

# Critical Minerals in South Dakota

Issue Memorandum

2024-XX



## Introduction

The federal government defines critical minerals as those that are essential to the national defense and United States economy.

Of the fifty critical minerals identified by the federal government, South Dakota has reserves of the following fifteen: antimony, arsenic, barite, beryllium, cesium, fluorspar, graphite, lithium, manganese, niobium, tantalum, tellurium, tin, tungsten, and vanadium.

South Dakota's critical minerals are found in at least two central counties—Buffalo and Lyman, and in six western counties—Custer, Fall River, Harding, Lawrence, Pennington, and Perkins.<sup>1</sup>

This memorandum will address why critical minerals are important, explore the ones most likely to be developed in South Dakota, and summarize federal and state law regarding the mining of critical minerals.

## What is a Critical Mineral?

The Energy Act of 2020, [30 U.S.C. 1601 et seq.](#), directed the Secretary of the Interior, acting through the director of the U.S. Geological Survey (USGS), to determine what qualifies as a "critical mineral" based on three criteria.

- (1) Is it a non-fuel mineral or mineral material essential to the economic or national security of the United States?
- (2) Does it have a supply chain that is vulnerable to disruptions?
- (3) Does it serve an essential function in the manufacturing of a product, with significant consequences for the economy and national security if it were absent?

The federal legislation requires that the USGS update the list at least every three years, since minerals can move on and off the list as circumstances change.

Currently, the following fifty minerals meet the criteria set forth above:

Aluminum, antimony, arsenic, barite, beryllium, bismuth, cerium, cesium, chromium, cobalt, dysprosium, erbium, europium, fluorspar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lithium, lutetium, magnesium, manganese, neodymium, nickel, niobium, palladium, platinum, praseodymium, rhodium, rubidium, ruthenium, samarium, scandium, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, and zirconium.<sup>2</sup>

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<sup>1</sup> Christopher Pellowski, South Dakota School of Mines & Technology, "Critical Minerals in South Dakota," at South Dakota Mineral Industries Association website, <https://sdmineralindustries.org/education/SDCriticalMinerals>

<sup>2</sup> "U.S. Geological Survey Releases 2022 List of Critical Minerals," news release, U.S. Geological Survey. <https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals>

Members of Congress have introduced, but not yet passed, several bills to amend the definition of a critical mineral, change the methodology for assembling the list, or add minerals such as copper, phosphate, potash, and uranium to the list.<sup>3</sup> In 2022, President Biden issued a [memorandum](#) directing the Secretary of Defense to "create, maintain, protect, expand, or restore sustainable and responsible domestic production capabilities of such strategic and critical materials by supporting feasibility studies for mature mining, beneficiation, and value-added processing projects," and similar efforts to encourage domestic production.

### South Dakota's Critical Minerals—Overview

In 2022, the South Dakota Geological Survey partnered with the USGS and scientists in Iowa, Nebraska, and Minnesota to carry out a survey for critical minerals called the Earth Mapping Resources Initiative, using an airplane to record data about the underlying geology. Scientists will begin interpreting the data in 2025.<sup>4</sup>

Several projects are underway to develop critical minerals in South Dakota.

- **Lithium:** Two companies are licensed to mine lithium-bearing pegmatite at five sites in South Dakota. Neither company had reported any production as of August 2024. During World War II, pegmatite ores near Keystone and Hill City were mined for lithium that was used to make high-pressure grease for airplane engines, and also to make lithium hydride that was used to fill aerial balloons, life jackets, and lifeboats. There are four exploration projects for which the target mineral is lithium.
- **Niobium, Tantalum, Tellurium, Tin, Tungsten:** One licensed pegmatite mine in Lawrence County has produced limited quantities of ore potentially bearing five critical minerals: niobium, tantalum, tellurium, tin, and tungsten. Recent mining of this site consisted of an operator excavating a small stockpile of material for testing. Tellurium is also found in Custer County. Niobium, tantalum, tin, and tungsten are also found in Custer and Pennington counties. At present, no economic mining of these minerals is occurring in the state. Niobium is used for making steel and superalloys. Tantalum is used in electronic components such as capacitors and in superalloys. Tellurium is used in solar cells, thermoelectric devices, and as an alloying additive. Tin is an ingredient in protective coatings and alloys for steel. Tungsten is used in making wear-resistant metals.
- **Tantalum, Tin, Tungsten:** One active mineral exploration project on record with the Department of Agriculture and Natural Resources lists its target materials as cassiterite, tantalite, scheelite, and placer gold. Cassiterite is the chief ore mined for tin. Tantalite is processed to make tantalum. Scheelite is an important ore of tungsten. All three elements are found in deposits in Custer, Lawrence, and Pennington counties.

