# Tom Drivas on the competitive advantages of Appia Energy's high-grade rare earths

"Appia's Alces Lake project in northern Saskatchewan has world class high-grade rare earths, about a quarter of them are critical rare earths (neodymium, praseodymium, dysprosium, terbium). We think that Appia could be feeding the North America in terms of rare earths as you know North America is looking to have their own supply of rare earths…We have monazite on surface that is running upto 85%. We have shown it to people in the industry and they have seen most of the other projects and they are basically telling us that this is one of a kind – they haven't seen anything like it. So Alces Lake could be one of the better or best projects out there." States Tom Drivas, CEO, President and Director of Appia Energy Corp. (CSE: API | OTCQB: APAAF), in an interview with InvestorIntel's Tracy Weslosky.

Tom went on to say that rare earths are used in high-tech military applications, electric vehicles. He added "We think the demand is coming back. In long term there will increased demand for rare earths." Tom also said that Appia has both uranium and rare earths.

To access the complete interview, click here

Disclaimer: Appia Energy Corp. is an advertorial member of InvestorIntel Corp.

# Jack Lifton says the ‘best choice’ for a producing rare earths mine in North America is…

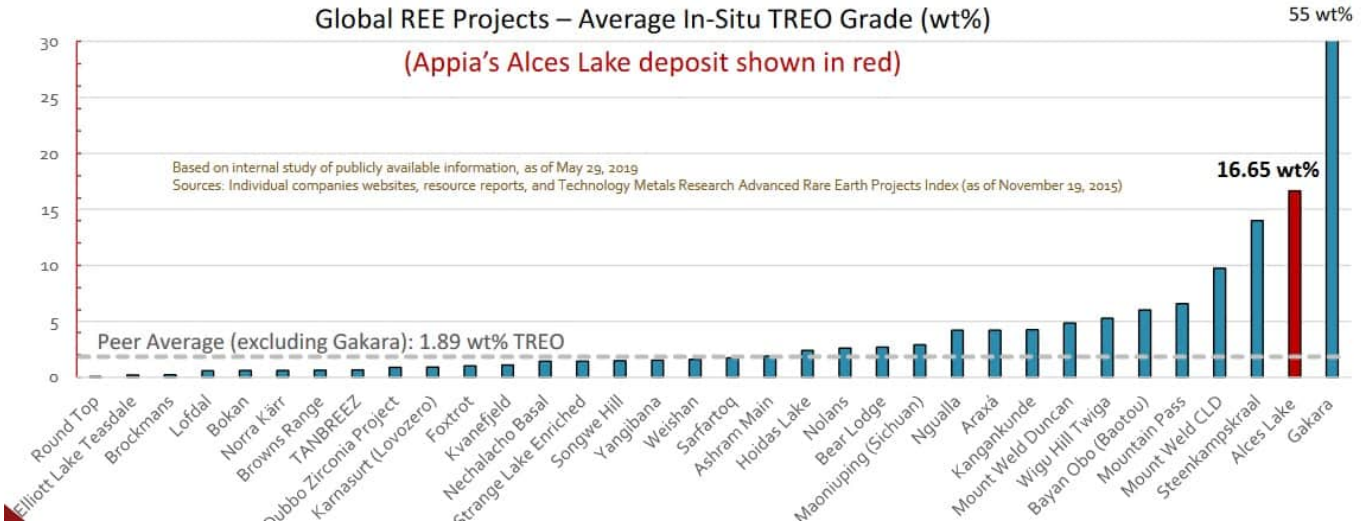
As the electric vehicles (EV) decade begins the need for quality rare earths in top tier locations is becoming a key focus for governments, OEMs, and electric motor manufacturers. Safer supply chains that can provide critical rare earths such as Neodymium (Nd) and Praseodymium (Pr) for electric motor magnets are becoming critically important, as we saw this week with the US Senate bill on rare earths.

