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I. INTRODUCTION

Chairman Palmer, Ranking Member Tonko, and Members of the Subcommittee, thank you for inviting me to testify at this hearing. My name is Aaron Goldberg, and I am a principal with Beveridge & Diamond, P.C., which is the nation's oldest and largest law firm focused on environmental law and litigation. My testimony today will address the need for legislation to change the nation's hazardous waste regulatory program under the Resource Conservation and Recovery Act ("RCRA") to facilitate and promote domestic recovery and reuse of critical minerals through recycling of lithium-ion batteries ("LIBs"), such as those used in consumer electronics, electric vehicles, and energy storage systems.

I believe I have a unique perspective on these issues, because of my background and experience. In addition to being an attorney, I have an advanced degree in chemistry. I was a consultant to the U.S. Environmental Protection Agency ("EPA" or the "Agency") throughout most of the 1980s on the development of the RCRA hazardous waste regulations. I also served as a legal intern in the White House Office of Management and Budget ("OMB") on environmental and other issues, before moving to private law practice. I have represented companies and trade associations across virtually all sectors of the economy, as well as federal, state, and local government entities. For example, I served as the sole attorney on a National Academy of Sciences panel that advised the U.S. Army on issues associated with the facilities that were used to destroy the nation's remaining stockpile of chemical weapons.

I currently represent several companies throughout the lithium-ion battery supply chain, including manufacturers of batteries and battery-containing products, distributors, large-scale users, collectors of used batteries, recyclers, and brokers. However, I am testifying today solely in my personal capacity. The views I express today are my own. I am not representing my law firm, any client of my law firm, or any other party.

II. SUMMARY

The existing RCRA regulatory framework was established before LIBs were widely marketed or used. As a result, even though the rules contain numerous provisions designed to promote recycling of other types of batteries, there are no similar provisions for LIBs. In the absence of such provisions, the rules create inconsistencies and obstacles that were never intended and that frustrate current national goals for recovery and recycling of the critical minerals in LIBs.

Key among the inconsistencies is the fact that used batteries sent for repair/refurbishment to enable “second-life use” are classified as wastes, even though used electronics sent for similar handling are not deemed wastes. Similarly, used batteries set for metals recovery are classified as wastes, even though unused (*e.g.*, off-specification) batteries sent for exactly the same processing are classified as non-wastes. And, the initial product of shredding LIBs for purposes of recycling (*i.e.*, “black mass”) is classified as waste, even though less processed or less valuable materials, like shredded circuit boards or lead plates/groups from simply breaking lead-acid batteries open and separating the components, are generally not classified as wastes.

The resulting obstacles to recovery of critical minerals are substantial. For example, the rules compel LIB recyclers to store the batteries off site prior to recycling, which serves no environmental purpose, and instead merely adds costs, complicates logistics, and increases transport/handling risks. The rules subject certain types of furnaces that process LIBs for metals recovery to stringent standards that furnaces processing other batteries are exempt from. They also make domestic recovery of black mass harder and put the U.S. at a disadvantage to countries like China, which generally views black mass as a valuable commodity. In addition, the rules unnecessarily restrict land disposal of *non-hazardous* residues from recycling LIBs, even though the corresponding residues from recycling other batteries are not restricted.

An upcoming rulemaking that EPA has announced could aggravate the problems further. While the details have not yet been released, the Agency has indicated that the focus will be on making the existing rules for both collectors and recyclers of LIBs more stringent to address fire risks, not to address any of the issues highlighted here. Fire risks are a legitimate concern, but they are already addressed by a host of other regulatory programs, such as fire codes and federal rules for LIB transport. Issuing new universal waste standards for LIBs that differ from the existing universal waste rules for batteries of all types is likely to result in confusion. New standards addressing fire risks also will likely not be appropriate for solid-state LIBs, which pose little or no risk of fire. Moreover, depending upon the nature of the new standards, they could be a strong disincentive to collection and recycling of LIBs.

