

# 150 YEARS ON: COMMON SENSE UPDATES TO THE MINING LAW OF 1872 TO ADDRESS OUR CHANGING CLIMATE

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*If we remove metals from the service of man, all methods of protecting and sustaining health and more carefully preserving the course of life are done away with.*<sup>1</sup>

#### INTRODUCTION

In June 2021, regions throughout the western United States experienced new maximum temperatures (for example, Portland, Oregon reached a staggering 116°F); nearly eight hundred deaths and hospitalizations were reported across western North America.<sup>2</sup> The Dixie Fire—the *largest* fire on record in California—ravaged northern California for four months in 2021, burning approximately 963,000 acres, including 73,240 unspoiled acres of Lassen Volcanic National Park.<sup>3</sup> On August 29, 2021, Hurricane Ida made landfall as a category 4 system.<sup>4</sup> Hurricane Ida was the *strongest* hurricane on record in Louisiana, surpassing Hurricane Katrina’s category 3 landfall, and it caused an estimated \$75 billion in economic losses and seventy-two deaths.<sup>5</sup> Abnormally cold weather also affected regions across North America. For instance, on February 16, 2021, Dallas, Texas reached -2°F, the lowest temperature there since 1949.<sup>6</sup> Freezing conditions caused a 30 gigawatt power outage on the Texas grid, affecting 4.5 million households and causing, at least, 246 deaths.<sup>7</sup>

While the high-impact weather events of 2021 indicate acutely that *something* is going on,<sup>8</sup> global climatic patterns—measured by the world’s leading collection of climate change scientists and experts—evidence the undeniable:

<sup>1</sup> GEORGIUS AGRICOLA, DE RE METALLICA 14 (Herbert C. Hoover & Lou H. Hoover trans., Dover Publications 1950) (1556). Agricola’s work was translated by mining engineer and future president Herbert Hoover in 1912. *Id.*

<sup>2</sup> *State of the Climate: Annual 2021 Global Climate Report*, NAT’L CENTERS FOR ENV’T INFO., <https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202113> [<https://perma.cc/HUC6-4WPH>] (Jan. 2022); WORLD METEOROLOGICAL ORG. [WMO], *State of the Global Climate 2021*, at 24, WMO-No. 1290 (2022), [https://library.wmo.int/doc\\_num.php?explnum\\_id=11178.pdf](https://library.wmo.int/doc_num.php?explnum_id=11178.pdf) [<https://perma.cc/577C-BW9V>].

<sup>3</sup> WMO, *supra* note 2, at 24; *Dixie Fire*, NAT’L PARK SERV., <https://www.nps.gov/lavo/learn/nature/dixie-fire.htm> [<https://perma.cc/V68L-AP7S>] (Oct. 4, 2022).

<sup>4</sup> WMO, *supra* note 2, at 30.

<sup>5</sup> *Id.*; *Extremely Powerful Hurricane Katrina Leaves a Historic Mark on the Northern Gulf Coast*, NAT’L WEATHER SERV. (Aug. 2005), <https://www.weather.gov/mob/katrina> [<https://perma.cc/U2YL-G8XB>].

<sup>6</sup> WMO, *supra* note 2, at 25.

<sup>7</sup> Joshua W. Busby et. al, *Cascading Risks: Understanding the 2021 Winter Blackout in Texas*, 77 ENERGY RSCH. & SOC. SCI., no. 102106, 2021, at 1, 1–2; Jeff Masters, *The Top 10 Global Weather and Climate Change Events of 2021*, YALE CLIMATE CONNECTIONS (Jan. 11, 2022), <https://yaleclimateconnections.org/2022/01/the-top-10-global-weather-and-climate-change-events-of-2021/> [<https://perma.cc/UR68-SRTA>]. *But see* Peter Aldhous et al., *The Texas Winter Storm and Power Outages Killed Hundreds More People than the State Says*, BUZZFEED NEWS (May 26, 2021, 3:09 PM), <https://www.buzzfeednews.com/article/peteraldhous/texas-winter-storm-power-outage-death-toll> [<https://perma.cc/XP52-Q3UP>] (estimating as many as seven hundred deaths).

<sup>8</sup> *See* Masters, *supra* note 7 (detailing the “top 10” global weather events of 2021).

our climate is changing.<sup>9</sup> The Intergovernmental Panel on Climate Change (“IPCC”) has observed that “[h]uman-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people.”<sup>10</sup> For example, the ten *warmest* average global surface temperatures (since global record-keeping began in 1880) were each in the *last decade* (2013–2021), and the last forty-five consecutive years have been, at least nominally, above the average global surface temperature of the twentieth century.<sup>11</sup>

The IPCC, nonetheless, believes that certain mitigation and adaptation measures may reduce climate risks to people and nature.<sup>12</sup> One of these measures is a global “energy system transition,” which includes energy generation diversification through the widespread use of renewable energy resources and demand-side management strategies (e.g., advanced battery storage).<sup>13</sup>

So called “critical minerals”<sup>14</sup> are essential to the renewable energy technologies that will drive the energy system transition necessary to address climate change.<sup>15</sup> For instance, a “typical electric car requires *six times* the mineral inputs of a conventional car, and an onshore wind plant requires *nine times* more mineral resources than a gas-fired power plant.”<sup>16</sup> Minerals like lithium, nickel, and cobalt are crucial for advanced battery performance, longevity, and

<sup>9</sup> See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC], CLIMATE CHANGE 2014: SYNTHESIS REPORT (2015), [https://www.ipcc.ch/site/assets/uploads/2018/05/SYR\\_AR5\\_FINAL\\_full\\_wcover.pdf](https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf) [<https://perma.cc/4XZU-4A9Z>] (reporting observed changes in climate).

<sup>10</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC], CLIMATE CHANGE 2022: IMPACTS, ADAPTATION AND VULNERABILITY SUMMARY FOR POLICYMAKERS SPM-7 (2022), [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_SummaryForPolicymakers.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf) [<https://perma.cc/2QQH-PUAS>].

<sup>11</sup> NAT’L CENTERS FOR ENV’T INFO., *supra* note 2.

<sup>12</sup> IPCC, *supra* note 10, at SPM-20, SPM-23.

<sup>13</sup> *Id.* at SPM-26.

<sup>14</sup> The Energy Act of 2020 (“Act”) defines “critical material” as any non-fuel mineral, element, substance, or material that the Secretary of Energy determines to have a high risk of a supply-chain disruption and serves an essential function in one or more energy technologies, including technologies that produce, transmit, store, and conserve energy, and includes all “critical minerals.” 30 U.S.C. § 1606(a)(2). The Act defines “critical mineral” as any mineral, element, substance, or material designated as critical by the Secretary of the Interior, but does not include: fuel minerals; water, ice or snow; or common varieties of sand, gravel, stone, pumice, cinders, and clay. *Id.* § 1606(a)(3). The 2022 Final List of Critical Minerals, issued by the U.S. Geological Survey, includes fifty minerals, including, e.g., cobalt, lithium, and nickel. 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10381 (Feb. 24, 2022).

<sup>15</sup> THE WHITE HOUSE, BUILDING RESILIENT SUPPLY CHAINS, REVITALIZING AMERICAN MANUFACTURING, AND FOSTERING BROAD-BASED GROWTH 152 (2021), <https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf> [<https://perma.cc/E92J-3GT4>].

<sup>16</sup> INT’L ENERGY AGENCY [IEA], THE ROLE OF CRITICAL MINERALS IN CLEAN ENERGY TRANSITIONS 5 (2021), <https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf> [<https://perma.cc/6Z4Q-CMYQ>] (emphasis added).

energy density, while “rare earth elements” (“REE”) (i.e., those found below the main body on the periodic table) comprise the permanent magnets inside electric vehicle (“EV”) motors and wind turbines.<sup>17</sup> The International Energy Agency (“IEA”) expects mineral demand for use in EVs and advanced batteries to grow at least *thirty times* by 2040 if the world is to meet the ambitious decarbonization goals set forth in the United Nations Paris Agreement.<sup>18</sup>

But an assured supply of many, if not most, of the fifty critical minerals identified in the 2022 Final List of Critical Minerals is presently limited. The United States lacks any domestic production of at least fourteen of the fifty identified minerals.<sup>19</sup> China is the leading producer of sixteen of the listed minerals,<sup>20</sup> and the United States imports, roughly, 80 percent of REEs from China.<sup>21</sup> Furthermore, market prices for many critical minerals have soared due to rising demand, supply chain disruptions, and tightening supply—that is, mined supply.<sup>22</sup> This point is best illustrated by lithium’s 250 percent price increase since the start of 2022.<sup>23</sup> Nickel and aluminum market prices have also risen sharply, due in part to Russia’s (a leading producer of both) invasion of Ukraine.<sup>24</sup>

So, what does a 150-year-old law inspired by the California Gold Rush have to do with climate change? The surging demand for critical minerals<sup>25</sup> and the recent concern over America’s supply chains<sup>26</sup> suggest one answer: everything.

