Manganese in Minnesota

DEPARTMENT OF NATURAL RESOURCES

Manganese is the twelfth most abundant within the Earth's crust and is found in trace amounts within rock-forming minerals, soils, and seawater. In rare instances, geologic processes enrich manganese concentrations to form ore deposits that can be mined. Globally, about 20 million tons of manganese are mined each year. This makes manganese the fourth-most mined metal in the world (in terms of tonnage), behind only iron, aluminum, and copper.

Manganese is an essential mineral used to make steel, transforming iron into a stronger and less brittle alloy. Manganese is also becoming increasingly vital in the manufacturing and development of green energy technologies such as electric vehicle batteries and off-the-grid energy storage.

There are currently no manganese mines in North America. The U.S. economy is 100% dependent on foreign sources to supply the more than 700,000 metric tones of manganese that it consumes each year. Due to this total import reliance, and manganese's importance to the U.S. economy, the U.S. Geological Survey included manganese in its list of 35 critical minerals.

Minnesota is home to the Cuyuna Range, one of the largest undeveloped manganese resources in North America. This mining district produced significant amounts of iron ore from 1911 to 1984. It stood out from Minnesota's other iron ranges because Cuyuna iron ore was also rich in manganese, and this mix of iron and manganese was valued by the U.S. steel industry.

During the Cuyuna Range's 70-year history of metallic iron mining, mineral explorers identified super-enriched pockets of ore where there more more manganese than iron. These undeveloped ore zones, found primarily in the Cuyuna's Emily District, have mineral potential for manganese as well as cobalt (which is also a critical mineral).