# Rowena Smith Highlights ASM's Operational Success at Korean Metals Plant in Rare Earth Metals Production

written by InvestorNews | March 18, 2024
In a conversation with InvestorNews host Tracy Weslosky, Rowena Smith, the Managing Director of Australian Strategic Materials Ltd. (ASX: ASM), highlighted the company's innovative edge in the rare earth sector. Smith detailed ASM's end-to-end approach from mining to metal production, underscoring its capability to control the entire supply chain outside China—a key differentiator in the market. She also pointed to the operational success of the Korean Metals Plant (KMP), which is already producing essential rare earth metals and alloys. Smith mentioned plans to expand KMP's production to include heavy rare earths, reinforcing ASM's competitive advantage and commitment to technological advancement.

Smith also delved into the technological innovations at the KMP, showcasing ASM's forefront position in metallurgical advancements. The KMP's current production of neodymium-praseodymium (NdPr) and the development of neodymium iron boron (NdFeB) alloys are pivotal for high-performance magnets used in renewable energy and electric vehicles. This technological edge not only demonstrates ASM's capacity to meet critical global demands but also reinforces its role as a leader in reducing dependency on the conventional rare earth supply chains. Smith's narrative underscores ASM's commitment to sustainability and innovation, highlighting its readiness to meet the increasing demands for rare earth elements critical to modern technology

and green energy solutions.

To access the complete InvestorNews interview, <a href="click here">click here</a>

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## About Australian Strategic Materials Ltd.

Australian Strategic Materials (ASX: ASM) is a vertically integrated 'mine to metals' producer of critical metals for new growth industries, high technologies and sustainable energy solutions. ASM operates a metals plant in in Ochang, South Korea which is currently producing critical metals and alloys to customer specifications. The initial production focus is on neodymium praseodymium (NdPr) and neodymium iron boron (NdFeB). Currently, ASM sources the rare earth oxides for the production of the critical metals at its Korean Metals Plant (KMP) from a third party located in Vietnam. The company's Dubbo Project, is a long-term resource of rare earth elements, zirconium, niobium and hafnium, located in New South Wales, Australia. ASM intends to develop the Dubbo Project to produce metal oxides which will be used for refining into critical metals at ASM's KMP and subsequent plants that may be established in other jurisdictions.

To learn more about Australian Strategic Materials Limited, <u>click here</u>

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# Rowena Smith sits down with Jack Lifton on ASM's 'Mines to Metal' Advantage in Supplying Rare Earths

written by InvestorNews | March 18, 2024
During an interview at PDAC 2024 in Toronto, Jack Lifton of InvestorNews sat down with Rowena Smith, the Managing Director of Australian Strategic Materials Ltd. (ASX: ASM), to delve into the company's position and strategic initiatives within the rare earths and permanent magnet supply chain. Smith elucidated ASM's comprehensive strategy, spanning from "mine to metal," highlighting their advanced development project in Dubbo, New South Wales, and their operational metals plant in South Korea. The company has successfully commenced production of neodymium praseodymium (NdPr) metal and neodymium iron boron (NdFeB) strip alloy, which are essential components for sintered magnets used across various technological applications. Smith proudly noted

ASM's pioneering role as the first Australian entity and one of the few globally to achieve such depth in the supply chain outside of China, emphasizing the critical nature of their work in diversifying the global supply chain and reducing dependence on single-source suppliers.

Smith also detailed the Dubbo Project's progress, underlining its pivotal role in ASM's mine-to-metals business model for supplying rare earths and critical minerals. Funding and securing off-take agreements are current priorities, with the project's engineering, exploration, and permitting stages already completed. Smith's participation in a U.S. trade delegation and discussions with U.S. government departments reflect a strong international interest in funding the project. These interactions highlight the alignment between Australian and U.S. interests in establishing a sustainable and transparent critical minerals supply chain. ASM's engagement with various U.S. government agencies and the passage of legislation recognizing Australia as a 'domestic source' for U.S. Department of Defense procurement showcases the international efforts to bolster critical mineral supply chains outside of China. The company's ongoing discussions for offtake agreements and advancements in metallization capability at the Korean Metals Plant further underscore ASM's commitment to securing a robust position within the global supply chain of rare earth metals and alloys.

