

Testimony of Prof. Simon Jowitt
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Introduction

Chairman Gosar, Ranking Member Dexter, and Members of the Subcommittee, I'd firstly like to thank you for the opportunity to testify today. My name is Dr. Simon Jowitt and I am currently the Director of the Nevada Bureau of Mines and Geology and the Arthur Brant Chair in Exploration Geology at the University of Nevada Reno. I also currently serve as the State Geologist of Nevada, the number one producer of non-fuel minerals in the U.S. by value^{1,2}, and the number one mining jurisdiction globally according to the Fraser Institute's annual survey of mining companies³. My educational background includes a B.Sc. (Hons) in Geology from the University of Edinburgh, an M.Sc. in Mining Geology from Camborne School of Mines, and a PhD in Economic Geology from the University of Leicester, all in the UK. I spent eight years at Monash University in Australia before moving to the U.S. in 2016, spending seven years as Assistant and then Associate Professor of Economic Geology at the University of Nevada Las Vegas before moving to Reno in 2023. In total I have more than twenty years of experience undertaking research on mineral deposits, on mineral exploration, and on critical mineral and base and precious metal supply and demand and have undertaken research with the minerals industry in six of seven continents. To date I have also published more than 130 papers focused on economic geology, mineral exploration, and mineral economics.

I am here to testify on how we can work to unleash America's mineral potential, with specific focus on critical mineral commodity supply chains. Before I provide some thoughts on how we might develop America's significant yet often untapped mineral potential, it is perhaps important to understand the impact the minerals industry is already having here in the U.S. and how growth of this industry is likely to positively effect our economy as well as national and economic security.

¹ <https://pubs.usgs.gov/publication/mcs2026>

² <https://pubs.nbmng.unr.edu/Mineral-Industry-s/1860.htm>

³ <https://www.fraserinstitute.org/studies/annual-survey-mining-companies-2025>

The Importance of the US Minerals Industry

As I mentioned previously, Nevada is the number one producer of non-fuel minerals in the U.S., with a value of \$12.6 billion in 2025⁴, a figure that excludes the significant and growing geothermal sector in the Silver State. This represents 11.26% of national non-fuel mineral production and indicates the importance of the sector to the state and the nation. Mining in 2023 generated 1.5% of GDP in the state, or \$2.9 billion in GDP in 2023, with a total of 30,000 people employed in the industry earning \$3 billion in wages and salaries and generating \$16.5 billion in economic output⁵. The average annual wage of those working in the Nevada mining industry in 2024 was \$120,200⁵, significantly higher than the average wage in the state and much higher than the average wage in rural areas of Nevada, where mining activity is predominantly concentrated. The minerals industry also directly benefits the state, with a total of \$488.3 million in tax paid in 2024, including \$190.8 million in net proceeds taxes and \$83.5 million in the gold and silver excise tax, with revenue from the latter going directly to the Nevada state education fund⁶.

The impact of mining beyond Nevada is also hugely significant to the nation, with non-fuel mining and related sectors excluding coal mining across the country employing an estimated 1.82 million people in 2025 including 150,000 direct employees, 900,000 employees in chemicals and allied products, 410,000 employees in stone, clay, and glass products, and 360,000 employees in primary metal industries⁷. Direct, indirect and induced tax payments by the U.S. minerals industry in 2021 were around \$41 billion, with \$133.3 billion of minerals mined in 2024, some \$24.8 billion of which were exported⁷. The mining sector accounted for 0.5% of nonfarm business sector employment⁸ but 1.4% percent of total U.S. GDP, or around \$404 billion in 2024⁹.

