BEFORE THE COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

Hearing to Examine the Department of the Interior's Final List of Critical Minerals
July 17, 2018

Testimony of Jim Sims
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Chairman Murkowski, Ranking Member Cantwell, and Members of the Committee, I am Jim Sims with NioCorp Developments, Ltd. I very much appreciate the opportunity to address the Committee regarding critical minerals and opportunities to strengthen the United States' mineral security. Following a short Executive Summary, my testimony will address these areas:

1. The Elk Creek Critical Minerals Mine and Processing Facility
2. How We Have Reduced the Project's Environmental Footprint
3. The Power of Elk Creek Critical Minerals: Some Examples
4. Applications and Markets That Utilize These Critical Minerals
5. Policy Recommendations for Strengthening U.S. Mineral Security

EXECUTIVE SUMMARY

Headquartered in Denver, Colorado, NioCorp is public company regulated by both U.S. Securities Commission and the Ontario Securities Commission. All required disclosure filings are available for public review on the SEC's EDGAR website and on www.sedar.com.

NioCorp is a small business focused on a large mission: bringing into commercial operation a breakthrough critical minerals mine and processing facility in Nebraska. We are pursuing this mission at a time when the U.S. has never been more reliant on other nations for so many of the critical minerals that keep our nation safe, support our standard of living, enable new technologies that reduce environmental impacts, and allow our economy to thrive.

I use the adjective "breakthrough" when speaking of the Elk Creek, Nebraska Critical Minerals Project for good reason. The Elk Creek Project is designed to produce multiple critical minerals, and only critical minerals. When operational, it will alleviate our total dependence on foreign nations for two critical minerals, and it will improve our production capacity of a third critical mineral. It also will position the U.S. as a global superpower in the production of a critical mineral that was once dominated for many years by one nation: the former Soviet Union.

1) **First-Ever U.S. Production of Niobium:** The Elk Creek Project will give America, for the first time ever, the ability to produce the superalloy metal Niobium, a critical and strategic metal that plays a vital role in both commercial and military technologies. America is 100% dependent upon foreign nations for Niobium, which is one reason why Niobium was recently named by the Department of Interior as a critical mineral. The criticality of Niobium was previously recognized by the U.S. Congress in the FY2014 National Defense Authorization Act when it authorized the National Defense Stockpile to purchase and store a form of Niobium in the event of national emergency. We need Niobium, we don't have it, and that makes it both critical and strategic to the U.S.

2) **First Initiation in Decades of U.S. Production of Scandium**: The Elk Creek Project will give America the ability to produce the superalloy metal Scandium from U.S.-sourced ore for the first time in decades. As with Niobium, America is 100% dependent upon foreign suppliers for Scandium. While Scandium is not yet used extensively in the U.S., that is because of constrained supply: very little Scandium is produced anywhere in the world today. The former Soviet Union once dominated production of Scandium, and reportedly used it

extensively in a variety of military technologies. Scandium also multiple current and prospective uses in clean energy and in transportation systems, where it promises to revolutionize fuel economy. The DOI recently named Scandium a critical mineral. We need Scandium, we don't have it, and that makes it critical and strategic to the U.S.

3) **Expanded Production of Titanium:** This project also will boost America's domestic production of Titanium, a highly versatile metal with many uses across both civilian and defense sectors. Today, the U.S. is 91% reliant on foreign producers for titanium mineral concentrate. Titanium – the third metal to be produced at Elk Creek -- is also on the DOI critical minerals list. We need Titanium, we don't have sufficient production of it, and that makes it critical and strategic to the U.S.

4) **America as a Global Scandium Superpower:** Not only will the Elk Creek Project help America produce its own Scandium, it is positioned to establish the U.S. as a global superpower of Scandium production. Currently, only about 15 tonnes of scandium are produced each year in the world, mostly from sources in China and Russia. Our Nebraska project plans to produce more than 100 tonnes per year of Scandium. That will position the U.S. as a global leader in the production of this critical and strategic metal.

5) **High-Performance Alloy Development:** While we are working to establish Scandium production in Nebraska, we also are engaged in a joint development effort with IBC Advanced Alloys to develop new aluminum-scandium alloys that can be utilized in a variety of markets and applications. IBC has deep expertise in producing high-performance alloys, including precision cast beryllium-aluminum alloy parts for commercial systems and defense platforms, including the F-35 Lightning II aircraft.

6) **Reduced Environmental Footprint**: The Elk Creek Critical Minerals Project has been extensively designed to limit environmental impacts that are typically associated with projects of this type and size. NioCorp has already secured its primary federal permit: a Section 404 permit from the U.S. Army Corps of Engineers. Moreover, we further reduced the Project's environmental footprint recently by removing plans to construct a waterline to the Missouri River. That design change, in turn, eliminated the need for any further NEPA-level federal permits for the Project. This fact that this Project now enjoys remarkable low permitting risk is a direct result of NioCorp's decision to make an early investment, and go the extra mile, in early stage environmental planning.

7) **Strong State and Local Support**: The project enjoys strong support from local residents and from state and local leaders, due in part to several factors. These include: (a) the Project's expected creation of hundreds of new jobs, increased economic opportunity, and higher tax revenues to state and local governments; (b) the increased diversification it will provide to Nebraska's economy; (c) its reduced environmental impacts; (d) the role these critical minerals play in energy efficiency, reduced fuel consumption, and reduced air emissions in downstream applications; (e) the Company's commitment to openness and transparency with area residents; and (f) the fact that this Project will position Nebraska as a global leader in the production of several critical minerals.