To access the complete InvestorNews interview, <a href="click here">click here</a>

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## Eyes on Korea: The Emerging Epicenter of the Rare Earth Supply Chain

written by Jack Lifton | March 18, 2024
To sum up, while the global discourse frequently orbits around China and the US, the Korean rare earth landscape is bustling. Their relentless quest to develop a comprehensive domestic supply chain for rare earth permanent magnets will invariably lead to a demand spike, which may catch many by surprise.

# Critical materials frontrunner ASM closes out 2021 with a pre-tax NPV of AUD\$2.36 billion

written by Tracy Weslosky | March 18, 2024

<u>Australian Strategic Materials Ltd.</u> (ASX: ASM) management team

closed out 2021 with a measurable project and corporate successes. Most significantly, in December 2021, the company updated the 2018 Dubbo Project Optimization Study. The <u>updated study</u> released in early December 2021, supports a 20-year mine life based on existing ore reserves, with Measured and Inferred mineral resources, (which have the potential to extend the mine life) being excluded for this study. The economics are robust — pre-tax NPV of AUD\$2.36 billion and a pre-tax IRR of 23.5%. This is 6% higher than the previous study done in 2018 and is measurably significant.

The Dubbo Project is based on the Toongi deposit in southeastern Australia (New South Wales), which contains rare earths, zirconium, niobium and hafnium and reserves that support a project life of 20 years and resources that may support a much longer mine life. Importantly, on July 21, 2021, the company announced a new 20% partner for Dubbo development, the receipt of US\$250 million from a consortium of South Korean investors, and a buyer for product from its Korean Metals plant in South Korea, which saw partial commissioning for the neodymium metal production furnace system last year with additional commissioning to follow this year and full scale production expected in the second half of 2022.

The Dubbo Project is ready for construction with all major state and federal approvals and licenses in place, along with a proven process flow sheet and solid project economics. Management has appointed Australian and New Zealand Banking Group Limited (ANZ) as debt financial advisor to assist in engaging with Australian and South Korean export finance agencies as part of the financing of the Dubbo Project.

The company has a "mines to metal" strategy and has executed on that in the past year. The company is nearing completion of the Korean Metals Plant (KMP) in South Korea and, as previously announced, as part of the framework agreement with the investors, a new and separate consortium will be established to develop a permanent magnet manufacturing business in South Korea (MagnetCo Fund).

Not to be outdone by the calendar, in mid-December the company announced the signing of a Joint Statement of Cooperation. ASM and KOMIR, the Korea Mine Rehabilitation and Mineral Resources Corp., have agreed to work together to expand the use of rare earths and critical metals in Korea and develop import opportunities that will secure the supply of these metals for Korean industry. While this is a lot of press-release-speak, it means that ASM has a deal to supply an alternative, secure and sustainable supply of critical metals to South Korea. ASM will commence production of critical metals at ASM's Korean Metals Plant in 2022.

#### In Summary:

- Dubbo Mine fully permitted, updated optimization study, now funded and partnered. Have a feedstock purchaser in KMP for rare earths.
- Metallization plant under construction in South Korea.
   Partially commissioned in 2021 and expected to be fully operational this year.
- Magnet producer to be constructed, partnership established.

Or as keen observers of the Australian Open tennis tournament would observe "Game, Set and Match".

## All Eyes on Australia in 2022 as a Global Rare Earths Production Leader

written by InvestorNews | March 18, 2024

The rare earths sector, particularly the rare earth magnet metals (such as neodymium (Nd)), had a great 2021; but given that the electric vehicle (EV) and clean energy booms are just getting started, 2022 should be another strong year. The most powerful electric motor magnets used today are known as permanent magnets, and they typically are made of neodymium iron boron (NdFeB). Dysprosium (Dy) and praseodymium (Pr) are also commonly used in permanent magnets.