Legislation is needed to address the fundamental problems with the current RCRA rules for LIBs. Although EPA could conceivably provide some measure of relief, a rulemaking for this purpose would take years, and any final federal rule would not take effect unless and until the states act to adopt it – a process that could take several more years and might never be complete.

The draft Battery Recycling for America’s Competitive Economy Act (“BRACE Act”) provides a useful start, but it requires important revisions. The draft provision to allow recyclers to store LIBs on site could paradoxically leave onsite storage less regulated than offsite storage. It would grant EPA broad authority to issue new universal waste standards for LIBs and would direct the Agency to do so, despite questions about the advisability of new standards, and without requiring EPA to account for existing safety requirements or national goals for recovery of critical minerals. Finally, it does not address key issues, such as the unwarranted regulation of critical mineral recycling furnaces, black mass, and non-hazardous recycling residues.

There are simple, commonsense ways to improve the draft BRACE Act on each of these fronts. With appropriate changes, the bill should be moved forward and enacted as an important means to support the domestic supply chain for critical minerals, while continuing to protect human health and the environment.

III. DISCUSSION

A. RCRA and Its Implementing Regulations Were Not Developed with Lithium-Ion Batteries in Mind

At the outset, it is important to note that virtually all the relevant RCRA regulations were promulgated in the 1980s and 1990s, before lithium-ion batteries started to be marketed or widely used. As a result, the rules are essentially silent on LIBs. However, it was recognized early on that special rules were required to facilitate and promote recycling of the other types of batteries that existed at the time. Numerous provisions were issued for this very purpose. For example, in the case of spent lead-acid batteries, there is an entire set of partial exemptions for such batteries when destined for various types of recycling (40 C.F.R. § 261.6(a)(2)(iv) and Subpart G of Part 266), special rules for import and export (§ 262.83(b)(1)(xi) and § 262.84(b)(1)(xi)), special treatment standards for the batteries (§ 268.40 (D008 Lead Acid Batteries Subcategory)), special rules for lead recovery furnaces processing the batteries (§ 266.100(d)(3) and Appendix XI to Part 266), an exclusion from the definition of debris for the batteries (§ 268.2(g)), special treatment standards for certain residues from secondary lead smelters processing the batteries (§ 268.40), and numerous delistings from the definition of hazardous waste for some of the resulting residues (Part 261, Appendix IX). For nickel-cadmium batteries, there are similar provisions, such as special treatment standards (§ 268.40 (D006 Cadmium Containing Batteries Subcategory)) and special rules for nickel-chromium recovery furnaces processing the batteries (§ 266.100(d)(3) and Appendix XII to Part 266).

The absence of any special provisions for lithium-ion batteries means that such batteries are subject to the general regulations for hazardous wastes that were developed without LIBs in mind and that therefore do not reflect the unique nature of such batteries, their importance to the nation's energy, technology, transport, and security infrastructure, or their value as a vital domestic source of critical minerals.

B. The RCRA Regulations Improperly Classify Used Lithium-Ion Batteries and Related Materials as Wastes, Rather than as Valuable Resources

The most fundamental problem with application of the general RCRA rules to lithium-ion batteries is that the rules generally result in classification of the used LIBs as wastes, rather than the valuable resources that they are. Such misclassification is not only unwarranted, but it is also inconsistent with the classification of closely analogous materials under the regulations, as illustrated below:

- o ***Used Batteries vs. Used Electronics Destined for Repair/Refurbishment.*** Under the rules, used battery packs sent for “regeneration,” such as replacement of bad cells or rewiring for continued use, are generally classified as wastes. *See, e.g.,* 60 Fed. Reg.

25,492, 25,522 (May 11, 1995) (“facilities regenerating used batteries are subject to the [RCRA universal waste] standards”); 48 Fed. Reg. 14,472, 14,496 (April 4, 1983) (“batteries [may be] regenerated by replacing the drained electrolyte or replacing one or more bad cells”); 58 Fed. Reg. 8102, 8124 (February 11, 1993) (“batteries [may be] regenerat[ed] [by] replacement of electrolyte or rewiring”). However, EPA has long stated that used electronics sent for similar repair operations are *not* wastes. *See, e.g.*, 67 Fed. Reg. 40,508, 40,511 (June 12, 2002) (“used CRTs undergoing repairs before resale or distribution are not being ‘reclaimed,’ and are considered to be products ‘in use’ rather than solid wastes. ... [Such] repairs typically consist of rewiring [or] replacing defective parts [T]hese repairs and replacement activities do not constitute waste management”).