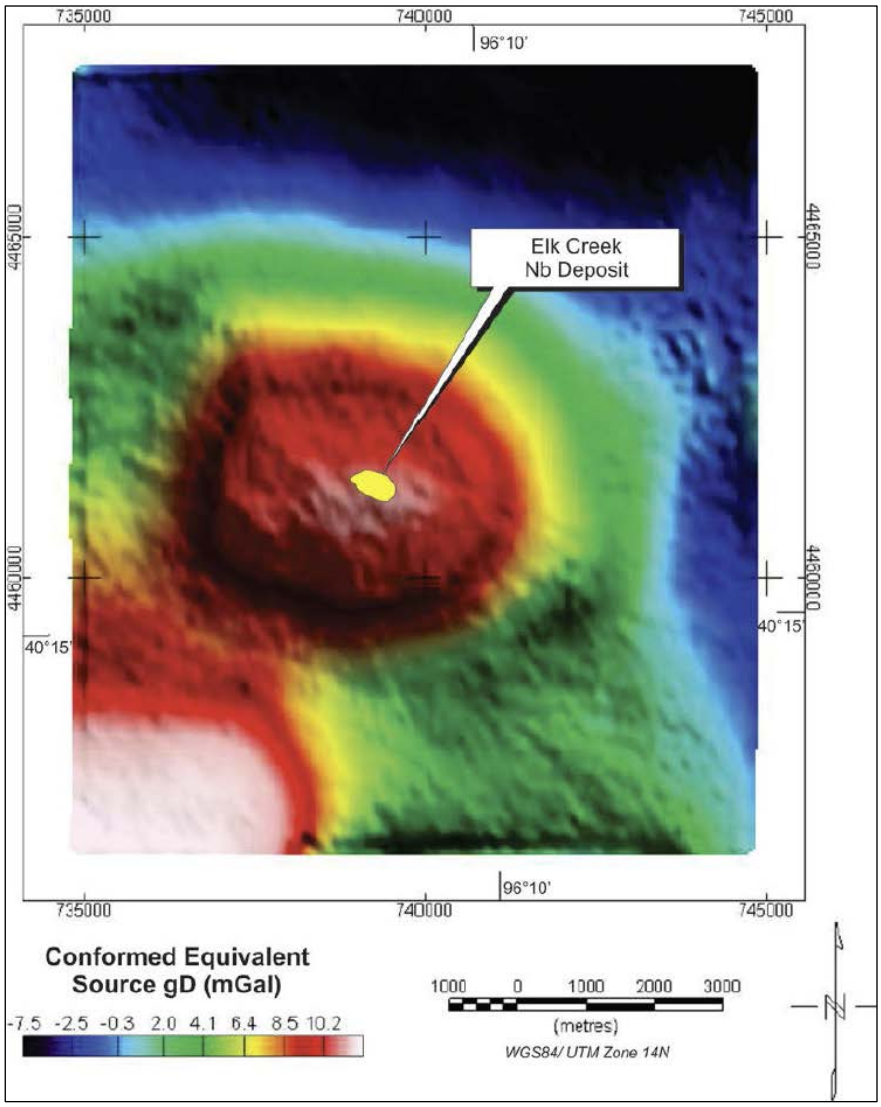
8) **Key Role in Infrastructure Repair/Re-Building**: This Project will help accelerate the ongoing "lightweighting" revolution in transportation systems. As a steel strengthener, Niobium is already is used in virtually all steel chassis cars and trucks today to lightweight the vehicle, make it safer, and increase fuel economy. It also is increasingly used in infrastructure projects such as bridges, tunnels, airports, and other structures because its anti-corrosion qualities allow bridges to last 100+ years, rather than 30-50 years. What Niobium does for steel, Scandium does for aluminum alloys. Its potential to lightweight commercial aviation and surface transportation is truly revolutionary.

9) **Potential Financial Support from Germany:** While the Elk Creek Critical Minerals Project is not currently seeking financial assistance by the U.S. Government, the Project has received in-principal eligibility from the German Government's Untied Loan Guarantee Program for a loan guarantee of approximately $130 million.

10) Rapid Progress. While no greenfield mining project in the U.S. moves forward at the speed preferred by management and its investors and supporters, the Elk Creek Critical Minerals Project is progressing more rapidly than most mining projects of its size and scope. Assuming the Company is successful in its current efforts to raise the $1 billion in required up-front capital, construction activities in Nebraska would begin as rapidly as possible.

THE ELK CREEK CRITICAL MINERALS PROJECT

Our Project is designed to tap into a relatively small part of a much larger underground resource in Nebraska. In the gravity gradiometer map at right, the ore body targeted for development is shown in yellow, against the backdrop of a much larger potentially favorable geologic structure, shown in red.



The Elk Creek orebody is classified geologically as a carbonatite. These types of geologic structures are highly unique and often contain high concentrations of valuable minerals. The Elk Creek Carbonatite is no exception. The orebody lies beneath approximately 100 feet of the area's topsoil, referred to as glacial till, which contains the area's freshwater resources, and beneath another 500 feet of limestone, which serves as an aquitard between the layers. Because there are no surface outcroppings of the carbonatite, it was discovered only through by aerial surveys conducted by the State of Nebraska in the 1960s. Because of its large size and strong magnetic and gravimetric signature, the carbonatite showed up like a large gravitic and magnetic bullseye on maps such as the one at right. Nebraska officials knew that a significant concentration of metallic elements existed in the ground near the town of Elk Creek, and that the prospective resource could be quite large.

Several companies conducted exploratory drilling campaigns over the following decades. But it wasn't until NioCorp negotiated agreements with local landowners, conducted the exploration work necessary to characterize an ore reserve, and completed a 3.5-year, $35 million Feasibility Study that this critical mineral resource was placed on the pathway to commercial operation.

Below are some data points on the Elk Creek Project. This and much more detailed information is contained in the Revised Elk Creek Feasibility Study, which can be downloaded here: http://niocorp.com/images/ElkCreek_FS_NI43-101_Revised_TechnicalReport_241900-040_Rev25_20171215.pdf.

- **Mineral Resources and Reserves**

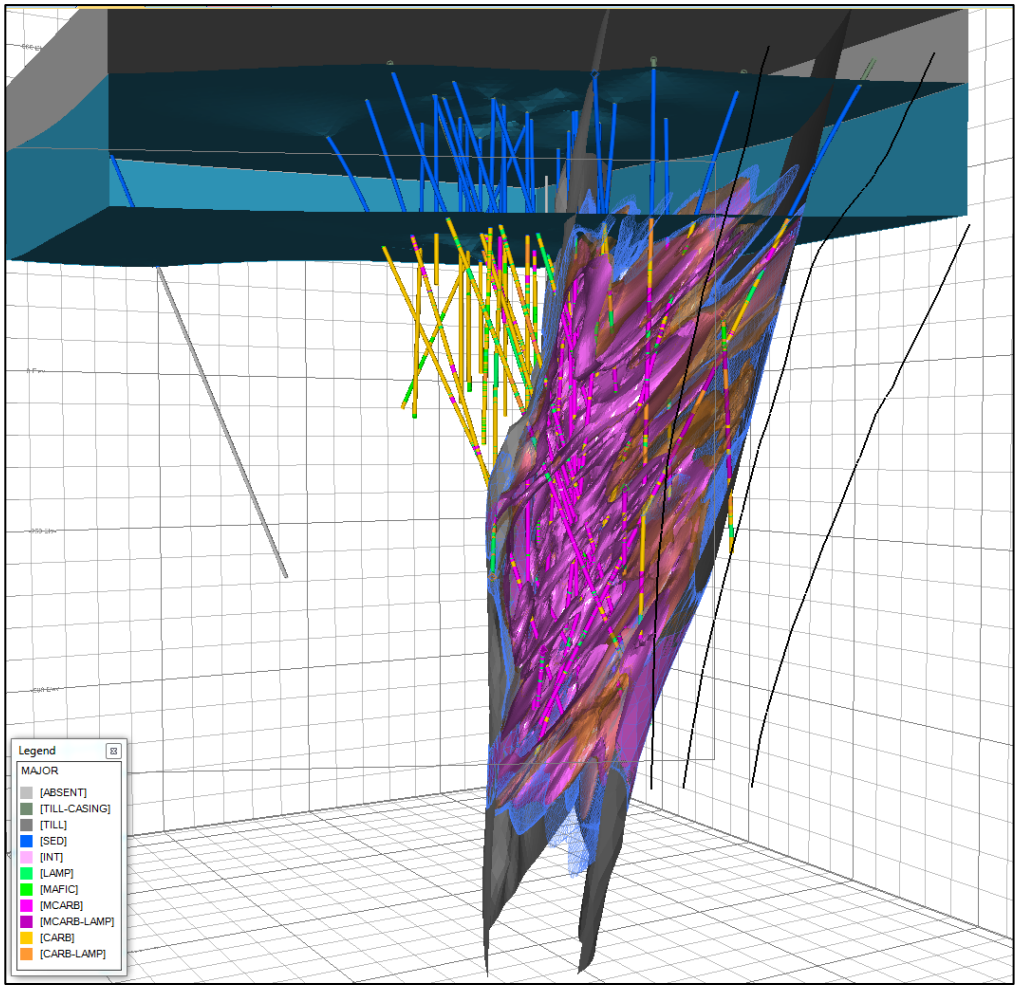
  Probable reserves of 31.7 million tonnes of ore at 0.79% niobium (Nb_2O_5), 71.6 grams per tonne (g/t) scandium (Sc), and 2.81% TiO_2. Total indicated mineral resources are 90.9 million tonnes at 0.66% Nb_2O_5, 70 g/t Sc, and 2.59% TiO_2, with inferred resources of 133.6 million tonnes at 0.48% Nb_2O_5, 59 g/t Sc, and 2.23% TiO_2.[i] Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resources and Mineral Reserves have an effective date of May 15, 2017.