As shown below, neodymium prices had a very strong 2021 reflecting a very strong demand for permanent magnets used in powerful electric motors. It is interesting to note the correlations of price and EV car sales from the chart below especially when considering that the peak months for global electric car sales in 2021 were March, June, October, November, and most likely December (usually the best month of the year).

If you think electric car sales will boom again in 2022 and throughout the decade (as I do), then there is a strong case for owning the rare earth miners of these key magnet metals.

Neodymium 1 year price chart — Currently at CNY 1,110,000/t (USD 174,134/t)



Source: <u>Trading Economics</u> (red arrows by the author to show peak e-car sales months in 2021)

#### Where is the opportunity in rare earths?

Most <u>rare earths reserves</u> are found in China, followed by Vietnam, Brazil, Russia, India, Australia and the USA. Canada also has some rare earths. Most of the global <u>rare earths</u> <u>production</u> is from China followed by USA and Australia.

For Western investors, the two largest rare earths producing mines are owned by Lynas Rare Earths Limited (ASX: LYC) and MP Materials Corp. (NYSE: MP). A third smaller producer is <a href="Energy Fuels Inc.">Energy</a> (NYSE American: UUUU | TSX: EFR), which, however, is a processor, not a rare earth miner.

For investors looking at the next potential rare earths producer then best to look to Australia and Canada. Today I will focus on Australia.

#### Australian rare earth miners

#### Lynas Rare Earths Limited (ASX: LYC) (Lynas)

Lynas is the second largest NdPr producer in the world. Lynas owns the Mt Weld rare earth mine and Concentration Plant in Western Australia (WA), one of the world's highest grade rare earths mines. Lynas ships concentrate from WA to their Malaysian plant for separating and processing into commercial rare earths' materials. As part of their 2025 plan, Lynas is progressing their new Kalgoorlie Rare Earths Processing Facility in WA as well as their LRE/HRE separation & specialty materials facility in the USA.

Boosted by strong prices and production (<u>5,461t of NdPr</u> in FY 2021), Lynas reported <u>record sales of A\$498 million and a record profit of A\$157 million</u> in FY 2021. I would expect this to continue in 2022.

Lynas is no longer cheap and trades on a market cap of A\$9.69

<u>billion</u>, and a 2022 PE of <u>24.9.</u> A top tier Western rare earths (NdPr) producer.

#### Australian Strategic Materials Limited (ASX: ASM) (ASM)

Australian Strategic Materials is an emerging integrated producer of critical metals for advanced and clean technologies based in Australia and South Korea. ASM plans a "mine to metal" strategy to extract, refine and manufacture high-purity metals and alloys that they can then supply directly to global manufacturers. ASM plans to produce a range of high-purity metals, alloys and powders from their metals plant in South Korea. Products will include titanium, zirconium and rare earths, required for permanent magnet production with the raw materials initially sourced from the market. The plan is to later source some materials internally, notably from their flagship Dubbo Project.

The Dubbo Project deposit contains rare earths, zirconium, niobium and hafnium. The Dubbo Project is ready for construction, subject to financing. In December 2021 ASM announced an updated base case in which the 20-year life of mine is expected to achieve a <u>pre-tax NPV of A\$2,361 million</u> and a pre-tax project internal rate of return of 23.5%.

In November ASM <u>announced</u> the commissioning of their Korean Metals Plant in Ochang Province, South Korea. In December ASM <u>announced</u> they had formed a JV with Resource Corporation (KOMIR) (formerly known as Korean Resources Corporation (KORES)) to enable the supply of critical minerals and metals into Korea.

Korea is a tech-based manufacturing powerhouse, and this JV is very timely as non-Chinese tech manufacturers try to wean themselves from dependence on China-centric supply chains.

ASM trades on a market cap of <a href="A\$1.34">A\$1.34</a> billion.

