

Statement of Randy MacGillivray
Vice President Project Development
Ucore Rare Metals, Inc.
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Chairman Murkowski, Ranking Member Cantwell, and distinguished Members of the Committee, I would first like to thank you for the invitation to testify before you today. It is a great honor to testify before the United States Senate and I hope to provide you with valuable information regarding the state of the industrial base for the production of strategic and critical materials in the United States from the perspective of domestic miners.

I presently serve as the Vice President of Project Development for Ucore (“Ucore”) Rare Metals, a junior mining company with a rare earth element project located in southeast Alaska. Ucore is currently developing its Bokan – Dotson Ridge Rare Earth Project which presents the opportunity for near term recovery of crucial heavy rare earth elements. Located in Alaska, the project would give the U.S., the world’s leading consumer of rare earth elements, strategic access to a domestic supply.

The issue of foreign mineral dependence is not new but its importance cannot be overstated. At present, the People’s Republic of China dominates the production of numerous materials, including rare earth elements, which are essential for the proper function of everything from the smart phones in our pockets to advanced weapons systems used by the modern warfighter. In fact, China exhibits a near monopoly on the production of these materials introducing a dangerous risk into our supply chains. Meanwhile, the U.S. has no operating producer of rare earth elements after the highly publicized bankruptcy and closure of the only domestic rare earth mine in 2015. To date, the sole mitigation strategy adopted by the U.S. has been to stockpile small reserves of materials deemed to be critical and to promote substitution and recycling efforts, an inadequate approach given the criticality of these materials. Without a U.S. supply base, should the Chinese ever decide to curtail the supply of these materials to the U.S. we would be left without access endangering both our domestic economy and our military.

Furthermore, Chinese production of these materials often relies on outdated and environmentally destructive mining and processing practices. The solvent extraction separation process used extensively by the Chinese to recover rare earths has a very low selectivity for individual elements necessitating the use of numerous separation stages using highly corrosive chemicals and generating vast amounts of toxic and radioactive waste for which very little care is taken in disposal. To witness firsthand the toll Chinese rare earth production is having on the environment one need not look further than the artificial lake located in China’s Inner Mongolia region where black chemical sludge, a byproduct of solvent extraction, stains the landscape. This embrace of environmental pollution on behalf of the Chinese, in combination with the lack of worker protections, allows the Chinese to manipulate the market and effectively control global prices. Chinese producers have willingly undercut the prices of foreign competition driving them out of the market while the government has refused to address illegal mining and trading

operations invariably leading to greater supply, lower prices, and further consolidation of production in China.

In light of the current situation and American dependence on these materials, the need for domestic sources and production is paramount to ensuring our national security. However, Chinese market manipulation over the past decade and notable failed domestic projects have left capital markets unwilling to fund critical material projects. Domestic mining and separation firms, despite advancements in environmentally friendly technologies, enabling the clean separation of critical materials, would benefit from Federal support to initiate commercialization of a new separation technology. Technologies that would secure American independence in the critical materials markets exist, but government needs to be the key to unlocking the door for a domestic supply of critical materials for energy and defense applications.

Congress has previously been supportive of the domestic mining sector as seen by the introduction of legislation last Congress by the Chairman which would have promoted the development of green technology to meet the nation's demand for critical materials. Ucore remains fully committed to solving the critical materials issues facing our country and working towards solutions developed in coordination with Congress to alleviate our dependence on foreign nations for these materials.

Ucore presents a unique opportunity to both invest in our domestic manufacturing base, which would spur job creation and support the local economy, and solve a pressing national security issue. Investment in the aforementioned Bokan – Dotson Ridge Rare Earth Project would not only provide the U.S. with a domestic supply of rare earth material but also support an estimated 190 families and deliver \$18 million in annual payroll. Furthermore, Ucore has embraced the adoption of green technologies capable of separating rare earths from virgin ore without using harsh chemicals, limiting the impact on the environment.

Molecular Recognition Technology (“MRT”) is a Nobel Prize winning technology that has been adapted by Ucore for use separating rare earth elements. MRT is a self-contained separation process capable of separating the entire suite of rare earth elements at greater than 99 percent purity. In partnership with IBC Advanced Technologies, Ucore invested in the development of ligands specific to rare earth chemistry and successfully incorporated MRT into its Plan of Operations for the rare earth mine project. Ucore and IBC have constructed and successfully operated a pilot scale plant to separate individual rare earths using the Bokan - Dotson Ridge ore as the feedstock material.

Since the successful completion of the pilot plant, Ucore staff have been evaluating the potential to source alternate rare earth feedstock material to supply a proof of concept commercial-demonstration scale rare earth separation plant using MRT. The ideal alternate feedstock would be sourced from by-product resources from existing mining operations. The natural attributes of MRT have allowed Ucore to identify profitable, niche opportunities to produce precious and specialty metals in very specific joint venture arrangements. These opportunities, however, given the current the Chinese controlled market, may not address national, metals security issues without federal support to scale projects focused explicitly on the critical material requirements of the U.S. military complex. Ucore is confident in the ability of MRT to meet the needs of the

U.S. government but remains cognizant that successful commercialization sometimes arrives too late to address the problem. Government support to take MRT from pilot scale production to commercialization should not be seen as proving out a new technology, but rather as facilitating the resolution of a growing problem. Given the current geo-political landscape, foreign access to rare earths could be restricted at any moment and while the technology to mitigate this problem exists, government should take the precaution to ensure that the domestic industrial base is established if such a time comes as the U.S. loses access to foreign sources of rare earths.

Government empowerment of a local supply of rare earth material, in combination with proven separation technology, MRT, would enable the U.S. to initially reduce and ultimately eliminate any dependence on foreign producer rare earths. This action is necessary to ensure that the U.S. has continued and uninterrupted access to materials essential for defense and national security purposes. Ucore is proud to be an industry leader in this effort and looks forward to working with Congress on solutions to this complex problem.