<sup>17</sup> *Id.*; see also *What are Rare Earth Elements, and Why are They Important?*, AM. GEOSCIENCES INST., <https://www.americangeosciences.org/critical-issues/faq/what-are-rare-earth-elements-and-why-are-they-important> [<https://perma.cc/F5TY-WED4>].

<sup>18</sup> IEA, *supra* note 16, at 8. See generally Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104.

<sup>19</sup> U.S. GEOLOGICAL SURV., MINERAL COMMODITY SUMMARIES 2022 17 (2022), <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022.pdf> [<https://perma.cc/8SAR-8WRB>]; U.S. DEP’T ENERGY, CRITICAL MINERALS AND MATERIALS: U.S. DEPARTMENT OF ENERGY’S STRATEGY TO SUPPORT DOMESTIC CRITICAL MINERAL AND MATERIAL SUPPLY CHAINS (FY 2021—FY 2031), at i (2021), [https://www.energy.gov/sites/prod/files/2021/01/f82/DOE%20Critical%20Minerals%20and%20Materials%20Strategy\\_0.pdf](https://www.energy.gov/sites/prod/files/2021/01/f82/DOE%20Critical%20Minerals%20and%20Materials%20Strategy_0.pdf) [<https://perma.cc/NW5R-JXW3>].

<sup>20</sup> U.S. GEOLOGICAL SURV., *supra* note 19, at 17. It is important to note that the Mineral Commodity Summaries of 2022 considers the 2018 Final List of Critical Minerals (83 Fed. Reg. 23295), which identified only thirty-five critical minerals. *Id.* at 17–18.

<sup>21</sup> Exec. Order No. 13,953, 85 Fed. Reg. 62539, 62539 (Sept. 30, 2020).

<sup>22</sup> See Tae-Yoon Kim, *Critical Minerals Threaten a Decades-Long Trend of Cost Declines for Clean Energy Technologies*, INT’L ENERGY AGENCY (May 18, 2022), <https://www.iea.org/commentaries/critical-minerals-threaten-a-decades-long-trend-of-cost-declines-for-clean-energy-technologies> [<https://perma.cc/7ZAQ-3NJR>].

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> See Exec. Order No. 13,817, 82 Fed. Reg. 60835, 60835 (Dec. 20, 2017).

<sup>26</sup> See Kim, *supra* note 22; Exec. Order No. 14,017, 86 Fed. Reg. 11849, 11849 (Feb. 24, 2021).

The Mining Law of 1872 (“Mining Law”) allows citizens to explore and develop “valuable mineral deposits” located on federal public lands.<sup>27</sup> Accordingly, the Mining Law governs the exploration, development, and extraction of many critical minerals vital to a clean energy transition. Yet, the sesquicentennial law has been criticized as “anachronistic,”<sup>28</sup> the “granddaddy of all subsidies,”<sup>29</sup> and as the “lord of yesterday.”<sup>30</sup> As Sam Kalen, the William T. Schwartz Distinguished Professor and Associate Dean of the University of Wyoming College of Law, frames the issue, the United States faces a classic Hobson’s choice: to “accede to the geopolitics of import reliance” and, thereby, insulate our public lands from the “antiquated” Mining Law, or to achieve “mineral independence” by developing our domestic supply of critical minerals, at the expense of our public lands.<sup>31</sup>

Although Professor Kalen is willing to accept that *some* critical minerals ought to be mined in the United States, he argues that domestic mining should begin “only once the U.S. Congress reforms the 1872 Mining Law” to create “a leasing system for hard-rock and critical minerals.”<sup>32</sup> In other words, Professor Kalen would support an expensive new tax on mining *before* supporting desperately needed policy reforms that would foster “a meaningful and effective national critical minerals policy,” which is “presently indispensable for the transition to a green economy.”<sup>33</sup>

But if we believe the ominous forecasts of the world’s leading climate experts, time is not on our side. We cannot wait out our present need for critical minerals over an untenable and punitive leasing policy, as any additional barrier to market entry or threat to the feasibility of existing mine projects would only *further* expose the nation’s decarbonization efforts to the everchanging whims of the geopolitics of import reliance. “Common sense” mining reforms—those that would pass under the established partisan political climate—quite differently, *can* protect our nation’s public lands while simultaneously promoting a robust and efficient domestic mining industry.

In this Note, I will briefly summarize the Mining Law, as well as the panoply of other laws and regulations that govern hardrock mining in the United States. Secondly, I will review federal legislation for reforming the Mining Law introduced at the 117th Congress. Finally, I will propose “common sense”

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<sup>27</sup> 30 U.S.C. § 22.

<sup>28</sup> Sam Kalen, *Mining Our Future Critical Minerals: Does Darkness Await Us?*, 51 ENV’T L. REP. 11006, 11008 (2021).

<sup>29</sup> DAVID GERARD, *THE MINING LAW OF 1872: DIGGING A LITTLE DEEPER* 16 (1997).

<sup>30</sup> CHARLES F. WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* 20 (1992).

<sup>31</sup> Kalen, *supra* note 28, at 11006–08, 11023.

<sup>32</sup> *Id.* at 11008.

<sup>33</sup> *Id.*

reforms to the Mining Law and mining law generally, which will ensure an ample supply of critical minerals necessary to address our changing climate.<sup>34</sup>

## I. A ROCK AND A HARD PLACE: MINING LAW IN THE TWENTY-FIRST CENTURY

### A. *The Mining Law of 1872*

Under the Mining Law,<sup>35</sup> enterprising US citizens may enter onto certain public lands to explore and occupy lands containing “valuable mineral deposits.”<sup>36</sup> Upon discovery, a person may “locate”<sup>37</sup> a mining claim—“a parcel of land containing precious metal in its soil or rock”<sup>38</sup>—to extract minerals.<sup>39</sup> A mining claim is an alienable interest in the mineral-bearing land, subject only to the paramount title of the United States,<sup>40</sup> and the claimant has exclusive right

<sup>34</sup> I use “mining law,” expressed in the lower case, to refer to the collection of laws, regulations, and policies that govern hardrock mining activity, including environmental protection, permitting, taxation, compliance, and corporate governance.

<sup>35</sup> The Mining Law was codified as 30 U.S.C. §§ 22–24, 26–30, 33–35, 37, 39–43, 47. *See 30 U.S. Code § 22—Lands Open to Purchase by Citizens*, CORNELL L. SCH.: LEGAL INFO. INST., <https://www.law.cornell.edu/uscode/text/30/22> [<https://perma.cc/KZR3-FA5D>] (Jan. 10, 2022).

<sup>36</sup> “In order for a claim to be valid, the substance discovered must not only be a ‘valuable mineral’ within the dictionary definition of those words, but must also be the type of valuable mineral that the 1872 Congress intended to make the basis of a valid claim.” *Andrus v. Charleston Stone Prods. Co., Inc.*, 436 U.S. 604, 611 (1978). Originally, the Mining Law applied to all “valuable mineral deposits,” or “locatable” minerals. Over the past 150 years, however, Congress has explicitly narrowed the list of minerals locatable under the Mining Law. For example, the Mineral Leasing Act of 1920, 30 U.S.C. §§ 181–263, excludes certain “fuel minerals,” such as coal, phosphate, and oil; the Mineral Leasing Act for Acquired Lands of 1947, 30 U.S.C. §§ 351–359, excludes solid minerals on acquired lands; the Materials Act of 1947, 30 U.S.C. §§ 601–604, excludes certain “mineral materials,” such as sand, stone, gravel, and clay; the Multiple Use Mining Act of 1955, 30 U.S.C. §§ 611–615, excludes other “common varieties” of mineral materials and limits the ability of a mining claimant to sever, remove, or use any vegetative or other surface resources; and the Geothermal Steam Act of 1970, 30 U.S.C. §§ 1001–1027, excludes “geothermal resources.”

<sup>37</sup> Location entails “staking the corners of the claim, posting a notice of location thereon and complying with the state laws concerning the filing or recording of the claim in the appropriate office.” *United States v. Curtis-Nev. Mines, Inc.*, 611 F.2d 1277, 1281 (9th Cir. 1980).

<sup>38</sup> *St. Louis Smelting & Refin. Co. v. Kemp*, 104 U.S. 636, 649 (1881).