#### Arafura Resources NL (ASX: ARU) (Arafura)

Arafura own the shovel ready Nolans rare earths (NdPr) Project in the Northern Territory of Australia. Arafura is aiming to be a trusted global leader for sustainably mined and processed rare earth products and plans to mine and process ore to separated commercial oxides at a single site at their Nolans Project. The main focus being to produce NdPr oxide. The Project has all Federal & NT Environmental approvals secured and Government and Minister support for A\$300 million senior debt facility. Basically, the Project is ready to go subject to final project funding being secured. Subject to that funding, first production is targeted to begin late 2024.

Arafura trades on a market cap of A\$333 million.

An interesting side note to end on is that Arafura quote:

- "EV market growth is exponential: 10 to 40 times in the next 20 years. This will require 6—15 times more rare earth elements.
- Most EVs need about 1kg of rare earths for their motor magnets.
- Just 0.05% of the vehicle cost: but it can't run without it.
- Market analysts forecast a supply gap that represents 109% of global supply today and is in excess of 11 Nolans Projects."

Source: Arafura Resources October 2021 company presentation

#### **Closing remarks**

We should remember that in 2021 the Morrison led Australian Government <u>announced a A\$2 billion loan facility</u> for Australian critical minerals projects. These funds have the potential to help Australian rare earths juniors to move towards production.

Combine this with high magnet rare earths prices and surging demand, and we have all the ingredients for a strong 2022 from the Australian rare earths' miners.

### Australian Strategic Materials demerger from Alkane Resources unlocks shareholder value

written by InvestorNews | March 18, 2024

<u>Australian Strategic Materials Limited</u> (ASX: ASM | ASMMF)

("ASM") is the result of <u>Alkane Resources Ltd.</u> (ASX: ALK |

OTCQX: ALKEF) demerging their Dubbo rare earths and polymetallic project <u>in late July 2020</u> to form a new listed company. The combined market cap of Alkane Resources and ASM now exceeds its previous value as a single company, showing that the demerger achieved its goal of unlocking shareholder value.

The key assets of the newly-listed Australian Strategic Materials ("ASM") include:

- The Dubbo Project (flagship) is a 100% owned 'construction ready' poly-metallic and rare earths project with potential to become a key global supplier of specialty metals and rare earths. The Dubbo deposit is a proven, large deposit of Zr, REE, Nb and Hf minerals
- Metals Technology Business ASM is investing in new technologies related to the separation, purification and metallisation of oxides. Their JV pilot plant with ZironTech is now in operation.

■ **Toongi Pastoral Company** — The company owns 3,500 hectares of freehold and leasehold land 25kms south of Dubbo, NSW, Australia.

#### What's happening now with Australian Strategic Materials

ASM's strategy is to not only produce rare earths concentrate but to go further up the value chain and produce various strategic metals. Should ASM succeed, it would place them in that exclusive club in the mining industry of being an alternative strategic high value metals producer outside of China.

To achieve this goal of producing metals from their Dubbo Project, ASM is working with their Joint Venture (JV) partner, South Korea's Zirconium Technology Corporation ("ZironTech"). The JV is now advancing a pilot project to produce various metals by combining their proprietary process with ZironTech's metallisation technology. ASM has exclusive global commercialization rights under the licence. The pilot plant is now up and running in South Korea.

## Australian Strategic Materials plans to move up the rare earths and strategic materials value chain



#### Source

### The latest progress in pilot testing the extraction of strategic metals:

<u>July 2, 2020</u> — ASM/ZironTech JV produces titanium metal alloy with a 45% power saving. The commercial pilot plant was commissioned on time and on budget, with ~30kg of titanium metal

alloy produced. A subsequent run of the pilot plant produced another 22kg of titanium metal alloy, with up to 50% less energy than current commercial production methods. Then in August ASM reported that their JV produced 9.16kg titanium (Ti) metal powder assaying 99.83%.

<u>July 13, 2020</u> — ASM/ZironTech JV produces high quality neodymium (Nd) metal alloy, with successful laboratory production of ~1kg of neodymium metal alloy.

