PLAYING THE LONG GAME: EXPEDITING PERMITTING WITHOUT COMPROMISING PROTECTIONS

by Jamie Pleune

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SUMMARY

The Biden Administration's efforts to promote clean energy have prompted calls for permit reform. A clean energy economy demands a global increase in mineral production, and some suggest environmental standards must be loosened. This premise fails to distinguish among causes of delay in the permitting process, and increased demand for minerals should not overshadow the productive purposes served by permitting. At the same time, there are opportunities to improve permitting without compromising health and safety standards. This Article recommends three actions to expedite mine permit processing times without sacrificing analytical rigor: avoid delay caused by insufficient agency capacity; reduce delay by making the legal structure, permitting requirements, and information more transparent and publicly available; and use the National Environmental Policy Act process to avoid delay caused by uncoordinated interagency requirements. These tools can promote efficiency without eliminating rigor and without waiting for statutory or regulatory reforms.

"We are going to take the most aggressive action ever, ever, ever to confront the climate crisis and increase our energy security, ever in the whole world . . . and that is not hyperbole, that's a fact," President Joe Biden told a crowd of solar industry players gathered on the White House lawn to celebrate the one-month anniversary of the Inflation Reduction Act (IRA).[1] Earlier that week, he issued an Executive Order reaffirming the national climate goal to achieve a carbon pollution-free energy sector by 2035.[2]

These lofty goals have material implications (pun intended). Clean energy technologies utilize more minerals than their fossil fuel-based counterparts.[3] According to a recent report from the International Energy Association, "[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."[4] Under a two-degree scenario, production of graphite, lithium, and cobalt will need to be increased by more than 450% by 2050 from 2018 levels to meet demand from energy storage technologies.[5]

Other base materials, like aluminum and copper, have a smaller percentage increase, but the absolute production figures are significant.[6] For example, over the past 5,000 years, an estimated 550 million tons of copper have been produced. The world will need approximately the same amount in the next 25 years to meet global demand.[7] This demand has led to the unavoidable conclusion that clean energy means more mineral production, which will involve new mines, mine expansions, innovative recycling techniques, and imaginative reuse technologies.

1. *Remarks by President Biden on the Passage of H.R. 5376, the Inflation Reduction Act of 2022*, White House (Sept. 13, 2022), https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/09/13/remarks-by-president-biden-on-the-passage-of-h-r-5376-the-inflation-reduction-act-of-2022/. *See also* Michael Doyle & Robin Bravender, *Biden Touts Climate Bill at Big White House "Celebration,"* E&E News (Sept. 13, 2022), https://www.eenews.net/articles/biden-touts-climate-bill-at-big-white-house-celebration/; Jules Scully, *US Solar Industry Players Celebrate Inflation Reduction Act at White House*, PV Tech (Sept. 14, 2022), https://www.pv-tech.org/us-solar-industry-players-celebrate-inflation-reduction-act-at-white-house/.
2. *Executive Order on the Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022*, White House (Sept. 12, 2022), https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/12/executive-order-on-the-implementation-of-the-energy-and-infrastructure-provisions-of-the-inflation-reduction-act-of-2022/.
3. Kirsten Hund et al., World Bank, Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition 11 (2020).
4. International Energy Association, The Role of Critical Minerals in Clean Energy Transitions 5 (rev. 2022).
5. Hund et al., *supra* note 3, at 11.
6. *Id.*
7. World Bank, *Infographic: Climate-Smart Mining: Minerals for Climate Action*, https://www.worldbank.org/en/news/infographic/2019/02/26/climate-smart-mining (last visited Sept. 22, 2022).

The haste to build new domestic mines in response to these demands has stoked calls for permit reform.[8] Sen. Joe Manchin (D-W. Va.) made "permitting reform" a condition of his support of the IRA,[9] and President Biden recently affirmed his commitment to the deal.[10] As these efforts progress, some fear that permit reform means quick approval of each permit application and a loosening of environmental standards in the name of expediting mineral production.[11]

Society faces an unavoidable conundrum.[12] Green energy demands more minerals, which ultimately means building new mines and expanding existing mines throughout the world. But not every mine permit should be approved as submitted. Basic environmental, health, and safety standards should still be enforced. The permit process necessarily involves multiple authorities, each enforcing their applicable standards. Rigorous permit review identifies opportunities to eliminate, reduce, or mitigate risk—whether that risk threatens workers, communities, or the environment (often all three). The increased demand for minerals should not overshadow the productive purposes served by permitting.

Accepting unfettered environmental degradation in exchange for clean energy would achieve short-term gains in exchange for long-term pain. The unrelenting challenges caused by climate change provide an almost daily reminder that downplaying environmental risks does not make them go away.

There are opportunities to improve permitting efficiency without compromising important health and safety standards. This Article makes three recommendations, each of which can be implemented without new regulations or legislation. To begin, Part I provides brief background on the federal government's recent focus on critical mineral supply and production issues. Part II distinguishes between productive and unproductive causes of delay in the permitting process. Part III identifies causes of unproductive delay in the existing hard-rock mine permitting process, by relying upon investigative studies and empirical evidence.

Part IV lays out my three practical recommendations to reduce or eliminate unproductive delay. Although these recommendations do not rely on regulatory or statutory changes, they do require funding and support from the U.S. Congress, as well as cooperation from state, tribal, and local governments. Each of these levels of government should work together to strengthen and improve the government's execution of the critical mineral permitting process by focusing on the real causes of delay. This approach is one way to expedite the transition to clean energy without sacrificing the long game.

I. Recent Federal Attention on Critical Minerals and Permitting Reform

Whether the objective is national security or transitioning to green energy, securing a stable supply of critical minerals has received focused attention from the White House during the past several years.[13] President Donald Trump focused on expanding domestic mineral production. In December 2017, he issued Executive Order No. 13817, A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals.[14] This Order blamed "permitting delays" and "the potential for protracted litigation regarding permits" as limitations to developing mineral deposits across the United States.[15]

The Order committed to "streamlining leasing and permitting processes to expedite exploration, production, processing, reprocessing, recycling, and domestic refining of critical minerals."[16] A report drafted in response to this Order explicitly blamed federal permitting for reduced mineral production in the United States: "Unfortunately, Federal permitting and land management policies have inhibited access to and the development of domestic critical minerals, which has contributed to increased reliance on foreign sources of minerals."[17]

8. Press Release, Senate Committee on Energy and Natural Resources, Republican News: Barrasso Calls on Biden Administration to Follow the Law & Streamline Critical Mineral Mine Permitting (May 19, 2022), https://www.energy.senate.gov/2022/5/barrasso-calls-on-biden-administration-to-follow-the-law-streamline-critical-mineral-mine-permitting; *see also* Letter from Sen. John Barrasso, Ranking Member, Senate Committee on Energy and Natural Resources, to Secretary Debra Haaland, U.S. Department of the Interior, and Secretary Thomas Vilsack, U.S. Department of Agriculture (May 18, 2022), https://www.energy.senate.gov/services/files/3C713FEC-CADD-4A28-A9A3-42247D5026C2.
9. Lisa Friedman, *Manchin Won a Pledge From Democrats to Finish a Contested Pipeline*, N.Y. Times (Aug. 1, 2022), https://www.nytimes.com/2022/08/01/climate/manchin-climate-mountain-valley-pipeline.html.
10. Jael Holzman, *Biden "Committed" to Permitting Deal With Manchin*, E&E News (Sept. 12, 2022), https://www.eenews.net/articles/biden-committed-to-permitting-deal-with-manchin/.
11. Rep. Raul M. Grijalva, Opinion, *Watch Out! Here Comes the Climate Deal's Other Shoe*, Newsweek (Aug. 17, 2022), https://www.newsweek.com/watch-out-here-comes-climate-deals-other-shoe-opinion-1734271. *But see* Jael Holzman, *Manchin Permitting Deal Offers Mixed Bag for Mining*, E&E News (Aug. 29, 2022), https://www.eenews.net/articles/manchin-permitting-deal-offers-mixed-bag-for-mining/.
12. David Blackmon, *Manchin's Permitting Side Deal Highlights the Energy Transition's Central Conundrum*, Forbes (Aug. 22, 2022), https://www.forbes.com/sites/davidblackmon/2022/08/22/manchins-permitting-side-deal-highlights-the-energy-transitions-central-conundrum/?sh=3ab51fcd7e05.
13. A "critical mineral" was defined by Executive Order No. 13817 to be (1) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (2) the supply chain of which is vulnerable to disruption, and (3) that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for the U.S. economy or national security. Exec. Order No. 13817, A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, 82 Fed. Reg. 60835 (Dec. 20, 2017). The Secretary of the Interior, in coordination with the Secretary of Defense and the heads of other relevant agencies, was tasked with publishing a list of critical minerals in the *Federal Register*. *Id*.