- **Mine Life**

  32 years, producing over the life of mine approximately 143,824 tonnes of payable niobium, 3,237 tonnes of Sc2O3, and 359,128 tonnes of TiO2.

- **Ore Body**

  Below is an illustration of the Elk Creek Carbonatite. The top gray layer is the glacial till layer, where topsoil and groundwater supplies exist. The blue layer represents limestone that separates the glacial till and groundwater resources from the orebody, which is shown in the main portion of the illustration. The straight lines extending from the surface represent exploratory drilling that was done to characterize the ore body. The zones colored purple host the critical minerals.



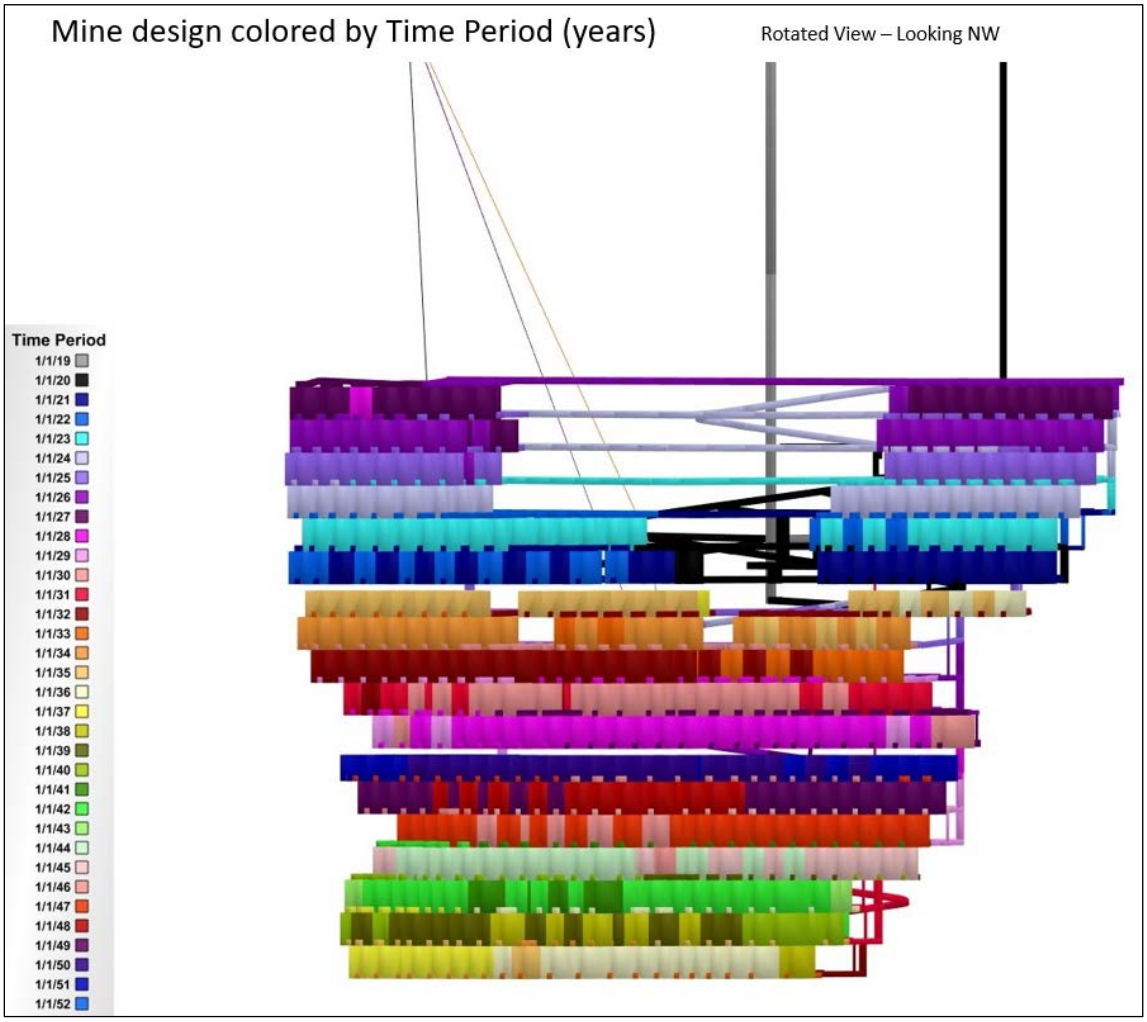
- **Planned Annual Production**
  - Ferroniobium ("FeNb"): annualized production rate of 7,055 tonnes.
  - Scandium Trioxide ("Sc_2O_3"): annualized production rate of 103 tonnes.
  - Titanium Dioxide ("TiO_2"): annualized production rate of 11,445 tonnes per year

- **CAPEX**

  Up-front direct capital costs of $705 million, in addition to indirect costs of $189 million, pre-production capital costs of $85 million, contingency of $109 million, and pre-production net revenue credit of $79 million.

- **Mining Plan**

  The Project plans to utilize industry-standard ground freezing technology during shaft sinking, which has the ability to facilitate the simultaneous sinking of both the production and ventilation shafts, instead of sequential shaft sinking. It also is expected to save schedule time, minimize water inflows, and improve overall safety during shaft sinking operations.