<sup>39</sup> *See Best v. Humboldt Placer Min. Co.*, 371 U.S. 334, 335 (1963) (describing claims located under the Mining Law as “a unique form of property . . . a possessory interest in land that is ‘mineral in character’ and as respects which discovery ‘within the limits of the claim’ has been made”) (quoting *Cameron v. United States*, 252 U.S. 450, 456 (1920)).

<sup>40</sup> The Mining Law allows claimants to obtain a patent for any land claimed and located for valuable mineral deposits. *See 30 U.S.C. §§ 22, 29*. However, the Bureau of Land Management (“BLM”), the federal agency authorized to grant patents under the Mining Law, has been prohibited by Congress from accepting new mineral patent applications since 1994. Department of the Interior and Related Agencies Appropriations Act of 1995, Pub. L. No. 103-332, 108 Stat. 2499 (1994).

of possession and enjoyment of both the surface and mineral estate.<sup>41</sup> A mining claim, however, may only be used for prospecting, mining, or processing operations and uses reasonably incident thereto.<sup>42</sup>

Open access and self-initiation are two of the Mining Law's preeminent features, as private sector actors are incentivized to explore and develop our nation's mineral resources.<sup>43</sup> The claim system provides mine operators indefinite "security of tenure" as they make significant capital investments in developing the mineral resource.<sup>44</sup> Secure mineral rights guarantees both the right to exclude others from developing a mineral discovery and the right to mine until exhaustion of the mineral deposit, without concern for artificial duration of use constraints.<sup>45</sup>

The Mining Law does not require a claimant to pay any federal royalty. Instead, the holder of a mining claim must pay the government a onetime location fee and an annual maintenance fee in lieu of performing annual assessment work or making annual filings.<sup>46</sup> These fees are adjusted every five years by the Secretary of the Interior to reflect changes in the Consumer Price Index.<sup>47</sup> The Mining Law's claim system generates, approximately, \$70 million in annual revenue for the federal government.<sup>48</sup> In 2018, the federal government collected \$550 million in royalties from leasable solid mineral operations.<sup>49</sup> While an impressive sum, coal mining accounted for 88 percent (\$481 million) of this amount, while leasable hardrock mineral (e.g., traditional hardrock minerals,

<sup>41</sup> 30 U.S.C. § 26. *But see id.* § 612(b) ("[M]ining claim[s] shall also be subject, prior to issuance of patent therefor [sic], to the right of the United States, its permittees, and licensees, to use so much of the surface thereof as may be necessary for [management of the vegetative surface resources] or for access to adjacent land.").

<sup>42</sup> 30 U.S.C. § 612(a). Although outside the scope of this Note, recent federal court decisions threaten the stability of the Mining Law. *See* *Ctr. for Biological Diversity v. United States Fish & Wildlife Serv.*, 33 F.4th 1202, 1206 (9th Cir. 2022); *Bartell Ranch LLC v. McCullough*, No. 321CV00080MMDCLB, 2023 WL 1782343 (D. Nev. Feb. 6, 2023).

<sup>43</sup> *See* Andrew P. Morriss et al., *Homesteading Rock: A Defense of Free Access Under the General Mining Law of 1872*, 34 ENV'T L. 745, 807 (2004).

<sup>44</sup> *Id.* at 754 & n.53.

<sup>45</sup> Letter from the U.S. Gov't Accountability Off., to Rep. Raul Grijalva (D-AZ), Chairman of the House Comm. on Nat. Res., *Mining on Federal Lands: More than 800 Operations Authorized to Mine and Total Mineral Production is Unknown* (May 28, 2020) [hereinafter GAO Letter], <https://www.gao.gov/assets/gao-20-461r.pdf> [<https://perma.cc/Z9CL-KPEJ>] ("[L]easing systems allow the federal government to . . . establish terms for use of the land, including duration of use . . .").

<sup>46</sup> *See* 30 U.S.C. § 28f(a). As of 2019, location fees are \$40 and maintenance fees are \$165 for lode claims, mill sites, and tunnel sites. 43 C.F.R. § 3830.21 (2019).

<sup>47</sup> 30 U.S.C. § 28j.

<sup>48</sup> U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., *PUBLIC LAND STATISTICS 2020*, 158 (2021), <https://www.blm.gov/sites/blm.gov/files/docs/2021-08/PublicLandStatistics2020.pdf> [<https://perma.cc/HFW3-ERHZ>].

<sup>49</sup> GAO Letter, *supra* note 45.

like gold and silver, found on “acquired” lands<sup>50</sup>) operations accounted for only 2 percent (\$8.7 million).<sup>51</sup>

The Mining Law’s critics argue that “giving away” title to the nation’s mineral resources is, effectively, a subsidy to miners.<sup>52</sup> While this argument ignores the substantial sum generated by maintenance fees, the Mining Law only offers security of tenure to those who have undertaken the effort of “produc[ing] knowledge about the location of a valuable deposit.”<sup>53</sup> Rather, the “subsidy” is a reward for this “production of knowledge, not a transfer payment unrelated to effort,” and recognizes the significant upfront investment in exploration, development, and production of valuable minerals deposits.<sup>54</sup> The Mining Law’s claim system, in this sense, works as intended: it is an “institutional response to the incentive problems of public ownership of resources and an effective, evolved mechanism for solving the problem of determining how to use those resources.”<sup>55</sup>

### B. *The Economics of Hardrock Mining*

Arguments in favor of extending a federal leasing system to *all* hardrock minerals include, among other things, securing a “fair return” to taxpayers for the use of public lands, “[m]odernizing” the antiquated Mining Law to achieve “[p]olicy [c]oherence,”<sup>56</sup> and conforming to the established practices of other mineral-producing countries.<sup>57</sup> Still, roughly 83 percent of mining operations on public lands are governed by the Mining Law.<sup>58</sup> This means that most hardrock mining is not subject to a federal leasing system, and for good reason: the economics of hardrock mining are *profoundly* different from those involved in the extraction of leasable solid minerals like coal and common-variety minerals.<sup>59</sup>

<sup>50</sup> For example, the Weeks Act authorized the Secretary of Agriculture, through the United States Forest Service, to acquire certain forested lands. *See* 16 U.S.C. § 515.

<sup>51</sup> GAO Letter, *supra* note 45.

<sup>52</sup> Morriss et al., *supra* note 43, at 765.

<sup>53</sup> *Id.* at 765–66.

<sup>54</sup> *Id.* at 766.

<sup>55</sup> *Id.* at 763.

<sup>56</sup> Press Release, Nat. Res. Comm., Chair Grijalva, Sen. Heinrich Introduce Legislation to Modernize Antiquated Mining Law, Protect Taxpayers (Apr. 26, 2022), <https://naturalresources.house.gov/media/press-releases/chair-grijalva-sen-heinrich-introduce-legislation-to-modernize-antiquated-mining-law-protect-taxpayers> [https://perma.cc/F7RP-HBJM]; Kalen, *supra* note 28, at 11013.

<sup>57</sup> *See generally* U.S. GOV’T ACCOUNTABILITY OFF., GAO-21-298, HARDROCK MINING MANAGEMENT: SELECTED COUNTRIES, U.S. STATES, AND TRIBES HAVE DIFFERENT GOVERNANCE STRUCTURES BUT PRIMARILY USE LEASING (2021).

<sup>58</sup> *See* GAO Letter, *supra* note 45.

<sup>59</sup> *See generally* SNL METALS & MINING, PERMITTING, ECONOMIC VALUE AND MINING IN THE UNITED STATES (2015), [https://www.nma.org/wp-content/uploads/2016/09/SNL\\_Permitting\\_Delay\\_Report-Online.pdf](https://www.nma.org/wp-content/uploads/2016/09/SNL_Permitting_Delay_Report-Online.pdf) [https://perma.cc/P93X-JA2G].