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<sup>3</sup> The Fertilizer Institute, for example, has argued that phosphate and potash both meet the definition of a critical mineral in the Energy Act of 2020, since both are essential for raising crops and assuring the United States will have a secure food supply. Potash was included in the 2018 list, but not in the 2022 list. Phosphate was not included on either list.

<sup>4</sup> Research geophysicist Benjamin Drenth, U.S. Geological Survey, e-mail message to author, September 11, 2024.



The following table includes other critical minerals that are found in South Dakota but are not currently the focus of exploration or mining:<sup>5</sup>

MINERAL	LOCATION (COUNTIES)	USES
Antimony	Pennington, Lawrence	Lead-acid batteries, flame retardants
Arsenic	Pennington	Semiconductors
Barite	Lawrence	Drilling muds, brake linings, X-ray imaging, pigments, fireworks
Beryllium	Custer, Pennington	Copper, nickel, aluminum alloys
Cesium	Custer	Drilling fluids, electronics, electricity production, chemistry
Fluorspar (fluorite)	Lawrence, Custer	Aluminum, steel, cement
Graphite	Pennington	Lubricants, batteries, and fuel cells
Manganese	Buffalo, Lyman, Custer, Lawrence	Steel, dry cell batteries, animal feed, fertilizers, and brick colorant
Vanadium	Lawrence	Iron and steel alloys

Mining of critical minerals in South Dakota may be complicated by the fact that, as geologists note, many critical minerals do not exist as economically viable, stand-alone deposits, but rather as by-products or co-minerals of other "gateway minerals" that are more profitable to mine. For example, while mining gold, miners might encounter antimony, tellurium, and arsenic. Uranium might be the gateway mineral that also leads to deposits of vanadium or rare-earth minerals.<sup>6</sup>

In recognition of the growing need and the inherent challenges in mining critical minerals, the South Dakota School of Mines and Technology is beginning to train students specifically to find and mine critical minerals. In May 2024, the South Dakota Board of Regents approved two new minors at the School of Mines. The first is Critical Minerals—Exploration & Development, and the second is Critical Minerals—Processing & Extraction.

### Critical Mineral Mining—Federal and State Law

The federal General Mining Act of 1872, [30 U.S.C. § 22 et seq.](#), allows citizens to establish legal claims to mineral-bearing rock on public lands through a lode mining claim, which applies to lodes or veins of rock with well-defined boundaries in the earth. The federal law also allows for placer claims to mine for loose material in deposits such as gravel. Most of the claims in South Dakota are lode claims.

Federal mining law gives a claimant the right to search for, develop, and extract mineral deposits contained within the claimed land, provided the claimant observes federal and state laws.

<sup>5</sup> The data about where specific minerals are found in South Dakota come mainly from a report prepared by Christopher J. Pellowski of the South Dakota School of Mines and Technology in January 2021, "Summary of critical minerals in South Dakota and adjoining states."

<sup>6</sup> "Critical Minerals in South Dakota," Department of Agriculture and Natural Resources, South Dakota Geological Survey, [https://www.sdgs.usd.edu/currentprojects/images/Critical\\_Minerals\\_Handout.pdf](https://www.sdgs.usd.edu/currentprojects/images/Critical_Minerals_Handout.pdf)



In South Dakota, an important law in that process is found in SDCL chapter [45-6C](#) and includes the following statement:

The relatively unknown and as yet largely undeveloped mineral resources of this state consist in major proportion of minerals below the surface. The exploration for and discovery of these minerals by means of drilling and other methods of detecting mineral deposits are necessary for the economic development of the state and the nation. Every effort should be used to promote and encourage the exploration for mineral resources, but to prevent the waste and spoilage of the land which would deny its future use and productivity. It is the responsibility of the state to ensure that:

- (1) Upon completion of an exploration operation the affected land is usable and productive to the extent possible for agricultural or recreational pursuits or future resource development; and
- (2) Both during and after an exploration operation, water and other natural resources are not endangered.