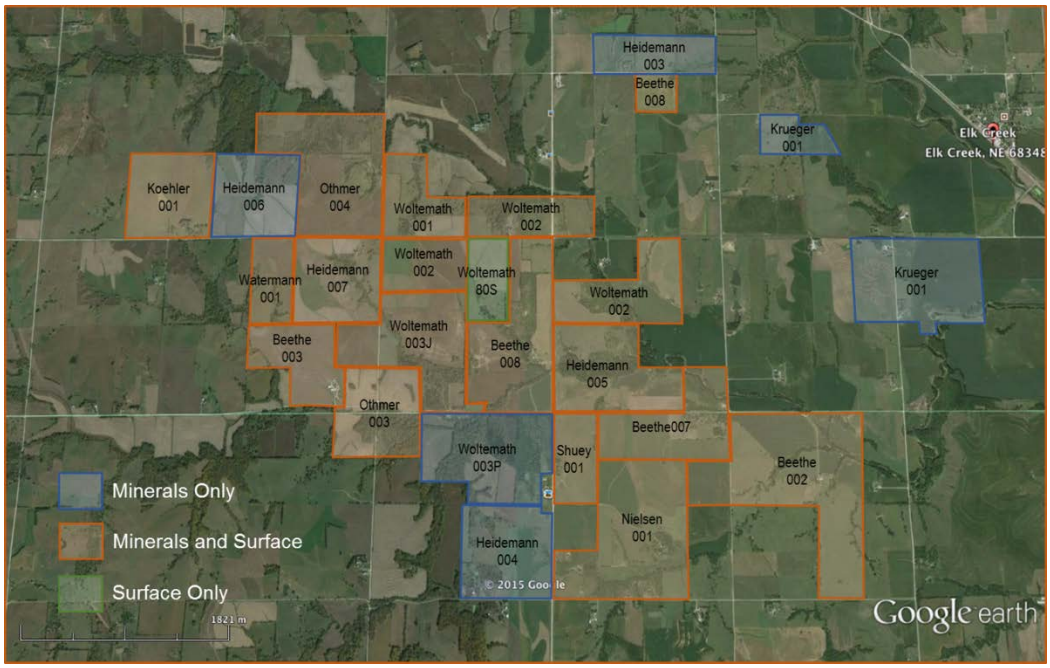


Source: SRK, 2017

Mine Production Schedule Colored by Year, Rotated View Looking Toward the Footwall (Northeast)

- **Land Position**

  The Project is located entirely on privately-owned lands, and no public lands are involved. NioCorp has successfully negotiated options agreements with all landowners necessary to build and operate the Project. Local landowners are crucial partners in this Project and are highly supportive of the effort to bring it to commercial reality.



- **Surface Processing Facility**

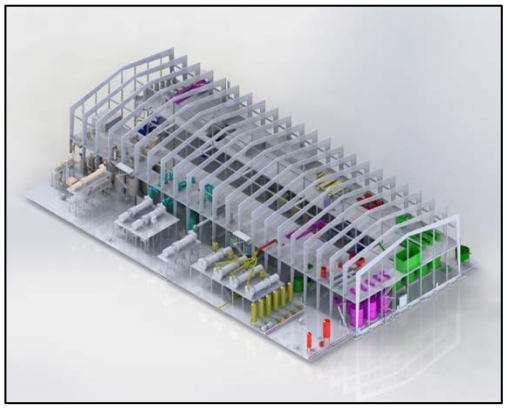
  The processing of mined ore into commercial products will largely be accomplished in three stages in the surface processing facility.

  Mineral Processing

  The Mineral Processing building will house all of its equipment within a single large building. The primary driver of the comminution circuit design is the dry processing of ore. The process design relies upon two things; receiving a primary crusher product with a characteristic particle size of (P80) 115 mm (6 inches or smaller) at the comminution circuit feed bin and producing feed material for the downstream hydrometallurgical processing at a characteristic particle size of (P80) 1.1 mm (i.e. sand sized). The primary crusher product will be fed to the secondary cone crusher system, operating in closed circuit with a double deck screen. The screen undersize from the cone crusher system will be fed to a HPGR unit, operating in closed circuit with another double deck screen. The HPGR screen undersize is the comminution product that will report to the hydrometallurgical process.

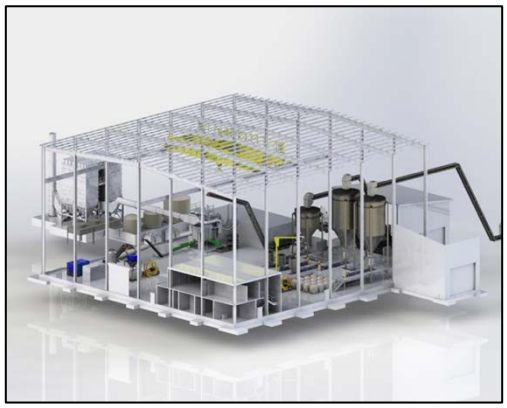
Hydrometallurgical Processing (Hydromet)

The Hydromet Plant building will house equipment on two levels for the 12 individual processes required to separate the three recoverable minerals. The Hydromet Plant is supported by a Hydrochloric Acid Regeneration (HCL) plant and a Sulfuric Acid Recycling Plant. The Hydromet plant will produce the final titanium and scandium products, and an intermediate niobium product that will be converted to a final product in the Pyromet plant.

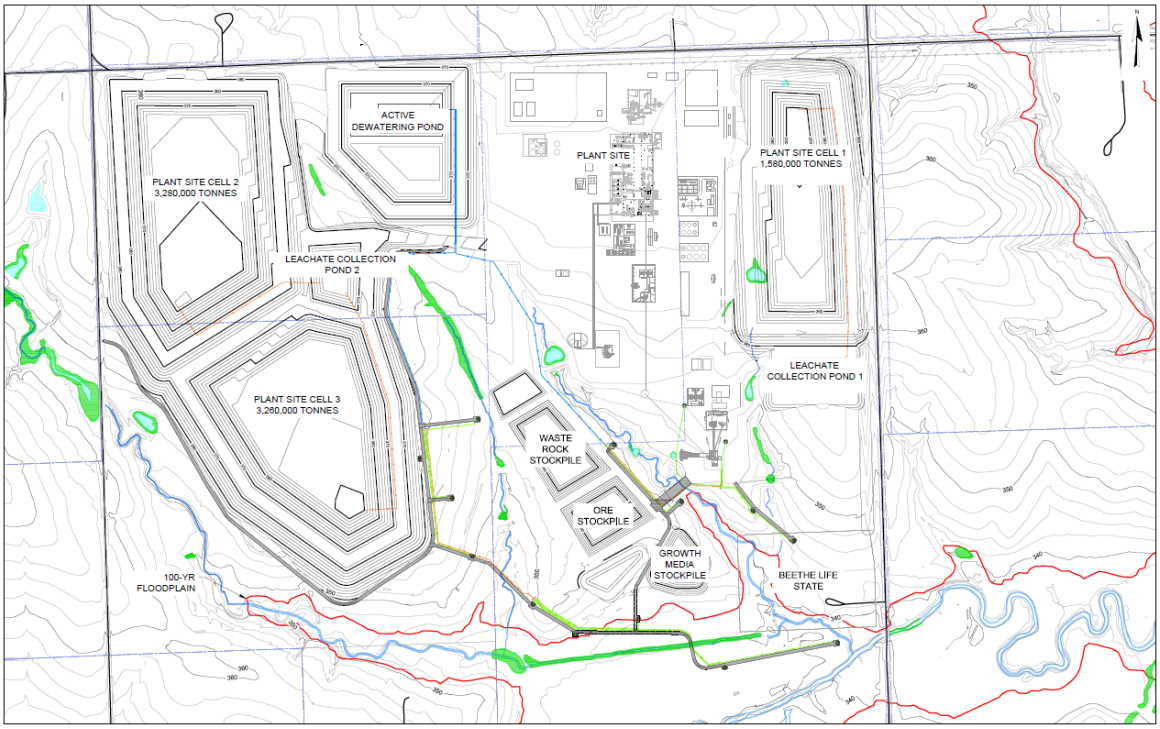


Pyrometallurgical Processing (Pyromet)

The purpose of the pyrometallurgical (Pyromet) plant is to convert the intermediate niobium product from the Hydromet Plant into a saleable ferroniobium (FeNb) metal. This conversion is performed in a single electrical arc furnace with a continuous feed of precipitate, additives and fluxes to produce a saleable a FeNb metal alloy.