At the front end, hardrock minerals—unlike minerals presently subject to leasing systems (e.g., oil, coal, and natural gas)—are difficult and expensive to find.<sup>60</sup> Exploration geologists and prospectors spend considerable sums to discover promising mineralized areas for further exploration activity.<sup>61</sup> If promising mineralization is discovered, a potential hardrock mine operator must consider “how much to spend on reducing investment risk.”<sup>62</sup> Yet, with more certainty comes more expense, as conducting intensive exploration and modeling to better define a mineral deposit—and therefore reduce uncertainty—can be cost prohibitive.<sup>63</sup> Ultimately, while “[g]eology and topography will determine the shape and size of a mining operation . . . economics determine the viability of a project.”<sup>64</sup>

The most significant—and expensive—obstacle in hardrock mining is permitting and licensing. In fact, many new projects “take 10 years or more just to get approved,” as thirty or more federal, state, and local regulatory programs may apply to a single project.<sup>65</sup> The National Environmental Policy Act (“NEPA”)<sup>66</sup> review process, by itself, can take three to five years.<sup>67</sup> “When the permitting process becomes excessively long or unpredictable, it can lead to unexpected incremental costs, which have a serious impact on the economic viability of a project.”<sup>68</sup> Accordingly, mine permitting approval is a “long-term investment,” requiring significant capital.<sup>69</sup>

If a hardrock operation clears the permitting hurdle, the removal of “waste rock”—the soil and rock that overlies the economic mineral deposit—is required before profitable ore formations can be mined.<sup>70</sup> Because “exploration is

<sup>60</sup> Only one in ten hardrock mineral exploration projects reach the drill stage, and only one in a thousand drill programs unearth viable mineral deposits. *Mining 101*, ONTARIO MINING ASS’N, <https://oma.on.ca/en/ontario-mining/Mining101.aspx> [<https://perma.cc/3R56-QLAU>]. Ultimately, less than one in ten thousand projects become productive mines. *Id.* Quite differently, the success rate of exploration for oil and natural gas was more than 60 percent. *See Natural Gas, Oil Drilling and Completions Up More than 35 Percent over 2017*, AM. PETROLEUM INST. (Apr. 19, 2018), <https://www.api.org/news-policy-and-issues/news/2018/04/19/natural-gas-and-oil-drilling-and-completions-up-more-than-35-percent-over-2017> [<https://perma.cc/SR2D-RWWH>].

<sup>61</sup> *See* SNL METALS & MINING, *supra* note 59, at 30 (estimating costs of fifteen to fifty million dollars over two years).

<sup>62</sup> *Id.* at 9.

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> Ned Mamula, *Mine US Minerals—Don’t Undermine Them*, THE HILL (May 16, 2019, 5:00 PM), <https://thehill.com/opinion/international/444122-mine-us-minerals-dont-undermine-them/> [<https://perma.cc/GV3R-8B4G>]; SNL METALS & MINING, *supra* note 59, at 23.

<sup>66</sup> *See infra* Section I.C.

<sup>67</sup> SNL METALS & MINING, *supra* note 59, at 24.

<sup>68</sup> *Id.* at 8.

<sup>69</sup> *Id.* at 7.

<sup>70</sup> *See id.* at 9 (“Capital costs [including ‘waste stripping’] are positively correlated with the size of the operation; whereas, the operating cost of extracting a unit of metal/coal will depend upon the mining method and may be lower for large-scale operations (due to econo-

never able to provide a complete understanding of [the] orebody,” the economics of recovery are unpredictable.<sup>71</sup> Even where valuable ore deposits are recovered, “the price of an extracted commodity is set by the market.”<sup>72</sup> Mining operations are thus exposed to the uncertainty and price volatility of global commodity markets.<sup>73</sup> Moreover, hardrock minerals typically require extensive concentration and processing to make them marketable.<sup>74</sup>

During exploration, development, production, and reclamation, the economics of hardrock mining are remarkably cost-sensitive.<sup>75</sup> Even minor cost alterations—like an expensive and unjustified leasing royalty—make domestic mining less attractive and chill investment in exploration and development.<sup>76</sup> Consequently, mining firms might operate more on non-federal lands (where environmental laws are less protective) or abroad, intensifying the nation’s import reliance at a time when a reliable source of critical minerals is most essential.<sup>77</sup> Moreover, mining industry employees earn considerably more than the average worker—an unnecessary leasing policy would compromise this status.<sup>78</sup>

### C. *Not Your Father’s Miner: Panoply of Other Laws Regulating Mining*

Proponents of reforming the Mining Law argue that it has “left behind a scarred legacy on our lands and water.”<sup>79</sup> Their assertions are undeniable: historical mining practices have left a legacy of pollution,<sup>80</sup> thousands of abandoned mines,<sup>81</sup> and pressing environmental justice concerns.<sup>82</sup> But today’s min-

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mies of scale). For low-grade deposits, small increases in the capital and/or operating costs can render the venture uneconomic.”).

<sup>71</sup> *Id.* at 8.

<sup>72</sup> *Id.* at 9.

<sup>73</sup> *See id.*

<sup>74</sup> For instance, gold ore must be processed, concentrated, and poured into “doré” bars before it can be marketed for sale. *See How Gold is Mined: The Lifecycle of a Gold Mine*, WORLD GOLD COUNCIL, <https://www.gold.org/gold-supply/gold-mining-lifecycle> [<https://perma.cc/9GXX-EGRJ>].

<sup>75</sup> *See SNL METALS & MINING*, *supra* note 59, at 10–20 (simulating three “incremental cost scenarios” to different mine projects at various stages of development).

<sup>76</sup> *See id.*

<sup>77</sup> *See generally* BERNARD A. GELB, CONG. RSCH. SERV., 94-540 E, *HARDROCK MINING, THE 1872 LAW, AND THE U.S. ECONOMY* (1994).

<sup>78</sup> *See Employment and Wages in Mining Industries*, U.S. BUREAU OF LAB. STAT. (Oct. 3, 2018), <https://www.bls.gov/opub/ted/2018/employment-and-wages-in-mining-industries.htm> [<https://perma.cc/A59R-ZZPP>].

<sup>79</sup> Nat. Res. Comm., *supra* note 56.

<sup>80</sup> *See, e.g.*, Lauren Pagel, *The Real Culprit in the Animas River Spill*, CNN, <https://www.cnn.com/2015/08/12/opinions/pagel-animas-river-pollution/index.html> [<https://perma.cc/8RKY-3WYN>] (Aug. 13, 2015, 12:56 PM).

<sup>81</sup> *See Abandoned Mine Lands*, BUREAU OF LAND MGMT., <https://www.blm.gov/programs/public-safety-and-fire/abandoned-mine-lands> [<https://perma.cc/UY5L-ZTVL>].

er is not your father's miner, as modern mining operations are regulated under a robust scheme of environmental protection, licensing, reclamation, and other oversight rules.

At the outset, the Mining Law of 1872 says that mining claims shall accord with "regulations prescribed by law," supplying BLM and other regulatory agencies with ample authority to oversee mining activity.<sup>83</sup> While additional laws help protect against the abuses of historical mining practices, none do so more than the Federal Land Policy and Management Act of 1976 ("FLPMA"), which authorizes the Department of the Interior to stop the "unnecessary or undue degradation" of public lands.<sup>84</sup> Pursuant to this authority, BLM requires mine operators to submit detailed "plan[s] of operations" that must include appropriate environmental protection and reclamation measures before shovel hits dirt.<sup>85</sup> Mine operators, ordinarily, must also furnish a security instrument in the amount of the full cost of reclamation.<sup>86</sup> BLM annually certifies that reclamation cost estimates submitted by mine operators are sufficient to cover the cost of reclamation and post-mining environmental protection.<sup>87</sup> Reclamation must be "commenced, conducted, and completed as soon after disturbance as feasible without undue physical interference with mining operations."<sup>88</sup>

Hardrock mining operations must comply with an assortment of federal environmental quality laws.<sup>89</sup> For example, mine operators must obey air quality laws, such as the Clean Air Act;<sup>90</sup> water quality laws, such as the Federal Water Pollution Control Act ("Clean Water Act");<sup>91</sup> and wildlife protection laws, such as the Endangered Species Act.<sup>92</sup> Mine operators must also comply

<sup>82</sup> See, e.g., JUDY PASTERNAK, *YELLOW DIRT: A POISONED LAND AND THE BETRAYAL OF THE NAVAJOS* (2011).

<sup>83</sup> 30 U.S.C. § 22; see also Kalen, *supra* note 28, at 11015 & n.121.

<sup>84</sup> See 43 U.S.C. §§ 1701, 1732(b).

<sup>85</sup> 43 C.F.R. § 3802.1 (2022).

<sup>86</sup> See *id.* § 3802.2.

<sup>87</sup> *Id.* § 3809.552; see *Reforming the Mining Law of 1872: Hearing Before the H. Nat. Res. Comm., Subcomm. on Energy and Min. Res., H.R. 7580*, 117th Cong. 3 (2022) (statement of Steve Feldgus, Ph.D., Deputy Assistant Sec'y, Land and Min. Mgmt., U.S. Dep't of the Interior).