- o ***Used Batteries vs. Unused Batteries Destined for Metals Recovery.*** Used batteries destined for metals recovery are generally classified as wastes. *See, e.g.*, 40 C.F.R. § 261.2(c)(3) (spent materials destined for reclamation are generally classified as solid wastes); Letter from Sylvia K. Lowrance, Director, Office of Solid Waste, EPA, to Peter Ploch, Waste Engineering and Enforcement Division, Connecticut Department of Environmental Protection (February 13, 1991) (RCRA Online #11584) (“Used batteries are classified as spent materials”); 40 C.F.R. § 261.1(c)(4) (“A material is ‘reclaimed’ if it is processed to recover a usable product, or if it is regenerated. Examples [include] recovery of lead values from spent batteries”). However, unused off-specification batteries destined for exactly the same processing are *not* wastes. *See* 40 C.F.R. § 261.2(c)(3) (commercial chemical products destined for reclamation are not solid wastes); 58 Fed. Reg. at 8115 (“Unused batteries ... are considered commercial chemical products [that when] reclaimed are not solid wastes under § 261.2(c)(3).”). While the federal regulations provide a mechanism for spent materials, including used batteries, to be excluded from regulation when destined for reclamation, such exclusion requires generators and recyclers of the materials to comply with a host of onerous requirements, and it is not available in many states. *See* 40 C.F.R. §§ 261.4(a)(23)-(25) (the “Hazardous Secondary Material” exclusions).
- o ***Materials from Mechanical Processing of Lithium-Ion Batteries vs. Materials from Similar Processing of Lead-Acid Batteries or Circuit Boards.*** Because used LIBs destined for recycling are generally classified as wastes, the critical mineral-rich “black mass” that results from the initial stage of recycling such batteries (*e.g.*, mechanical grinding under water or inert nitrogen, or thermal processing) is also classified as a waste under the rules. *See, e.g.*, Memorandum from Carolyn Hoskinson, Director, Office of Resource Conservation and Recovery, EPA, to Land, Chemical, and Redevelopment Division (“LCRD”) Division Directors, EPA Regions 1-10 (May 24, 2023) (RCRA Online #14957) (“EPA LIB Guidance”) at 10 (discussing “[a] battery recycler that stores hazardous waste (*e.g.*, ... black mass that exhibits one or more characteristics of hazardous waste).”). However, circuit boards that have merely been shredded and that have much lower value are explicitly *excluded* from classification as waste when destined for recycling. *See* 40 C.F.R. § 261.4(a)(14). EPA has also indicated that lead plates and groups from simply breaking lead-acid batteries open and separating the components are properly excluded from the definition of waste if a facility “stores and handles its plates

and groups in a manner that minimizes losses and otherwise runs a sound operation.” *See* Memorandum from Sylvia K. Lowrance, Director, Office of Solid Waste, EPA, to Waste Management Division Directors, EPA Regions 1-10 (August 26, 1988) (RCRA Online #11364). Black mass, like these other materials, appear to meet the criteria that EPA has established for identifying “partially reclaimed materials” that are “commodity-like” and thus should be excluded from the definition of solid waste. *See* 40 C.F.R. § 260.31(c). The material results from substantial processing of LIBs, has substantial value, is a suitable substitute for virgin material (e.g., critical mineral ores), and is handled to minimize loss.

These classifications for LIBs and related materials are not only in conflict with the classifications of similar materials under RCRA, but they are in stark contrast with how some of the nation’s key competitors classify the materials. China, for example, views most black mass as non-waste in order to promote import and recovery of the critical minerals it contains. *See, e.g.,* Beveridge & Diamond, P.C., “China and Europe Diverge on Classification of Black Mass from Recycling of Lithium-Ion Batteries” (June 18, 2025). In this way, the EPA misclassification of LIBs and black mass has needlessly placed the U.S. at a competitive disadvantage and undercut its efforts to secure a robust domestic supply chain for critical minerals.

