself to an equally world-class sized mining operation, the project submitted for permitting is relatively modest in size.



### **NORTHERN NEIGHBORS**

Back River is now in the final regulatory and licensing phase.

"After a multi-year environmental assessment process, we are very pleased to end the year with the issuance of the final project certificate for Back River," said Sabina President and CEO Bruce McLeod.

In conjunction with the issuance of the project certificate, Zhaojin International Mining Co. agreed to purchase 24.93 million shares of Sabina at a price of C\$2.65 per share for a total investment of roughly C\$66.1 million. Upon completion of the private placement, Zhaojin International will own approximately 9.9 percent of Sabina's issued and outstanding common shares on a non-diluted basis.

"For the Pebble

team, this day has

been a long time in

result of a tremen-

work. We have lis-

tened to our stake-

holders, supporters,

presenting a much

Collier.

miles;

and skeptics, and are **TOM COLLIER** 

safeguards," said Pebble CEO Tom

smaller mine with enhanced environmental

In response to stakeholder concerns, the

Pebble Partnership has also chosen not to

use cyanide for secondary gold recovery

and is keeping the mining infrastructure

not yet been published, some of the new

• a mine site footprint of 5.9 square

enhanced environmental safeguards, a but-

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pyritic tailings in a separate, lined storage

see **NEWS NUGGETS** page 8

• a tailings storage facility with

region noted for its salmon habitat.

project design elements include:

• a 20 year mine-life;

out of the Upper Talarik Creek drainage, a

While a detailed project description has

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"We are very excited to welcome Zhaojin, a leading Chinese gold producer, as a strategic investor," said McLeod. "This financing with Zhaojin provides Sabina with a cornerstone investor that has financial and technical resources to assist us in advancing the project to production."

"With this capital in hand, we are currently working on finalizing plans and budgets for 2018 which will focus on de-risking the project with initial preconstruction activities as well as furthering exploration activities," the Sabina CEO added.

According to a 2015 feasibility study, the 3,000-metric-ton-per-day mine submitted for permitting would average 198,100 ounces of gold per year over an 11.8-year mine life at a cost of US\$534 per oz. ●

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minerals through investment and trade with our allies and partners;

• a plan to improve the topographic, geologic, and geophysical mapping of the United States and make the resulting data and metadata electronically accessible to support private sector mineral exploration of critical minerals; and

• recommendations to streamline permitting and review processes related to developing leases with the goal of enhancing the access, discovery, production and refining of critical minerals in the United States.

Zinke, who has worked on both ends of the critical minerals supply chain, welcomed the stance taken in the executive order.

"The fact that previous administrations allowed the United States to become reliant on foreign nations, including our competitors and adversaries, for minerals that are so strategically important to our security and economy is deeply troubling," he said. "As both a former military commander and geologist, I know the very real national security risk of relying on foreign nations for what the military needs to keep our soldiers and our homeland safe." •



### Pacific Rim Geological Consulting, Inc.

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Thomas K. Bundtzen, President

## continued from page 6 **MINERAL POTENTIAL**be identified here.

As part of its critical metals investi-

gation, USGS also looked at carbonatehosted copper deposits, which often also host the critical minerals cobalt, germanium and gallium.

Cobalt is an important ingredient of super-alloys used to make aircraft turbine engines. This application makes up nearly half of the United States' consumption of this critical mineral.

Germanium and gallium have properties that make them important minerals in many modern applications including solar cells, infrared optics, LEDs, semiconductors and smartphones.

Bornite, a large and high-grade copper deposit that is part of Trilogy Metals' Upper Kobuk Mineral Projects in Northwest Alaska, is one carbonatehosted deposit with significant quantities of cobalt.

Interestingly, USGS' geospatial tool found that almost the entire length of the Brooks Range, especially the underexplored northern slopes stretching the entire width of Alaska, is prospective for the style of copper deposits known to host cobalt, germanium and gallium.

In addition, the USGS study identified two areas of the Seward Peninsula



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#### Narrowing the search

Overall, the geospatial tool seems to have broadened Alaska's critical mineral potential, while narrowing the search to the hottest areas across the 663,000-square-mile minerals-rich state.

"Using this process, we have identified the potential for critical minerals in new areas such as the northern Brooks Range, and have expanded the area with potential for resources around known mineralized areas like the Seward Peninsula and east-central Alaska," the authors of the study wrote in a summary of their findings.

For explorers seeking critical minerals, the new and under-explored areas turned up by the geospatial tool may provide enough data to unearth new deposits in areas where no one has thought to look.

The full report – complete with source information, datasets and maps – can be found under the title "GISbased identification of areas that have resource potential for critical minerals in six selected groups of deposit types in Alaska" in the publications section of USGS' website.

-SHANE LASLEY



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NORTH OF 60 MINING

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facility;

• a power plant fueled by natural gas from a pipeline extending from the Kenai Peninsula across Cook Inlet to the Project site with compressor stations on the Kenai Peninsula and at a port facility to be constructed at Amakdedori on the west side of Cook Inlet;

• an 83-mile transportation corridor from the mine site to a year-round port site located on Cook Inlet at Amakdedori that includes a 30-mile road from the mine site to a ferry terminal on the north shore of Iliamna Lake, an 18-mile lake crossing utilizing an ice breaking ferry to the south shore of Iliamna Lake, and a 35-mile private double-lane road to the Amakdedori Port; and

• spur roads from the transportation corridor to the communities of Iliamna, Newhalen and Kokhanok.