Although these statistics provide a good indication of the importance of the minerals industry to the U.S., they do not indicate the vital role the minerals industry has as the foundation of supply chains, especially critical mineral supply chains. A critical mineral is essential to the economy and national security of the nation but has a supply chain that is vulnerable to disruption¹⁰. As such, it is vital that secure supply chains of these minerals are developed or expanded to meet current and future national demand and to ensure that the economic or national security of the U.S. is not jeopardized in any way. This in turn means

⁴ <https://pubs.usgs.gov/publication/mcs2026>

⁵ <https://nevadaminging.org/wp-content/uploads/2025/09/2025-The-Role-of-Nevada-Mining-Industry.pdf>

⁶ <https://tax.nv.gov/tax-types/gold-and-silver-excise-tax/>

⁷ https://nma.org/wp-content/uploads/2025/08/economic-contributions_2024_data_onepager.pdf

⁸ <https://www.bls.gov/productivity/highlights/manufacturing-mining-labor-productivity.htm>

⁹ <https://www.bea.gov/sites/default/files/2026-01/gdp3q25-updated.pdf>

¹⁰ <https://www.usgs.gov/programs/mineral-resources-program/science/what-are-critical-minerals-0>

that although the U.S. minerals industry is already a vital part of the country's economy, expansion is required as this industry is necessarily the foundation of any critical mineral supply chain. Although challenging, this represents an opportunity for transformational economic, employment, and other growth, especially as the mineral exploration potential of the U.S. is significant yet under-realized.

America the Underexplored

Any unlocking of America's mineral potential is predicated on the discovery and development of new mineral deposits, especially those deposits that have the potential to produce critical minerals. I want to start this section of my testimony with a quote from a mining textbook: "Nay, if I understand anything, greater wealth now lies hidden beneath the ground in the mountainous parts of your territory than is visible and apparent above ground."¹¹ This quote is from the 1556 mining textbook *De Re Metallica* by Agricola, likely the first comprehensive guide to mining and mineral exploration and translated in 1912 by Herbert and Lou Henry Hoover, later President and First Lady. Even though this sentiment is over 450 years old, it is still very much true today even after significant mineral exploration and mining within the U.S. To use Nevada as an example, the question is where in the Silver State is underexplored from a minerals industry perspective within a state that has undergone mineral exploration and mining for more than 150 years. It is likely that most of Nevada is underexplored, primarily because there are large parts of the state considered too challenging from a technical perspective to undertake exploration. One example of this is the large portions of the state covered by Quaternary alluvial deposits or other shallow barren cover geological units that themselves are unprospective hosts for mineral deposits but may be covering areas highly prospective for exploration. Exploration in these areas could be enabled by the provision of publicly available geoscience data that would enable the initial stages of effective exploration targeting and the identification of prospective areas for mineral exploration through this barren cover. This indicates that to increase exploration and discovery in order to generate the foundations required for critical mineral and other mining supply chains and to attract more industry and retain or generate competitive advantage we need to actively derisk mineral exploration and stimulate industry interest.

Although there are perhaps a few reasons why the U.S. and Nevada remains underexplored and therefore why the critical mineral and base and precious metal potential of the country remains unrealized, one of the major reasons for this if not the main reason for this is the lack of modern, publicly available, high quality geoscientific data I mention immediately above. This data is often called precompetitive data and

¹¹ <https://www.gutenberg.org/files/38015/38015-h/38015-h.htm>

is used by industry to derisk exploration and when available often stimulate mineral exploration in a comprehensive, regional manner. Precompetitive data is essentially publicly available basic geoscientific data (i.e., geological, geophysical, and geochemical data, including the preservation of data and legacy samples and other materials) that is collected, collated and integrated by government agencies. This data is typically the result of strategic regional geoscientific research that either provides baseline data or upgrades to historic datasets and fills data gaps in order to support mineral and other exploration activities (e.g., geothermal, oil and gas, and water resource identification and exploration). All of this is undertaken by the efficient and economic acquisition of modern geoscientific data typically at a regional scale. Government agencies such as geological survey organizations commonly assign priority to generating or upgrading datasets over areas considered to be prospective for mineral exploration or exploration for other commodities, such as geothermal energy, but are underexplored.