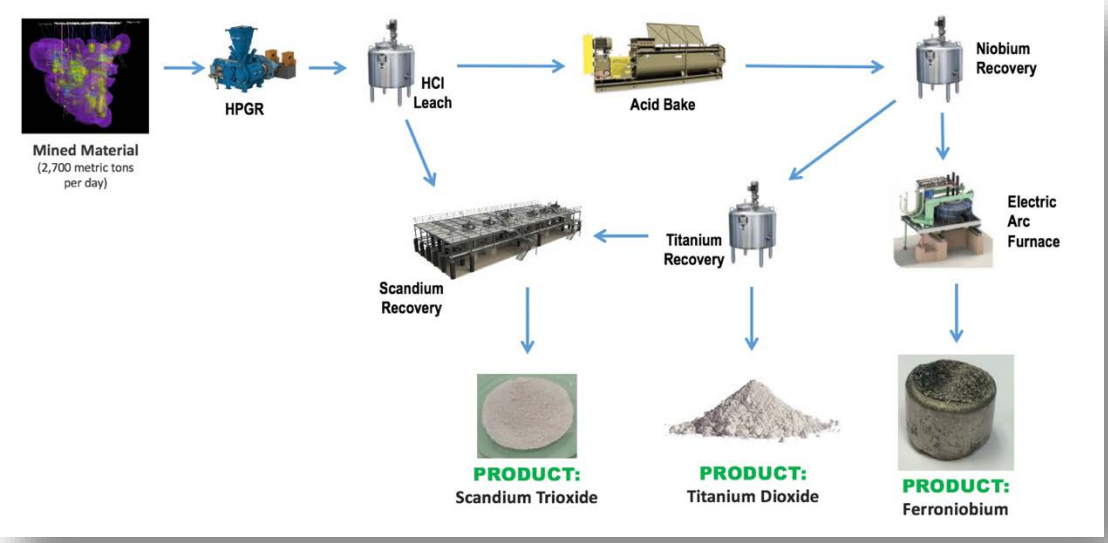


The proposed layout of the surface processing facilities appears below.



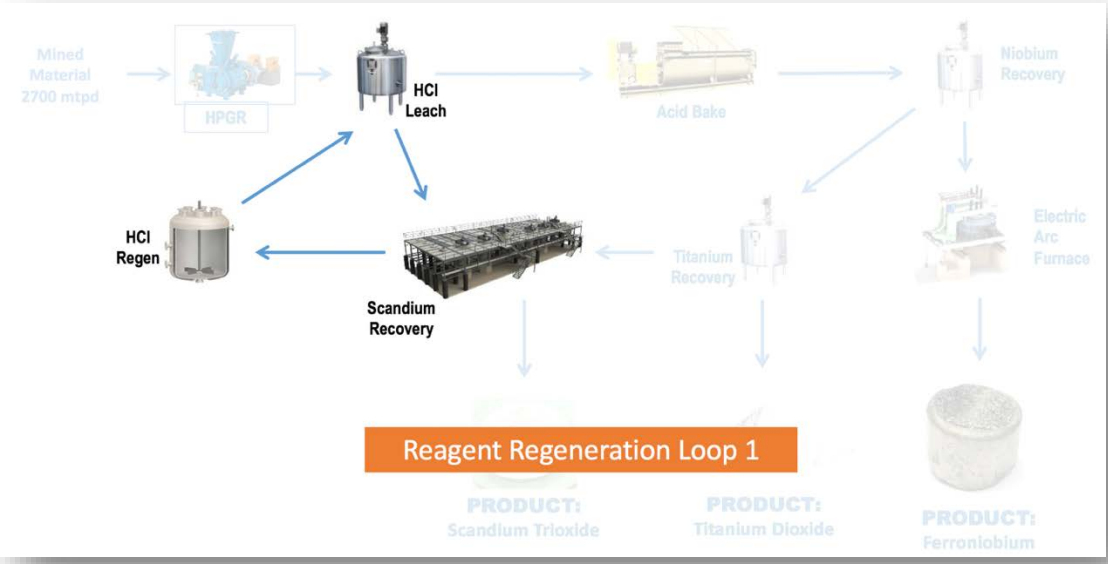
Simplified Process Flow Sheet

A simplified illustration of the process flow sheet is shown below. A detailed description of the processes in each of these steps can be found in the Revised Elk Creek Feasibility Study, downloadable here: http://niocorp.com/images/ElkCreek_FS_NI43-101_Revised_TechnicalReport_241900-040_Rev25_20171215.pdf

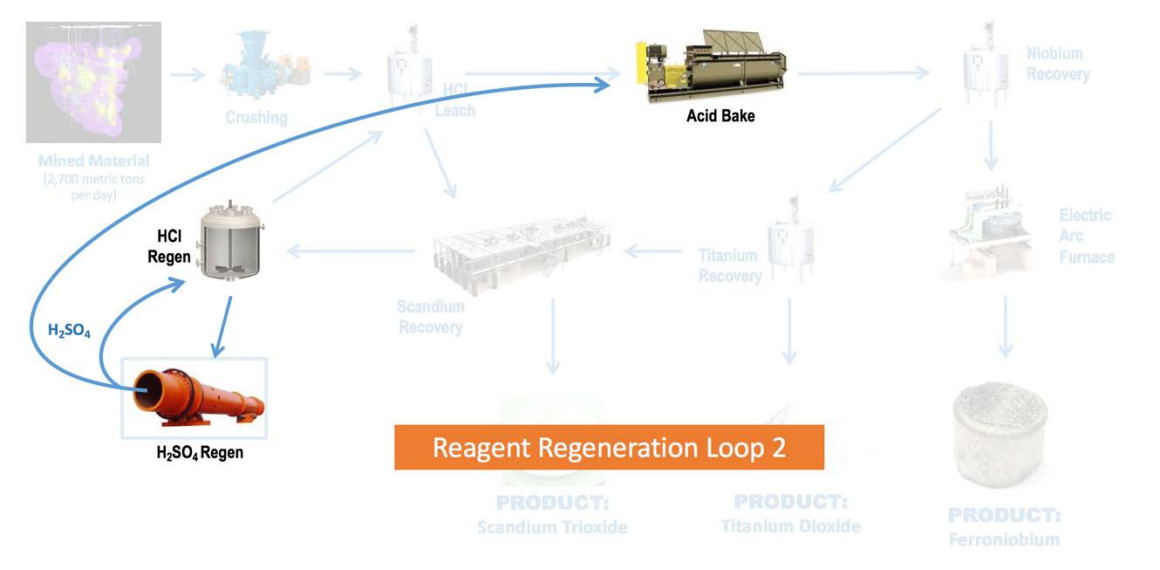


Recycling and Regeneration Operations

The facility will employ two recycling and regeneration operations. The first, shown below, is designed to regenerate the hydrocholoric acid (HCl) used to process the ore. This regeneration significantly reduces the need for the facility to ship in large quantities of HCl or its precursor chemicals, and this helped to reduce the overall environmental footprint and impacts of the Project.