C. The Misclassification of Lithium-Ion Batteries Creates Numerous Obstacles to Recovery of Critical Minerals

The misclassification of lithium-ion batteries and black mass results in a cascade of other problems under the RCRA regulations that serve as significant obstacles to recycling and recovery of critical minerals from the materials. Examples include, but are not limited to, the following:

- o ***Virtual Mandate that Recycling Facilities Be Split into Two.*** Under the regulations, waste batteries qualify as “universal wastes,” which are subject to only limited requirements for persons generating, transporting, or collecting the wastes. *See generally* 40 C.F.R. § 273.2 (discussing the applicability of the universal waste rules to hazardous waste batteries) and Subparts B, C, and D of Part 273 (requirements for small handlers of universal wastes, large handlers, and transporters, respectively). However, facilities that recycle the wastes are subject to full regulation for storage of the batteries they receive, including the requirement to have a hazardous waste storage permit. *See* 40 C.F.R. § 273.60(a). Obtaining such a permit is at best an expensive multi-year process, if it is practical at all. So, recyclers are compelled to split their facilities into two parts: a collection-only facility and a nearby (but non-adjacent) recycling-only facility. The collection-only facility can operate (without a permit) under the reduced universal waste handler rules, and as long as it can deliver the wastes to the recycling-only facility on a “just-in-time” basis for processing, the recycling facility won’t be storing the wastes and thus won’t require a storage permit, either. *See* 40 C.F.R. §§ 273.60(b), 261.6(c)(2). Of course, such an arrangement serves no environmental purpose whatsoever. On the contrary, it just imposes unnecessary costs, complicates logistics, and increases transport and handling risks.

- o ***Requirements for Separate Management of Intact and Non-Intact Lithium-Ion Batteries.*** EPA has long maintained that “[a] handler of universal waste may only manage broken or damaged hazardous waste batteries as universal wastes if the breakage or damage *does not constitute a breach in the cell casing.*” See RCRA Hotline Report (September 2002) (RCRA Online #14634) (emphasis added). In 2023, the Agency explicitly applied this view to lithium-ion batteries. See EPA LIB Guidance at 8. As a result, separate and parallel systems must be established for collecting and transporting intact LIBs (pursuant to the universal waste rules) and non-intact LIBs (pursuant to the full hazardous waste regulations). Importantly, EPA has not claimed that such separate management is required due to differences in risks associated with the two types of batteries. On the contrary, the Agency based its conclusions on semantics, namely the precise wording of the universal waste rules that it had issued years before. See, e.g., *id.* (“The definition of battery [in the regulations] does not explicitly state that all batteries must be whole; however, the definition includes an intact, unbroken battery from which the electrolyte has been removed Additionally, the requirements for handlers of universal waste allow certain management activities ... provided the batteries or cell casings are not breached and remain intact.”).

Moreover, it is questionable whether the disparate rules for intact and non-intact LIBs could be justified based on risks. The universal waste rules cover wastes with a variety of significant hazards, including devices that contain mercury that is highly mobile (liquid and volatile) and highly toxic. See 40 C.F.R. § 273.4 (discussing the applicability of the universal waste rule to mercury-containing equipment) and § 273.9 (defining universal waste lamps to include mercury vapor lamps); 70 Fed. Reg. 45,508, 45,513 (August 5, 2005) (stating that the mercury-containing equipment covered by the universal waste rule includes thermometers and other devices in which the mercury is contained in glass (which presumably may be susceptible to breakage)). In addition, in the case of LIBs, cells with broken casings might be *less* hazardous than intact cells, since they likely would have already undergone a thermal event or otherwise may no longer contain the key ignitable component (*i.e.*, the organic electrolyte). Accordingly, the requirement for separate management may serve no purpose, while needlessly increasing the costs of recycling and complicating the associated logistics.