Appia Energy Corp. (CSE: API | OTCQB: APAAF) is currently exploring and developing uranium and rare earth deposits in its Alces Lake property, in the Athabasca Basin area of northern Saskatchewan, Canada. They also have a promising uranium-rare earths project in Ontario, Canada.

**Alces Lake Rare Earth Project**

What is unique about Alces Lake is that it hosts some of the highest  rare earth elements (REE) grades in the world (2nd highest average grade as shown on the chart below). At a 4 wt% total rare earth oxide cutoff, Alces Lake average grade is 16.65 wt% Total Rare Earth Oxides (TREO).

**A grade comparison of global rare earth projects**




Source

**Alces Lake has excellent mineralogy with high value rare earths**

At Alces Lake all the REEs have simple mineralogy and are hosted 100% within 'monazite', which means it can be economically extracted.

Even better is that the monazite is enriched in valuable critical rare earth elements, namely Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy), and Terbium (Tb). These 4 elements account for between 23-25% of the TREO, or ~85% of the potential value at Alces Lake.

**Alces Lake has high-grade outcrops and drill hole intersections comprising an average of 27% monazite. Locally up to 85% monazite is naturally pre-concentrated**


Source

**Appia have access to a nearby pilot plant and extraction lab in Saskatchewan, Canada**

The Alces Lake Project is located close to a pilot plant and REE extraction lab in Saskatoon, Saskatchewan, which is the same Provincial jurisdiction as the Project. It has a capacity of 2,000 tonnes of material per annum. This gives Appia a significant advantage by having a low start up CapEx to commence some production via a fully permitted plant and extraction facilities at the Saskatchewan Research Council (SRC). Unlike competitors this means the rare earths can be produced in North America and not China.

Considering environmental regulations, especially due to safe handling and disposal radioactive materials, the Province of Saskatchewan, and SRC, are miles ahead of other global jurisdictions because they permit high-grade uranium mines in the northern parts of the province.  A country like India, or USA, has policies in-place that are detrimental to processing monazite for REEs because of the presence of Uranium/Thorium.  In Saskatchewan, and working with SRC, a lot of these problems are already resolved, as Saskatchewan is a global jurisdiction that continuously leads efforts in safely working with radioactive materials.

**Appia's projects summary and strategy**

**Alces Lake Rare Earths Project**

Based on mineralization discovered to date, Appia would "ideally" consider a surface and near-surface operation to start production, smaller than open pit scenario, easier to permit and manage, potentially low CapEx and OpEx. Given the nearby pilot plant and extraction facility in Saskatchewan the Project will be easier to put into small scale production of rare earth oxides.

**Saskatchewan Uranium Projects**

Appia also holds surface rights to exploration for about 57,048 hectares (140,968 acres) in Saskatchewan. Within this area Appia has high-grade uranium deposits in the prolific Athabasca Basin area; including Loranger, Eastside and North Wollaston properties.

**Elliot Lake Uranium-REE Project**

This Project is located in northern Ontario. Elliot Lake has a NI 43-101 Mineral Resource Estimate of 8.0 million lbs contained metal U3O8 and 47.7 million lbs contained metal TREE Indicated; and 47.7 million lbs contained metal U3O8 and 133.2 million lbs contained metal TREE Inferred. Indicated TREE grades are 1,647ppm, and CRE 344ppm.

The next step for Appia is to raise additional capital to fully fund aggressive property-wide exploration on Alces Lake as well as the Saskatchewan uranium properties for the next 12 to 24 months, with a view of producing a mineral resource estimate at Alces Lake.

**Experts view**

Rare earths expert and host of the Technology Metals Show Jack Lifton quoted to InvestorIntel:"Appia Energy's Alces Lake deposit in Saskatchewan is probably the best choice for

development into a producing rare earth magnet materials' mine in North America."

**Closing remarks**

The rare earths sector looks highly likely to follow in the foot-steps of uranium, which recently got a huge boost from the US Government. A rare earths funding bill has now been put to the US Senate with the intent to help revive the U.S. rare earths industry.