<sup>88</sup> 43 C.F.R. § 3802.0-5(a) (2022); *id.* § 3809.5 ("[R]eclamation include[s] . . . (1) Isolation, control, or removal of acid-forming, toxic, or deleterious substances; (2) Regrading and re-shaping to conform with adjacent landforms, facilitate revegetation, control drainage, and minimize erosion; (3) Rehabilitation of fisheries or wildlife habitat; (4) Placement of growth medium and establishment of self-sustaining revegetation; (5) Removal or stabilization of buildings, structures, or other support facilities; (6) Plugging of drill holes and closure of underground workings; and (7) Providing for post-mining monitoring, maintenance, or treatment.").

<sup>89</sup> See 43 C.F.R. § 3802.3-2 (2022) (requirements for environmental protection).

<sup>90</sup> 42 U.S.C. § 7401; *id.* § 7420(2)(A) (outlining penalties "against every person who owns or operates . . . a stationary source which is not in compliance with an emission limitation, emission standard, standard of performance, or other requirement").

<sup>91</sup> 33 U.S.C. § 1251.

<sup>92</sup> 16 U.S.C. § 1531.

with NEPA's environmental review mandate.<sup>93</sup> Though NEPA “does not mandate particular results,”<sup>94</sup> it requires federal agencies to take a “hard look” at the environmental consequences of a proposed mine.<sup>95</sup> A reviewing agency must prepare an environmental assessment (“EA”) of the impacts of the proposed mine operation, and, if those impacts are significant, complete an environmental impact statement (“EIS”).<sup>96</sup>

Furthermore, mine operators must comply with state and local regulatory laws.<sup>97</sup> Western states, especially, have 150 years of experience regulating hardrock mining on public lands under their jurisdiction and have developed regulatory frameworks to address permitting, environmental protection, and bonding and reclamation.<sup>98</sup> Moreover, states may be delegated implementing authority of federal environmental programs, such as the hazardous waste disposal program under the Resource Conservation and Recovery Act<sup>99</sup> and the National Pollutant Discharge Elimination System program of the Clean Water Act.<sup>100</sup> States have also developed sophisticated taxation schemes and collect taxes on mining activities in a variety of forms and rates.<sup>101</sup>

#### D. Nevada: A Leader in State-Level Mining Regulation

Nearly 20 percent of the nation's locatable hardrock mine operations are in the State of Nevada.<sup>102</sup> Nevada currently has the nation's only domestic source of lithium production.<sup>103</sup> Moreover, Nevada has appreciable reserves (and, in a few cases, production) of many other critical minerals, such as antimony, barite, beryllium, fluor spar, gallium, germanium, indium, lithium, manganese, tel-

<sup>93</sup> 42 U.S.C. § 4321. NEPA is required for all “major Federal actions significantly affecting the quality of the human environment.” *Id.* § 4332(C).

<sup>94</sup> *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

<sup>95</sup> *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976); 43 C.F.R. § 3802.3-1 (2022).

<sup>96</sup> *See, e.g.*, BUREAU OF LAND MGMT., THACKER PASS LITHIUM MINE PROJECT: FINAL ENVIRONMENTAL IMPACT STATEMENT (2020), [https://eplanning.blm.gov/public\\_projects/1503166/200352542/20030633/250036832/Thacker%20Pass\\_FEIS\\_Chapters1-6\\_508.pdf](https://eplanning.blm.gov/public_projects/1503166/200352542/20030633/250036832/Thacker%20Pass_FEIS_Chapters1-6_508.pdf) [<https://perma.cc/N3E6-2SCC>]; *National Environmental Policy Act Review Process*, EPA, <https://www.epa.gov/nepa/national-environmental-policy-act-review-process> [<https://perma.cc/6SYY-FACE>].

<sup>97</sup> U.S. ENV'T PROT. AGENCY, EPA'S NATIONAL HARDROCK MINING FRAMEWORK 3 (1997), <https://semspub.epa.gov/work/HQ/176028.pdf> [<https://perma.cc/VF3S-ZDT9>].

<sup>98</sup> *See, e.g.*, MONT. CODE ANN. § 82-1-101 (2021); WYO. STAT. ANN. § 30-1-101 (2022); UTAH CODE ANN. § 40-1-1 (West 2022).

<sup>99</sup> 42 U.S.C. §§ 6901–6992k.

<sup>100</sup> 33 U.S.C. § 1342.

<sup>101</sup> Letter from Susan D. Sawtelle, Managing Assoc. Gen. Couns., GAO, to Tom Udall, Ranking Member, U.S. Senate, *Hardrock Mining: Updated Information on State Royalties and Taxes* (July 16, 2019), <https://www.gao.gov/assets/b-330854.pdf> [<https://perma.cc/A3VU-774A>].

<sup>102</sup> GAO Letter, *supra* note 45, at 8–9. In 2018, 143 of the nation's 728 locatable hardrock mining operations were located in Nevada. *Id.* at 8.

<sup>103</sup> U.S. GEOLOGICAL SURV., *supra* note 19, at 100.

lurium, tin, and vanadium.<sup>104</sup> Nevada also ranked third in the Fraser Institute's 2021 Mining Investment Attractiveness Index, a composite index factoring in both mineral potential and governmental policy attitudes toward mining.<sup>105</sup> For these reasons, Nevada is an outstanding model of state-level mining regulation in the era of critical minerals and climate change.

While 67 percent of land in Nevada is federal public land, much of which is open to entry by the public under the Mining Law, location of mining claims on Nevada state public land follows the general principles of the Mining Law (i.e., citizenship, discovery, and location).<sup>106</sup> Nevada has developed comprehensive state-level permitting, environmental protection, taxation, and reclamation programs. For example, a mining company must obtain a valid permit, submit a plan for reclamation, and provide a bond or other surety in the full amount of reclamation before engaging in exploration or mining in Nevada.<sup>107</sup> The Reclamation Branch of the Nevada Division of Environmental Protection ("NDEP") held more than \$3.3 billion in reclamation sureties in 2021.<sup>108</sup>

To further promote responsible mining, the Nevada Legislature adopted a "bad actors" statute in 2021, forbidding permit applicants who have defaulted on any obligation relating to reclamation from obtaining an exploration or mining permit.<sup>109</sup> The Mining Oversight and Accountability Commission ("MOAC"), furthermore, oversees the industry's compliance with Nevada law with respect to taxation, operation, safety, and environmental protection.<sup>110</sup>

The Nevada Constitution requires the state legislature to provide for a tax upon the net proceeds of all minerals extracted in the State.<sup>111</sup> The State collected, approximately, \$190 million in net proceeds of minerals taxes in

<sup>104</sup> MICHAEL VISHER, OVERVIEW OF CURRENT MINERAL PRODUCTION AND DEVELOPMENT ACTIVITY IN NEVADA, NEV. DIV. OF MINERALS (2022), [https://minerals.nv.gov/uploadedFiles/mineralsnv.gov/content/home/features/RP/RP\\_GSN\\_20220502\\_NDOM%20Mike%20Visher.pdf](https://minerals.nv.gov/uploadedFiles/mineralsnv.gov/content/home/features/RP/RP_GSN_20220502_NDOM%20Mike%20Visher.pdf) [<https://perma.cc/XUZ9-3D8T>]; see also 2022 Final List of Critical Minerals, 87 Fed. Reg. 10381, 10381 (Feb. 24, 2022).

<sup>105</sup> JAIRO YUNIS & ELMIRA ALIAKBARI, FRASER INST., FRASER INSTITUTE ANNUAL SURVEY OF MINING COMPANIES 2021, at 8–9 (2021), <https://www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2021.pdf> [<https://perma.cc/KD6L-6VXY>].

<sup>106</sup> NEV. REV. STAT. § 517.010 (2021); *BLM Nevada*, BUREAU OF LAND MGMT., <https://www.blm.gov/nevada> [<https://perma.cc/N4E4-PNCW>].

<sup>107</sup> NEV. REV. STAT. §§ 519A.180, 519A.190, 519A.200, 519A.210 (2021).

<sup>108</sup> *Reclamation Branch*, NEV. DIV. OF ENV'T PROT., <https://ndep.nv.gov/land/mining/reclamation> [<https://perma.cc/LFG6-JWQJ>]; see also NEV. REV. STAT. § 519A.240 (2021) ("[A]n approved federal plan of operations and a surety that are consistent with the requirements of this chapter supersede the requirements for a permit and bond or other surety . . .").

<sup>109</sup> NEV. REV. STAT. §§ 519A.190, 519A.210 (2021).

<sup>110</sup> NEV. REV. STAT. § 514A.060 (2021).