Activities related to mining critical minerals typically will fit under the regulatory umbrella of an Exploration Notice of Intent, a mine license, or a mine permit.

#### *Exploration Notice of Intent and Mining Exploration*

Pursuant to SDCL chapter [45-6C](#), a person making an "exploration operation" for minerals is required to file an Exploration Notice of Intent (EXNI). Section [45-6C-3](#) defines an exploration operation as "the act of searching for or investigating a mineral deposit, including by sinking shafts, tunneling, drilling test holes, digging pits or cuts" prior to extracting minerals, and testing "to prove the commercial grade of a mineralized deposit." Activities that cause little or no surface disturbance, such as test holes that are less than fifty feet deep and less than seven inches in diameter, are not considered exploration operations and do not require an EXNI.

The operator carrying out the exploration must file an EXNI that describes the planned work and includes a legal description of the land, a date when work will begin, and the type of mineral being sought. The operator also must file a map of the exploration area, and a reclamation plan. The notice must be accompanied by a fee of two hundred fifty dollars. Once the operator posts a reclamation bond with the Department of Agriculture and Natural Resources, the operator is authorized to carry out mineral exploration as described in the notice but must comply with any restrictions outlined in a letter issued by the department. EXNIs are not permits and are not subject to public intervention, a hearing before the Board of Minerals and Environment, or department approval.

In the case of uranium exploration, permit requirements are found in SDCL chapter [45-6D](#). A permit under this chapter covers activity similar to the exploratory work covered under an EXNI. However, the permit is subject to public intervention and a hearing is required before the Board of Minerals and Environment.

#### *Mine License*

Some operations mining critical minerals will require a mine license, and others will require a mine permit, depending on the type of rock formation in which the ore is found. SDCL § [45-6-65](#) requires a mine license for the mining of pegmatite minerals. Pegmatite is coarse-grained granite containing large crystals of other material, such as quartz, feldspar, or mica. Pegmatite formations are common in the central and southern Black Hills. They are typically small deposits of ten acres or less. A small pegmatite mine would be similar to a gravel pit in its potential



for environmental impacts and scope of disturbance, and would have to meet the same requirements as those imposed upon gravel pits under state law.

Thus, if critical minerals are discovered in a pegmatite formation, a mine license is required. The law requires public notice before the mine begins operation, notice to state agencies before operations begin, posting of surety until the land has been reclaimed, and annual fees and reporting of areas mined and reclaimed, along with the tonnage of material removed.<sup>7</sup> The annual fee for the license is one hundred dollars for each mine site.

Historically, South Dakota's production of beryllium ore, lithium ore, tantalum ore, tin ore, and tungsten ore is associated with pegmatite formations, so mining for those critical minerals would likely require a mine license.

### *Mine Permit*

Pursuant to SDCL § [45-6B-5](#), if critical minerals are discovered in any rock formation other than pegmatite, a mine permit is required. The process to obtain a mine permit is more extensive than the process to obtain a mine license because there is a greater potential to impact the environment.

A person seeking a mine permit must file an application with the Board of Minerals and Environment, together with a reclamation plan, a map of the affected lands, and a post-closure plan for mine waste. The application requires information regarding the mineral or minerals to be mined and the depth and direction of mining, a timetable of the proposed duration of mining, and a proposal for the disposition of mine spoil and tailings. SDCL §§ [45-6B-20](#) and [45-6B-21](#) also require the board to set the level of surety necessary to guarantee the costs of reclamation before issuing a permit. The fee for a large-scale mine permit is one thousand dollars.

A project that will disturb ten acres or less, extracts less than twenty-five thousand tons of material per calendar year, and does not use cyanide, other chemicals, or a biological leaching process to extract minerals may apply for a small-scale mine permit. The application fee is one hundred dollars and requires a surety that may not exceed thirty-eight thousand five hundred dollars.

### *Filing a Mineral Claim*

SDCL § [45-4-1](#) prohibits filing a mining claim until a vein or lode has been discovered in the exploration process.

SDCL § [45-4-3](#) requires marking the surface boundaries of the claim with "eight substantial posts," or with stone monuments, if rock or precipitous terrain will not allow the driving of posts.

