RBN Energy LLC

Daily Blog *(/daily-energy-post)*

Don't Pass Me By - With Many Steps Required, Mining Projects Face Trickiest Path to Approval

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When it comes to large-scale energy and infrastructure projects, permitting can sometimes look like a game of Whack-a-Mole, where efforts to conclude the process are continually frustrated by issues that appear (and then sometimes reappear again and again), encompassing everything from environmental reviews and the vagaries of different federal agencies to legal challenges and public (and political) opposition. But if the difficulties in building a new pipeline, transmission line, or solar farm seem immense, they pale in comparison to what developers of mining projects can face. In today's RBN blog, we look at why mining projects take so long to develop, the unique challenges of the permitting process, and some ways that it might be improved.

As we outlined in **Part 1** *(https://rbnenergy.com/dont-pass-me-by-plans-for-energy-development-largely-rest-on-fate-of-us-permitting-reform)* of this series, permitting for large-scale infrastructure projects can be a complicated, drawn-out process that is often easier said than done. The permitting process can drag on for years — such as with Mountain Valley Pipeline (MVP), the poster child for today's permitting challenges — and prevent some from ever becoming a reality. As an example of how long the process can take, we looked in **Part 2** *(https://rbnenergy.com/dont-pass-me-by-part-2-transwest-express-shows-challenges-in-building-long-distance-transmission)* at the TransWest Express Transmission Project, which will move 3,000 megawatts (MW) of Wyoming's wind-generated electricity to utilities in more densely populated regions of the Desert Southwest. Even though it's a straightforward idea, the project didn't receive final federal approval until April — 18 years after it was first proposed — and serves as a prime example of how long the permitting process can take. New transmission lines are critically important for the development of wind- and solar-powered generation, which are increasingly running into more permitting issues at the local level as they grow in scale and move closer to populated areas, a topic we discussed in **Part 3** *(https://rbnenergy.com/dont-pass-me-by-part-3-for-wind-and-solar-projects-permitting-battes-increasingly-turn-local)* .

If the challenges of building new infrastructure seem significant, mining developments can be a whole other story. There are various permits, approvals and consultations required in any mining project — which can vary by the type of activity and location — and developers have to work with any number of federal, state and local agencies, plus tribal authorities in some instances. On top of all that, mining projects have also faced increasing political headwinds in recent years. (More on that in a bit.) In a nutshell, nearly every hurdle faced by an energy-related project is one that a mining development might have to clear at some point in the process.

It's also hard to understate the need to speed up the domestic production of critical minerals and metals, especially in today's economic, environmental and political environment. Last year's passage of the Inflation Reduction Act (IRA) created significant incentives to decarbonize the economy and advance all kinds of clean-energy technologies, but it also highlighted some significant manufacturing challenges. For example, the IRA includes generous tax credits for the purchase of electric vehicles (EVs), but they are dependent on ever-increasing domestic requirements related to **critical minerals and battery components** *(https://rbnenergy.com/name-game-part-3-ira-sourcing-rules-chart-narrow-path-to-full-ev-tax-credits)* , which puts the U.S. in a difficult position. The U.S. has ambitious goals to expand EV adoption, and several automakers have **moved battery production to the U.S.** *(https://rbnenergy.com/one-shining-moment-part-3-as-interest-in-evs-spikes-revised-tax-credit-boosts-plans-for-us-production)* to take advantage of those new tax credits, but significant headwinds remain. China is not only the world's leader in EV sales, accounting for more than half the global total, it also produces three-quarters of all lithium-ion batteries and has the capacity to produce 70% of cathodes and 85% of anodes, key battery components. In addition, China is home to more than half the world's lithium, cobalt and graphite processing capacity. It's a significant enough issue that the Biden administration sees China's dominance of the global market not only as a major economic issue, but a matter of national security as well. We could go on and on about the environmental, humanitarian and geopolitical tensions surrounding our growing appetite for many critical minerals, but suffice to say mines in the U.S. face a level of scrutiny lacking in many other regions. And as we wrote in our **Tell It Like It Is** *(https://rbnenergy.com/tell-it-like-it-is-unseen-costs-of-the-energy-transition-materials-metals-and-construction-materials)* series, the U.S. will need huge quantities of critical minerals and metals — from copper and lithium to graphite and nickel — for production of EVs and a host of clean-energy technologies in the years ahead.