    The first list, finalized in May 2018, identified 35 minerals or mineral material groups. Those included aluminum (bauxite), antimony, arsenic, barite, beryllium, bismuth, cesium, chromium, cobalt, fluorspar, gallium, germanium, graphite (natural), hafnium, helium, indium, lithium, magnesium, manganese, niobium, platinum group metals, potash, the rare earth elements group, rhenium, rubidium, scandium, strontium, tantalum, tellurium, tin, titanium, tungsten, uranium, vanadium, and zirconium. Final List of Critical Minerals 2018, 83 Fed. Reg. 23295 (May 18, 2018). That list was revised in 2022 and expanded to include 50 minerals. Final List of Critical Minerals 2022, 87 Fed. Reg. 10381 (Feb. 24, 2022).
14. Exec. Order No. 13817, *supra* note 13.
15. *Id*. §1, at 60835.
16. *Id*. §3(d), at 60836.
17. U.S. Department of Commerce, A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals 37 (2019).

A few years later, President Trump issued Executive Order No. 13953, declaring a national emergency caused by "undue reliance on critical minerals . . . from foreign adversaries."[18] That Order also announced that the United States "must broadly enhance its mining and processing capacity, including for minerals not identified as critical minerals and not included within the national emergency" declaration.[19] It instructed the Secretaries of the Interior, Agriculture, Commerce, and Army and the Administrator of the U.S. Environmental Protection Agency (EPA) to "use all available authorities to accelerate the issuance of permits and the completion of projects in connection with expanding and protecting the domestic supply chain for minerals."[20]

When President Biden took office, he shifted the focus from domestic production to ensuring a secure supply chain for a clean energy economy. For example, he issued Executive Order No. 14017 on strengthening America's supply chains.[21] With respect to critical minerals, the Order instructed the Secretary of Defense to issue a report identifying risks in the supply chain for critical minerals, strategic materials,[22] and rare earth elements and to describe and update work done pursuant to Executive Order No. 13953.[23]

The report, issued on June 6, 2021,[24] recognized that the transition to green technology would intensify the need for strategic and critical minerals.[25] It also provided a more nuanced view of permit reform. It acknowledged the historic environmental, safety, and health risks in the mining industry. "Given the environmental and labor legacy of mining, increased mineral production and reclamation activities must be held to modern environmental standards, require best practice labor conditions, and consultation with affected communities, including Tribal Nations in government-to-government consultation."[26]

One does not have to look far to find the legacy of past mining practices. According to the U.S. Government Accountability Office (GAO), federal agency databases contain at least 140,652 identified abandoned hard-rock mine features, of which 60% pose a physical or environmental threat.[27] Additionally, officials within 13 western states identified 246,000 abandoned hard-rock mine features, of which 115,000 pose a physical threat and 11,000 pose an environmental threat.[28] In 2019, the Associated Press examined public records related to mining sites under federal oversight, some of which contained multiple individual mines.[29]

The records showed that, on average, more than 50 million gallons of contaminated wastewater streams daily from these sites, often running untreated into nearby groundwater, rivers, or ponds.[30] In addition to this relentless drip of water pollution, some mines also pose threats of catastrophic failure, like the accidental release of three million gallons of mustard-colored mine sludge from the Gold King Mine in Colorado.[31] According to GAO, between 2008 and 2017, the federal government spent an average of $287 million annually to address physical safety and environmental hazards at abandoned hard-rock mines.[32] Federal officials estimated that it would cost billions more to address these mines in the future.[33]

On November 15, 2021, Congress passed the Infrastructure Investment and Jobs Act (IIJA).[34] The Act included several provisions focused on critical minerals and investments to jump-start a domestic clean energy supply.[35] Section 40206, Critical Minerals Supply Chains and Reliability, directs the Secretaries of the Interior and Agriculture to submit a report to Congress identifying "additional measures, including regulatory and legislative proposals, if appropriate, that would increase the timeliness of permitting activities for the exploration and development of domestic critical minerals."[36] In preparation for this report, the U.S. Department of the Interior issued a request for information seeking, among other things, recommendations on "opportunities to reduce time, cost, and risk of permitting without compromising . . . strong environmental and consultation benchmarks."[37]

Some analysts have suggested that there is an inherent tension between stringent environmental standards

18. Exec. Order No. 13953, Addressing the Threat to the Domestic Supply Chain From Reliance on Critical Minerals From Foreign Adversaries and Supporting the Domestic Mining and Processing Industries, 85 Fed. Reg. 62539, 62540 (Oct. 5, 2020).
19. *Id*.
20. *Id*. §5, at 62543.
21. Exec. Order No. 14017, America's Supply Chains, 86 Fed. Reg. 11849 (Feb. 24, 2021).
22. The term "strategic and critical materials" is defined by the Strategic and Critical Materials Stock Piling Revision Act of 1979 as "materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need." 50 U.S.C. §98h-3(1).
23. Exec. Order No. 14017, *supra* note 21, at §3(iii).
24. White House, Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews Under Executive Order 14017 (2021) (including report by U.S. Department of Defense).
25. *Id*. at 152.
26. *Id*. at 171.
27. GAO, Abandoned Hardrock Mines: Information on Number of Mines, Expenditures, and Factors That Limit Efforts to Address Hazards 16 (2020) (GAO-20-238) [hereinafter GAO, Abandoned Hardrock Mines].
28. *Id*. at 20-21.
29. Matthew Brown, *50 M Gallons of Polluted Water Pours Daily From US Mine Sites*, Associated Press (Feb. 20, 2019), https://apnews.com/article/sd-state-wire-nv-state-wire-north-america-mo-state-wire-in-state-wire-8158167fd9ab4cd8966e47a6dd6cbe96.
30. *Id*.
31. *Id*.; *see also* Brian Clark Howard, *5 Other Mines at Risk of Spilling Toxic Waste*, Nat'l Geographic (Aug. 14, 2015), https://www.nationalgeographic.com/history/article/150814-hardrock-mines-toxic-waste-pollution-colorado-mine-environment-gold-king-spill.
32. GAO, Abandoned Hardrock Mines, *supra* note 27, at 23.
33. *Id*. at 32.
34. H.R. 3684, Pub. L. No. 117-58 (2021).
35. Danny Broberg & John Jacobs, *Getting Serious About Critical Materials: The IIJA and Energy Act of 2020*, Bipartisan Pol'y Ctr. (Apr. 11, 2022), https://bipartisanpolicy.org/blog/getting-serious-about-critical-materials-the-iija-and-energy-act-of-2020/ (providing a table of critical mineral provisions in the IIJA).
36. H.R. 3684, Pub. L. No. 117-58, §40206 (2021).
37. Request for Information to Inform Interagency Working Group on Mining Regulations, Laws, and Permitting, 87 Fed. Reg. 18811 (Mar. 31, 2022).

and efficient permitting. For example, David Blackmon, a *Forbes* columnist, wryly opined, "the central feature in any bill designed to speed up federal permitting for energy projects will come down to a proposition to lessen environmental protections in order to . . . save the environment?"[38]

This *schadenfreude*-laced summary conflates two separate issues that permit reform proposals must address. The first is obvious. Can we improve efficiency, eliminate redundancy, and decrease the cost and time spent navigating the permit process? The answer to that question is yes. Moreover, achieving this result is feasible. Recent research shows that many NEPA analyses are completed efficiently.[39] Part III of this Article focuses on recommendations to make the existing permit system more efficient.

The second issue is more nuanced. Should some mine permit proposals be modified or denied because the risks (health, safety, or environmental) exceed the rewards? The answer to this question should also be yes. Permit reform should not eliminate the ability to say "no." This suggests that some delays may be productive. The next section explores this concept.

II. Distinguishing Between Productive and Unproductive Delays

Mining is dangerous. Permitting ensures that mines are built safely and that risks to mine workers, society, and the environment are reduced or mitigated as much as possible. Hard-rock mining involves enormous risk. Whether the ore deposit is accessed by surface (open pit) or underground mining, most mines require drilling, blasting, mucking (loading), and transporting (hauling).[40] As mining progresses, open pits are excavated on the surface and voids are created where the in-place ore was removed. Continued mining results in larger mines, along with growing waste dumps, heap leach piles, tailings ponds, and so on.[41] The ore removed from the earth must be crushed or ground into smaller particles, which are then subjected to various physical or chemical processes to separate the valuable minerals from the unwanted waste ore.[42]

Alternatively, metals may be extracted through a leaching process, such as a cyanide solution.[43] The waste minerals are routinely disposed of in a tailings pond. Although tailings dams, ponds, and leach pads should be carefully designed to high standards, the potential impacts resulting from release or discharge of tailings or leached rock can be devastating. For example, defective tailings ponds at the Buenavista del Cobre copper mine in Sonora, Mexico, released more than 10 million gallons of toxic chemicals into the Bacanuchi River, a tributary of the Sonora River. This 2014 event left approximately 25,000 people without clean water, ruining crops and contaminating the aquatic ecosystem with heavy metals.[44]

"A review of 14 copper porphyry mines in the U.S. (accounting for nearly 90% of U.S. production) found the mines were often associated with water pollution from acid mine drainage and accidental releases of toxic materials."[45] Tailings failures are "the most common source of mining accidents."[46] Additionally, some mining companies go out of business without reclaiming their sites. In 2012, there were 156 hard-rock mining Superfund sites in the United States.[47] The permitting process is designed to mitigate the safety, health, and environmental risks that are inherent to hard-rock mining.