Increasing the availability of precompetitive data is a key and direct factor in the successful identification of new mineral resources, the development of new mines, and is a vital part of unleashing America's mineral potential. To quote Madeleine King MP, Minister for Resources and Minister for Northern Australia, a country that is likely 20 years ahead of the U.S. in the acquisition and use of precompetitive data, "The key to unlocking new commercial exploration is precompetitive geoscience. This is comprehensive, integrated and publicly accessible geoscience data and information focused on frontier regions. It narrows the search space into prospective regions and allows explorers and investors to make informed decisions about where they concentrate their own activities."¹².

The availability of precompetitive data is also an important factor in the attractiveness of a country as a destination for mineral exploration and mining investment. This data, if publicly available, allows industry to more actively and rapidly develop, refine and test exploration hypotheses, directly acting to shorten the time needed for the exploration process, the development of new mines and sources of critical minerals and other commodities, and associated supply chains¹³. All of the above indicates that it is vital that the U.S. works to increase the amount of high quality data that is available to the minerals industry in order to catch up to global competitors like Australia and Canada and to enable the unleashing of America's significant yet unrealized mineral potential. The U.S. has seen a recent increase in the acquisition of precompetitive data through initiatives such as the U.S. Geological Survey (USGS) Earth

¹² <https://www.minister.industry.gov.au/ministers/king/speeches/speech-geoscience-australia-exploring-future-2023-program-showcase-launch>

¹³ <https://www.mining.com/wp-content/uploads/2025/01/tracking-the-trends-2025.pdf>

Mapping Resources Initiative (Earth MRI) program¹⁴. However, the availability of high-quality precompetitive geoscientific data in the U.S., even for major mining jurisdictions such as Nevada, remains poor compared to that available for mining and mineral exploration in countries such as Canada, Australia, and even Finland. This lack of data is crucial when considering that the reduction of critical mineral import reliance and the improvement of the inherent insecurity of critical mineral supply can only be met by domestic discovery, forming the foundation of critical mineral supply chains.

Precompetitive publicly available geoscientific data also have demonstrable economic returns on investment in addition to benefits to supply chain development and national and economic security. A number of studies of the return on investment of precompetitive data have been undertaken globally, including:

- A conservative economic analysis of the costs and benefits of geologic mapping, an important form of precompetitive data, in the U.S. between 1994 and 2019 indicated that the investment of \$1.99 billion had a minimum economic return on investment of \$13.91–20.61 billion, and a maximum economic return on investment of \$45.69–70.15 billion, with more than 16 million online views of maps in 2019 alone¹⁵.
- A 2023 Deloitte Access Economics¹⁶ study focused on precompetitive data in Australia that demonstrated that the expenditure of A\$151 million on precompetitive data acquisition in 2021–2022 generated A\$71 million in value added from the generation of the data alone and supported 432 full-time equivalent (FTE) jobs. Use of the precompetitive geoscience data during resource *exploration* generated A\$5.5 billion in value add and supported 24,361 FTE jobs. Finally, the use of precompetitive geoscience data and analysis for resource *extraction* generated A\$70.5 billion in value add and supported 55,549 FTE jobs. These are conservative estimates, indicating that the A\$151 million investment in precompetitive data in Australia generated a return on investment of A\$500 of value add for every Australian federal and state dollar spent on this data, in addition to supporting more than 75,000 FTE jobs.
- Precompetitive data has been directly cited in the discovery of numerous important mineral deposits and systems in the past decade alone¹⁷, including Boda, Gonneville, Havieron, Hemi, Oak Dam and Winu in Australia, Queensway in Canada, Ikkari in Finland, and Jaca in Brazil. The availability of data like this in the U.S. will certainly increase the chance of major

¹⁴ <https://www.usgs.gov/earth-mapping-resources-initiative-earth-mri>

¹⁵ <https://www.americangeosciences.org/news/press-releases/2025-march-geological-mapping-report/>

¹⁶ https://d28rz98at9flks.cloudfront.net/148640/148640_00_0.PDF

¹⁷ <https://www.australianminerals.gov.au/events/Session-1-Driving-exploration-with-government-geoscience.pdf>

discoveries, enabling the development or expansion of secure domestic supply chains of critical and other minerals.