Large-scale mining projects can take several years to develop even under the best of circumstances, which makes improvements to the permitting process a political and economic necessity. To understand why the speed of permitting is so critical, it's important to consider the major steps required in any mining development and how long the entire process can last. Let's start by looking at the four main stages of a mine's life cycle (see Figure 1 below) and then outline the basics of the permitting process.

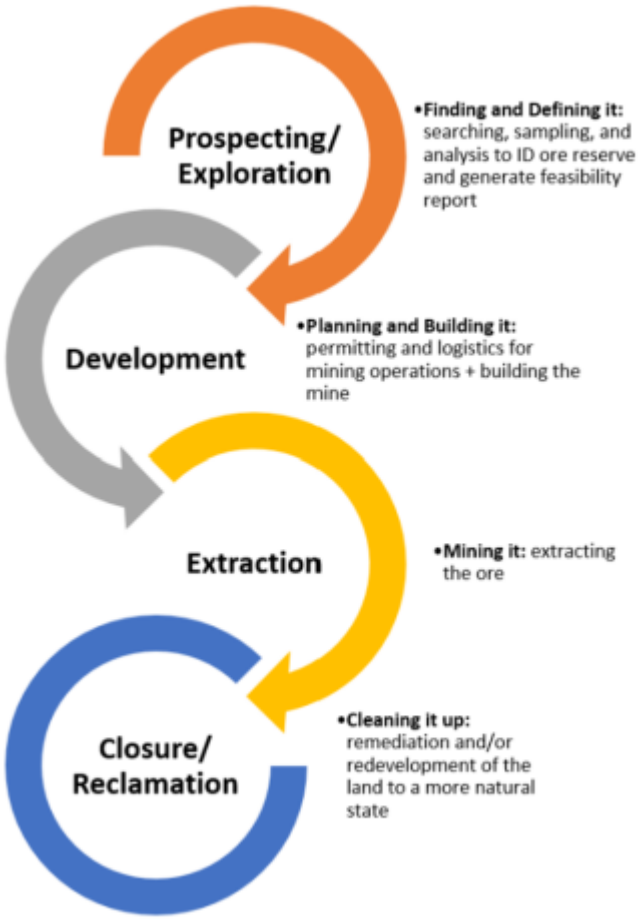


Figure 1. The Life Cycle of a Typical Mine. Source: University of Arizona Superfund Research Center

Prospecting and Exploration: These two precursors to mining can occur simultaneously. For a copper mine, the example we'll use today, it can take two to eight years. The process includes searching, sampling and analysis to identify reserves. Once prospecting and exploration are complete, a feasibility study determines whether it makes economic sense to turn a mineral deposit into a mine.

Development: The stage where permitting is handled (much more on that in a bit), mining operations are developed and the mine itself is constructed. A report prepared for the National Mining Association (NMA) estimates the permitting process alone can take 7-10 years in the U.S. (By way of comparison, the average permitting time is two to three years in Canada, where the roles and responsibilities of the agencies involved in permitting are identified and timeline-based targets are agreed to and published at the start of the application process. It should be noted that Canada is also looking for ways to further streamline the process.)

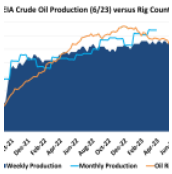
ANALYST INSIGHTS *(/ANALYST-INSIGHTS)*

JULY 5 (6:30 PM)

RBN Headliner: Oil Prices 2.9% Higher on New Production Cuts; U.S.

