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House Committee on Natural Resources Republican Members  
Congressman Bruce Westerman, Ranking Member

Good afternoon, thank you for the opportunity to speak at this forum on “Critical Minerals: Addressing Supply Chain Challenges and Rising Demand.” I am Ian Lange, Director of the Mineral and Energy Economics Program at the Colorado School of Mines. My past experience as a Senior Economist at the Council of Economic Advisers for both the Trump and Biden Administrations’ strengthen my beliefs that the issue of supplying critical minerals for the U.S. economy is a bipartisan concern.

There are three issue within the critical minerals supply chain that I would like to discuss: permitting of new mines, the economic structure of the refining/processing (midstream) sector, and the impact of uncertainty on investment in this area.

Re-shoring of critical industries is an important goal to further the national security and economic progress of the U.S. Unlike many key industries, the upstream mining sector, the part of the mining industry which extracts the minerals from the ground, has the necessary inputs available to them now in the U.S. Mineral deposits of commercial quality as well as the mining technology and labor force to extract these resources exist within the U.S., we just have to allow it to happen. Permitting of mining operations, on federal lands especially, is a process filled with much uncertainty. This uncertainty reduces investor and firm interest in the industry, ultimately limiting the ability of the U.S. to mine the minerals needed along with their associated jobs along the supply chain. Experiences like PolyMet’s NorthMet mine, which according to the Minnesota Department of Natural Resources submitted its initial project proposal in February 2005 and still is not able to mine its copper-nickel deposit, and Rare Element Resource’s Bear Lodge rare earth deposit make it difficult to predict when or how domestic production of critical minerals will expand.

Apart from opening new mines in the U.S., refining and processing of the material mined is needed before we can utilize the minerals in the technologies we demand. The sector that transforms the material from the ground to the minerals needed is generally referred to as the midstream sector of the mining industry. As many others have noted in previous testimony to both House and Senate committee, including my Colorado School of Mines’ colleagues Rod Eggert and Morgan Bazilian, Chinese firms undertake the majority of refining and processing of critical minerals. The midstream sector is generally characterized by an economies of scale production process such that the average cost of production is lowest when the plant is working close to maximum capacity. Economies of scale production processes often occur when the fixed cost of building the plant are large compared to operating the plant. This can lead to a coordination problem where a refining/processing plant could be built if sufficiently sized contracts were signed for the output of the plant to ensure it would run at near capacity. Users of critical minerals would certainly be interested in shortening their supply chain and purchasing

minerals for a U.S. refining/processing plant, however these users are competing with each other to sell their copper wires, lithium-nickel batteries, and neodymium magnets. If one company signed a contract with a potential domestic refining/processing plant at a cost higher than their competitors supplied by Chinese firms, they risk losing sales and market share. If many firms decided to use a domestic refining/processing plant, it is likely that the economies of scale would allow for competition with Chinese firm. Thus finding a way for the risk of a domestic refining/processing plant to be “bought down”, as the Department of Defense is doing with their support for Lynas’s light rare earth processing facility, is important for improving the domestic supply chain.

A final point worth making is that the previous two issues discussed increase risk for investors and companies in the domestic mining industry. The high level of demand, and expected increases in demand, for technologies using these critical minerals suggests that these minerals will find their way to market even if the U.S. does not produce them. Relying on foreign production of raw and processed critical minerals lengthens the supply chain for those using these minerals in their production process, the downstream sector. Longer supply chains are associated with greater risk for downstream producers, whether through a quantity risk of inability to obtain the minerals or price risk through changes in international trade policy. These risks would incentivize locating downstream production near the up- and midstream production. This moves the jobs and value added from the entire mining industry outside of the U.S. Reducing the level of risk in the mining industry is important to ensuring the U.S. maximizes its gains from the energy transition occurring today.

Thank you for the opportunity to speak today. I am happy to address any questions the Committee Members have.