<sup>111</sup> NEV. CONST. art. X, § 5; NEV. REV. STAT. § 362.140 (2021) (providing that tax rates are based upon the ratio of the net proceeds to the gross proceeds); NEV. REV. STAT. § 362.120 (2021) ("net proceeds" are the gross yield less deductions for the cost of extraction, transport, processing, and other incidental costs); see JAMES L. WADHAMS, NEV. LAW., *THE TAXATION OF MINING* 12–14 (2013), [https://www.nvbar.org/wp-content/uploads/NevLawyer\\_April\\_2013\\_Taxation\\_On\\_Mining.pdf](https://www.nvbar.org/wp-content/uploads/NevLawyer_April_2013_Taxation_On_Mining.pdf) [<https://perma.cc/9CWP-DG3U>].

2021.<sup>112</sup> Roughly \$816,000 in net proceeds of minerals tax was collected from Ablemarle’s Silver Peak lithium-brine operation in Clayton Valley, the nation’s lone lithium producer.<sup>113</sup>

## II. TOWARD A NEW MINING LAW

### A. Federal Legislation

The debate over reforming the Mining Law is a generations old debate, and the crucial need to address our changing climate has sparked a renewed interest in this conversation.<sup>114</sup> Thirty-two bills and resolutions with the phrase “critical mineral” were introduced during the 117th Congress (2021–2022), a considerable increase from the fifteen introduced during the 116th Congress (2019–2020).<sup>115</sup> Nine bills specifically referencing the “Mining Law of 1872” were introduced during the 117th Congress, but most, with the exception of the bicameral Clean Energy Minerals Reform Act of 2022, do not seek to reform or repeal the Mining Law’s location provisions.<sup>116</sup> Four of these bills are surveyed below.

#### 1. American Critical Minerals Independence Act of 2021 (Rep. Waltz, R-FL)

The American Critical Minerals Independence Act of 2021 would “promote the domestic exploration, research, development, and processing of critical minerals to ensure the economic and national security of the United States.”<sup>117</sup> The bill would create a “Critical Minerals Subcommittee” of the National Science and Technology Council to coordinate federal efforts to ensure a secure and reliable supply of critical minerals, and it would direct the National

<sup>112</sup> NEV. DEPT. OF TAX’N, 2021–2022 NET PROCEEDS OF MINERALS BULLETIN 10 (2022), [https://tax.nv.gov/LocalGovt/PolicyPub/ArchiveFiles/Net\\_Proceeds\\_of\\_Minerals/](https://tax.nv.gov/LocalGovt/PolicyPub/ArchiveFiles/Net_Proceeds_of_Minerals/) [<https://perma.cc/G7CG-9Z9Q>].

<sup>113</sup> *Id.* at 39.

<sup>114</sup> See Kalen, *supra* note 28, at 11015–18 (reviewing the earliest attempts at reforming the Mining Law, from a Public Land Commission report in the 1880s to the Paley Commission in the 1950s).

<sup>115</sup> Search Results, U.S. CONGRESS, <https://www.congress.gov/> [<https://perma.cc/TX5A-RWVR>] (following link, then searching field for “critical mineral,” filtering for the 117th Congress, and filtering for only “Introduced (Bills and Resolutions)”); *id.* (following link, then searching field for “critical mineral,” filtering for the 116th Congress, and filtering for only “Introduced (Bills and Resolutions)”). For context, there were only three bills mentioning “critical mineral” during the 115th Congress (2017–2018). *Id.* (following link, then searching field for “critical mineral,” filtering for the 115th Congress, and filtering for only “Introduced (Bills and Resolutions)”).

<sup>116</sup> *Id.* (following link, then searching field for “Mining Law of 1872,” filtering for the 117th Congress, and filtering for only “Introduced (Bills and Resolutions)”); H.R. 7580, 117th Cong. § 101(a) (2022); S. 4083, 117th Cong. § 307(1) (2022).

<sup>117</sup> H.R. 2637, 117th Cong. (2021).

Science Foundation to award grants to support research on critical-mineral mining strategies and technologies.<sup>118</sup>

Most importantly, the legislation would require federal agencies to coordinate permitting efforts, limit the scope of NEPA review when the law applies to the issuance of any mineral exploration or mine permit relating to a critical-mineral project, and establish maximum permitting timelines for EAs (eighteen months) and EISs (twenty-four months) for critical-mineral projects on federal land.<sup>119</sup> Lastly, the bill would require congressional approval for the Secretary of the Interior to declare a moratorium on issuing leases, claims, or permits on federal lands or to withdraw certain federal lands from entry under the Mining Law.<sup>120</sup>

2. *National Strategic and Critical Minerals Production Act of 2021 (Rep. Amodei, R-NV)*

Representative Amodei's National Strategic and Critical Minerals Production Act of 2021 would require the Secretary of the Interior and the Secretary of Agriculture to promote the development of domestic sources of "strategic and critical minerals," or minerals necessary for the national defense, energy infrastructure, domestic manufacturing, and the economic security of the United States.<sup>121</sup> The bill would require federal agencies engaged in NEPA review of a mineral exploration or mine permit to minimize delays, and would establish a maximum timeline of thirty months for completion of the permitting process.<sup>122</sup> The bill would require the lead federal agency in a NEPA review to defer to the baseline data, analyses, and reviews performed by state agencies with jurisdiction over the proposed project.<sup>123</sup>

3. *Energy Infrastructure Act (Sen. Manchin, D-WV)*

The Energy Infrastructure Act is a comprehensive piece of legislation addressing, among other things, the nation's energy infrastructure.<sup>124</sup> Principally, the bill would require the Secretary of the Interior and the Secretary of Agriculture to complete federal permitting for critical-minerals projects more expediently by establishing and adhering to timelines, performance goals, and engaging in early and active consultation with agencies, sponsors, and

<sup>118</sup> *Id.* §§ 101, 102; *see* Energy Infrastructure Act, S. 2377, 117th Cong. § 2010 (2021).

<sup>119</sup> H.R. 2637, 117th Cong. § 201 (2021); *see also* Accessing America's Critical Minerals Act of 2021, H.R. 2604, 117th Cong. (2021); S. 1352, 117th Cong. (2021).

<sup>120</sup> H.R. 2637, 117th Cong. § 204 (2021); *see* Ensuring Access to Domestic Mineral Production Act, H.R. 2176, 117th Cong. §§ 2, 4 (2021); Saving America's Mines Act, H.R. 488, 117th Cong. § 2(b) (2021).

<sup>121</sup> *See generally* H.R. 3240, 117th Cong. § 4 (2021).

<sup>122</sup> *Id.* § 5.

<sup>123</sup> *Id.*

<sup>124</sup> *See generally* S. 2377, 117th Cong. (2021).

stakeholders.<sup>125</sup> Also, the bill would fund research, development, and demonstration projects to advance critical-minerals mining, recycling, and reclamation strategies, including reuse and recycling of critical minerals from advanced batteries.<sup>126</sup> Finally, the bill would require the Energy Information Administration to develop a plan for the modeling and forecasting of demand for energy technologies that use critical minerals.<sup>127</sup>

#### 4. *Clean Energy Minerals Reform Act of 2022 (Rep. Grijalva, D-AZ)*

The Clean Energy Minerals Reform Act of 2022 would repeal the Mining Law and impose a federal leasing system for all hardrock minerals.<sup>128</sup> New mine operations would be subject to an exorbitant 12.5 percent royalty on the gross value of production of hardrock minerals, mineral concentrates, or products derived from hardrock minerals.<sup>129</sup> Existing mine operations that are actively producing hardrock minerals in commercial quantities before the date of enactment would be subject to an 8 percent royalty on the gross value of production.<sup>130</sup> While the bill would authorize the Secretary of the Interior to reduce the royalty rate to encourage exploration and development of critical minerals, the rate could not be lower than 6.25 percent—effectively, staunching any exploration and development from the outset.<sup>131</sup> Leases would be valid for “a period of 20 years, with the right to renew for successive periods of 10 years if hardrock minerals are being produced in commercial quantities under the lease.”<sup>132</sup>

Additionally, the Clean Energy Minerals Reform Act of 2022 would create a statutory federal exploration and operation permitting program, with an applicable federal “bad actors” provision, and would require reclamation plans and financial assurances.<sup>133</sup> The bill would forbid the issuance of permits or leases for mining activities that would impair the land or resources of designated “special places” (e.g., national parks, conservation areas, or sacred sites) or that would result in undue degradation to a “special characteristic” of the land, such as a significant water resource or endangered species habitat.<sup>134</sup> The bill would also require federal agencies to engage in meaningful and timely consultation with Indian Tribes and Tribal officials before permitting mining activity that might impact Tribes.<sup>135</sup>

<sup>125</sup> *Id.* § 2006.