(/analyst-insights/oil-prices-29-higher-new-production-cuts-us-

Military Action Stops Iran from Seizing Two Tankers *military-action-stops-iran-seizing-two)*



JUNE 29 (10:45 AM)

EIA Data on Crude Oil Production Shows Disconnect Between Weekly, Monthly Trends *(/analyst-insights/eia-data-crude-oil-production-shows-disconnect-between-weekly-monthly-trends)*

Extraction: Once development is complete, extraction and processing of the mineral or minerals can begin. (Exploration and development can also continue after extraction begins.) This stage often lasts for 5-30 years, although some mines have operated for a century or more.

Closure/Reclamation: A reclamation plan must be established even before a mine is allowed to open. In a reclamation plan, the mining operator describes how it will attempt to restore or redevelop the land that has been mined to a more natural or economically usable state.

As noted earlier, permitting plays a central role in the second major phase of a mine's life cycle, development. But while some types of projects can be stymied on one or two fronts — or several, as in the case of the **long-delayed MVP** *(https://rbnenergy.com/dont-pass-me-by-plans-for-energy-development-largely-rest-on-fate-of-us-permitting-reform)* — mining projects typically need to attain approvals from several agencies, as shown in Figure 2 below. There's way too much there to go through in detail, but let's walk through the basics of a National Environmental Policy Act (NEPA) review.

Typical Permitting Approvals Needed for Mining Projects at Federal, State and Local Levels

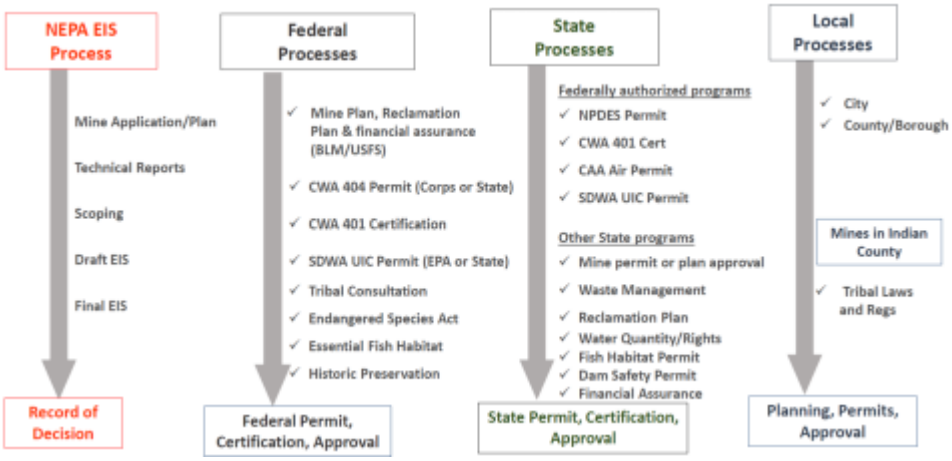


Figure 2. Typical Permitting Approvals Needed for Mining Projects at Federal, State and Local Levels.

Source: EPA

When a federal agency develops a proposal to take a major federal action, the NEPA process begins. (A major federal action generally falls into one of four categories: adoption of an official policy, adoption of formal plans, adoption of programs, or approval of specific projects.) Enacted in 1970, NEPA requires federal agencies to consider the impact of their actions on the environment before any project can proceed. Some actions may qualify for a categorical exclusion — and avoid the need for a detailed environmental review — if they do not normally have a significant effect on the human environment. (Each federal agency generally has its own criteria for granting exclusions.) If a categorical exclusion does not apply, a federal agency may then prepare an Environmental Assessment (EA), which determines whether a project has the potential to cause significant environmental effects. (Each agency also has its own procedures for the preparation of EAs.) If the agency determines that the action will not have significant environmental impact, the agency will issue a Finding of No Significant Impact (FONSI). If the EA determines that the environmental impact will be significant, an Environmental Impact Statement (EIS) must be prepared, which includes its own four-step process:

- An agency publishes a Notice of Intent in the Federal Register, which informs the public of the upcoming environmental analysis.
- A draft EIS is published for public review and comment for a minimum of 45 days. At the end of the comment period, agencies consider all substantive comments and may conduct further analyses.
- A final EIS is published, which provides responses to substantive comments. After publication, agencies are generally required to wait 30 days before taking action.
- The EIS process ends with the issuance of the Record of Decision (ROD), which explains the agency's decision.

