Written Testimony of Josh Gubkin

Associate General Counsel
Redwood Materials

Before the
Subcommittee on Environment
Committee on Energy and Commerce
United States House of Representatives

Hearing on
Help or Hindrance? The Impact of U.S. Environmental Laws on Critical Material Supply Chains, National Security, and Economic Growth

April 22, 2026

Introduction

Redwood Materials appreciates the opportunity to submit written testimony to the Subcommittee on Environment regarding the impact of federal environmental laws on efforts to reshore and develop U.S. supply chains for critical minerals.

Redwood is the largest lithium-ion battery recycler in North America. We operate across the full battery lifecycle: collecting end-of-life batteries from consumers and manufacturers, repurposing batteries for stationary energy storage, and recycling batteries through calcination and hydrometallurgical processes that recover, on average, 98 percent of critical minerals including nickel, cobalt, lithium, and copper.

Redwood is today the largest domestic source of recovered nickel and cobalt, and among the largest sources of recovered lithium, producing more of these critical minerals annually than any active mine in the United States.

The critical minerals we recover are processed into battery-grade materials, ready for reintroduction into the domestic battery supply chain, reducing American dependence on foreign sources and strengthening our national security.

An independent lifecycle analysis by Stanford University engineers, published in *Nature Communications* in January 2025, quantified the environmental footprint of Redwood's processes compared to traditional mining and refining.[1] According to the analysis, our recycling process uses approximately 77 percent less energy, generates 58 percent fewer CO2 emissions, and requires 72 percent less water compared to conventional methods. In conventional mining, extraction and transport account for over 30 percent of the environmental footprint of cathode materials. Recycling reduces that impact to less than 5 percent.

Furthermore, not every battery that reaches the end of its original purpose is ready for recycling. Many EV packs retain significant capacity for stationary energy storage. By 2030, enough end-of-life EV battery packs will exist in North America to supply roughly half of the projected energy storage market.[2] Repurposing these batteries for grid-scale energy storage enables rapid deployment of reliable electricity supply for utilities, manufacturing facilities, and data centers at a fraction of the cost and timeline of new-build alternatives.

Repurposed battery energy storage systems can deploy in 6 to 8 months compared to 3 to 5 years for greenfield projects, targeting 8 or more hours of duration at significantly lower cost. This presents opportunities for rapid deployment of energy storage for data centers, AI infrastructure, and grid stabilization.

Despite these advantages, two EPA regulatory frameworks are creating significant barriers to domestic lithium-ion battery recycling, repurposing, and critical mineral recovery: the Resource Conservation and Recovery Act (RCRA), which governs waste classification, and the Toxic Substances Control Act (TSCA), which governs chemical classification, including of battery

[1]Machala, M.L., Bunke, S., Vilchez, S. et al., "Life cycle comparison of industrial-scale lithium-ion battery recycling and mining supply chains," Nature Communications 16, 988 (2025). DOI: 10.1038/s41467-025-56063-x.
[2]Solar Energy Industries Association (SEIA) and Benchmark Mineral Intelligence, U.S. Energy Storage Market Outlook Q1 2026 (ESMO), February 23, 2026. See also MarketsandMarkets, "Second Life EV Battery Market Worth 330–350 GWh by 2030," August 8, 2025.

materials. Together, these frameworks push investment, manufacturing, and mineral recovery offshore, directly undermining the administration's priorities on energy dominance, critical mineral security, and domestic supply chain development. These same barriers also impede the rapid deployment of repurposed battery energy storage systems that could deliver more stable and affordable electricity supply to utilities, manufacturing facilities, and data centers.

The Strategic Context: Batteries Are a Critical Mineral Feedstock, Not Waste

The concentrations of nickel, cobalt, lithium, and copper in end-of-life batteries are significantly higher than in mined ores. These materials were already refined once, removing impurities. Moreover, they all are packaged in one place rather than scattered within the earth across continents. Batteries represent a strategic domestic stockpile of critical minerals ready to be recovered and reused.