- o ***Requirements for Smelting, Melting, and Refining Furnaces Recovering Metals from Lithium-Ion Batteries.*** Smelting, melting, and refining furnaces (“SMRFs”) that process hazardous wastes, including lithium-ion batteries, for purposes of recovering metals are potentially subject to extensive regulation and permitting under the RCRA rules for industrial furnaces (or boilers, if they also recover and export energy). See generally 40 C.F.R. § 260.10 (defining industrial furnaces to include SMRFs that recover materials or energy from hazardous wastes) and Subpart H of Part 266 (requirements for boilers and industrial furnaces). There is an exemption for SMRFs that process the wastes *solely* for the purpose of recovering metals. See 40 C.F.R. § 266.100(d). However, processing generally is not viewed as solely for that purpose if the waste contains more than 500 parts per million (“ppm”) of certain toxic organics (such that the waste is deemed to be processed, at least in part, for purposes of destroying such constituents), or if the waste

has a heating value of more than 5,000 Btu/lb (such that the waste is deemed to be processed, at least in part, for purposes of energy recovery). *See* 40 C.F.R. § 266.100(d)(2). In addition, facilities claiming this exemption generally must notify EPA, test the wastes being processed to ensure their compliance, and keep associated records. *See* 40 C.F.R. § 266.100(d)(1).

For batteries *other than* LIBs, the conditions for exemption (*e.g.*, the numeric standards and requirements for testing) generally do not apply. *See* 40 C.F.R. § 266.100(d)(3); Part 266, Appendix XI (spent lead batteries and their components) and Appendix XII (nickel-cadmium batteries). However, there are no special provisions for LIBs, and thus all of the conditions for exemption apply to such batteries. It could be a significant burden for SMRFs processing LIBs to comply with all the exemption conditions. Moreover, it may not even be possible for these SMRFs to comply with the conditions; for example, the heating value of the LIBs may be too high because of combustible materials they contain (*e.g.*, organic electrolytes and plastics). Without the exemption, the SMRFs may be subject the full permitting requirements for industrial furnaces, even though SMRFs processing other batteries are exempt. It is also noteworthy in this regard that there is a separate exemption (with much fewer conditions) for SMRFs that process hazardous wastes to recover economically significant amounts of precious metals, *see* 40 C.F.R. § 266.100(g), but no corresponding exemption for SMRFs recovering valuable critical minerals (*e.g.*, from LIBs).

- o ***Complications for Disposal of Non-Hazardous LIB Recycling Residues.*** The RCRA Land Disposal Restrictions (“LDR”) program establishes treatment standards for each type of hazardous waste that must be met before the waste or residues thereof can be disposed of on land. *See generally* 40 C.F.R. Part 268. For hazardous waste batteries that existed when the LDR rules were promulgated, EPA issued treatment standards specifically tailored for the battery wastes, which simply required (thermal) recovery of the metals (or microencapsulation, in the case of radioactively contaminated batteries). *See* 40 C.F.R. § 268.40 (establishing treatment standards of “RTHRM” for the D006 Cadmium Containing Batteries Subcategory, and “RLEAD” for the D008 Lead Acid Batteries Subcategory); § 268.42 (defining “RTHRM” and “RLEAD” as thermal recovery of the relevant metals). However, because there are no treatment standards specific to LIBs, such batteries are subject to the general treatment standards for other wastes with similar hazardous characteristics.

According to EPA, “most lithium-ion batteries on the market today are likely to be hazardous wastes ... due to the ignitability (D001) and reactivity (D003) characteristics.” *See, e.g.*, EPA LIB Guidance at 3. In the case of ignitability, two different LDR treatment standards seem potentially applicable, depending on whether the batteries contain more or less than 10% Total Organic Carbon (“TOC”). *See* 40 C.F.R. §§ 268.40. There is uncertainty about how the TOC level should be determined for this purpose (*e.g.*, whether organic carbon from plastic separators or battery pack housings should be counted together with organic carbon from electrolyte solvents). However, if the batteries contain greater than 10% TOC, the batteries or their recycling residues must be treated using specified technologies (*e.g.*, combustion) before the residues can be land