ASM & ZironTech produce a ~1kg of neodymium (87%) metal alloy using their 45% more efficient reduction process at their pilot plant



#### Source

August 19, 2020 — JV produces second key permanent magnet metal, praseodymium (Pr). Commercial pilot plant produces 5.3kg Pr metal assaying 99.3%. JV announces a forward plan for commercial pilot plant production of neodymium, praseodymium and dysprosium metal in August.

ASM & ZironTech produce 5.3kg of high purity praseodymium metal (99.3%)



#### Source

"This is a major milestone in ASM's integrated strategy that includes clean metal production for all products from the development of the Dubbo Project in Central West NSW", according to ASM's Managing Director, David Woodall. "This integration of metal production into ASM's business is consistent with the Australian Government's objective of adding value within

Australia, while ensuring supply security and stability of these critical materials to global and domestic Australian manufacturing sectors."

The Dubbo Project is a large resource of zirconium, hafnium, niobium, and rare earths (including praseodymium, neodymium, and yttrium). It is the most advanced poly-metallic project of its kind outside China. The Project has an estimated 70-year mine life and can be an open pit design. The Project is ready for construction with all major state and federal approvals and licenses in place. The 2013 DFS resulted in a pre-tax NPV8% of A\$1.235 billion, and a pre-tax IRR of 19.3%. The Company has since proposed a two stage production start up so as to lessen the first stage CapEx from an estimated US\$930 million to US\$480 million. A follow up FS plans to incorporate the new and improved processing techniques from their ZironTech JV.

#### Closing remarks

Rare earths are not rare in the earth's crust, however extracting and purifying them is the challenge that has traditionally been an expensive and polluting process, mostly done in China. What ASM and their JV partner ZironTech are doing is revolutionizing the process of rare earth metals production, using much more energy efficient methods that are also less harmful to the environment. It is still early days with their pilot plant testing however results so far with titanium, neodymium, and praseodymium appear to be highly promising.

Effectively ASM is working towards becoming a vertically integrated ("mine to metal") western producer of high purity strategic/critical and valuable metals. Subject to further testing and funding the plan is to have clean metal processing plants in Korea and Australia. More efficient processing techniques should significantly improve the economics of ASM's

Dubbo Project as well as opening up the opportunities for wider commercialization of their breakthrough technology.

The market seems to agree. Australian Strategic Materials' stock price has doubled so far in August and ASM is now trading on a market cap of A\$264m.

## Alkane's disruptive technology to reduce metallization costs by +50%

written by InvestorNews | March 18, 2024 [Note from the Publisher: This InvestorIntel interview is about the Alkane Resources Limited: Investment in Clean Metal Processing Technology news release put out on June 6, 2019 that starts: "Alkane Resources Ltd (ASX: ALK) (Alkane) through its wholly owned subsidiary Australian Strategic Materials Limited (ASM) has executed a binding agreement with Zirconium Technology Corporation (a South Korean company) (Ziron Tech) to fund the final stage research and feasibility in relation to a clean metal process to convert metal oxide — including key Dubbo Project metals — to metals of high marketable purity

InvestorIntel did a follow-up column titled <u>Alkane deal with Ziron Tech to reduce metallization costs in excess of 50% for zirconium, hafnium, and titanium metals</u> on July 15, 2019 as we deem this news to be disruptive for the overall critical materials sector.]

(Technology)."

"It is an electrolysis process. So it uses standard electrolysis but through a solid oxide membrane rather than a carbon electrode. That is a big step because it takes carbon out of the equation. The really exciting thing for us was, the solid oxide membrane that they use is a yttria stabilized zirconia. Here are two products that we will produce from Dubbo, we can actually produce yttria stabilized zirconia used in the process, so there was an added bonus for us. The beautiful thing about the process is that it generates only oxygen as waste material and produces high purity metals" States Ian Chalmers, Technical Director of Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY), in an interview with InvestorIntel's Tracy Weslosky.