Investors can look to capitalize on the positive sentiment in the rare earths sector, especially those companies in safe countries with lower start-up CapEx.

Appia Energy offers a North American high grade rare earths project with a low CapEx pathway to production via a third party existing fully permitted plant and extraction facility in Saskatchewan. Plus Appia also has uranium projects.

Rare earths expert Jack Lifton and the man who coined the term "technology metals" is also very positive on Appia Energy, making them a top tier junior for investors to consider.

Note from the Publisher: To become a member of the Technology Metals Report, go to TechnologyMetals.com

---

# Search Minerals expands their rare earths discovery with critical materials' zirconium

# and hafnium

As the West looks to establish a non-Chinese source of supply of critical rare earth elements, one Canadian company has been successfully expanding its rare earths project, as well as discovering some additional valuable metals like zirconium (Zr) and hafnium (Hf).

Zirconium dioxide ($ZrO_2$) is used in laboratory crucibles, metallurgical furnaces, as a refractory material, and in ceramics (including use in dental ceramics); because it is mechanically strong and flexible. Zircon ($ZrSiO_4$) and the cubic zirconia ($ZrO_2$) are cut into gemstones for use in jewelry. Ceria-zirconia is widely used as a component in current three-way catalytic converters.

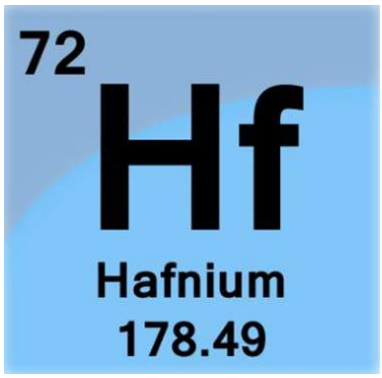
**Zirconium is used in ceramics, jewelry, dentistry, and catalytic converters**

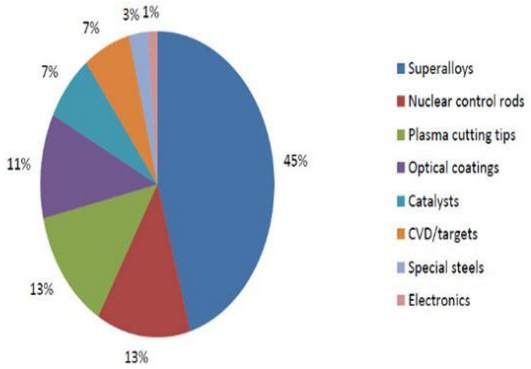

Hafnium is a good absorber of neutrons and is used to make control rods, such as those found in nuclear power plants and submarines.

Hafnium is used in some superalloys for special applications such as jet engine turbines in combination with niobium, titanium, or tungsten. Hafnium oxide is used as an electrical insulator in microchips, filaments and electrodes.

**Hafnium is used in superalloys, nuclear rods in nuclear**

**submarines, microchips, and jet engine turbines**




**Search Minerals discovers zirconium and hafnium**

Search Minerals Inc. (TSXV: SMY) recently announced that they have discovered zirconium and hafnium, in addition to their existing valuable rare earths dysprosium (Dy), neodymium (Nd), praseodymium (Pr), terbium (Tb) and yttrium (Y). The discovery was made at their Silver Fox Deposit.

With regards to the Silver Fox discovery Search Minerals stated: “This surface expression is significantly longer, but thinner, than the surface expressions of the nearby and related **FOXTROT** and **DEEP FOX** Resources. The mineralization is similarly hosted by peralkaline volcanic rocks and contains slightly lower grades of the REE magnet materials (Nd, Pr, Tb and Dy) but significantly higher grades of Zr and Hf.”

Dr. David Dreisinger commented: “The objective of metallurgical testing of the **SILVER FOX** (and other deposits) will be to recover a high grade zirconium by-product for sale with minimal processing cost and complexity. Search is engaged with our technology advisor, SGS Canada, to identify process flowsheet options.”