The second reagent recycling / regeneration loop will help the facility regenerate sulphuric acid (H_2SO_4), also used in processing. This further reduces the facility's need to consume outside supplies of process reagents.



HOW WE HAVE REDUCED OUR ENVIRONMENTAL FOOTPRINT

The Elk Creek Critical Minerals Project is a relatively large, $1 billion CAPEX facility that will required dozens of federal, state, and local government permits to construct and operate. A detailed list of these permits is shown below.

NioCorp was able to reduce its permitting requirements in several areas of the Project by reducing or eliminating the environmental impacts that would have required those permits. The Company made an early decision to invest more time and resources on the front end of the Project in order to limit environmental impacts as much as possible. As various metallurgical innovations, design changes, and process optimizations were discovered and implemented into the Project's design, the environmental footprint of the Project shrunk considerably from earlier designs.

For example, NioCorp's initial design of the surface processing facility would have caused impacts to federally regulated wetlands and stream channels sufficient to require an authorization under Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers (USACE). Typically, these permits require an associated NEPA-level review, such as an Environmental Assessment or Environmental Impact Study. However, because of a number of metallurgical and process improvements to the design of the facility, and the reagent recycling / regeneration circuits that were added to the process flow sheet, the Company was able to eliminate the need for a planned railroad spur line to the site that was to deliver large amounts of incoming chemicals. Additionally, NioCorp engineers found ways of reducing the production of mine tailings and reducing the size of surface tailings storage areas. It also made changes to the surface facility's layout to avoid federally regulated wetlands and stream channels.

As a result of this work, and significant upfront investment, the Project's estimated impacts to federally jurisdictional waters was reduced to such low levels that the Project was able to qualify for a Nationwide Permit under Section 404 of the Clean Water Act, which is a more streamlined process than a typical Individual Permit under Section 404. NioCorp was granted its 404 authorization in June of 2017.

Two other federal permits from the USACE were initially required for a planned 33-mile waterline from the Project site to the Missouri River. This waterline was designed to discharge into the river brackish water that was expected to be pumped out of the underground ore body and surrounding bedrock to facilitate shaft sinking and mining operations. This waterline would have required two federal permits from the USACE: an additional Section 404 authorization and a Section 408 permit. The latter, in turn, would have required an Environmental Assessment to be completed through a NEPA-level review.

However, by adjusting the mine plan to utilize artificial ground freezing, and as a result of additional hydrogeological analysis of the ore body, NioCorp was able to dispense with the need for the waterline to the Missouri. This eliminated the need for the additional two federal permits and an Environmental Assessment associated with the waterline.

NioCorp has incorporated other elements into the Project to reduce its overall environmental impact:

- Returning a significant percentage of mine tailings to the underground mine, in the form of a structural backfill, as mining operations are completed in sections of the ore body.
- Utilizing locally produced fly ash as a binder in the underground mine, which puts the fly ash to beneficial use and avoids disposal of the fly ash in a surface landfill.
- Designing to make maximum use of water pumped out of the underground mine to supply the operation with potable and process water, minimizing the impact on water resources currently used by local communities for drinking and agriculture.

Remaining Permits

While the Elk Creek Project has been able to reduce its permitting requirements by shrinking its environment footprint, the Project must still obtain dozens of permits from federal, state, and local government units. Following is a list of the permits still required to be obtained by the Project, as outlined in the Revised Project Feasibility Study. This list will be updated as detailed engineering is completed on the Project.

Permit/Approval	Issuing Authority	Permit Purpose
Federal Permits Approvals and Registrations		
Explosives Permit	U.S. Bureau of Alcohol, Tobacco and Firearms (BATF)	Storage and use of explosives
EPA Hazardous Waste ID No.	U.S. Environmental Protection Agency (EPA)	Registration as a Conditionally Exempt Small Quantity Generator (CESQG) or a Small Quantity Generator (SQG) of waste
Spill Prevention, Control, and Countermeasure (SPCC) Plan	U.S. Environmental Protection Agency (EPA)	Regulation of facilities having an aggregate aboveground oil storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons with a nexus to jurisdictional waters
Notification of Commencement of Operations	Mine Safety and Health Administration (MSHA)	Mine safety inspections, safety training plan, mine registration
Federal Communications Commission Permit	Federal Communications Commission (FCC)	Frequency registrations for radio/microwave communication facilities
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers (USACE)	Permit for discharge of dredged or fill material into waters of the U.S. under Section 404 of the CWA
State Permits, Authorizations and Registrations		

Permit/Approval	Issuing Authority	Permit Purpose
Permit to Appropriate Water	State of Nebraska Department of Natural Resources (DNR)	Regulates the use and storage of surface and ground waters
Explosives Permit	Nebraska State Patrol	Regulates the use, storage, or manufacture of explosive materials.
Permit to Discharge under the National Pollutant Discharge Elimination System (NPDES)	State of Nebraska Department of Environmental Quality (DEQ)	Multiple permits applicable to the discharge of industrial wastewater and stormwater.
Mineral Exploration Permit	State of Nebraska DEQ	Regulates the exploration for minerals by boring, drilling, driving, or digging.
Air Construction Permit	State of Nebraska DEQ (under Federal PSD Program)	Regulates emissions during construction activities to protect ambient air quality.
Air Operating Permit	State of Nebraska DEQ (under Federal PSD Program)	Regulates emissions during operation to protect ambient air quality. Will be based on a FS mine plan.
Water Well Installation Declaratory Ruling Request	Nebraska Department of Health and Human Services, Division of Public Health	Water well installation requirements; well must be registered with the Department of Natural Resources.
Authorization for Class V Well Underground Injection	State of Nebraska DEQ	All activities conducted pursuant to Title 122 - Rules and Regulations for Underground Injection and Mineral Production Wells.
Septic Systems – Permit for Onsite Wastewater Treatment System Construction/Operations	State of Nebraska DEQ	Protects surface water and groundwater as well as public health and welfare through the use of standardized design requirements.
Boiler Inspection Certificate	Nebraska Department of Labor	Protects public safety through an inspection and approval process of boilers.
Section 401 Water Quality Certification	State of Nebraska DEQ	Program evaluates applications for federal permits and licenses that involve a discharge to waters of the state and determine whether the proposed activity complies with NAC Title 117- Nebraska Surface Water Quality Standards. Isolated wetlands are included in NAC Title 117.
Development Permit	State of Nebraska DEQ/Johnson County Floodplain Administrator	Program regulates building requirements for any structures that are constructed on a floodplain.
Fire and Life Safety Permit	Nebraska State Fire Marshall	Review of non-structural features of fire and life safety.
State Business License	Nebraska Secretary of State	License to operate in the state of Nebraska.
Retail Sales Permit or Exemption Certificate	Nebraska State Tax Commissioner	Permit to buy wholesale or sell retail.
Solid Waste Management Permit	State of Nebraska DEQ	Regulates the construction and operation of solid waste management facilities.