Many critics of the permitting process cite controversial projects or permit denials as proof that the permitting system is broken.[48] Large projects with irreversible environmental consequences, like Pebble Mine, Twin Metals, PolyMet, and Resolution Copper, often face fierce opposition from people who will be affected by the project's negative consequences.[49] The delays faced by these projects are caused by a conflict in values. Pebble Mine in southwest Alaska presents an irreversible choice between copper and commercial fishing.[50] It is opposed by more than 80% of the Native Alaska population, as well as many commercial fishermen, because acid mine drainage threatens Bristol Bay, the world's largest sockeye salmon fishery.[51]

Twin Metals, outside of Ely, Minnesota, presents an irreversible choice between copper and drinking water protected by the Boundary Waters Canoe Area Wilderness.[52] It also threatens culturally important and treaty-protected wild rice waters, wetlands, and aquatic life.[53] These competing values have inspired dueling legislative overrides.[54] Nearby, the PolyMet mine faces opposition in part because the earthen upstream design it proposed for its tailings is the same design used for the Brumadinho dam in Brazil

38. Blackmon, *supra* note 12.
39. *See* John C. Ruple et al., *Evidence-Based Recommendations for Improving National Environmental Policy Act Implementation*, 46 Colum. J. Env't L. & Pol'y 273 (2022).
40. National Research Council, Hardrock Mining on Federal Lands 143 (1999).
41. *Id.*
42. *Id.* at 144.
43. *Id.*
44. *Id.* at 230.
45. Alexandra B. Klass & Allison J. Mitchell, *The Energy Transition and Mining: Reconciling the Growth of Renewable Energy With the Need for New Mineral Development*, 67 Rocky Mtn. Min. L. Inst. 13-1, at 17 (2021).
46. *Id.*
47. Brett A. Miller, *Embracing the Water-Energy Contradiction: The Pebble Mine Conflict and Regulatory Implications Associated With Renewable Energy's Dependence on Non-Renewable Copper*, 19 U. Denv. Water L. Rev. 213, 229 (2016).
48. Letter from Sen. John Barrasso, *supra* note 8:

> In the midst of these pro-domestic supply chain announcements, the Department of the Interior pursued an opposite course. It suspended the permit for the Ambler Road, which is essential to accessing and developing minerals in northwest Alaska. I need not mention last year's cancellation of Twin Metals' copper and nickel leases in Minnesota and suspension of Resolution Copper's environmental review. These cancellations, delays, and impending regulations will have a chilling effect on American mining at a time when our country can least afford it.

49. Klass & Mitchell, *supra* note 45, at 12-17 (describing each of these projects and concerns voiced by opponents to the projects).
50. Miller, *supra* note 47, at 229.
51. Klass & Mitchell, *supra* note 45, at 15.
52. *Id.* at 17.
53. *Id.* at 16.
54. Jennifer Bjorhus, *Dueling Mining Measures Float Twin Metals Future in Congress*, Star Trib. (Jan. 25, 2021), https://www.startribune.com/dueling-mining-measures-float-twin-metals-future-in-congress/600015013/.

that failed in 2019, killing 270 people and spilling 11.7 million cubic meters of toxic mud downstream.[55]

In Arizona, the Resolution Copper project proposes to build the largest and deepest mine in the United States using a mining technique called block caving.[56] This proposal threatens lands considered sacred by local tribes.[57]

The permitting delays faced by each of these projects are not caused by inefficiency. They are caused by legitimate disagreements, value judgments, the enforcement of environmental standards, the democratic process of public comment, and the right of communities to protect themselves against being forced to shoulder undue environmental degradation for the benefit of others.

Although frustrating for mine proponents and investors, some delays in permitting may be evidence that the process is working. The environmental analysis required during the permitting process may identify potential issues that would have otherwise escaped consideration, and drive a reassessment of options and impacts before an irretrievable commitment of resources occurs. Slower projects may reflect iterative changes to improve the proposed action or minimize impacts. Delays that mitigate safety and environmental risks or stop socially unacceptable projects may be inconvenient for investors, but they are ultimately productive for society.

To understand this concept, it is helpful to think about a different regulated activity that is inherently risky—aviation. Before departing the planet, every pilot—both commercial and recreational—must conduct a preflight inspection to ensure the safety of the aircraft.[58] This involves looking carefully for tiny hints that could portend a structural failure. Careful fulfillment of this duty may result in delay, while a dilatory attitude could be catastrophic. Consider the pilot who failed to notice missing cowling fasteners during his preflight inspection.[59] Careful observation would have resulted in brief delay to fix the problem. Instead, the cowling detached from the aircraft during flight, forcing an emergency landing that resulted in a brushfire that consumed the plane.

Thus, diligent fulfillment of the duty to notice safety risks or structural anomalies may be a productive source of delay. Permitting authorities are also tasked with the duty of diligently ensuring that the proposed mining operations are well-designed and safe. Noticing safety risks or structural anomalies is a productive source of delay that could avoid catastrophic accidents.

Pilots must also mitigate risks through preflight planning, which includes consideration of the proposed route, anticipated weather, fuel requirements, runway lengths, known traffic delays, and performance limitations.[60] Changing conditions with any one of these factors may delay, cancel, or reroute a proposed flight. Although inconvenient, these delays are ultimately productive, because they eliminate, reduce, or mitigate risk. Often a decision to delay or reroute a flight may be based on incomplete information. It is impossible to accurately forecast the future. Moreover, new or changing conditions may require reconsideration of an earlier decision.

These possibilities must be weighed against the all-too-human desire to reach the final destination without delay. As the Kobe Bryant accident tragically illustrated, failure to appreciate the gravity of these risks, or to respond to changing conditions, can be fatal.[61] One board member of the National Transportation Safety Board investigation committee investigating the Bryant flight observed that the pilots should not only be measured by whether they complete a flight. "Perhaps a better way to look at it is that professional pilots aren't paid to fly—they're paid to say no when conditions warrant. If . . . [pilots] look at it this way, perhaps we will have fewer crashes."[62]

The same principles apply to permitting decisions. Permitting authorities are tasked with the responsibility of mitigating risks. New information may intensify to an unacceptable level the potential risk associated with a project. In these cases, the permitting authority should have confidence to say "no." When operated effectively, this process avoids unacceptable environmental degradation and catastrophic accidents. Permit reform should not create a system of rubber-stamping. It must include the ability to say "no" when conditions warrant. Saying "no" to unacceptably risky proposals creates delay, but in the long run, that delay is socially productive.

III. Identifying Unproductive Causes of Delay in the Permitting Process

Hard-rock mining operations consist of four primary stages: (1) exploration (locating and defining the extent and value of mineral deposits); (2) development (completing the mine plan approval process, including obtaining necessary permits); (3) production (extracting the minerals); and (4) reclamation (reshaping disturbed areas and controlling for any toxic materials).[63] The Bureau of Land Management (BLM) and U.S. Forest Service oversee hard-rock mining operations on public lands and national forests and grasslands, respectively.

55. Klass & Mitchell, *supra* note 45, at 16.
56. *Id*. at 14.
57. Debra Utacia Krol, *Oak Flat: A Place of Prayer Faces Obliteration by a Copper Mine*, AZCentral (Aug. 20, 2021), https://www.azcentral.com/in-depth/news/local/arizona/2021/08/18/oak-flat-apache-sacred-resolution-copper-mine/7903887002/.
58. 14 C.F.R. §91.7.
59. National Transportation Safety Board, Aviation Incident Data Summary, Incident Number NYC07IA164 (July 11, 2007).
60. 14 C.F.R. §91.103.
61. National Transportation Safety Board, Accident Report NTSB/AAR-21/01 PB2021-100900, Aircraft Accident Report: Rapid Descent Into Terrain Island Express Helicopters Inc. Sikorksy S-76B, N72EX Calabasas, California (Jan. 26, 2020) (concluding that a contributing factor to the accident was the pilot's self-induced pressure and plan continuation bias, which adversely affected his decisionmaking).
62. *Id*. at 58.
63. GAO, Hardrock Mining: BLM and Forest Service Have Taken Some Actions to Expedite the Mine Plan Review Process but Could Do More 6-7 (2016) [hereinafter GAO, Hardrock Mining].