**Search Minerals expands the mineralized zone at Fox Meadow**

Search Minerals also recently announced that they have successfully expanded the critical rare earth element mineralized zone at Fox Meadow. The Company stated:”The trenching/channelling programs at **FOX MEADOW** have outlined a

mineralized zone of up to 123.6 m wide and at least 500m in strike length; mapping and airborne magnetic anomalies suggest that the zone is up to 650m long. In contrast, both the **DEEP FOX** and **FOXTROT** mineralized resources are about 350-450m long and up to 40m thick.”

**About Search Minerals**

Search is focused on finding and developing critical rare earth element mineral assets in Labrador, Canada. The Company controls properties in three distinct areas of this region; the Port Hope Simpson (PHS) Critical Rare Earth Element District in SE Labrador; the Henley Harbour Area in Southern Labrador; and the Red Wine Complex located in Central Labrador.

Within the Port Hope Simpson District, Search’s main discoveries are the Foxtrot Resource, Deep Fox, Fox Meadow, and Silver Fox deposits which contain rare earths including dysprosium (Dy), neodymium (Nd), praseodymium (Pr), terbium (Tb) and yttrium (Y).

The flagship Foxtrot Resource covers a 70 km long and 8 km wide belt. At Foxtrot the Total Indicated Resource is 7.392 million tonnes with grades of neodymium oxide (1,732ppm), neodymium (1,485ppm), praseodymium (397ppm), and dysprosium (191ppm).

The 14 year LOM Foxtrot Project offers an IRR of 16.7% on an after tax NPV10% of $48 million, with a CapEx of $152 million.

Investors should note the NPV quoted above is only for the Foxtrot Project, so once the other projects are combined into a bigger project the NPV should improve materially.

**Closing remarks**

Search Minerals is both expanding their existing very promising rare earths project as well as finding other

valuable metals zirconium and hafnium. Investors will need some patience, as more exploration work needs to be done to further grow the resource and improve on the economics.

Combined with an excellent management team, and strong Government and local support, the Company continues to advance their Port Hope Simpson District project at a steady pace. Rare earths expert Jack Lifton recently stated about Search Minerals: “I think it may well be Canada’s first commercial rare earth producer.”

With a market cap of just C$9 million there is plenty of potential upside ahead for investors if Jack is right.

---

# Tom Drivas on the coronavirus and Appia’s commitment to a North American rare earths supply

“China supplies 85% of the rare earths to the world. The world is nervous not only because China has control on supply but also, let’s take coronavirus as an example, if work stops in China then what happens to the supply.” States Tom Drivas, CEO, President and Director of Appia Energy Corp. (CSE: API | OTCQB: APAAF), in an interview with InvestorIntel’s Peter Clausi at PDAC 2020.

Tom went on to say that the US, Canada, Australia, and other countries want to see some supply outside of China but there are only a few projects that can compete with the Chinese. Tom also spoke on Appia’s Alces Lake property which has uranium

and rare earths. Tom said it is one of the best projects in North America in terms of high grade critical rare earths. The company is drilling at the property and has got some zones right on the surface with grades upto 49% rare earths.

To access the complete interview, click here

Disclaimer: Appia Energy Corp. is an advertorial member of InvestorIntel Corp.

---

# Search Minerals' Greg Andrews on establishing a safe and secure rare earths supply chain in NA

"Canada has a very good auto market and as it transitions from internal combustion vehicles to electric vehicles, the supply chain of the EV market is not here in Canada. That needs to be established and it starts with rare earths…That is what we want to provide." States Greg Andrews, President, CEO and Director of Search Minerals Inc. (TSXV: SMY), in an interview with InvestorIntel's Peter Clausi at PDAC 2020.

Greg went on to say that Search Minerals is drilling for key rare earth magnets like neodymium, praseodymium, dysprosium and terbium. The rare earth permanent magnets are very important for the electric vehicle industry because an average electric car needs about a kilogram of the magnets. Greg also spoke on Search Minerals' patented Direct Extraction Technology. The technology successfully eliminates many stages of a conventional extraction process, thus reducing cost and

increasing efficiencies in processing.