Collier said the permitting process is the correct place to evaluate an important Alaska asset such as Pebble.

"The Pebble resource is on state of Alaska land and could generate hundreds of millions in annual economic activity for Alaska as well as generating revenues for state and local governments. It could also provide much needed year-round jobs for Southwest Alaska. As such, all Alaskans have a stake in knowing whether we can safely and responsibly operate a mine at Pebble and the place to determine this is through the rigorous permitting process," said Collier.

Once the Army Corps of Engineers has determined the sufficiency of Pebble's application package, the Pebble Partnership will publish a detailed project description on its website.

The submission of permit applications to develop a mine at Pebble completes the three major milestones Northern Dynasty Minerals Ltd., owner of the Pebble Partnership, set out to achieve this year.

"At the outset of 2017, we established three ambitious corporate objectives for Northern Dynasty and the Pebble



Core from drilling through the thick layers of high-grade graphite at the Graphite Creek project in western Alaska.

Project," said Northern Dynasty President and CEO Ron Thiessen. "We committed to reaching a resolution with the US Environmental Protection Agency to restore the Pebble Project to normal course permitting, to re-partnering on the Pebble Project and to initiating permitting under NEPA. As we approach the end of the year, I'm proud to report that we will hit our mark on all three important milestones."

### **Critical Graphite Creek awareness**

Graphite One Resources Inc. Dec. 21 said a U.S. Geological Survey report on critical minerals of the United States and an executive order to develop a federal critical mineral's strategy highlights the importance of the company's Graphite Creek project in western Alaska.

The USGS report lists graphite among the 23 metals and minerals critical to "the national economy and nation-

al security of the United States." Additionally, Graphite is one of just four critical minerals on the list for which the U.S. is fully import-reliant.

"The report and President Trump's executive order track with the ongoing discussions our team has been having with key U.S. officials at the federal level and the state of Alaska, with interest far more intense now than our initial discussions five years ago," said Graphite One CEO Anthony Huston.

One of the reasons the USGS considers graphite a critical mineral is the growing demand of this mineral as anode material in the lithium-ion batteries that power electric vehicles and a rapidly expanding number of personal electronic devises.

Located about 35 miles north of Nome, Graphite Creek is the largest known deposit of graphite in North America.

Systematic drilling of only a small section of the 11 miles of known near-surface mineralization at Graphite Creek has 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 graphitic carbon at this deposit.

The unique characteristics of the material at Graphite Creek makes it well suited for being transformed into coated spherical graphite, which is used as an anode material in the batteries of electric autos.

A preliminary economic assessment completed early in 2016 outlined plans for a mine at Graphite Creek and an off-site facility to refine the graphite that would produce 41,850 metric tons of coated spherical graphite and 13,500 metric tons of purified graphite powders annually.

"As a major graphite developer in the U.S., Graphite One is seeing a growing awareness that graphite is critical to a full range of new applications - from electric vehicle batteries and energy storage systems to defense weapons platforms," said Houston. "The USGS report makes it clear that 100 percent import dependence on graphite and other materials pose risks to the U.S. economy and national security."

# **Congratulations Fort Knox!**

Kinross Gold has gained mineral rights to Gilmore, a land parcel immediately west of the open-pit at its Fort Knox gold mine near Fairbanks. With roughly 2.4 million oz of gold already identified at Gilmore, this expansion area could add roughly another five years to this iconic openpit mine.

Kinross pays out roughly \$70 million in annual wages to its 650 Fairbanks area residents that work at the Fort Knox Mine and pays roughly \$7 million in taxes to the Fairbanks North Star Borough, making it a key contributor to the economy of Interior Alaska.

In addition to the direct jobs, the Fort Knox Mine is estimated to spur another \$50 million in wages for an estimated 650 indirect and induced jobs related to the 400,000-ounce-per-year gold operation.

Roughly another \$17 million is paid in taxes and fees to the state of Alaska and the mine spends more than \$200 million on goods and services from more than 400 private sector vendors in Alaska, making this mine an important contributor to the economic well-being of the state.

With the previously federal owned Gilmore land parcel conveyed to the state, Fort Knox will likely be able to extend these economic benefits to Interior Alaska and across the state for several more years.

Congratulations to Kinross Gold and the employees of the Fort Knox Mine!

Alaska Aggregate Products Alaska Dreams Alaska Land Status Alaska Steel Co. Arctic Wire Rope Austin Powder Co. Brilliant Media Strategies Calista Corp. Constantine Metal Resources Construction Machinery Industrial Denali Industrial Supply Fort Knox Gold Mine Greer Tank Inc. Judy Patrick Photography Last Frontier Air Ventures Lynden Motion & Flow Control Products Pacific Rim Geological Consulting PND Engineers Sourdough Express Inc. Sumitomo Metal Mining Pogo LLC Usibelli Coal Mine Gilmore expansion promises longer mine, good paying jobs near Fairbanks

