

# **Potential Utilization of Waste Streams in the Williston Basin for Developing Rare-Earth Elements, Critical Minerals, and Carbon-Based Products**

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## **Abstract**

The Williston Basin (WB) is a large sedimentary basin centered in western North Dakota with portions reaching into South Dakota and Montana, as well as Canada. The WB has a rich and extensive history of producing critical resources for the United States. The WB contains extensive infrastructure today for mining, transport, and processing of a variety of resources. The primary areas of resource development within the WB have been the Bakken oil and gas development, producing over 1.1 million barrels of oil per day, and lignite coal for power production, providing over 4000 MW of electrical generation capacity. Significant research has been previously done on rare-earth elements (REEs) and critical minerals (CM) in the WB as well as exploration of technologies for extraction of these components. Additionally, recent research has also focused on the production of nonfuel carbon-based products (CBPs) such as graphene and carbon-based building materials from lignite coal. This paper will discuss the identification of waste streams available and appropriate for reuse in developing the WB production of REEs, CMs, and CBPs under the U.S. Department of Energy CORE-CM project in the WB.