To access the complete interview, click here

**Disclaimer:** Search Minerals Inc. is an advertorial member of InvestorIntel Corp.

---

# Tom Drivas on Appia's Alces Lake Rare Earths Project with world-class grades

"Appia is concentrating on the Alces Lake Project…It has world-class grades. We see grades up to 49-50% rare earths and a quarter of that is critical rare earths like neodymium and praseodymium." States Tom Drivas, CEO, President and Director of Appia Energy Corp. (CSE: API | OTCQB: APAAF), in an interview with InvestorIntel's Alastair Neill at PDAC 2020.

Tom went on to say that the Alces Lake Project has up to 80% monazite right on the surface making it the highest grade deposit in North America in terms of monazite and in terms of rare earths one of the highest grades in the world. The company is currently working with Saskatchewan Research Council (SRC) to advance the project into the next level in terms of processing.

To access the complete interview, click here

Disclaimer: Appia Energy Corp. is an advertorial member of InvestorIntel Corp.

# Catching the world with our rare earths contingency pants down

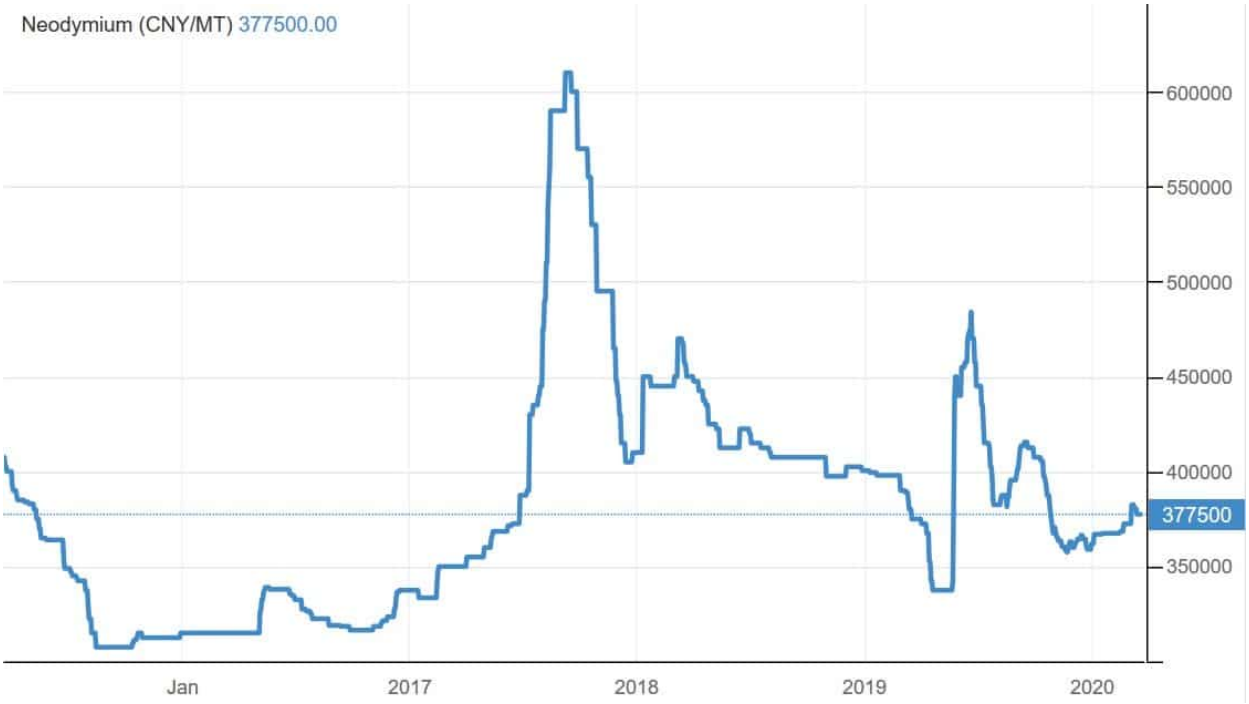
The rare earths market has had its ups and downs the past few years. In particular, the US-China trade war brought a new focus to the sector highlighting the world's dependency on China for rare earths supply.