Many federal, state, and local statutes affect mining operations, and a proposed mine must obtain several different permits from multiple different agencies. For example, when studying 68 proposed mine plans submitted between 2010 and 2014, GAO identified six different categories of federal permits and authorizations and seven categories of state and local permits and authorizations.[64] These range from air quality, hazardous waste management, and workplace safety operations to dam structures and the use of explosives.[65]

As part of the permitting process, federal agencies must conduct an analysis under the National Environmental Policy Act (NEPA)[66] of potential impacts to the environment, human health, and cultural and historical resources. NEPA is a far-reaching procedural statute that applies to all "major Federal actions significantly affecting the quality of the human environment."[67] NEPA's implementing regulations utilize a tiered decisionmaking framework. Decisions that will have a significant impact on the environment undergo searching review through an environmental impact statement (EIS).[68] The EIS discloses adverse environmental impacts and considers alternatives to the proposed project.[69]

GAO estimated that EISs constitute about 1% of all NEPA decisions.[70] More benign projects with uncertain environmental impacts undergo a less thorough analysis referred to as an environmental assessment (EA).[71] GAO estimates that less than 5% of decisions government-wide are analyzed in an EA.[72] Projects with a presumptively insignificant effect on the environment undergo a truncated analysis through a categorical exclusion (CE).[73] According to GAO's estimates, these truncated analyses constitute 95% of NEPA analyses.[74]

NEPA does not operate in a vacuum. Since its passage 51 years ago, it has been incorporated into the fabric of the administrative state and often provides the analytical structure justifying decisions made by federal agencies, including permit approvals or denials. As the Congressional Research Service explains, "[m]ost agencies used NEPA as an umbrella statute—that is, a framework to coordinate or demonstrate compliance with any studies, reviews, or consultations required by any other environmental laws."[75] For this reason, even though the requirements of NEPA are only one part of a much larger, amorphous system of permits, the NEPA process and the permitting process are often conflated.

Despite its importance, little is known about how NEPA operates. When asked to review various NEPA compliance issues, including (1) the number and type of NEPA analyses conducted by agencies, (2) costs and benefits of completing the analyses, and (3) the frequency and outcomes of litigation, GAO concluded that very little information exists regarding these issues.[76] Absent information, most recommendations for NEPA reform have historically been loosely moored to empirical data and focused primarily on the most complex decisions that undergo the most rigorous review, even though these decisions constitute only a small fraction of NEPA decisions. Because of its central role in the permitting process, understanding how NEPA is implemented and identifying sources of delay within the NEPA process is critical to designing effective permit reform.

Reviews of the permitting process indicate that only a small percentage of projects encounter extensive delays. GAO issued a report in 2016 studying hard-rock mine permit processing times.[77] Between 2010 and 2014, BLM and the Forest Service approved 68 mine plans of operations. The majority (55%) were processed in less than 18 months, and 63% were processed in under two years.[78] This appears to indicate that permit applications can be processed efficiently. The remaining 37% were spread out over a wide time frame, with six applications taking longer than four years.

GAO's findings regarding hard-rock mine permit processing times are consistent with the results of empirical research conducted by a team from the Wallace Stegner Center in Utah, including this author. They investigated NEPA decisionmaking times within the Forest Service, analyzing more than 41,000 Forest Service projects that required NEPA analysis between 2004 and 2020.[79] Their research revealed that the majority of decisions were made within a reasonable time frame for the complexity of the project; however, a small percentage of projects consistently took much longer, regardless of the complexity of the project.[80] They sought to identify what causes some projects to drag on, while others are completed efficiently. Because NEPA is a part of the permitting process, the details of their empirical research provide valuable insight into potential causes of delay in hard-rock mine permitting.

The Stegner team also observed that most NEPA analyses are completed within a predictable time frame, consistent with the level of analysis required. However, a small percentage of projects get bogged down at every level of review. For example, between 2004 and 2020, the mean time to complete an EIS was 2.8 years.[81] Turning to EAs,

64. *Id.* at 17.
65. *Id.*
66. 42 U.S.C. §§4321-4370h, ELR Stat. NEPA §§2-209.
67. 42 U.S.C. §4332(C).
68. *Id.*
69. *Id.*
70. GAO, Report to Congressional Requesters: National Environmental Policy Act: Little Information Exists on NEPA Analyses 8 (2014) (GAO-14-3770) [hereinafter GAO, NEPA: Little Information Exits].
71. 40 C.F.R. §1501.3 (identifying the three levels of review); *id.* §1501.5 (describing the analysis to be included in an EA).
72. GAO, NEPA: Little Information Exits, *supra* note 70, at 8.
73. *See* 40 C.F.R. §1501.4 (discussing CEs).
74. GAO, NEPA: Little Information Exits, *supra* note 70, at 8.
75. Congressional Research Service, The National Environmental Policy Act (NEPA): Background and Implementation 1 (2011).
76. GAO, NEPA: Little Information Exits, *supra* note 70, at 1 (sidebar describing "Why GAO Did This Study").
77. GAO, Hardrock Mining, *supra* note 63.
78. *Id.* at 16.
79. Ruple et al., *supra* note 39, at 273.
80. *Id.* at 293-97.
81. *Id.* at 293.

the mean time for completion was 1.2 years, and the mean time to complete a CE was slightly under four months.[82] These average time frames predictably correlate to the rigor of the analysis required by NEPA's analytical structure.

However, the Stegner team also observed that some projects take extraordinarily long, regardless of the level of analysis. Table 1 below compares the median time for completion at every level of review with the average time for projects in the slowest 10%. Notably, at each level of review, the slowest 10% of decisions take longer than the median time to complete a more rigorous level of analysis. For example, the slowest 10% of CEs take 1.3 years, while the median time to complete an EA is 1.2 years. This demonstrates that a less rigorous level of analysis does not automatically generate a faster decision.

Table 1. Comparison of Median Completion Times for Select Percentiles by Level of Analysis

	Median Time for the Fastest 25%	Median Time for Completion	Median Time for the Slowest 10%
EIS	1.6 years	2.8 years	6.6 years
EA	8 months (235 days)	1.2 years	3.6 years
CE	2 months (54 days)	4 months (112 days)	1.3 years

The Stegner team also observed that a large percentage of decisions are made efficiently at each level of review. Table 2 below compares the average time for the fastest 25% of decisions against the median time for completion at each level of review. The degree of achievable efficiency is even more apparent when considering the average times for the fastest 10% of decisions (also depicted below). On average, the fastest 25% of decisions are completed twice as quickly as the median time for completion at every level of review. The fastest 10% of decisions show even greater efficiency. This empirical evidence demonstrates that analytical rigor can be accomplished efficiently, even at the most searching level of analysis.

These observations are important for designing permit reform for two reasons. First, they demonstrate that it is not necessary to sacrifice analytical rigor in order to achieve efficiency.[83] The fastest 25% of EISs are completed more quickly than the slowest 25% of EAs, and the fastest 25% of EAs are completed more quickly than the slowest 25% of CEs.[84] Second, decisions subject to a truncated

Table 2. Comparison of Fastest 10% and 25% of Completion Times With the Standard Median Completion Time for Each Level of Analysis

	Median Time for the Fastest 10%	Median Time for the Fastest 25%	Median Time for Completion
EIS	1.1 years	1.6 years	2.8 years
EA	4 months (133 days)	8 months (235 days)	1.2 years
CE	1 month (30 days)	2 months (54 days)	4 months (112 days)

analysis are not immune to delay. The slowest 10% of CEs took longer to complete than the fastest 10% of EISs.[85]

This result begs the question, why are some decisions completed quickly, while others get bogged down? Despite developing a multivariate regression analysis that analyzed four different factors, including the complexity of each project,[86] the Stegner team could not accurately predict which projects would proceed efficiently and which ones would encounter delays using NEPA-specific information.[87] This led them to conclude that factors outside the analytical requirements of NEPA contribute significantly to project delays.[88] Causes of delay included inadequate agency budgets, a lack of qualified staff, staff turnover, delays receiving information from permit applicants, and compliance with other laws.[89]

The GAO report on hardrock mine permitting made similar observations, identifying 13 causes of delay and the amount of time associated with each factor.[90] The second most common source of delay was insufficient allocation of resources (e.g., number of staff, staff expertise, funding, infrastructure, training, and/or computer technology).[91] Another prominent source of delay was waiting for information from an applicant following a permit application that was incomplete or vague or responding to a changed mine plan.[92] Other sources of delay were compliance with other legal requirements and/or ineffective agency coordination or collaboration during the mine plan review process.[93]

82. *Id.*
83. *Id.* at 297 (chart demonstrating that at every level of analysis, the fastest 25% of decisions are made more quickly than the slowest 25% of decisions conducted under a less rigorous level of analysis).
84. *Id.*
85. *Id.* (providing chart showing that the slowest 10% of CEs took an average of 481 days to complete, while the fastest 10% of EISs took an average of 395 days to complete).
86. *Id.* at 297-98 (describing development of regression model).
87. *Id.* at 299.
88. *Id.*
89. *Id.* at 307-10, 313-17, 318.
90. GAO, Hardrock Mining, *supra* note 63, at 22.
91. *Id.*
92. *Id.*
93. *Id.*

IV. Recommendations to Reduce Unproductive Causes of Delay

The observations described above suggest that policy changes or regulatory reforms will not address many of the root causes of delay. Instead, permit reform should be designed to address identifiable, unproductive causes of delay. The following subsections provide three practical recommendations.