Ian went on to say that the Ziron Tech Electrolysis Process is estimated to reduce metallisation costs by in excess of 50% and is applicable to the majority of Dubbo Project products, including zirconium, hafnium, titanium, neodymium and praseodymium. Ian also said that the process doesn't add much to the capital and operating cost of the Dubbo Project and expects that by the end of 2020 this technology will be available to the global critical material market.

To access the complete interview, <a href="click here">click here</a>

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#### Nic Earner on the state of the

#### rare earths market

written by InvestorNews | March 18, 2024

"We have a project that is State and Federal approved, mining lease is granted, we own all the farmland underneath, mines approved, so we can start developing today. This project, with finance, can be executed right now." States Nic Earner, Managing Director of Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY), in an interview with InvestorIntel Corp. CEO Tracy Weslosky.

**Tracy Weslosky:** What is happening with the rare earths market right now?

Nic Earner: It is really interesting time for the market. If you go out and listen to people, they will say that we know that Lynas which supplies about 20-25% of the worlds battery materials, China has a lock on this stuff...So what you have is, the rise of a producer, Lynas, and a whole series of other projects including ourselves as one of the most advanced projects that can produce rare earths waiting for a news to say, I am going to act now to secure my supply chain. So, its quite a dynamic time and particularly as you can imagine with the Trump administration and who is doing what in trade tariffs people are really watching closely, waiting for a signal that things are starting to break.

**Tracy Weslosky:** Those of you out there that look at issues like sustainability and geopolitical factors, this is the kind of company to be watching. Can you give us kind of an overview on what's happening right now with the Dubbo Project?

**Nic Earner:** Our project is amongst if not the most advanced non-developed project in the world. We have a project that is State and Federal approved, mining lease is granted, we own all the farmland underneath, mines approved, so we can start developing

today. This project, with finance, can be executed right now. So we are in a constant and continuous push on marketing, looking for off-takes, co-investors, etc...For us we have a ready to execute project and we are really pushing to get a critical step taken.

**Tracy Weslosky:** Correct me if I am wrong, that outside of China, when you get this financing in place, you will be one of the largest producers of these rare earths outside of China. Is that correct?

**Nic Earner:** Absolutely. At the moment outside of China of any substantial nature we have Lynas Corp. digging up at the Mt Weld and shipping to Malaysia. They are the sole supply outside of China. Almost two-third of their product goes into Japan, the rest goes to China. So that's correct we would be....to access the complete interview, <u>click here</u>

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## Alkane's Chalmers on the supply shortage of rare earths

written by InvestorNews | March 18, 2024

"Surprisingly the rare earth market still has not shown the jumps that we believe it would have by now. The equity market is still very skeptical of us. I think that is a combination of things. Eventually the customers, the equity market are going to lock on or understand that if we are going down this path, which

we all believe we are going, then the demand for rare earth magnets is just going to have to increase dramatically and there is not the supply around at this point in time." States Ian Chalmers, Technical Director of Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY), in an interview with InvestorIntel Corp. CEO Tracy Weslosky.

**Tracy Weslosky:** Ian, the headlines everywhere, we have got U.S.-China trade negotiations happening. We have China and Canada at each other. What is happening with the rare earth market?

Ian Chalmers: That is a good question actually. It is pretty hard to summarize in a short space of time. Surprisingly the rare earth market still has not shown the jumps that we believe it would have by now. The equity market is still very skeptical of us. I think that is a combination of things. Eventually the customers, the equity market are going to lock on or understand that if we are going down this path, which we all believe we are going, then the demand for rare earth magnets is just going to have to increase dramatically and there is not the supply around at this point in time. At some point in the not too distant future the market is going to crack and we are going to see some really, really strong interest.

**Tracy Weslosky:** Ian I think we are both getting our updates on what is happening with Lynas for instance from just the general news media. What is your understanding of what is happening right now?