Yet the United States is actively exporting this stockpile. Because EPA has classified used lithium-ion batteries and processed battery materials as hazardous waste, domestic recyclers face permitting timelines, compliance costs, and operational restrictions that foreign processors do not. Battery materials generated in the United States, containing cobalt, nickel, lithium, and copper already refined once on American soil, are routinely shipped overseas for mineral recovery. According to Argonne National Laboratory, the United States had domestic refining capacity for only 35,500 tons of battery materials as of 2023, while an additional 76,000 tons of planned capacity remains years away from coming online.[3] The material that cannot be processed here does not wait. It leaves. In practice, this regulatory framework suppresses the value of these materials domestically, creating a perverse incentive to export them to jurisdictions that recognize them as valuable feedstock. We remain a net importer of refined critical minerals.[4] Many of these batteries also retain significant capacity for stationary energy storage and could be repurposed to support grid reliability, data center growth, and domestic energy infrastructure before they are ultimately recycled.

Other nations have recognized the value of battery materials as a critical feedstock and are acting accordingly. China changed its regulations in August 2025 to classify qualifying recycled battery materials, including black mass meeting specified quality standards, as non-waste raw material eligible for import.[5] By reducing regulatory and administrative burdens, China has made itself a more attractive destination for critical materials processing. China now controls more than 80 percent of global lithium-ion recycling capacity.[6]

---

[3]Argonne National Laboratory, "Securing Materials for the U.S. Electric Vehicle Industry" (February 2024).
[4]U.S. Geological Survey, Mineral Commodity Summaries (2025).
[5]China Ministry of Ecology and Environment et al., "Announcement on Matters Related to Regulating the Import Management of Recycled Black Mass Raw Materials for Lithium-Ion Batteries and Recycled Steel Raw Materials" (June 10, 2025, effective August 1, 2025), implementing national standard GB/T 45203-2024. For English-language analysis, see Beveridge & Diamond P.C., "China and Europe Diverge on Classification of Black Mass from Recycling of Lithium-Ion Batteries" (June 18, 2025).
[6]International Energy Agency (IEA), Global EV Outlook 2024 (Paris: IEA, 2024).

The European Union, by contrast, classified black mass as hazardous waste.[7] The result is widespread reports of declining investor confidence, paused or cancelled projects, and increased exports of battery materials to jurisdictions with more favorable regulatory treatment.

The United States is currently positioned to make the same mistake as Europe. The actions taken in the coming months will determine our destiny.

The federal government has made its priorities on critical minerals clear. Executive Orders on *Unleashing American Energy* and *Boost Critical Mineral Production* include streamlined permitting for domestic mining projects. However, despite lower costs, fewer environmental impacts, and superior recovery rates, projects utilizing our urban mines to recycle and repurpose the critical minerals we already have on U.S. soil have not benefited from similar advantages.

I. RCRA: Waste Classification Barriers

EPA regulates used lithium-ion batteries as hazardous waste under RCRA. EPA's May 2023 guidance memorandum formalized this position, concluding that "most lithium-ion batteries on the market today are likely to be hazardous waste when they are disposed of" — a determination that can apply equally to a battery retaining 80 percent of its usable capacity headed for a second-life energy storage application and to a depleted cell headed for recycling.[8] In fact, "EPA recommends that … businesses consider managing all of their used lithium batteries as hazardous waste under the federal 'universal waste' regulations in Title 40 of the Code of Federal Regulations (CFR) part 273." This classification is the root cause of a cascade of regulatory barriers that penalize domestic recyclers, create unnecessary red tape, and cause the United States to cede strategic ground to China.

The Two Current Options

Today, EPA gives American companies that want to recycle lithium-ion batteries two options. Both push investment overseas.

Option 1: Enter a RCRA Part A/B permitting process that, through EPA's own admission, can take years to complete before construction can even begin, with similarly frustrating timelines for any subsequent modifications.[9] This timeline is insurmountable for fast-moving, high-growth companies operating in a rapidly evolving industry.

Option 2: Store batteries as the hazardous waste subclassification of universal waste at a physically separate facility from where they are processed. Facilities cannot even be adjacent to each other, and batteries must be transported on a public roadway between them. This requirement results in additional, unnecessary handling and transport, increasing risk to the public and the environment. It runs directly counter to EPA's own mission.

---

[7]Commission Delegated Decision (EU) 2025/934 of 5 March 2025 amending Decision 2000/532/EC as regards an update of the list of waste in relation to battery-related waste, OJ L, 2025/934 (May 20, 2025).

[8] U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, *Lithium Battery Recycling Regulatory Status and Frequently Asked Questions*, Memorandum from Carolyn Hoskinson, Director, Office of Resource Conservation and Recovery, to LCRD Division Directors, Regions 1–10 (May 24, 2023), RCRA Online Document No. 14957, available at https://rcrapublic.epa.gov/files/14957.pdf.