A. Recommendation 1: Avoid Delay Caused by Insufficient Agency Capacity

One persistent and overarching cause of delay is insufficient or inconsistent staff availability.[94] According to the GAO, nsufficient agency staff in certain critical positions caused a bottleneck in the NEPA review process and increased the length of time to review the mine permit application.[95] This problem is not new. In 1999, the National Research Council found that "[s]taff shortages are likely to be at least partially responsible for the excessive delays experienced in NEPA reviews and issuance of permits."[96] The Council went on to note:

> Some land management offices report that they have too few people to conduct inspections, review proposed operating plans, process appeals, and conduct other required activities. This concern extends beyond the numbers of people. . . . Offices responsible for regulating mining projects may not always have access to the trained and experienced personnel required.[97]

In other words, there are two distinct elements to agency capacity: (1) staff availability and (2) expertise or institutional knowledge. Both elements affect permitting times. In order to improve permitting efficiency without compromising environmental protection, agencies must have both elements—sufficient staff and the necessary expertise.

The long-standing problem of agency capacity has been exacerbated in recent years. Between 2016 and 2020, BLM reported losing almost 300 senior Washington D.C. office staff who chose to retire or seek other employment rather than relocate to Colorado.[98] The U.S. Fish and Wildlife Service lost 231 staff scientists. EPA lost almost 750 senior scientists—one in four environmental specialists—between 2016 and 2020.[99] The departure of senior staff resulted in a loss of expertise and institutional knowledge that cannot be addressed with entry-level hires. Left unaddressed, the problem of insufficient staff capacity will affect regulatory efficiency and environmental protection in the context of hard-rock mining for the foreseeable future.

Accelerating efforts to restore agency capacity, develop expertise, and restore institutional knowledge are among the fastest ways to improve permitting efficacy and promote supply chain resiliency. Some efforts are already underway. For example, to address work force challenges within EPA, Congress boosted the Agency's budget by 11.3% and called upon EPA to "prioritize efforts to streamline hiring, support retention, and manage the erosion of expertise stemming from retirement of senior staff."[100] In order to expedite mine permitting, similar efforts must be undertaken to ensure that other agencies, like BLM and the Forest Service, have sufficient knowledgeable and experienced staff members capable of processing technical and complex applications for a mine permit.

Agency capacity does not only involve people and expertise. It also includes confidence to make a decision—even if it results in litigation. The Stegner team observed that litigation risk aversion causes delay and unwieldy documents.[101] Perceived professional risk associated with litigation caused Forest Service staff to avoid making controversial decisions for fear of affecting opportunities for promotion.[102]

Litigation aversion also caused delay by encouraging staff to "bulletproof" NEPA documents by addressing every possible issue, rather than focusing the analysis on issues that are truly significant and tailoring the level of analysis to the magnitude of the issue.[103] This overanalysis produces unwieldy, bulky, time-consuming documents that unnecessarily consume time and scarce agency resources. GAO made a similar finding regarding delays in the hard-rock mine permitting process. "Both BLM and Forest Service officials said that concerns regarding possible litigation or the implications of case law have prompted them to conduct additional or more extensive NEPA analyses during the mine plan review process."[104]

Other agencies have also recognized that encouraging confident decisionmaking can produce more efficient decisionmaking. As one NEPA practitioner in the U.S. Department of Transportation observed, "perhaps the most effective action agencies can take to increase efficiencies in the NEPA review process is to get back to the basics with NEPA and halt efforts to make NEPA documents litigation-proof."[105] With this in mind, she suggested that agen-

94. *See* Ruple et al., *supra* note 39, at 307-10, 327-30; GAO, Hardrock Mining, *supra* note 63, at 23.
95. GAO, Hardrock Mining, *supra* note 63, at 25.
96. National Research Council, *supra* note 40, at 74.
97. *Id*. at 115.
98. Press Release, U.S. Department of the Interior, Secretary Haaland Outlines Next Steps to Rebuild Bureau of Land Management (Sept. 17, 2021) ("Of the 328 positions moved out of Washington, D.C., only 41 of the affected people relocated, with 3 moving to Grand Junction. This led to a significant loss of institutional memory and talent.").
99. Taryn MacKinney, *Federal Agencies Have Lost Hundreds of Scientists Since 2017. What Comes Next?*, Union Concerned Scientists (Jan. 30, 2021), https://blog.ucsusa.org/taryn-mackinney/federal-agencies-have-lost-hundreds-of-scientists-since-2017-what-comes-next/:

> By 2019, the EPA and the Bureau of Ocean Energy Management (BOEM) had both lost 6% of their scientists compared to 2016. But the EPA is far larger than BOEM. A 6% loss is 28 scientists at BOEM—and *nearly 750 scientists* at the EPA. And while BOEM regained many scientists between 2019 and 2020, the EPA did not.

100. *Id.*
101. Ruple et al., *supra* note 39, at 330-32.
102. *Id*. at 331.
103. *Id*.; *see also* GAO, Hardrock Mining, *supra* note 63, at 34.
104. GAO, Hardrock Mining, *supra* note 63, at 33.
105. Helen Leanne Serassio, *Legislative and Executive Efforts to Modernize NEPA and Create Efficiencies in Environmental Review*, 45 Tex. Env't L.J. 317,

cies avoid wasteful encyclopedic documents by using their discretion to focus the analysis, methodology, and depth of discussion as necessary to make an informed decision.

This can be achieved through transparent analysis, incorporation of documents by reference, tiering to prior environmental reviews where appropriate, and exercising discretion in how to best gather and assess information.[106] Although these tools are available, agency officials must also feel confident using them. An informal culture that prioritizes litigation avoidance will continue to eschew these available strategies in favor of bulky, time-consuming bullet-proof documents.

While decisions should rigorously comply with substantive and procedural requirements, the fear of litigation should not delay action. Litigation is rare. Only 0.22% of decisions made under NEPA are challenged in court.[107] An investigation by GAO on the impact of litigation on Forest Service fuel reduction projects between 2006 and 2008 revealed that only 29 out of 1,415 decisions were litigated, and litigation only impacted 1% of the lands slated for fuel reduction.[108]

In conclusion, responsible critical mineral permitting can be expedited by increasing agency capacity. This can be done by providing agencies with the qualified staff and resources they need to complete environmental analyses and permitting documents, to retain those staff members throughout the entire permitting process, and to structure performance incentives that reward prompt deliberation, even where the project is unpopular and may result in litigation.

B. *Recommendation 2: Create Tools That Make the Legal Structure, Permitting Requirements, and Available Information More Transparent and Publicly Available*

The legal and regulatory structure for hard-rock mining is complex, multifaceted, and lacks uniformity. Navigating the intricate and complex array of laws applying to mining operations takes time. Without clear guidance, this legal structure causes delay. This delay is evident in the number of vague and incomplete permit applications, instances of limited or ineffective interagency coordination, and delays caused by balancing competing legal priorities.[109] Simply figuring out what law applies, how to apply the regulatory standard, and who has authority to issue the relevant permits can be a daunting task for both agency officials and permit applicants.

Regarding the regulatory structure of hard-rock mine permitting, the National Research Council observed:

> [T]he complexity of various programs can make the system difficult to understand, approach, and implement efficiently. As a result, mining regulation, permitting, monitoring, reclamation, closure, and post-closure becomes a series of negotiations carried on against a background of regulatory requirements and programs. This means that governmental regulators at all levels need a significant degree of sophistication and training in order to make these programs efficient and effective. The programs do not—and cannot—operate in cookbook fashion.[110]

In other words, implementing a complex regulatory structure requires institutional knowledge and expertise. Regulators require "sophistication and training" to make the programs efficient and effective. This includes understanding how the overall permitting process works, the standard to apply to a particular decision, and who is responsible for making that decision.

Uncertainty about this regulatory backdrop causes two types of delay. First, conducting research to confirm the permitting process with each application adds time and creates inefficiencies in the preparation and review of each application. Second, hard problems without obvious answers tend to sit on the back of the desk, especially when there is a fear of repercussion for making the wrong decision. Reducing procedural and legal uncertainty within this complex labyrinth will improve efficiency and assist both regulators and applicants.

The current legal and regulatory structure varies by mineral category, surface/subsurface estate ownership, and with the agency owning or entity charged with managing surface and subsurface resources.[111] In general, minerals fall within three categories: saleable, leasable, and locatable (hard-rock). Each category has different statutory frameworks and regulatory standards.[112] Distinct regulatory standards by mineral category can cause permitting challenges because the exact same mineral on federal land

333 (2015); *see also* Thomas C. Jensen et al., *Infrastructure Permit Streamlining Under the FAST Act*, 46 ELR 10369, 10376 (May 2016) (noting that within the infrastructure permitting process, even well-conceived, high dollar projects occasionally face substantial delay caused by "confusion or risk aversion within or among agencies, lack of decisionmaking resources, or deliberate foot-dragging").