Then in early 2020 with much of China closed down by the coronavirus the Chinese rare earths supply was put to test. While the Chinese market is often quite opaque, market pricing for key rare earths such as neodymium give an indication of the supply and demand dynamics.

**Key rare earths price movements in 2020 as the China disruption was taking place**

Neodymium (Nd) prices are up 4.28% so far in 2020, despite the slowdown in industrial production of goods that contain neodymium. Asian Metal reports praseodymium (Pr) prices are slightly down in 2020, and dysprosium (Dy) prices are up ~5% over the past 2 months.

**Neodymium 5 year price chart**




Source

All of this suggests that despite the coronavirus chaos in China the key rare earths market remained very stable. It would appear from this that China's inventory was adequate to cover any mining disruptions; however, demand was also lower due to the industrial slowdown.

**Experts view**

In this exclusive February 18, 2020 InvestorIntel video, rare earths expert Jack Lifton discussed with Tracy Weslosky the impact the coronavirus is having on critical metals:

Jack Lifton states:

*"(China) Shipments could stop at anytime……logistics are compromised…..**The coronavirus has caught the West with its contingency pants down**…….this is a warning bell for everyone in the world."*

Jack also revealed that we do not even know if the Chinese possess enough stockpiles of rare earths to handle their own demand, never mind the needs of Americans.

**Rare earths are vital ingredients for modern technology and the world relies largely on China**

Source

**Lynas Corporation Limited**

Outside of China, the rare earths supply chain is completely reliant on one company. That company is Lynas Corporation Limited (ASX: LYC). Lynas is the world's second largest supplier of rare earth materials, and the only significant rare earths producer outside of China. Most of Lynas' rare earths go to long term contracts mostly with Japan. This means if we get a rare earths supply disruption from China and higher NdPr prices, then Lynas Corporation will be the key global company to benefit. This is worth keeping in mind in case we get a second wave of the coronavirus outbreak in China.

**The latest news with Lynas Corporation**

- February 3, 2020 – Australian government awards major project status to new Lynas WA plant. The Lynas Kalgoorlie plant will undertake cracking & leaching of rare earth concentrate from Lynas' Mt Weld mine, which is also located in Western Australia's Goldfields

region. Lynas will also explore opportunities for additional processing in Kalgoorlie.
- February 27, 2020 – Lynas Malaysia operating license renewed for three years.

The good news here for investors is that Lynas has achieved good progress towards their new cracking & leaching (C&L) facility planned for completion by 2023. This will tie in nicely with the 3-year Malaysian license renewal given the relocation of the C&L facility to Australia should be able to be done in the 3 year time frame. This clears the cloud over the stock from 2019 when they had uncertainties over their Malaysian license renewal due to environmental concerns. This is good for Lynas and good for security of rare earths supply ex-China.

**Lynas Corporation to diversify its rare earths operations under their 2025 plan**


**A summary of Lynas' progress towards their 2025 plan**


Source

**Closing remarks**

Japan recently announced they plan to stockpile rare metals as part of an effort to reduce dependence on China. Let's hope

the US and others finally get their act together to financially support the critical materials miners. This includes not only rare earths, but also the key EV metals cobalt and lithium.

The 2020s will be a decade of enormous technological advancements with AI, IoTs, robotics, electrification of transportation, renewable energy, and energy storage. All of these need a secure supply of the 35 critical materials as identified by the U.S. Government, including rare earths.

For now, the West is lucky to have Lynas Corporation, but clearly we need many more great critical materials miners and processors to help build up our severely damaged local supply chains.

As Jack said: "*this is a warning bell for everyone in the world.*" Western leaders please listen and let's not get caught with our pants down!