<sup>126</sup> *Id.* §§ 2006, 2010.

<sup>127</sup> *Id.* § 4105.

<sup>128</sup> *See generally* H.R. 7580, 117th Cong. (2022).

<sup>129</sup> *Id.* §§ 103, 107.

<sup>130</sup> *Id.* § 107.

<sup>131</sup> *Id.* § 103.

<sup>132</sup> *Id.*

<sup>133</sup> *Id.* §§ 303–307.

<sup>134</sup> H.R. 7580, 117th Cong. §§ 111–112 (2022).

<sup>135</sup> *Id.* § 201.



*B. “Common Sense” Updates to the Mining Law of 1872*

The implementation of climate change mitigation and adaptation systems, including a comprehensive energy system transition, depends upon “the capacity and effectiveness of governance and decision-making processes.”<sup>136</sup> In other words, avoiding the potential threat of climate change necessitates “political commitment and follow-through, institutional frameworks, policies and instruments with clear goals and priorities, enhanced knowledge on impacts and solutions, mobilization of and access to adequate financial resources, monitoring and evaluation, and inclusive governance processes.”<sup>137</sup> These principles must steer the debate surrounding a domestic critical-minerals policy and, in particular, reformation of the Mining Law. The following recommendations for reforming the Mining Law and developing a comprehensive critical-minerals policy consider these principles, as well as the suitability of existing legal and regulatory frameworks.<sup>138</sup>

*1. Streamline the NEPA Process by Encouraging Expediency and Collaboration*

Permitting requirements in major mineral-producing countries, like Australia and Canada, are as stringent as the NEPA review process.<sup>139</sup> However, the process in both Australia and Canada is remarkably more expedient than those observed in the United States.<sup>140</sup> As such, the federal permitting process is an obstacle to domestic mineral production. Reforming the permitting review process to be more expedient, efficient, and collaborative will guarantee a robust domestic critical-minerals policy to address climate change.

Section 2006 of the Energy Infrastructure Act sets forth a programmatic approach to reforming the quality and timeliness of NEPA review with respect to the consideration of critical-minerals projects.<sup>141</sup> The legislation recommends, *inter alia*: establishing and adhering to timelines and schedules; establishing clear, quantifiable, and temporal permitting performance goals; and en-

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<sup>136</sup> IPCC, *supra* note 10, at SPM-20.

<sup>137</sup> *Id.* at SPM-27.

<sup>138</sup> While this Note focuses primarily on newly mined sources of critical minerals, research and development of critical-mineral recycling and processing must be a part of a comprehensive critical-minerals policy. *See* S. 2377, 117th Cong. §§ 2006, 2010 (2021). Critical-minerals processing capacity is yet another important feature of a comprehensive critical-minerals policy. Additionally, responsible mining of non-domestic sources of critical minerals must be promoted through trade deals and Energy Resource Governance Initiatives (“EGRI”). *See* U.S. DEP’T OF STATE, ENERGY RESOURCE GOVERNANCE INITIATIVE (EGRI) (2020), [https://www.state.gov/wp-content/uploads/2020/12/Marketing-Materials\\_ERGI-One-Page\\_2.20.20.pdf](https://www.state.gov/wp-content/uploads/2020/12/Marketing-Materials_ERGI-One-Page_2.20.20.pdf) [<https://perma.cc/RWJ6-5TFS>].

<sup>139</sup> *See* SNL METALS & MINING, *supra* note 59, at 28.

<sup>140</sup> *Id.*

<sup>141</sup> S. 2377, 117th Cong. § 2006 (2021).

gaging in early collaboration among agencies, project sponsors, and stakeholders, especially Tribes and historically disadvantaged groups.<sup>142</sup>

Ultimately, an interagency team of officials from the BLM, Forest Service, and other federal agencies with a major role in the federal permitting process must study the major shortfalls in the federal permitting process. The Energy Infrastructure Act would require these agencies to submit a report to Congress, within one year of its enactment, identifying actionable regulatory or legislative proposals that would increase the timeliness of permitting activities.<sup>143</sup> Reforming NEPA will not only align the United States with other major mineral-producing countries, in terms of permitting expediency, but will promote investment in a strong domestic critical-mineral mining sector—creating jobs and generating tax revenues.

## 2. *Codify Minimum Permitting and Reclamation Standards for Mining Activity on Federal Lands*

The BLM, Forest Service, and many states have developed strong permitting and reclamation standards for hardrock mine operations under their jurisdiction. Yet, there is no comprehensive federal statute that provides clear standards for permitting and reclamation for hardrock mining. Congress could pass federal standards for hardrock mining that would govern exploration, operation, closure, and reclamation. Of course, these standards, like many other federal environmental quality laws, should embrace cooperative federalism principles by allowing states to exceed the minimum criteria set forth in federal law and respecting the role of states in mining regulation.<sup>144</sup>

Similarly, while the critical minerals of today may not be critical tomorrow, as advancements in energy production and storage technology continue, concern over what is “critical” must not delay our response to climate change.<sup>145</sup> An elastic framework that evolves with the Geological Survey’s quinquennial revision of its Critical Minerals List is possible. Accordingly, federal standards for permitting and reclamation must be stringent enough to ensure responsible mining while being flexible enough to allow BLM and Forest

<sup>142</sup> *Id.*; see also DEP’T OF INTERIOR, BIDEN-HARRIS ADMINISTRATION FUNDAMENTAL PRINCIPLES FOR DOMESTIC MINING REFORM (2022), <https://www.doi.gov/sites/doi.gov/files/biden-harris-administration-fundamental-principles-for-domestic-mining-reform.pdf> [<https://perma.cc/65ET-Z7LN>].

<sup>143</sup> S. 2377, 117th Cong. § 2006 (2021).

<sup>144</sup> See Letter from Alexandra Dapolito Dunn, Exec. Dir. & Gen. Couns., Evt’ Council of the States, to Anna Krueger, Economist, EPA (Aug. 17, 2016) (“[S]tates have . . . [taken] responsibility for 96% of the primary [federal] environmental programs which can be delegated to the states. . .”).

<sup>145</sup> See Kalen, *supra* note 28, at 11019 (expressing concern “that today’s critical minerals . . . will remain ‘critical’ over the next several years”).

Service to tailor regulations that accommodate the specific needs of different minerals and mining processes.<sup>146</sup>

### 3. Retain the Mining Law's Claim System

A leasing system for hardrock mining would be disastrous to our domestic mining industry. For starters, hastily adopting a leasing system ignores the economic realities of hardrock mining.<sup>147</sup> A leasing system, with an exorbitant royalty on the gross production of minerals, would add an unjustifiable expense to an already cost-sensitive process, disincentivizing exploration and development of future critical-minerals projects. Additionally, tax revenues collected from mining activities on public lands should be collected by, and invested in, the communities most affected by those operations—in the states in which mining operations are located. The states have 150 years of experience in developing mining-tax policy, and their mining-tax revenues contribute to vital social programs and infrastructure. For instance, in 2021, the Nevada Legislature dedicated all mining-tax revenues to support the operation of public schools.<sup>148</sup>

Second, displacing the Mining Law's longstanding claim system with a leasing system would eliminate the security of tenure that promotes mining activity on federal public lands. For instance, the Clean Energy Minerals Reform Act of 2022, discussed above, would impose artificial (i.e., they lack a basis in the practical realities of modern mining) duration-of-use and acreage limitations on both prospecting and mining licenses.<sup>149</sup> But artificial limitations on title to mineral resources incentivizes, rather than discourages, rapid exploitation of the resource at the expense of the residual title holder (i.e., the federal government) and the environment.<sup>150</sup> Secure title to mineral resources, in contrast, incentivizes long-term management rather than wasteful or environmentally destructive strategies.<sup>151</sup> Without the security of tenure offered under the Mining Law, investment in exploration and development of domestic mineral deposits—including the “critical” minerals imperative to a clean energy transition—will be stifled.

<sup>146</sup> For example, certain lithium mineralogies may be extracted using traditional hardrock mining methods, like open-pit or underground mining. Nat. Env't Rsch. Council, *Lithium*, at 9 (June 2016), [https://www2.bgs.ac.uk/mineralsuk/download/mineralProfiles/lithium\\_profile.pdf](https://www2.bgs.ac.uk/mineralsuk/download/mineralProfiles/lithium_profile.pdf) [<https://perma.cc/4RD5-S7VT>]. Lithium may also be extracted from geothermal brines stored in expansive brine evaporation ponds. *Id.* at 11–14. One-size-fits-all laws and regulations would fail to address the distinct requirements of these processes.