106. Serassio, *supra* note 105, at 334-37.

107. John Ruple & Kayla Race, *Measuring the NEPA Litigation Burden: A Review of 1,499 Federal Court Cases*, 50 Env't L. 479 (2020). *See also* Serassio, *supra* note 105, at 333-34:

> The vast majority of CEs, EAs, and EISs are not litigated. On average, NEPA lawsuits represent only two-tenths of one percent of more than 50,000 actions that are documented by federal agencies each year under NEPA. Furthermore, when NEPA documents are litigated, the federal government has been successful in the majority of these cases. In fact, the cases that the federal government usually loses are those in which the agency failed to follow a procedural step or relied upon flawed data.

108. GAO, Forest Service: Information on Appeals, Objections, and Litigation Involving Fuel Reduction Activities, Fiscal Years 2006 Through 2008, at 1 (2010) (GAO-10-337).

109. GAO, Hardrock Mining, *supra* note 63, at 22.

110. National Research Council, *supra* note 40, at 54.

111. Brandon S. Tracy, Congressional Research Service, R46728, Policy Topics and Background Related to Mining on Federal Lands (2020) (summary).

112. *Salable* minerals are defined by the Materials Act of 1947 and include low-value common minerals. They are sold to the public at fair market value, often from community pits. *Leasable* minerals are defined by the Mineral Leasing Act of 1920, and are subject to lease and royalty payments. *Locatable* minerals are governed by the General Mining Law of 1872. They are not subject to federal royalties, and are governed under a different statutory and regulatory framework than leasable minerals.

may be characterized as locatable or leasable, depending on whether the land is public or acquired.[113] Similarly, otherwise locatable minerals may be leasable when found on some tribal lands.[114]

A consequence of this fragmented legal structure is that the same mineral could be subject to a leasing system or a claim system depending on whether the lands were acquired, tribal, or public.[115] More complexities arise with private landownership or where surface and subsurface ownership involves multiple parties, including states, tribal governments, and private individuals, and these complexities only increase when split-estate issues are involved.[116]

The difference between locatable and leasable minerals has consequences for land use management. The Federal Land Policy and Management Act (FLPMA)[117] guides BLM's management of lands that are subject to both mineral leases and claims as well as nearby public lands that may be necessary to access or develop minerals. Management requirements are imposed through its land use planning requirements, and subject to the duty to administer public lands on the basis of multiple use and sustained yield.[118] Similarly, the National Forest Management Act (NFMA) informs the Forest Service's surface management of lands that are subject to mineral leases and claims as well as lands that must be crossed to access and develop minerals.[119]

In contrast, mining operations for locatable minerals are primarily governed by the General Mining Law of 1872. Land management plans developed pursuant to FLPMA and the NFMA may directly and severely restrict a mining claimant's ability to access newly staked claims, to conduct exploration-phase activities on those claims, and to use adjacent lands for other mining-related purposes. New management plan requirements are, however, likely to have less impact on existing claims. With a few exceptions, such as lands that have been withdrawn[120] and wilderness study areas, BLM's authority to regulate surface management of locatable mineral operations derives primarily from its authority to prevent unnecessary or undue degradation of public lands.[121]

Once a claim or lease has been obtained, access to the minerals secured, and exploration has demonstrated the viability of the operation, the miner will still need to obtain mining plan approval as well as numerous other environmental and land use approvals. Many states exercise delegated statutory authority over aspects of mine permitting.[122] Some federal statutes, like the Clean Water Act (CWA),[123] contain provisions allowing the federal agency to delegate its permitting authority to the state. In addition to these federal statutes, state or local laws may also impose additional permitting requirements, including state environmental review requirements, like the California Environmental Quality Act. When reviewing the hard-rock mining permit application process, GAO identified six categories of federal permits and authorizations and seven categories of state and local permits and authorizations that mine operators may need to obtain from entities other than BLM and the Forest Service.[124]

This complexity may contribute to the number one source of delay identified by GAO in the hard-rock mine permitting process—low quality of information provided in a mine plan.[125] According to officials interviewed for the study, the low quality of information provided in a mine plan created a challenge in 21 of the 23 locations studied, and added from one month to seven years to the length of time to review plans.[126] Delays associated with this factor can be reduced through simple efforts to make permitting information and requirements more accessible.

113. This anomaly arises partially from the definition of a "locatable" mineral. Originally, the definition encompassed all mineral deposits on federal lands that were considered valuable. Now, however, locatable minerals are defined in the negative—minerals are locatable if they are (1) not leasable under the Mineral Leasing Acts and (2) not salable under the Mineral Materials Act of 1947. 43 C.F.R. §3830.11 (2021). As a result of this definition, an otherwise locatable mineral is a leasable mineral in certain circumstances. For example, locatable minerals on acquired federal lands are leasable. Tracy, *supra* note 111, at 2, 4-5. Similarly, locatable minerals on Forest Service lands that were acquired under the Weeks Act are also leasable. *See* Anne-Marie Fennell, GAO, Mining on Federal Lands: More Than 800 Operations Authorized to Mine and Total Mineral Production Is Unknown 2 (2020).

114. BLM, U.S. Department of the Interior, Mining Claims and Sites on Federal Lands 3 (2019), https://www.blm.gov/sites/blm.gov/files/PublicRoom_Mining_Claims_Brochure-2019.pdf (summarizing that "when minerals that are typically locatable are found on lands acquired (purchased or received) under the Mineral Leasing Act for Acquired Lands of 1947, as amended, by the United States or found on American Indian reservations, they are subject to lease only"); 43 C.F.R. §3501.2(a) (articulating scope of regulations applicable to leasable hard-rock minerals). *See generally* Michael E. Webster et al., 1 American Law of Mining §67.05 (2d ed.) (describing complex statutory authority for mineral development on Indian lands).

115. BLM, *supra* note 114, at 4.

116. *Id*. at 2-6.

117. 43 U.S.C. §§1701-1785, ELR Stat. FLPMA §§102-603.

118. *Id*.

119. 16 U.S.C. §§1600-1687, ELR Stat. NFMA §§2-16.

120. Lands that have been withdrawn from mineral entry include national parks, national monuments, tribal lands, most Bureau of Reclamation projects, military reservations, scientific testing areas, national wildlife refuges, and lands withdrawn pursuant to FLPMA §204. Additionally, mining claims may not be located on lands that have been designated by Congress as part of the National Wilderness Preservation System; designated as a wild portion of a wild and scenic river; or withdrawn by Congress for study as a wild and scenic river. BLM, U.S. Department of the Interior, Mining Claims and Sites on Federal Lands 12 (2019), https://www.blm.gov/sites/default/files/documents/files/PublicRoom_Mining_Claims_Brochure-2016.pdf.

121. Memorandum from Solicitor, U.S. Department of the Interior, to Director, BLM 8 (Aug. 17, 2020) (M-37057):

> In 1976, Congress enacted FLPMA, which specifically amended the Mining Law to require the Secretary to, 'by regulation or otherwise, take any action to prevent unnecessary or undue degradation of the lands.' 43 U.S.C. §1732(b). This mandate to prevent 'unnecessary or undue degradation' . . . gave BLM the authority to impose limits on how existing and future reasonably incident mining uses under the Mining Law could be conducted.

(citation omitted).

122. *See* 43 C.F.R. §3809.202(a) ("A State may request BLM enter into an agreement for State regulation of operations on public lands in place of BLM administration of some or all of the requirements of this subpart.").

123. 33 U.S.C. §§1251-1387, ELR Stat. FWPCA §§101-607.

124. GAO, Hardrock Mining, *supra* note 63, at 17.

125. *Id*. at 23.

126. *Id*.

1. Create a Mine Permitting Hub With Flow Charts and Environmental Checklists to Make the Legal Structure More Transparent, Predictable, and Manageable

In the absence of statutory reforms to simplify and update mining laws, one way to expedite the permitting process would be to create a public, geographically organized database of regulations and permitting requirements ("mine permitting hub").

A similar resource was created by the U.S. Department of Energy for renewable energy and bulk transmission project development. The web-based Regulatory and Permitting Information Desktop (RAPID) Toolkit collects permitting information, best practices, and reference material.[127] As the RAPID website recognizes, "[u]ncertainty about the duration and outcome of the permitting process has been a deterrent to project investment and project construction."[128] The website aims to provide easy access, in one location, to permitting and regulatory information for project development in order to optimize the regulatory process, lower project costs, and ease investor risk.[129]

The same challenges face prospective mine permittees. Uncertainty about the duration and outcome of the permitting process deters project investment. This is even more true for entities that are exploring innovative ways to re-mine or reprocess previously mined lands or mine and mill tailings.[130] A publicly available, geographically organized database of regulatory standards and required permits would help mineral developers as well as federal, state, and tribal officials navigate overlapping and interrelated permitting programs.

