Utah’s Critical Minerals

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Definition of a Critical Mineral:
(as defined by Executive Order 13817, which was issued on December 20, 2017)

Under the Executive Order, a “critical mineral” is a mineral identified to be a non-fuel mineral or mineral material essential to the economic and national security of the United States, the supply chain of which is vulnerable to disruption, and that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for the economy or national security.

In 2018, in response to the executive order, the U.S. Geological Survey (Dept. of the Interior) published a list of 35 mineral commodities designated as critical minerals.
Helpful Publications:

Mills and Rupke (2020)

Mills and others (2020)


**UT Critical Mineral Summary**

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From Mills and Rupke (2020)
Produced Critical Minerals

Beryllium

- Utah is the leading global producer of Be
- Utah is the only Be producer in U.S.
- Source: highly-evolved magmatic fluids deposited Be as bertrandite in a Miocene tuff

From Mills and Rupke (2020)
Tons of Beryllium Ore (from OGM annual reports)
Produced Critical Minerals

**Helium**

- Producing in Lisbon Valley
- Typically, He is a byproduct of oil and gas production; Helium gas is trapped under similar conditions as oil and gas
- Tyler Wiseman (SITLA) has written a comprehensive study on helium available at UGS website; geology.utah.gov

From Mills and Rupke (2020)
Lithium

- Lithium is now being produced by US Magnesium as a byproduct
- Anson Resources has defined a lithium resource in the Paradox Basin
- Mg is a problem in most Utah brines
- Primary sources: brines (surface and subsurface)

From Mills and Rupke (2020)
Produced Critical Minerals

Magnesium

- Utah is the only Mg-metal producer in North America
- Linked with idled titanium sponge plant
- Sources: brines, evaporites, high-magnesium dolomite

From Mills and Rupke (2020)
Produced Critical Minerals

Potash

- Utah is one of two producing states in U.S.
- Utah produces potash at 3 locations and produces two types of potash
- UT is the only producer of the more valuable potassium sulfate
- Sources: brines, evaporites, alunite

From Mills and Rupke (2020)
Tons of Potash (from UGS report)

- 2016
- 2017
- 2018
- 2019
Platinum, Palladium, Rhenium, and Tellurium
• Byproducts of mining at Bingham Canyon

From Mills and Rupke (2020)
Defined Resources

Aluminum

- Utah hosts the largest alunite deposit in the U.S.: the Blawn Mtn. deposit
- The Blawn Mtn. deposit was defined in the 1970s and then again in the 2010s
- Blawn Mtn. deposit is primarily being considered as a potash (potassium sulfate) target

From Mills and Rupke (2020)
Defined Resources

Fluorspar

- Utah is set to become the largest producer of fluorspar in the U.S. at the Lost Sheep mine in Juab County
- Ares Strategic Minerals is defining a resource and preparing a mine plan for production
- Sources: hydrothermal deposits

From Mills and Rupke (2020)
Defined Resources

Indium

- Indium is typically recovered as a byproduct of zinc mining
- The West Desert Deposit contains enough Indium to supply the U.S. for over 14 years based on current consumption
- Source: skarn mineralization

From Mills and Rupke (2020)
Defined Resources

Uranium & Vanadium

- Multiple Utah uranium mines are on standby ready to produce
- Utah hosts the only operational uranium and vanadium mill in the U.S.
- Source: sandstone-hosted deposits
- Utah contains defined resources of these critical minerals

From Mills and Rupke (2020)
Tons of Uranium Ore (from OGM annual reports)
Potential Resources

- Antimony
- Arsenic
- Barite
- Bismuth
- Gallium-Germanium
- Manganese
- Titanium, Zirconium, Hafnium
- Tin
- Cobalt

Rare Earth Elements

From Mills and Rupke (2020)
UT Critical Mineral Summary

From Mills and Rupke (2020)