<sup>147</sup> See *supra* Section I.B.

<sup>148</sup> See Assemb. B. 495, 2021 Leg., 81st Sess. §§ 45, 51, 63 (Nev. 2021) (“[The State Education Fund] become[s] effective on July 1, 2023.”).

<sup>149</sup> H.R. 7580, 117th Cong. § 103 (2022) (limiting prospecting licenses to 2,560 acres; limiting leaseholds to an aggregate of no more than 20,480 acres; limiting leaseholds to twenty years).

<sup>150</sup> Morriss et al., *supra* note 43, at 771.

<sup>151</sup> *Id.*

Third, as domestic mining decreases under a leasing system, the nation would be further exposed to the volatility of international commodities markets and the geopolitics of import reliance.<sup>152</sup> In this regard, a leasing system would undermine the Biden Administration's ambitious goal to increase domestic critical-minerals production and to reduce economy-wide greenhouse gas emissions to 40 percent below 2005 levels by 2030.<sup>153</sup>

Although it is outside the scope of this Note, it is important to identify that alteration of rights under the existing claim system might implicate the Fifth Amendment's Takings Clause.<sup>154</sup> To avoid constitutional takings and the attendant risk of protracted litigation, a leasing system for hardrock minerals must "grandfather in" existing mining claims.<sup>155</sup>

#### 4. Consider a Modest Royalty on Net Production

Any royalty on hardrock mineral production—gross<sup>156</sup> or net<sup>157</sup>—will affect the feasibility of mine projects and affect our nation's ability to produce critical minerals domestically. Gross royalties, however, are especially problematic. First, gross royalties are a tax on the sum of investments made to produce the mineral, rather than the mineral itself. The cost to produce a given mineral varies widely, as several factors—like geologic complexity, mining

<sup>152</sup> Presently, the nation's net import reliance on several critical hardrock minerals is greater than 50 percent. See Letter from Anne-Marie Fennell, Director of Nat. Res. & Env't, U.S. Gov't Accountability Off., to Tom Udall, Ranking Member of Subcomm. on Interior, Env't, & Related Agencies, U.S. Senate (Apr. 30, 2019), <https://www.gao.gov/assets/gao-19-434r.pdf> [<https://perma.cc/B5YD-X8E5>].

<sup>153</sup> See Infrastructure Investment and Jobs Act, H.R. 3684, 117th Cong. § 40206 (2021) ("Critical Minerals Supply Chains and Reliability"); U.S. DEP'T OF ENERGY, OFFICE OF POL'Y, THE INFLATION REDUCTION ACT DRIVES SIGNIFICANT EMISSIONS REDUCTIONS AND POSITIONS AMERICA TO REACH OUR CLIMATE GOALS (2022), [https://www.energy.gov/sites/default/files/2022-08/8.18%20InflationReductionAct\\_Factsheet\\_Final.pdf](https://www.energy.gov/sites/default/files/2022-08/8.18%20InflationReductionAct_Factsheet_Final.pdf) [<https://perma.cc/EZM2-X5FQ>].

<sup>154</sup> U.S. CONST. amend. V ("nor shall private property be taken for public use, without just compensation"); see CAROLYN L. MCINTOSH & JOSHUA B. COOK, AMERICAN EXPLORATION & MINING ASS'N, MINING LAW FIFTH AMENDMENT TAKINGS ANALYSIS 2 (Stephen Alfers ed., 2021), <https://docs.house.gov/meetings/II/II06/20210727/113958/HHRG-117-II06-20210727-SD007.pdf> [<https://perma.cc/KK5K-NQ9G>].

<sup>155</sup> MCINTOSH & COOK, *supra* note 154, at 15.

<sup>156</sup> A "gross" royalty is "typically assessed as a percentage of the value of the mineral extracted" on the basis of a reference price or the actual sales price, and does not allow for deductions, such as operating and processing costs. Letter from Susan D. Sawtelle, *supra* note 101.

<sup>157</sup> Net royalties are determined in a variety of ways, based on the particular deductions allowed. Net proceeds royalties "are assessed as a percentage of the net proceeds (or profit) of the sale of the mineral with deductions for various mining costs." *Id.* Net smelter returns "are assessed as a percentage of the value of the mineral" with deductions allowed for costs of transporting and processing, but not extraction costs. See *id.*

method,<sup>158</sup> processing requirements, and transportation to market costs—are different at every mine.<sup>159</sup> Second, gross royalties do not accommodate fluctuations in market prices and, unlike net royalties, are assessed against a mine operator even when they are operating at a loss or have yet to reach economic ores, increasing the likelihood of premature closure or stoppage. Finally, imposition of an exorbitant gross royalty ignores the extensive tax burden already imposed on domestic mine operators.<sup>160</sup> The current effective tax rate for mining operations in the United States is between 40 to 50 percent, which is similar to other major mineral-producing countries.<sup>161</sup>

Net royalties, by contrast, accommodate the differing nature of minerals and mining methods by allowing deduction of certain costs before assessment.<sup>162</sup> By recognizing the variability of mining economics, net royalties are actually an equitable revenue device, as royalties are assessed against profitable, mineral-producing mines, while new operations and mines that are not profitable due to unfavorable market conditions are not taxed. Furthermore, net royalties reduce the likelihood of boom-and-bust cycles and premature mine closure by sheltering mine operations from unfavorable market prices.

Accordingly, the United States could consider adopting a modest royalty, or a tax similar to a royalty, on the net production of minerals. Major mining countries, like Australia, Canada, and Chile, all fix modest royalty rates according to the net market or net revenue of the minerals produced.<sup>163</sup> Eleven western states also collect net royalties, or taxes similar to royalties, for hardrock mining.<sup>164</sup> These jurisdictions should serve as exemplary models for setting rates and deciding what costs are suitable for deductions, should such a royalty be considered.

#### CONCLUSION

The evidence is undeniable: our climate is changing. Yet, despite record-breaking temperatures and extraordinary weather events happening with greater frequency, politicians seek to cast out the “lord of yesterday”—the sesquicentennial Mining Law—from atop its throne.<sup>165</sup> But our present need for an ener-

<sup>158</sup> See 43 C.F.R. § 3504.21 (2022) (setting minimum rates for phosphate, sodium, potassium, sulphur, and asphalt); see also *id.* § 3473.3-2 (2022) (setting an 8 percent royalty on gross proceeds of federal coal leases for underground coal mines but 12.5 percent for surface coal mines).

<sup>159</sup> See generally U.S. GOV’T ACCOUNTABILITY OFF., *supra* note 57.

<sup>160</sup> “In 2019, domestic mining generated about \$18 million in taxes.” Rich Nolan, *New Taxes and Fees Will Set Back U.S. Mining*, NAT’L MINING ASS’N (Sept. 29, 2021), <https://nma.org/2021/09/29/taxes-set-back-us-mining/> [<https://perma.cc/JFW8-SURB>].

<sup>161</sup> *Id.*; see U.S. GOV’T ACCOUNTABILITY OFF., *supra* note 57, at 25 (comparing corporate income tax rates of Australia, Canada, and Chile).

<sup>162</sup> Letter from Susan D. Sawtelle, *supra* note 101.

<sup>163</sup> U.S. GOV’T ACCOUNTABILITY OFF., *supra* note 57, at 25–26.

<sup>164</sup> See *id.* at 26.

<sup>165</sup> WILKINSON, *supra* note 30, at 20.

gy system transition requires our nation to have a steady supply of critical minerals to power the electric vehicles and renewable energy technologies that will ween us from fossil-fuel dependency.<sup>166</sup> And, with mounting pressure from geopolitical rivals, the likely source of those minerals is from domestic mines.

Yet, Mining Law critics assert we face a Hobson's choice—to “accede to the geopolitics of import reliance” or to achieve “mineral independence” at the expense of our public lands while simultaneously reanimating their decades long crusade to repeal the Mining Law.<sup>167</sup> The hasty imposition of a leasing system, however, will fail to address our changing climate. The claim system will continue to promote domestic exploration for, and production of, critical minerals under the Mining Law's three preeminent features: free access, self-initiation, and security of tenure. In addition to these enduring features, “common sense” updates to our nation's mining laws (such as permitting expediency and codifying minimum reclamation standards) can both safeguard our public lands and furnish our supply chains with a domestic source of critical minerals.

In short, while a 150-year-old law might seem like a suitable candidate for change, its continued existence may be the *only* solution to address our changing climate.

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<sup>166</sup> IEA, *supra* note 16, at 5.

<sup>167</sup> Kalen, *supra* note 28, at 11008.