As part of the mine permitting hub, an analytical flow chart should be included to help regulatory officials and permit applicants determine which legal standards apply to a proposed mine, and how multiple permitting requirements fit together. The Washington State Governor's Office for Regulatory Innovation and Assistance has developed multiple, very useful flow charts to assist regulators, permit applicants, and the public to understand the steps involved in obtaining common permits.[131] Simply creating the flow chart to identify the various permits that are required, the sequence of permits, and opportunities for permit coordination may improve permitting efficiency.

A flow chart may also help identify circumstances where legal ambiguity exists and where agency guidance or solicitor opinions would be useful in reducing uncertainty. For example, in the mineral development context, an individual seeking to mine cobalt from the tailings of an abandoned copper mine located on federal public lands would need to know whether his or her proposal is subject to the General Mining Law of 1872 or the Mineral Leasing Act. (Presumably the General Mining Law would apply, though this may not be the case if the tailings occur on acquired lands.) If the mining proposal is covered by the General Mining Law, is it necessary to submit a plan of operations for exploratory activity due to the cumulative effects of prior use?[132]

Legal guidance would reduce delay caused by research and analysis. Uniform guidance and a clear permitting path also would promote collaboration and communication across multiple jurisdictions. These procedural efficiencies may also decrease litigation aversion and the fear of making an incorrect decision in a complex regulatory arena.

A mine permitting flow chart could also be used to develop location-specific environmental checklists. A checklist could be created proactively for specific regions. Alternatively, a checklist could be developed at the initiation of the mine permitting process on a case-by-case basis. Either option would create transparency and predictability, likely translating into faster and more durable permitting decisions. Mine permitting checklists could identify each potentially relevant permit to be obtained during the mine permitting process, the environmental standards to meet, the lead agency and personnel to be contacted regarding that permit, and appropriate contact information. Such a checklist would be particularly useful where federal, tribal, and state permitting programs or requirements overlap.[133]

Creating the mine permitting checklist would help regulatory officials across agencies (state and federal) proactively develop cooperative agreements aimed at coordinating and harmonizing requisite environmental and engineering studies. It would also help identify specific requirements associated with land designations.[134] Further, it would help identify circumstances where a more stringent state law may require a higher level of protection than required under federal regulations.[135] Consolidating this information at the outset of the permitting process would reduce delays attributable to uncertainty, duplication, and

127. OpenEI, *Regulatory and Permitting Information Desktop Toolkit: About the RAPID Toolkit*, https://openei.org/wiki/RAPID/About (last visited Sept. 22, 2022).

128. *Id*.

129. *Id*.

130. *See generally* Lynn M. Kornfeld, *Reclamation of Inactive and Abandoned Hardrock Mine Sites: Remining and Liability Under CERCLA and the CWA*, 69 U. Colo. L. Rev. 597 (1998). *See also* Bart Lounsbury, *Digging Out of the Holes We've Made: Hardrock Mining, Good Samaritans, and the Need for Comprehensive Action*, 32 Harv. Env't L. Rev. 149, 164-72 (2008) (exploring benefits and risks of allowing mining companies to enjoy reduced liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the CWA through Good Samaritan legislation).

131. *See* Washington Governor's Office for Regulatory Innovation & Assistance, *Permit Schematics*, https://www.oria.wa.gov/site/alias__oria/347/Permitting.aspx#anchor-3430 (last visited Sept. 22, 2022).

132. *See* 43 C.F.R. §3809.31 (defining special situations that affect what submittals must be made before conducting operations).

133. *See id*. §3809.200 (identifying the types of federal/state agreements that may affect surface management standards). *See also* GAO, Hardrock Mining, *supra* note 63, at 22 (identifying "[q]uantity and quality of coordination and collaboration" as a major factor associated with permitting delays).

134. *See* 43 C.F.R. §3809.11 (identifying special status areas where §3809.21 does not apply, and an applicant must submit a plan of operations for surface disturbance greater than casual use).

135. *Id*. §3809.3.

conflicting standards that exist in the current legal and regulatory regime.

A flow chart and environmental checklist would also ensure that mine permit applications are properly prepared and appropriately thorough. According to the U.S. Department of Commerce, incomplete permit applications are one source of delay in the permitting process. Further:

> [M]ining permit applications often lack sufficient quality or key information needed for regulators to make a decision on an application. Insufficient information in the mining application can significantly delay the permitting process as it may require multiple application iterations until the application is of sufficient quality to allow the permitting agencies to make a decision.[136]

This observation is not surprising given the ambiguity involved in federal regulations,[137] as well as the vast variety in mining operations governed by these regulations. Notably, the Federal Permitting Improvement Steering Council identified flow charts and checklists as best practices that promote efficiency and help ensure that applicants provide necessary information in a timely manner.[138]

Checklists can serve additional purposes. As discussed in more detail below, a checklist could be refined during the scoping process once environmental review of a permit application begins. This early scoping analysis would ensure the thoroughness of the checklist and avoid surprises later in the permitting process. Checklists and flow charts can also be used to facilitate pre-submittal meetings with operators and other stakeholders, and to clarify expectations, thereby improving the quality of mine permitting applications.[139]

Once permitting review begins, the same checklist could be used to create agreed-upon deadlines for decisionmaking, and those deadlines could be posted on a permitting dashboard. Similar practices, particularly the use of the permitting dashboard, have been effectively implemented for infrastructure projects covered by the FAST Act.[140] As one commentator observed, these types of streamlining practices are most likely to benefit "novel or unusually complex projects, or familiar projects in novel or unusually complex contexts . . . because those projects tend to require agencies to confront unfamiliar facts, make new choices, resolve untested legal issues, and otherwise take risks."[141] Although the comment was made with reference to infrastructure permitting, it seems equally applicable to mine permitting.

In summary, flow charts and environmental checklists are two tools that can immediately improve efficiency in the permitting process. These tools support agency capacity by developing institutional knowledge and reducing legal uncertainty. They can also help avoid delays caused by incomplete or vague permit applications. These tools do not require regulatory reform, and can be implemented immediately.

2. Create a Geographically Organized, Searchable Database of Previously Drafted NEPA Documents

The RAPID website[142] has another helpful feature that could be included in the mine permitting hub: it provides a link to previously drafted NEPA documents.[143] This feature facilitates tiering,[144] and minimizes the risk of duplicative environmental analyses. NEPA regulations encourage using program, policy, or plan EISs, as well as tiering statements of broad scope to those of narrower scope, to eliminate repetitive discussions of the same issue.[145] NEPA documents can also incorporate information by reference.[146]

While mining interests and agency staff presumably have ready access to prior permitting documents for the sites in question, obtaining access to documents or studies at far-flung locations that addressed similar issues could expedite environmental analyses. The NEPA database provided on the RAPID website may help overcome this challenge. The website allows a user to search for a document

136. U.S. Department of Commerce, *supra* note 17, at 37; *see also* GAO, Hardrock Mining, *supra* note 63, at 23 (reporting that low-quality mine plan submissions were the primary source of delay).

137. *See*, *e.g.*, 43 C.F.R. §3809.401 (vaguely identifying information that must be included in a plan of operations, and including a vague catch-all requirement of "other information, if necessary to ensure that your operations will comply with this subpart").

138. Federal Permitting Improvement Steering Council, Recommended Best Practices for Environmental Reviews and Authorizations for Infrastructure Projects for Fiscal Year 2018, at 11 (2017) ("Flow charts clarify the process for stakeholders. Checklists assist entities in collecting appropriate and required information. Checklists can identify responsible agencies, facilitate identification of purpose and need, and assist with alternatives development.").

139. GAO, Hardrock Mining, *supra* note 63, at 25 (strongly recommending that BLM and the Forest Service expand the use of pre-submittal meetings with operators whenever possible to expedite the mine plan review process); Federal Permitting Improvement Steering Council, *supra* note 138, at 11 (recommending the use of checklists, flow charts, and templates to ensure that the various permitting entities obtain the appropriate information required for environmental review early in the process, thereby reducing the administrative burden of multiple application iterations).

140. Jensen et al., *supra* note 105, at 10373 (describing FAST Act provisions that coordinate environmental review and permitting schedules, including an inventory of permits and the use of a public permitting dashboard); *see also* Permitting Dashboard, *Home Page*, https://www.permits.performance.gov/ (last visited Sept. 22, 2022).

141. Jensen et al., *supra* note 105, at 10376 (noting further that "[a] system that mandates establishment of schedules, discourages potential delays, and empowers the schedule-keepers to push the process forward should help offset agencies' inherent aversion to risk").

142. Permitting Dashboard, *RAPID Toolkit*, https://www.permits.performance.gov/tools/rapid-toolkit (last updated Mar. 8, 2017).

143. *See, e.g.*, OpenEI, *Transmission NEPA Database*, https://openei.org/wiki/RAPID/NEPA?technology=Transmission (last modified Apr. 17, 2018) (providing link to previously drafted NEPA documents for bulk transmission lines).