disposed. *Id.* and § 268.42 (defining the required treatment methods). Regardless of the TOC content, if the batteries are also reactive, any recycling residues that are land disposed must meet numerical Universal Treatment Standards (“UTSs”) for any Underlying Hazardous Constituents (“UHCs”) that they contain (*e.g.*, nickel). *Id.* and § 268.48 (UTSs). Importantly, this is true even if the residues are *non-hazardous*. *See* 40 C.F.R. § 261.3(d)(1) (“wastes that exhibit a characteristic at the point of generation may still be subject to [LDR] requirements ... even if they no longer exhibit a characteristic at the point of land disposal”). As a result, the non-hazardous residues from recycling LIBs – unlike the corresponding residues from recycling of other batteries, which already meet LDR standards since they result from the required recycling of the batteries – might require testing and/or further treatment, both of which could significantly, and unnecessarily, increase total recycling costs.

- o ***Uncertainties Regarding the Status of Certain LIB Categories in the States.*** Under the RCRA regulations, waste LIBs generated by households or facilities that generate very small quantities of total hazardous wastes (“VSQGs”) are generally excluded or exempt from regulation. *See* 40 C.F.R. §§ 261.4(b)(1), 262.14, and 273.8(a). However, in the case of LIBs, EPA has stated that “some states are more stringent and may have different requirements.” *See* EPA LIB Guidance at 7. This assertion by the Agency appears to be in direct conflict with the 1996 Mercury-Containing and Rechargeable Battery Management Act, Pub. L. No. 104-142 (“Battery Act”), which provides that collection, storage, and transport of rechargeable batteries (including LIBs) shall be regulated under EPA’s universal waste rule “notwithstanding any law of a State.” *See* 42 U.S.C. § 14323(a). The universal waste rule explicitly incorporates the exclusions/exemptions for household and VSQG wastes, *see* 40 C.F.R. § 273.8(a), and therefore should preempt any state rules that purport to regulate lithium-ion batteries from households or VSQGs. EPA’s guidance to the contrary may cast uncertainty over the regulatory status of these LIBs. Similar uncertainty may arise with respect to other categories of LIBs that are not subject to federal regulation but that states may purport to regulate. That would include batteries that are non-hazardous under the federal characteristics of hazardous waste, but would be classified as hazardous under state-issued hazardous waste characteristics. *See, e.g.*, 40 C.F.R. § 273.2(b)(3) (exempting batteries that do not “exhibit[] one or more of the [hazardous] characteristics identified in [40 C.F.R.] part 261, subpart C [*i.e.*, the federal characteristics]”).
- o ***Restrictions on Import of LIBs for Recovery of Critical Minerals.*** The classification of lithium-ion batteries as hazardous wastes means that the potential for import of the batteries for recovery of critical minerals is significantly limited. The U.S. is one of the few nations that are not party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (“Basel Convention”). As a result, other countries that are party to the Convention are generally obligated to prohibit shipments of hazardous wastes to the U.S. *See* Basel Convention, Article 4(5) (“A party shall not permit hazardous wastes ... to be exported to a non-Party”). For these purposes, hazardous wastes are defined as wastes that are classified as hazardous wastes under certain Annexes of the Convention or “by the domestic legislation of the Party of export, import, or transit.” *Id.*, Article 1(1). In practice, shipments are commonly prohibited

even if the importing country is a non-party (*e.g.*, the U.S.) and it defines the waste as hazardous. Thus, imports of LIBs into the U.S. for recycling and recovery of critical minerals is generally prohibited – even if the exporting country does not view the batteries as wastes or hazardous. In this way, the misclassification of LIBs limits the ability of the U.S. to source critical minerals from abroad.