Permit/Approval	Issuing Authority	Permit Purpose
Drinking Water Construction Permit	Nebraska Department of Health and Safety	The Drinking Water Construction Permit regulates the design and construction of a public water system.
Drinking Water Permit to Operate	Nebraska Department of Health and Safety	Defines testing and water quality criteria for public drinking water systems.
Radioactive Materials Program and Licensing	Nebraska Department of Health and Human Safety	Regulates and inspects users of radioactive materials.
Hazardous Waste Management	State of Nebraska DEQ	Management and recycling of hazardous wastes.
Dam Safety Approval	State of Nebraska DNR	Regulates the design and construction of any dam (i.e., any artificial barrier with the ability to impound water or liquid-borne materials).
Water Storage Permit	State of Nebraska DNR	Regulates any water impoundment that has a normal operating water volume of at least 15 AF below the spillway.
Local Permits for Johnson and Pawnee Counties		
Building and Construction Permits	Johnson County Zoning Administrator	Ensure compliance with local building standards/requirements.
County Road Use and Maintenance Permit/Agreement	Johnson County Zoning Administrator	Use and maintenance of county roads.
County Road Use and Maintenance Permit/Agreement	Pawnee County Commission	Use and maintenance of county roads.
Permitted Use Zoning Permit	Johnson County Zoning Administrator	Regulates and authorizes permitted uses.
Special Use Permit	Pawnee County Assessor	Regulates and authorizes permitted uses

Permitting Process Delays

Has the Project experienced unreasonable delays in some of its permitting processes? Unfortunately, yes. For example:

- A jurisdiction delineation from the USACE that determines where federally regulated wetlands and stream channels in the Project area were located took nearly two years for the USACE to complete. Under published agency guidelines, that process is supposed to be completed within 60 days.

- A U.S. Fish & Wildlife (USFWS) evaluation of potential issues related to threatened and endangered species was promised by that agency in 2015. It was produced in July 2018.

- The Army Corp's 408 program office stopped work on the 408 permit for the project in February 2018 on the basis that a fee agreement with the company was needed to continue working. The fee agreement was never produced by the Corps, and the Corps did not complete any additional work on the 408 permit. This was a partial driver in the Company's decision to remove from the project's design those features of the project that triggered the 408 permit.

In spite of these experiences, NioCorp has generally found that federal, state, and local regulatory authorities have worked diligently to assist the Company and the Project in navigating the various permitting processes that are required for this Project.

THE POWER OF THESE CRITICAL ELEMENTS: SOME EXAMPLES

1. **Niobium provides a better bang for the taxpayer buck as we re-build America's crumbling infrastructure**. High performance "super steels" that contain Niobium are increasingly used by states in building and repairing bridges and other major infrastructure projects. These steels greatly extend the expected lifespan of structures from a 50-year design life to more than 100 years. This can dramatically lower lifecycle costs while increasing safety and performance.

2. **Niobium reduces air emissions associated with infrastructure construction and transportation systems.** Niobium-strengthened super steels deliver significant environmental benefits because of their ability to dramatically reduce air emissions and other environmental impacts when used in bridges and other infrastructure projects. For example, the addition of only .0025% of niobium into the steel of the Millau Viaduct in France allowed that bridge to use 60% less steel and concrete, which resulted in large avoided air emissions and other environmental impacts.

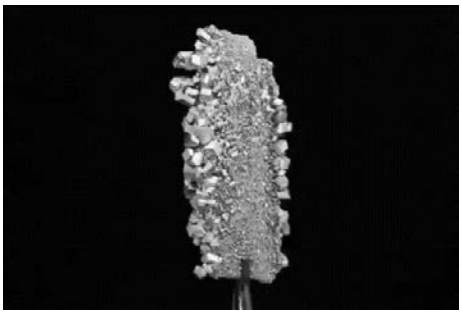
3. **Niobium increases fuel efficiency and reduces air emissions from vehicles.** Niobium-strengthened super steels also reduce emissions from surface transportation systems such as cars, trucks, buses, and trains. Because of their superior strength, they can help reduce the mass (or weight) of a vehicle. For example, only $9 of niobium added to a mid-sized passenger vehicle today helps to reduce the weight of the vehicle by about 220 pounds, resulting in a 5 percent increase in fuel efficiency and reduced emissions per mile.

4. **Scandium can increase fuel efficiency and reduces air emissions from commercial aircraft.** When alloyed with aluminum, scandium creates an ultra-high-performance alloys that can lightweight jetliners, reducing emissions and cutting costs. For example, Scandium-contained aluminum alloys can save airline operators approximately $9 million in net present value for a single B737-sized jetliner, assuming Scandium oxide pricing at $3,500/kg.

5. **Scandium can deliver large saving in aircraft manufacture**. Aluminum-Scandium (AlSc) alloys allow aluminum components to be welded instead of joined via hundreds of thousands of rivets per plane. This could lead to tens of millions of dollars/year in lower bill of materials costs, tens of millions of dollars/year in lower direct manufacturing costs, and higher manufacturing throughput: a 1% increase in annual production of a narrow body jet is worth ~$500 million in added revenue to an original equipment manufacturer (OEM).

APPLICATIONS THAT USE THESE CRITICAL ELEMENTS

Niobium



Niobium is used in various superalloys and in High-Speed, Low-Alloy (HSLA) steels. Niobium helps to strengthen steel and make it more lightweight and corrosion resistant. It is used extensively today in cars, trucks, buses, trains and other transportation systems to make them both safer and more fuel efficient. The HSLA and High Performance Steels (HPS) that contain Niobium help to ensure that bridges, pipelines, buildings, rail lines, and other structures can last decades longer than the current generation of structures that are now crumbling across America. Niobium-containing superalloys also play a key role in many military systems.