144. 40 C.F.R. §1508.1(ff) (defining tiering as:

> the coverage of general matters in broader environmental impact statements or environmental assessments (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basin-wide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.

145. 40 C.F.R. §1500.4(h)(i).

146. *Id.* §1502.21.

by analysis type, lead agency, and 17 state jurisdictions. The same information should be provided on the mine permitting hub.

This database would be more useful if it also provided a map with links to the available documents. An applicant or an agency official could then use a geographic search for relevant environmental documents. Improving access to prior and related environmental documents would help agency officials and permittees identify and avoid repetitive analyses and discussions of the same issues.

Creating a mine permitting hub that includes analytical flow charts, environmental checklists, and a NEPA database would help reduce delay caused by the complexity of the legal system governing hard-rock mining. Additionally, these actions would expand agency capacity by developing expertise and creating a system of institutional knowledge to offset the loss of senior staff members who may not be available to provide guidance or mentoring to new staff members. Finally, the hub would help stakeholders better understand the mine permitting process, engage more effectively, and appreciate how their input will be addressed through the permitting process. Although these actions are simple, they cannot be accomplished without adequate funding. Agency budgets must be adjusted with enough resources to achieve these objectives.

C. Recommendation 3: Use the NEPA Process as a Tool to Avoid Delay Caused by Uncoordinated Interagency Permitting Requirements

The NEPA process can be used to avoid delay by coordinating permitting and planning requirements. As one senior agency official in the transportation sector observed, "The NEPA process itself is inherently efficient because it provides the platform for agencies to coordinate permitting and planning activities at all levels of the government, thereby avoiding duplicate or sequential reviews and providing the opportunity for potential issues to be identified and resolved early in the process."[147] In a system of overlapping (and at times conflicting) jurisdictional authority, gaps or duplication of effort are likely to occur without strong coordination between authorities.[148]

Done properly, the NEPA process functions as an umbrella statute, facilitating compliance with a host of other laws such as the CWA, the NFMA, or the National Historic Preservation Act. Indeed, there is some evidence that permitting decisions undergoing a NEPA review are often completed faster than those that are exempted from NEPA.[149] This likely reflects improved communication and coordination that results through interagency coordination as part of the NEPA process.

Delays are likely to increase where interagency coordination is lacking.[150] The National Research Council found:

> Timing of environmental review and permitting is affected by agencies' ability to coordinate with one another, as well as by the availability of sufficient agency staff and technical resources. Where coordination among state and federal regulatory agencies is high, environmental review and permitting appears to be faster . . . where separate agencies engage in serial permitting, rather than coordinating their review efforts, the process—including data gathering—can take longer.[151]

Early consultation is essential to ensure coordination.[152] Early consultation should include all stakeholders, including the relevant federal, state, and county agencies, tribes, citizen groups, and the applicant.[153] NEPA's analytical process can provide a structure for ensuring that a proposed plan of operation "complies with all pertinent Federal and state laws."[154] NEPA's scoping process could be used to identify all relevant state, federal, and local permits that would be necessary, as well as the individual officer responsible for approving or denying a permit.

Because the statutory and regulatory regime governing hard-rock mining is so complex, simply identifying the applicable legal standards and the responsible official would bring clarity for all regulatory authorities, the public, and the permittee. The scoping process could also define the sequence of permitting, and appropriate timelines for permitting decisions within that sequence. This approach, which has been successfully used for transportation projects, would significantly reduce delays caused by ambiguity, confusion, and reluctance to act.[155]

Proactively requiring all stakeholders to engage in NEPA's scoping process can expedite permitting by identifying issues of contention early and clarifying information that must be gathered. "Agreement might not be reached among all of the stakeholders. However, the issues would be better understood by the public and defined to the benefit of the public, the agencies, and the applicant if early consultation occurred under the NEPA and permitting processes."[156] Additionally, without providing opportunity to raise concerns during the scoping process, stakeholders may raise concerns late in the process or through litigation. Some of those concerns may require collecting additional

147. Serassio, *supra* note 105, at 330.
148. National Research Council, *supra* note 40, at 53.
149. John Ruple et al., *Does NEPA Help or Harm ESA Critical Habitat Designations? An Assessment of Over 600 Critical Habitat Rules*, 46 Ecology L.Q. 829 (2020).
150. *See also* GAO, Hardrock Mining, *supra* note 63, at 22 (identifying challenges involving "[q]uantity and quality of coordination and collaboration" as a leading cause of permitting delay).
151. National Research Council, *supra* note 40, at 55.
152. *Id*. at 81 ("Early consultation among all stakeholders is essential for regulatory efficiency.").
153. *Id*. at 55.
154. 43 C.F.R. §3809.420(a)(6) (including obligation to "conduct all operations in a manner that complies with all pertinent Federal and state laws" as a general performance standard for plans of operations); *id*. §3809.415(a) (clarifying that prevention of unnecessary or undue degradation includes compliance with "other Federal and State laws related to environmental protection and protection of cultural resources").
155. *See generally* Serassio, *supra* note 105, at 317.
156. National Research Council, *supra* note 40, at 81.

baseline data that may have been easily collected at the beginning of the permitting process.[157] Thus, a thorough and inclusive scoping process avoids disruptions late in the permitting process.

Including critical stakeholders at the beginning of the NEPA process also provides an opportunity to initiate consultation requirements early.[158] This approach would provide three benefits. First, engaging stakeholders in consultation early maximizes the opportunity to identify problems that can be avoided or mitigated at the design phase of the project. Second, identifying problems at the design phase of a project minimizes the cost of impact reduction and avoids delays later in the analysis or at the implementation phase.[159] Third, early collaboration ensures shared mapping and database development, which facilitates decisionmaking.

In summary, the NEPA process can promote, rather than hinder, efficiency. At the site level, the NEPA process can be used to coordinate permitting requirements and improve communication between permitting officials at the federal, state, tribal, and local levels. The NEPA process can also be used to initiate consultation requirements early enough in the process to be meaningful and effective, which can avoid delays in the long run. These procedures can improve timeliness, predictability, and transparency in the permitting process. Achieving these outcomes, however, depends upon sufficient agency capacity and expertise to utilize these tools effectively.

V. Conclusion

Transitioning to a renewable energy economy demands an increase in mineral production. But not every permit should be approved as it was submitted. The permit process necessarily involves multiple authorities enforcing different environmental, health, and safety standards. Along the way, opportunities to eliminate, reduce, or mitigate risk may be identified. These opportunities can only be identified through rigorous application of the relevant standards. The increased demand for minerals should not overshadow the productive purposes served by permitting.

At the same time, there are opportunities to improve permitting efficiency without compromising rigorous health and safety standards. This requires identifying and addressing unproductive causes of delay within the permit process.

Analytical rigor does not appear to cause delay in the permitting process. Empirical evidence reveals that the majority of permitting decisions are made within a reasonable time frame for the complexity of the project. Some decisions encounter excessive delays, but this occurs even where analytical rigor is not required. The disparity in decisionmaking times suggests that factors other than regulatory requirements contribute significantly to project delays. Causes of delay include inadequate agency budgets, a lack of qualified staff, staff turnover, delays receiving information from permit applicants, and compliance with other laws.

Based upon this information, three simple actions can be taken to expedite mine permit processing times without sacrificing analytical rigor. First, avoid delay caused by insufficient agency capacity. This can be achieved by increasing agency staff, stabilizing budgets, rebuilding expertise, and encouraging confident decisionmaking even where it results in litigation.

Second, reduce delay by creating tools that make the legal structure, permitting requirements, and available information more transparent and publicly available. This can be achieved by creating a mine permitting hub with flow charts clarifying the permitting process and identifying permit authorities. Environmental checklists would help permit applicants submit high-quality applications that do not require supplementation. Additionally, a geographically organized database of previous environmental studies would encourage tiering and avoid unnecessarily repetitive studies.

Third, use the NEPA process as a tool to avoid delay caused by uncoordinated interagency permitting requirements.

These tools can promote efficiency without eliminating analytical rigor and without waiting for statutory or regulatory reforms. Implementing these recommendations could help the Biden Administration dispel the myth that permit reform requires loosening environmental standards or analytical rigor in order to respond to the challenges of climate change.

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157. *Id.*

158. *See*, *e.g.*, 43 C.F.R. §3809.411(a)(3)(iii), (iv), (vii) (clarifying that a proposed plan of operations cannot be approved until BLM completes consultation under the National Historic Preservation Act, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, tribal consultation, and consultation with the surface management agency where BLM does not have responsibility for managing the surface).

159. *Compare* Jensen et al., *supra* note 105, at 10376 (noting that developers most likely to benefit from the streamlining opportunities afforded by the FAST Act are those who "think ahead of the regulatory process, engage early with local stakeholders, and define their success in an agile way that anticipates and integrates the tangible outcomes reasonably necessary to address stakeholder interests").