The general Basel Convention prohibition does not extend to imports of hazardous wastes into the U.S. from countries that are members of the Organization for Economic Cooperation and Development (“OECD”), which are covered by a side-agreement under Article 11 of the Convention. *See* OECD Council Decision on the Control of Transboundary Movements of Wastes Destined for Recovery Operations (“OECD Council Decision”). However, such shipments are subject to significant procedural requirements (*e.g.*, prior informed consent) under the OECD Council Decision, the RCRA hazardous waste import rules (*e.g.*, 40 C.F.R. § 262.84), and the corresponding rules of the exporting country and any transit countries. Such requirements complicate any transboundary movements and would not apply if the U.S. (and the other countries involved) did not classify LIBs as hazardous wastes.

As these examples illustrate, EPA’s misclassification of lithium-ion batteries and black mass as wastes creates significant obstacles to recycling and recovery of critical minerals from LIBs.

D. An Upcoming EPA Rulemaking Could Make the Problems Worse

EPA has announced its intent proceed with a rulemaking first announced by the Biden administration to revise some of the RCRA rules for lithium batteries. *See generally* Beveridge & Diamond, P.C., “EPA Moving Forward Soon with Rulemaking to Modify and Expand the RCRA Universal Waste Rule for Lithium Batteries and Solar Panels” (October 22, 2025). However, the focus appears to be on imposing *more stringent* standards to address fire risks, not addressing any of the issues discussed above or promoting the recycling of batteries to recover critical minerals. *See, e.g.*, Office of Management and Budget, Spring 2025 Unified Agenda of Regulatory and Deregulatory Actions (RIN: 2050-AH32) (“Th[e] change in the RCRA regulations would ... improv[e] safety standards and reduc[e] fires from end-of-life lithium batteries, while continuing to promote recycling.”); EPA, “Improving Recycling and Management of Renewable Energy Wastes: Universal Waste Regulations for Solar Panels and Lithium Batteries” (website last updated August 6, 2025) (“EPA is working on a proposal [that] ... will improve safety standards and reduce fires from mismanaged end-of-life lithium batteries, while continuing to promote battery recycling.”).

While the details of EPA’s planned proposal are not known at this time, some state regulatory officials have urged the Agency to dramatically increase applicable requirements, for example by further limiting allowed battery storage times, restricting battery storage quantities, prescribing specific standards for storage areas, requiring contingency planning, ratcheting up existing training requirements, and mandating financial assurance. *See* Letter from Melissa Ferree, Chair, Hazardous Waste Subcommittee, Association of State and Territorial Solid Waste Management Officials (“ASTSWMO”), and Holly Nelson, Chair, ASTSWMO Lithium Battery Workgroup, to EPA Office of Resource Conservation and Recovery (August 5, 2024).

Any such increase in applicable requirements, however, would undercut the goal of recovering critical minerals from LIBs. Moreover, although the fire risks associated with LIBs are real, it is questionable whether new fire safety standards are warranted, given the existence of fire codes developed by fire safety experts (*e.g.*, under the auspices of the National Fire Protection Association (“NFPA”)), U.S. Department of Transportation (“DOT”) requirements for safety during transport, and other applicable regulatory regimes. The National Technology Transfer and Advancement Act (“NTTAA”) explicitly directs federal agencies, including EPA, to “use technical standards that are developed or adopted by voluntary consensus standards bodies ... as a means to carry out policy objectives.” *See* Pub. L. 104-113, § 12(d)(1); 15 U.S.C. § 272, note. Section 3003 of RCRA similarly directs EPA to ensure its regulations are coordinated with DOT rules. *See* 42 U.S.C. § 6923(b).

It is also questionable whether EPA has the legal authority to impose such new standards, due to Section 104(a) of the Battery Act mentioned above. That statutory provision states as follows: “The collection, storage, or transportation of used rechargeable batteries ... shall, notwithstanding any law of a State or political subdivision thereof ..., be regulated under applicable provisions of the regulations promulgated by the Environmental Protection Agency at 60 Fed. Reg. 25492 (May 11, 1995), as effective on May 11, 1995.” *See* 42 U.S.C. § 14323(a). The unusual specificity of this statutory provision – referring to rules as published on a specific date on a particular page of the Federal Register – suggests that the 1995 rules for collection and storage of rechargeable batteries (including LIBs) were “locked in” by Congress and cannot now be changed by EPA. *Cf. Jam v. International Finance Corp.*, 586 U. S. 199, 209-10 (2019) (“a statute that refers to another statute by specific title or section number in effect cuts and pastes the referenced statute as it existed when the referring statute was enacted, without any subsequent amendments.”).