We should note that the recently passed Fiscal Responsibility Act (FRA), which allows the U.S. to avoid hitting the debt ceiling until 2025 and seeks to **expedite MVP's completion** *(https://rbnenergy.com/rescue-me-could-the-fiscal-responsibility-act-really-end-mountain-valley-pipelines-troubles)* , also **reforms the NEPA process** *(https://rbnenergy.com/rescue-me-debt-ceiling-deal-remakes-nepa-shows-a-path-to-further-permitting-reforms)* . The highlights include a requirement to designate a lead agency when two or more agencies are involved in an environmental review, a provision allowing project applicants to prepare their own environmental reviews under the supervision of a federal agency, time limits on the preparation of an EIS or EA, and an expanded use of categorical exclusions, all of which are intended to speed the permitting process, although it's impossible to say how significant the changes will ultimately turn out to be.

Sierrita Copper Mine. Source: Center for Land Use Interpretation

In addition to the numerous regulatory hoops that mining projects must jump through, it's worth remembering that they are also unique endeavors with their own peculiar set of challenges in terms of scope and scale:

Footprint: Mining operations can cover a wide area and move tremendous amounts of material. Freeport-McMoran's Sierrita open-pit copper mine (see photo above) in Arizona is more than a mile wide and produced an estimated 83,000 metric tons (MT) of copper in 2022, making it the fourth-largest copper mine in the U.S.

Time: Mining operations can last for several decades or longer. The first claims in the area of the Sierrita mine date back to 1895. It was first worked as an underground mine in 1907 and open-pit development began in 1957. It is expected to operate until around 2080, based on its remaining deposits.

Maintenance: Some critical elements of a mine's infrastructure can have a significant environmental impact, such as water management and tailings dams, and need maintenance for the lifetime of the mine. (Tailings are a byproduct of mining. After the commodity of value is extracted from the recovered ore, the tailings are what's left.)

The Unknown: Fluctuating metals prices can greatly impact a project's feasibility. Rising prices for metals critical to the energy transition have made more projects economically viable, but a downturn could have the opposite effect. On the environmental side of things, it's difficult to predict how conditions around a mine will change, especially given the long timeframe of operations. Uncertainty can include changes to surface and groundwater flows, water treatment requirements, and the potential impact of climate change.

(https://rbnenergy.com/advisory)

So, with all those challenges, what can be done to improve things? The NMA outlined its hopes for permitting reform in April. Many of its stated priorities were centered around changes to the NEPA process, some of which were included in the FRA, and additional reforms could be addressed in future legislation. The NMA also advocated for two industry-specific provisions:

- Continued access to federal lands unless specifically withdrawn by Congress and unless the U.S. Geological Survey can ensure that a withdrawal does not threaten supply chains.
- A continuation of current mining regulatory practice to not only ensure U.S. competitiveness but to prevent impediments to domestic production. (The applicable federal law is the Mining Law of 1872, which declared all valuable mineral deposits in land belonging to the U.S. to be free and open to exploration and purchase.)

Mining projects have an extensive permitting process to navigate, but we'd be remiss not to mention that the political currents can quickly shift as well. In January, the Biden administration closed off more than 350 square miles of Superior National Forest in Minnesota to mineral leasing for 20 years, effectively sidelining the proposed Twin Metals copper-nickel mine project. (Leases for the Twin Metals project were denied toward the end of the Obama administration, then reinstated during the Trump administration.) That same month, the Biden administration vetoed development of the proposed Pebble gold-copper mine in Alaska. The administration cited environmental concerns in blocking both projects.