- South Australia's 2004–2013 Plan for Accelerating Exploration (PACE) involved an expenditure of A\$56 million but directly led to an extra A\$700 million being invested in private mineral exploration, an extra A\$2.4 billion in South Australian state mining revenues, and the discovery of two major copper deposits and 14 other significant deposits¹⁸. This research also led to the establishment of two major research centers in the state focused on mineral and geothermal exploration.
- Research by ACIL Allen¹⁹ assessed the net present value of benefits to Australia attributed to just three Geoscience Australia precompetitive data acquisition projects, namely the Mineral Potential Mapper Project (2012–2016), the Salt Lakes Study (2012–2014), and the Northeast Yilgarn Project (2001–2004). This total investment of A\$44.6 million has a return on investment in net present value terms of between A\$962 million and A\$2.4 billion.

This clear economic return on investment is another clear argument for the acquisition of high quality and regionally extensive precompetitive data and demonstrates why this data is crucial for the opening up of new target areas for mineral exploration and the development and expansion of secure base, precious, and critical metal and mineral supply chains in the U.S. The acquisition of this data is therefore vital for national security, economic security, secure supply chain development to support U.S. industry and manufacturing, and numerous other reasons, and the discovery and expansion of mineral and metal resources is the foundation of any supply chain involving metals or minerals. Precompetitive data are also not just used for mineral exploration but have a huge variety of different development, construction, engineering, natural hazard assessment, agricultural, and other uses²⁰, all of which further underlines the significant return on investment on the acquisition of this data. This data can also provide vital baseline information in advance of work needed during exploration and mining permitting, potentially expediting this key process.

The globally competitive nature of mineral exploration combined with the challenges facing the mineral exploration sector also clearly indicates a need for the U.S. and Nevada to maintain, or in the case of some states develop, a reputation as premier locations for mineral exploration globally. The role of precompetitive data in this development or continuation of a competitive advantage has been recognized

¹⁸ <https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/145195>

¹⁹ <https://ecat.ga.gov.au/geonetwork/srv/api/records/5937edd7-2c89-4e66-a73a-75f978bd2671>

²⁰ https://www.jstor.org/content/oa_book_edited/j.ctt1g69w6r

by a number of groups^{21,22}. Access to high-quality precompetitive data can only further boost the competitiveness of the U.S. in terms of attractiveness to mineral exploration and mining investment.

Getting industry input into the nature, type and location of precompetitive data acquisitions is also crucial to ensure that the data generated are fit for purpose. In order to address this, the Nevada Bureau of Mines and Geology undertook a recent survey of industry in Nevada and beyond to ask them what they needed to derisk mineral exploration and to increase the chances of discovery success. The resulting report²³ outlined the findings of this survey, with clear areas of consensus across industry that more publicly available data of a variety of different types would certainly increase the chances of success in mineral exploration, including for a variety of critical minerals. Hearing this direct from a variety of industry sources is a clear indication of the importance of precompetitive data in the development of critical and other mineral supply chain foundations – mining operations.

The need for whole-of-supply-chain approaches

Securing increased supply of any commodity, but especially of critical minerals with inherently insecure supply chains, requires more than just solid foundations. For the minerals industry this means not just securing new supplies of ore but ensuring we have the means to process and refine the minerals and metals extracted by mining. There are a number of reasons to do this domestically, not just security of entire supply chains but for employment, tax, value-add and a number of other reasons. Using coffee as an analogy, coffee growers sell their products for a certain amount, but every step along the supply chain, from the grinding and roasting of the coffee to the packaging of the coffee and the use of the coffee to produce a cup of Starbucks or similar, increases the value of the commodity in question. In addition, if all of these activities were to take place in one country, that country would benefit from tax revenue along the supply chain, increased employment, and increased security of coffee supply to ensure that anyone in that country that wanted a cup of coffee could have one.