A listing of some of the applications that use Niobium follows:

- Steel mega-projects such as bridges, dams, buildings and many other structures
- Superalloys for use in aircraft engines and jet turbines
- Rockets, satellites and other aerospace platforms
- High-Strength, Low-Alloy (HSLA) steel components in automobiles, trucks, buses and trains
- High-pressure oil and gas pipelines
- Power plants
- Stainless steel
- Medical applications such as Magnetic Resonance Imaging and implants and braces
- Arc welding applications
- Nuclear power plants
- Superconductors
- Particle accelerators
- Batteries
- Optical systems
- Electronics

Scandium

Scandium has important uses in environmentally preferred Solid Oxide Fuel Cells, as well as in ultra-high-performance aluminum alloys. Scandium greatly strengthens aluminum alloys and allows them to be reliably welded, which presents high potential savings for the commercial airline industry. Scandium-contained aluminum alloys can save airline operators approximately $9 million in net present value for a single B737-sized jetliner, assuming Scandium oxide pricing at $3,500/kg.[2]

Here is a list of some of the current and potential applications for Scandium:

- Solid Oxide Fuel Cells
- High-performance alloy parts
- Commercial and military aircraft
- Automotive
- High-intensity lighting
- Lasers
- High-voltage transmission components
- Additive manufacturing for alloy parts
- Ceramics
- Electronics
- Phosphors and Displays
- Sporting goods

Titanium

Titanium has the highest strength-to-density ratio of any metallic element, and it is used in a wide variety of sectors, including aerospace, national defense, chemical processing, desalination, automotive, health care, communications, sporting goods, and many others. Titanium also is used in the pigments in paints, plastics and paper, and as a photocatalyst.

In 2017, according to the USGS, an estimated 80% of titanium metal was used in aerospace applications; the remaining 20% was used in armor, chemical processing, marine hardware, medical implants, power generation, and consumer and other applications.

POLICY RECOMMENDATIONS FOR STRENGTHENING U.S. MINERAL SECURITY

The following are policy recommendations that should be considered by the Congress, and the Executive Branch, in order to strengthen America's mineral security. Some of these are specific to the three superalloy materials that NioCorp intends to produce, while others are more general in nature.

1. **Support passage of the critical minerals provisions contained in the current House-passed FY2019 National Defense Authorization Act.**

2. **Recognize that increased domestic production of strategic and critical materials will help catalyze investment in downstream, value-adding processing and manufacturing processes.** Downstream, value-adding supply chains tend to form when upstream supply chains are established that are reliable and secure. Upstream production in the U.S. of metals such as Niobium and Scandium will likely attract investment in new downstream businesses that can convert mined materials into more advanced forms (alloys, compounds, etc.). needed by end-use manufacturing.

3. **Encourage non-statutory administrative reforms to improve permitting efficiency.** While Congress examines possible legislative changes to the federal mining and mineral extraction permitting regimes, it should recognize that non-statutory reforms and permitting best practices by federal agencies can make a very significant difference in the time it takes for permitting processes to complete. For example:

    - ✓ Congress should encourage greater utilization of the FAST-41 process, approved as part of the Fixing America's Surface Transportation (FAST) Act and signed into law by President Obama on December 4, 2015, for domestic projects that produce materials that further the goals of Section 1428 of the FAST Act. That Section encourages the use of "durable, resilient, and sustainable materials" in highway bridges and other transportation-related structures. The Ferroniobium that we intend to produce in Nebraska is a critical additive to certain High-Strength Low-Alloy ("HSLA") steels that are increasingly used to build stronger and more corrosion resistant bridges and other transportation structures, which significantly extends design lifespans, decreases lifecycle costs, and reduces environmental impacts.

    - ✓ Require federal agencies to meet or exceed process deadlines laid out in current statute or forfeit their determinative role in a specific process. Of course, this reform also requires that federal agencies be provided with sufficient financial resources to do their jobs in the time required.

- ✓ Encourage that as many NEPA-level reviews by separate federal agencies as possible be conducted concurrently with other agencies, instead of consecutively. This is one of the goals of the FAST-41 process and should be applied more broadly where appropriate.

- ✓ Amend federal civil servant bonus performance criteria to include performance that is related to advancing resource development and project permitting.

- ✓ Require federal agencies to issue quarterly metrics reports, as does the Nebraska Department of Environmental Quality, reporting on "Received Applications," "Application Decisions," "Monthly Goals," and "Agency Inspections with Average Days to Complete Reports."

- ✓ Adopt systems such as those recently implement by the Nebraska Department of Environmental Quality (NDEQ) to encourage efficient processing of permitting applications. On a monthly basis, the NDEQ tracks and monitors key metrics around permit processing, such as permit backlog and processing times. The NDEQ then establishes initiatives to improve performance. The NDEQ has made notable improvements in permit processing times without additional legislation or appropriations using this system.

4. **Encourage greater use of High Performance Steels in infrastructure and construction projects.** States are making greater use of HSLA and HPS steels containing Niobium, Vanadium, and other metals in bridges and other infrastructure projects because of the enhanced strength and greatly extended working lifespans these materials provide to structures. Longer lived bridges can save taxpayers many billions of dollars in reduced lifecycle costs. Legislative incentives and financial assistance should be considered to encourage greater use of niobium-contained high-performance steels in federally funded infrastructure projects.

5. **Encourage the National Defense Stockpile to enter into purchase agreements with prospective producers of strategic and critical materials prior to the onset of domestic production.** Section 303(a)(1) of the Defense Production Act (50 U.S.C. Appx. §2093(a)) authorizes the DoD to encourage greater domestic production of critical and strategic materials by engaging in "commitments to purchase" strategic and critical materials. This could take the form of forward purchase agreements from prospective U.S. producers prior to the onset of commercial production. Such forward purchase agreements could be structured so that they are contingent on future appropriations. Such agreements would greatly assist prospective producers in raising project development funds from capital markets.

6. **Encourage federal agencies such as DOT, DOE, and DoD to analyze the benefits of a secure domestic supply of scandium for transportation, clean energy, and military uses.**

Conclusion

In conclusion, let me thank the members of this Committee – and Chairman Murkowski and Ranking Member Cantwell in particular – for your leadership and the several years of grinding hard work you have contributed to finding common sense approaches to addressing the challenges of critical minerals. This is certainly not an easy set of topics.

I also want to thank Nebraska Governor Pete Ricketts, and the members of the Nebraska Congressional delegation -- Senators Deb Fischer and Ben Sasse, and Congressmen Jeff Fortenberry, Don Bacon, and Adrian Smith -- for their ongoing support of this Project.

Our nation is preparing to tackle some formidable tasks: strengthening our national defense; rejuvenating our industrial and manufacturing base, repairing and rebuilding our transportation infrastructure; increasing the efficiency and effectiveness of our energy generation and distribution systems, among many others. As we work on these challenges, we also want to improve our environment performance wherever possible.

Critical minerals are the foundation that enables us to achieve each and every one of these goals. We can appropriate money to rebuild America. But we cannot create the critical minerals we need without first harvesting them from the Earth's crust. And, we cannot assume that nations that currently supply us with these minerals will continue to do so – particularly when so many do not have America's best interests at heart. The disruption that can occur when America's access to critical minerals is threatened -- or even cut off -- is not theoretical. In recent years, we have experienced it. It is less a question of if, but when. That is why America's current deficit of critical minerals production capacity represents a clear and present danger to our Nation that must be addressed soon.

Thank you very much.

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[i] Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. All figures are rounded to reflect the relative accuracy of the estimate and have been used to derive sub-totals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, SRK does not consider them to be material. All composites have been capped where appropriate. The reporting standard adopted for the reporting of the MRE uses the terminology, definitions and guidelines given in the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Mineral Reserves (May 10, 2014) as required by NI 43-101.