SDCL § [45-4-4](#) requires the claimant to file a location certificate, within sixty days, in the register of deeds office for the county in which the discovery was made. The certificate must have the name of the lode, the name of the location, the date of the location, and the number of linear feet claimed along the course of the vein from the point of discovery; as well as the width claimed on each side of the center of the vein; and a description of the claim, located by reference to some natural object or permanent monument.

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<sup>7</sup> Pursuant to SDCL §§ [45-6-68](#), [45-6-69](#), [45-6-71](#), and [45-6-72](#), respectively).



[Federal law](#) limits a lode claim to a maximum of 1,500 feet in length along the vein or lode. Width is a maximum of 600 feet, specifically 300 feet on either side of the centerline of the vein or lode. SDCL § [45-4-6](#) maintains the same dimensions for a lode claim, but gives any county the authority, at a general election, to set the width of a lode claim at less than 300 feet, but not less than twenty-five feet, on each side of the vein or load.

## Tax Policy

South Dakota has tax statutes designed for two kinds of minerals extracted from the state—precious minerals and energy minerals. The only critical mineral that is taxed currently is uranium, and that is only because it is also classified as an energy mineral. Under SDCL § [10-39A-2.2](#), uranium ore is taxed on the "sales price per pound of the content of triuranium octa-oxide contained in the severed and saved uranium ore or processed yellow cake concentrate, regardless of the form in which the product is disposed of." Pursuant to SDCL § [10-39A-2](#), the taxable value of any energy mineral is based on the sale price, less any rental or royalty payments.

Lithium remains untaxed even as companies seemed poised to begin mining it in South Dakota. During the 2023 session, [House Bill 1072](#) was unsuccessful. It would have subjected lithium to the same severance tax that applies to energy minerals. In the 2024 session, [House Bill 1043](#) was unsuccessful. It would have listed lithium as a precious metal, placing it under the severance tax that applies to gold and silver. It was argued that lithium did not fit into the category of an energy mineral or that of a precious metal.

## Critical Mineral Tax Policy in Other States

Lithium is, however, taxed in several other states. California has a lithium extraction excise tax that uses three tax brackets, based on the cumulative tonnage of lithium carbonate equivalent extracted from various source materials. The highest tax rate, \$800 per metric ton extracted above 30,000 tons, is for the largest operations.<sup>8</sup>

Nevada taxes lithium under a property tax that specifically applies to mining operations. The tax is based on net proceeds as a percentage of gross proceeds. Gross proceeds are calculated from the value of any mineral extracted and sold, exchanged, or removed from the state in a form ready for use or sale, used in a manufacturing process, or used in providing a service. Net proceeds are calculated by subtracting, from the gross proceeds, a list of deductions for costs incurred. Nevada's formula has a sliding scale of two to five percent. Operations pay more as their net proceeds increase.<sup>9</sup>

In addition to specific taxation provisions for minerals such as uranium, Wyoming has a two percent severance tax in place for unnamed "other valuable deposits." The tax is determined based on the fair market value of the product at the mouth of the mine where it was produced.<sup>10</sup> Wyoming also placed an ad valorem tax on mines and mining claims based on the assessed value of the property, including the gross product of minerals and mine products.<sup>11</sup>

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<sup>8</sup> [California Revenue and Taxation Code 47010.](#)

<sup>9</sup> [Nevada Revised Statutes 362.140.](#)

<sup>10</sup> [Wyoming Statute 39-14-703.](#)

<sup>11</sup> [Wyoming Statutes chapter 39-13.](#)



## Conclusion

South Dakota has been famous for producing gold for 150 years, but geologists know there are significant deposits of other minerals in the Black Hills and other parts of the state. Some of those minerals are necessary for high-demand products for national defense, industry, and modern technology.

South Dakota is poised to participate in this emerging market because of the critical minerals known to be present in the state, and other minerals that are potentially present. This is an opportune time to examine whether the state's current tax and regulatory policy should be revised to accommodate these critical minerals.

The Legislative Research Council provides nonpartisan legislative services to the South Dakota Legislature, including research, legal, fiscal, and information technology services. This issue memorandum is intended to provide background information on the subject. For more information, please contact Lance Nixon, Research Analyst.