Ian Chalmers: My understanding, and again like you I am just getting it from the public domain, is that Lynas had been instructed that they have to come up with a solution to the radioactive waste. Now in the meantime they have stopped production. I understand it was only initially for a month while this review was completed, but they have to come up with an

issue to deal with the radioactive waste that is already on site. It is a serious problem, but it is a problem I do not believe the Malaysian government cannot resolve because there is too much outside influence on the Malaysian government. There is a strong relationship between Japan and Malaysia and really a lot of Lynas' product goes to Japan. I think I would be very surprised if the Malaysian government shut down the operation.

**Tracy Weslosky:** I really appreciate the update with that. Speaking of updates, considering the size and the magnitude of your critical material resource, can you give us an update on what is happening with the Dubbo Project?

Ian Chalmers: Basically the Dubbo Project is ready to go. We are continuing to work on offtake agreements. We are continuing to work on the finance. One of our major issues is our customers, particularly in the rare earth space keep wanting to see discounts. They want to see discounts to Chinese domestic price. In other words they are saying to us, yeah we will sign an off take contract, but you accept the 7%-8% vet as a discount and you put another small discount on top of that as the Chairman stated at the lead in to our annual general meeting back earlier in November…to access the complete interview, click here

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#### Alkane Resources' Nic Earner

## on the supply challenges facing the critical materials sector

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"Our project stands ready to execute. We continue to look for market offtakes, strategic investment in Australia, government support as well. We wait and watch prices rise around for all of the commodities that we are in. We think that it is approaching a trigger where some of the customers must have to act and secure their supply chains." States Nic Earner, Managing Director of Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY), in an interview with InvestorIntel Corp. CEO Tracy Weslosky.

**Tracy Weslosky:** Thank you so much for joining us because many of us, actually everybody at InvestorIntel is well aware of Alkane's Dubbo Project and being one of the leaders of critical materials in the world. Why do we not just start with an update on Dubbo please?

**Nic Earner:** Thank you Tracy. Our project stands ready to execute. We continue to look for market offtakes, strategic investment in Australia, government support as well. We wait and watch prices rise around for all of the commodities that we are in. We think that it is approaching a trigger where some of the customers must have to act and secure their supply chains.

**Tracy Weslosky:** In your critical material food chain we have got zirconium, hafnium, rare earths and niobium. Did I get the highlights or am I missing any?

Nic Earner: You did get the highlights. Thank you.

Tracy Weslosky: Okay. Of course we have all been watching the

geopolitical tensions caused between the United States and China. I was reading a little bit more about what is happening specifically with the niobium and the ferroniobium steel and how this is actually affected by this. Can you talk to this a little bit more?

Nic Earner: With increased use in vanadium in particular niobium is a key substitute for vanadium. We are seeing both highstrength low-alloy steels rising in their use, but as well as that we are seeing vanadium-flow batteries starting to emerge. Vanadium itself is taking off and it is dragging niobium with it as a substitution. Niobium is at the highest prices we have seen in quite some time. It is into the plus \$40 range, which is really, really interesting. As well as that we also have the fact that CBMM based in Brazil, single largest producer, 85% of the market, is out there. All of those things are combining. People are a little bit worried that there is a shortage. They are looking for alternative supply. They are looking for substitutes for vanadium and there is a lot of price pressure with not many new supply options out there.

**Tracy Weslosky:** Okay. In addition to that, of course, we have had a couple of the rare earths leaders saying, okay, they are back. Rare earths are back. I am not seeing the rise or the lift in the share prices yet, but we are watching and we are noticing an increase in people going to the rare earth columns and reading about them and sending us emails. Can you talk to us about rare earths and their demand right now?

Nic Earner: Fundamental demand continues to rise. CAGRs are 6% generally. A lot of it is driven by renewable energy and the rise of electric vehicles. A lot of the forecast in the future are almost all driven by electric vehicles and the rise of renewables and higher efficiency domestic devices. We are right to see that interest is rising so people are saying, hang on a

minute, particularly like we talked before about the tensions between China and the U.S...to access the complete interview, <u>click here</u>

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