Despite its actions, the Biden administration has also spoken about the need to speed the permitting process and get more mining operations into development. The administration outlined its principles for mining reform in February 2022, which includes updating mining laws and regulations, updating and prioritizing the federal list of critical minerals, and strengthening critical mineral stockpiling. The administration moved in May to expedite the review of the South32 Hermosa Critical Minerals Project, a proposed $1.7 billion zinc and manganese mining and processing operation in Santa Cruz County, AZ, near the U.S.-Mexico border. Part of the project area will involve subsurface and surface disturbance of lands within Coronado National Forest, which has drawn local opposition.

Given the time it takes to develop any large-scale mining operation and the built-in uncertainty that goes along with any project that could run for several decades or longer, it's easy to overlook the impact of a slow permitting process. After all, what's a few more years in the big scheme of things when it comes to sound planning and appropriate environmental safeguards? But unless the permitting process can be improved, U.S. mining developments

will continue to take longer to come online and carry more financial risks compared with the rest of the world, China's domination of battery manufacturing and critical minerals production will continue for a longer period, and the U.S. will find it increasingly difficult to acquire the metals and minerals it needs for its long-term clean-energy goals.

"Don't Pass Me By" was written by Richard Starkey (Ringo Starr) and appears as the sixth song on The Beatles' ninth studio album, *The Beatles (White Album)*. Starr wrote the song shortly after he joined The Beatles in August 1962. He said it was the first song he wrote, "while sitting round at home, fiddling with the piano." He wrote two songs for The Beatles, "Don't Pass Me By" and "Octopus's Garden," and co-wrote "What Goes On" and "Flying." Keith Richards once commented to Paul McCartney that the difference between their groups was that The Stones had one front man, while The Beatles had four. "Don't Pass Me By" was recorded during June and July 1968 at Abbey Road in London. It was released as a single in Scandinavia in April 1969 and went to #1 in Denmark. Personnel on the record were: Ringo Starr (vocals, drums, percussion, tack piano), Paul McCartney (grand piano, bass), and Jack Fallon (fiddle). Both pianos on the song were recorded into a Leslie 147 speaker.

The Beatles (White Album) was recorded between May and October 1968 at Abbey Road and Trident in London with George Martin producing. Nineteen of the LP's 30 songs were written during March-April 1968 at a Transcendental Meditation retreat that the band attended in Rishikesh, India. The double album was released in November 1968 and went to #7 on the Billboard 200 Albums chart. It has been certified 24x Platinum by the Recording Industry Association of America. The original release of the album had The Beatles name embossed on the front cover and were numbered. No singles were released from the LP but "Hey Jude" backed with "Revolution" originated from the same sessions and were issued as a single in August 1968. It went to #1 on the Billboard Hot 100 Singles chart and has been certified 4x Platinum by the RIAA.

The Beatles were an English rock band formed in Liverpool, England, in 1960. The band, with members John Lennon, Paul McCartney, George Harrison, and Ringo Starr, went on to change pop culture and are considered by many to be the most influential band of all time. They have released 21 studio albums, six live albums, 36 EPs, 54 compilation albums, and 63 singles. All of the band are Members of the Order of the British Empire (MBE). They were inducted into the Rock and Roll Hall of Fame in 1988, and have received one Academy Award, Seven Grammy Awards, and 15 Ivor Novello Awards. They are the best-selling band in history, having sold more than 600 million records worldwide. All band members went on to successful solo careers after the breakup of The Beatles in 1970. John Lennon was

assassinated in December 1980, George Harrison died in November 2001. Both Paul McCartney and Ringo Starr continue to record and tour as solo artists.

Don't Pass Me By - Remastered 2009

The Beatles