[9]Introduction to United States Environmental Protection Agency Permits and Interim Status (40 CFR Part 270), Solid Waste and Emergency Response (5305W) EPA530-K-05-016, p5.

Limited waste exclusions, such as for Hazardous Secondary Materials (HSM) and Commercial Chemical Products (CCP), avoid these problematic options, but their availability varies state by state. HSM is a federal exclusion that has not been adopted by all states, including California and much of the northeast. Some are even suggesting removal of these exclusions, further restricting the limited relief available today.

The Handler/Destination Facility Distinction

Under universal waste regulations, battery handlers can store and perform basic operations such as sorting, discharging, and disassembling batteries. However, handlers are not permitted to recycle. Batteries must be sent to a destination facility, and the moment they arrive, they become fully regulated as hazardous waste subject to much stricter standards. No change to the batteries has taken place that alters any hazardous characteristics. The only change is their location. Yet that change in location triggers an entirely different regulatory regime.

The Battery Act of 1996 Preemption Problem

Congress enacted the Battery Act of 1996 with the goal of increasing voluntary recycling of batteries. The Act made federal universal waste regulations effective in all 50 states for the collection, storage, and transportation of used rechargeable batteries. Importantly, the Act limited applicable regulations to those effective on May 11, 1995.

This creates a legal gray area that only Congress can resolve. Either the Battery Act preempts new EPA rulemaking on lithium-ion batteries, making any new rule unenforceable in the states, or it does not, in which case states can selectively adopt new regulations and the result is a 50-state patchwork. Either outcome undermines the goal of a coherent national framework for managing these strategically important materials.

Without Congressional action, litigation is inevitable. States have already begun enacting battery collection and producer responsibility regulations that potentially conflict with the Battery Act. Nearly a dozen states have enacted or are advancing extended producer responsibility laws for small-format lithium-ion batteries, while New Jersey has enacted and states including Colorado, California, Massachusetts, Washington, and Hawaii have proposed frameworks addressing large-format EV batteries. Each of these programs creates collection, reporting, and fee structures that may conflict with the Battery Act's preemption provisions, and the inconsistencies across state lines are already creating compliance challenges for manufacturers and recyclers operating nationally. Additionally, EPA plans to publish proposed rulemaking for lithium-ion batteries, which could be viewed as a direct contradiction of the Battery Act's explicit limitations.

The Repurposing Opportunity

EPA's current framework creates uncertainty about whether batteries destined for repurposing are wastes. If classified as waste the moment they leave a vehicle, the entire repurposing industry is subject to RCRA, which makes no sense for a product with significant remaining useful life. Batteries sold for reuse are commodities with value, not discarded materials. Any legislative framework should establish that batteries are not waste until a determination is made that they cannot be repurposed.

EPA itself promotes a waste management hierarchy that favors reuse and repurposing before recycling, and recycling before disposal. Yet RCRA, supported by EPA's recent guidance, presumptively categorizes lithium-ion batteries as hazardous waste and requires companies to clear numerous hurdles to overcome that presumption. This is internally contradictory and must be resolved. EPA's own May 2023 guidance memorandum illustrates this problem. In FAQ #1, EPA acknowledges that "it can be difficult for a generator to identify which of its used lithium batteries are hazardous waste when disposed" and therefore recommends that businesses manage all of their used lithium batteries as universal waste.

In FAQ #14 of the same document, EPA describes a reuse pathway, but conditions it on four legitimacy factors under 40 CFR 260.43, including "The battery is managed as a valuable commodity—between removal from service and reuse, it is managed with appropriate safety and tracking procedures similar to newly manufactured inventories of batteries." The upstream handlers who feed the domestic second-life supply chain, including auto shops, dealerships, junkyards, and insurance salvage companies, typically lack the systems and documentation to demonstrate compliance with that standard and default to universal waste management as a result.

II. TSCA: Chemical Classification Barriers

TSCA creates a separate but equally significant set of barriers to domestic battery manufacturing and recycling. EPA recognizes modified cathode active materials (mCAMs) as chemical substances subject to TSCA Section 5 notification requirements.[10] Other global regulatory frameworks take a different approach for nomenclature, treating modified CAMs as a statutory mixture of existing CAMs and metals, rather than a new chemical substance. This is reflected in global chemical inventories where mCAMs are not listed but the base CAM is.