Turning back to mining and critical minerals, the value-add as one progresses along a supply chain can be illustrated by the estimated size of different parts of the lithium-ion battery value chain in 2040. The value of the precursory material sector derived from mining operations in 2040 is estimated to be \$45 billion

²¹ <https://www.deloitte.com/us/en/insights/industry/government-public-sector-services/critical-minerals-strategy.html>

²² <https://www.miningmagazine.com/technology/news-analysis/4522610/nevadas-explorers-talk-precompetitive>

²³ <https://pubs.nbmgs.unr.edu/Nevada-Precompetitive-Data-Survey-2025-p/pds-2025.htm>

globally²⁴. Processing this material into a form that can go directly into battery production in places such as the Tesla/Panasonic Gigafactory in Sparks, Nevada increases the value of this part of the supply chain to \$203 billion by 2040²⁴. The production of battery cells then increases the value of the next part of the supply chain to \$513 billion by 2040²⁴. Each step also brings employment, tax revenue, indirect benefits to local economies, and more importantly security of supply for a strategic and important sector of industry if all of this is done domestically. However, the development of a supply chain like this requires mineral deposit discovery and mine development, the development of intermediate processing steps such as refineries, smelters, and other processing operations, and then initial (i.e., battery) and later-stage (i.e., car, home or grid storage) manufacturing. To emphasize, this applies to all supply chains that use mined materials, including those vital to the defense and energy sectors. As such, understanding where gaps are present in existing supply chains beyond mining is crucial to enabling the full realization of America's mineral potential; foundations are great, but we need to construct the rest of the supply chain in a similarly robust manner. Identifying these gaps and how they can be filled using a mix of traditional and new approaches to mineral processing, smelting, refining and the extraction of critical minerals and other metals from ores will be a vital step in securing critical mineral supply chains. This will also directly act to reduce America's reliance on insecure, non-domestic sources of commodities that are crucial for national and economic security.

Who will do the work?

The final key aspect to unleashing America's mineral potential and securing critical mineral commodity supply chains that I want to address today is having the people we need to do the work. Workforce challenges are present throughout critical mineral supply chains in the U.S.²⁵ and there is an urgent need to turn these challenges into opportunities. Outlining the wide range of employment opportunities along these supply chains to young people and the well-paid and secure jobs that these sectors generate is key to ensuring generational security of supply of critical and other minerals to U.S. manufacturing and the defense and energy sectors. Ensuring that people know of the opportunities and perhaps more importantly that "if it can't be grown, it has to be mined" is crucial if we are to succeed in this endeavor. Increasing workforce development capacity at all levels through initiatives like the Mining Schools Act is also vital if we are to have people to train and educate the growing workforce. Other countries do this pretty successfully; most of the students I worked with or supervised in Australia have ended up with successful careers in the minerals industry, sometimes despite my encouragement to think about continuing down

²⁴ [https://www.woodmac.com/news/opinion/value-addition-in-the-us\\$1-trillion-battery-value-chain/](https://www.woodmac.com/news/opinion/value-addition-in-the-us$1-trillion-battery-value-chain/)

²⁵ <https://www.nationalacademies.org/projects/DELS-BESR-23-04>

the research path. If we can replicate this awareness of opportunity here and generate the skilled workforce that critical mineral supply chains require, then we have achieved another key step toward success.

Conclusions

I would like to conclude by reemphasizing that America has huge but unrealized mineral potential, and the discussion above outlines some key steps that can be taken to start to realize this potential. The U.S. is underexplored from a mineral exploration perspective, and there is a huge opportunity to develop not only new domestic sources of critical minerals but importantly entire secure domestic supply chains. These supply chains will also bring jobs, tax revenue, and many other benefits in addition to supporting national and economic security. There may be a number of challenges in this area but every challenge is an opportunity, and the opportunities right here and right now are enormous, and are generational; we have a chance to make the U.S. minerals industry and associated downstream supply chains the best in the world.

The final thing I'd like to say is that I'm obviously happy to answer any questions you may have here but equally I feel this conversation is hugely important to the nation and I would encourage anyone who wants more information or has further questions to reach out to me after the hearing. The more we discuss these urgent and important matters, the quicker we can move to unleash America's as yet unrealized mineral potential. Thank you for the opportunity to testify today.