Dopant metals are added to CAM at trace amounts in ppm levels. Treating mCAMs as statutory mixtures would still allow EPA to adequately address exposure risk driven by the individual components. Alternatively, EPA could address mCAMs as a categorical substance with defined boundaries to reduce the need for PMNs, reviews, and associated delays.

EPA's designation of mCAMs as new chemical substances triggers Section 5 premanufacture notification (PMN) requirements. EPA generally approves a PMN with restrictions in the form of a consent order (CO), after which a significant new use rule (SNUR) is published to ensure the same restrictions apply to other users. This process creates three categories of harm: manufacturing delays, distribution restrictions, and inconsistent compliance standards.

Delays That Push Manufacturing Offshore

The statutory review period for premanufacture notifications is 90 days. In practice, EPA decisions take 8 to 16 months. After a PMN is approved with a consent order, a separate SNUR must go through federal rulemaking procedures before publication in the Federal Register,

[10]U.S. EPA, "CAMs and modified CAMs Compliance Advisory" (October 5, 2022). Available at: https://www.epa.gov/system/files/documents/2022-10/CAMs%20and%20modified%20CAMs%20Compliance%20Advisory__10-5-22.pdf

adding an additional period ranging from months to years. Total timelines from submission to market regularly exceed three years.

During the PMN review period, no company can domestically manufacture or import the new chemical substance for commercial purposes until approval in the form of a consent order, creating a direct incentive to manufacture offshore and import finished batteries as TSCA-exempt articles. Only the PMN submitter is burdened with the consent order restrictions after a notice of commencement is filed, while competitors are not bound to the same restrictions until a SNUR is published, which can take years. The consent order obligations flow downstream to recyclers handling the same materials through a written agreement with the submitter, compounding the penalty on domestic participants throughout the battery lifecycle. The net effect is a system that punishes first movers, rewards importers, and disadvantages the domestic supply chain at every stage.

This is not unique to battery materials. As this Committee has heard in prior testimony, EPA's process for reviewing new chemicals is significantly slower than regulators in other countries, creating a systemic disadvantage for domestic manufacturers across multiple sectors.

Consent Order Restrictions That Block Domestic Recycling

TSCA was not designed with circularity in mind. Consent orders typically restrict distribution of materials to the original PMN submitter. A recycler operating as a downstream user of the PMN submitter via a written agreement is prohibited from further distributing recycled or reclaimed materials domestically except for disposal. This distribution restriction remains in place until a SNUR is published, which can take one to two years. For SNUN consent orders, if a modified SNUR is never published, the restriction exists indefinitely. The practical result is that domestically recycled materials must be exported, which is the exact opposite of the policy goals of this Committee.

This challenge is magnified by the realities of mixed feedstocks, where chemical identity may be protected by supplier intellectual property, material composition varies from batch to batch, and full characterization is often impractical.

Inconsistent Compliance Requirements

EPA imposes restrictions through consent orders and SNURs as risk management tools, but the restrictions are often highly conservative relative to actual exposure and risk and vary between submitters and similar materials. Orders frequently impose restrictions such as air and water release, disposal requirements, workplace controls, personal protective equipment, and occupational exposure limits, that overlap with OSHA, RCRA, CAA, and CWA. Consent orders lack formal rulemaking process and extensive stakeholder involvement which can lead to restrictions that may not reflect the best available science. The regulatory overlap creates confusion as TSCA imposes standalone restrictions that are not integrated with the enforcement systems that other statutes have in place. EPA can coordinate restrictions within its divisions and with OSHA to make protective measures for the recycling sector more efficient and consistent. Costs associated with the restrictions compound the delays already created by the PMN and SNUR timeline, further discouraging the domestic investment that both Congress and the administration are working to attract.

III. Interagency Misalignment

The regulatory barriers described above are compounded by a fundamental misalignment among federal agencies. The Department of Energy funds battery recycling research and development. The administration's executive orders on energy dominance and critical minerals explicitly promote domestic mineral recovery. The Department of Defense treats these materials as defense-critical. Meanwhile, EPA classifies the same materials as hazardous waste and subjects domestic battery manufacturers to exhausting review and prohibitive restrictions on production.

The administration has streamlined permitting for critical mineral mining projects. Recycling operations recovering identical minerals from domestic sources, with significantly lower environmental impact, have not received the same treatment.

This misalignment extends beyond waste and chemical classification. EPA regulates releases, including spills and emissions, and this authority is not contingent on whether batteries are new or used. Concerns about battery fire safety have legitimacy, but that does not mean EPA is the appropriate agency to regulate them. EPA should not bootstrap its authority over hazardous waste to regulate matters such as fire prevention, storage configurations, emergency response procedures, and packaging requirements. These issues fall squarely within the established authority of other agencies and standards bodies, including OSHA for workplace safety, DOT and PHMSA for transportation, and state and local Authorities Having Jurisdiction for fire prevention under nationally adopted NFPA and ICC/IFC codes. Redwood and other industry experts actively participate in developing these safety standards through NFPA technical committees and the UL 9540 Task Group.

Adding to this complexity, new battery safety codes are being developed that will include transportation provisions, creating the prospect of PHMSA, NFPA, and EPA all regulating the transportation of batteries under separate and potentially conflicting frameworks. This kind of regulatory fragmentation creates enforcement chaos and compliance uncertainty for the companies this Committee is trying to support.

These inconsistencies must be resolved through a clear Congressional directive requiring interagency coordination, harmonized policy, and clear jurisdictional boundaries that prevent regulatory overlap.

IV. Policy Recommendations

The RCRA and TSCA constraints described above share a common root cause: regulatory frameworks designed before the lithium-ion battery industry existed, applied to materials and processes they were never intended to govern. Actions to address both include:

1. **Enact a national Lithium-Ion Battery Management Act.** A standalone federal framework that supersedes existing laws and regulations governing lithium battery management, including classification, transportation, storage, modification, and recycling, and addresses both RCRA and TSCA constraints in a unified structure. This would provide the consistency, clarity, and regulatory efficiency needed to attract and retain domestic investment. Alternatively, amend the Battery Act of 1996 to properly address lithium-ion batteries and processed critical minerals as a strategic feedstock.

Redwood has prepared a draft framework that could serve as a starting point for Congressional consideration.

2. **Use EPA rulemaking to recognize lithium-ion batteries as feedstock.** Under TSCA, an "article" is a manufactured item whose function is determined by its physical shape or design rather than its chemical composition. Intact used lithium-ion batteries meet this definition — their purpose is to store and deliver energy, not to serve as a chemical input. Formally classifying them as articles would exempt them from TSCA's premanufacture notification requirements, removing a significant barrier to domestic handling and recycling. Separately, under RCRA, adding used lithium-ion batteries and battery materials, including processed materials such as black mass, destined for reuse, repurposing, or legitimate reclamation to the list of excluded materials at 40 CFR 261.4 would clarify that these materials are not solid waste, consistent with how EPA already treats circuit boards, scrap metal, and other recoverable materials. Notably, EPA's 2023 guidance explicitly states that batteries are excluded from the scrap metal exclusion (FAQ #19) — a deliberate policy choice that Congress should revisit.

3. **Reform TSCA treatment of cathode active materials to reflect current science and support domestic manufacturing.** Consistent with other global regulatory frameworks for CAM nomenclature, classify mCAMs as mixtures of known CAMs and metals rather than new chemical substances. Eliminate consent order restrictions that block domestic distribution of recycled materials. Align restrictions with the best available science protecting the worker and general population without adverse impacts to the industry. Reduce the practical timeline for PMN review and SNUR publication to match statutory targets.

4. **Mandate interagency alignment between EPA, DOE, and DOW.** Direct these agencies to issue joint guidance harmonizing environmental, energy, and defense policy on battery materials. Ensure EPA rulemaking does not overlap with authorities already exercised by NFPA, ICC/IFC, OSHA, and DOT/PHMSA on fire safety and transportation.

5. **In the interim, require EPA to align any rulemaking with Congressional intent and report to Congress on progress.** EPA's current regulatory trajectory would impose more restrictive requirements on lithium-ion batteries, moving in the opposite direction of the policy goals described above. Until comprehensive legislation is enacted, clear timelines, Congressional reporting requirements, and substantive guardrails are necessary to ensure that any rulemaking supports, rather than undermines, domestic critical mineral recovery.

Conclusion

The regulatory frameworks governing lithium-ion batteries were designed decades before these materials existed and are now actively working against our national interests. Every day that these barriers remain in place, critical minerals leave American shores for processing in nations that have recognized their strategic value and acted accordingly.

The solutions are clear and achievable. Congress has the authority to modernize these frameworks in a way that protects the environment, ensures public safety, and unlocks the domestic critical mineral recovery capacity that our energy security, economic competitiveness, and national defense require.

Redwood Materials appreciates the opportunity to submit this testimony and stands ready to work with the Subcommittee and Congress to achieve these goals.

* * *