Moreover, even if EPA could still legally impose additional requirements as a matter of federal law, those requirements would not take effect in the 48 states with “authorized” RCRA programs, which operate in lieu of the federal RCRA regulations, unless and until such states were to adopt the new requirements as a matter of state law. *Cf., e.g.*, 64 Fed. Reg. 36,466, 36,482 (July 6, 1999) (stating that the universal waste rule for lamps would “not take effect in an authorized State until the State adopted the federal requirements as State law”); *see also* 91 Fed. Reg. 27,299 (May 14, 2026) (tentative decision to grant a 49th state, Alaska, RCRA authorization). And, since the Battery Act explicitly states that the 1995 universal waste rule shall apply “notwithstanding any law of a State,” it seems clear that if a state were to change its law in that manner, the change would be null and void. Accordingly, EPA may effectively be blocked from any effort to impose more stringent standards for collection, storage, or transportation of lithium-ion batteries.

E. Statutory Changes Are Needed to Facilitate and Promote Recovery of Critical Minerals from LIBs and Black Mass

The problems discussed in Section III.C above cannot be resolved, at least within a reasonable timeframe, without legislation. While EPA in theory could address most of the issues, it does not currently appear to be pursuing solutions for many, if any, of them. Moreover,

it would take years before the Agency could complete a rulemaking and before any final rules could be adopted by the states. Indeed, some states might not adopt the federal rules, resulting in a patchwork of regulation. Action by Congress is needed for timely and nationwide solutions.

As discussed above, the Battery Act cabins EPA's authority, but only with respect to "collection, storage, or transportation of used rechargeable batteries [such as LIBs]." *See* 42 U.S.C. § 14323(a). The Agency retains authority to modify the rules with respect to LIB recycling, the product of recycling (*i.e.*, black mass), and residues from the recycling process. Accordingly, it could address many of the existing problems, for example by (i) expanding the SMRF exemptions for units processing other battery types to include units processing LIBs, (ii) excluding black mass from the definition of solid waste, and (iii) modifying land disposal requirements for LIBs so that non-hazardous residues from recycling LIBs can be land disposed without restriction, just like non-hazardous residues from recycling other batteries.

Similarly, EPA may retain authority to lift the restrictions on onsite storage of LIBs at recycling facilities. The Battery Act provision locking in the 1995 universal waste rules for battery "collection [and] storage" arguably relates only to the relevant rules for handlers (*i.e.*, generators and collection/storage-only facilities), not recyclers or other "destination facilities." The reason is that the 1995 universal waste rule did not establish unique collection/storage requirements at destination facilities, but instead simply deferred to the generally applicable hazardous waste rules for such facilities. *See* 40 C.F.R. § 273.60; 60 Fed. Reg. at 25,501 ("In general, [destination] facilities are subject to the same requirements that are applicable to treatment, storage, and disposal facilities under the full hazardous waste regulations").

However, because any changes the existing regulations in these areas would be outside the confines of the Battery Act, the revised regulations would not enjoy the immediate nationwide application afforded by that Act. Rather, as with other RCRA rules, the changes issued by EPA would not take effect in the 48 (soon 49) authorized states, unless and until the rules are adopted by the states. The state adoption process could take years, on top of the years likely needed for EPA to make the changes at the federal level. And, if some states decide not to adopt the changes, uniform national rules might never be achieved.

Allowing such a process to play out would delay, perhaps indefinitely, the solutions needed, and it would frustrate national goals to develop a more robust domestic supply chain for critical minerals. Legislation is needed to ensure timely solutions that apply across the country and serve the nation's interests.

F. The Draft BRACE Act Is a Useful Start But Requires Important Revisions

In drafting the BRACE Act, the Subcommittee has taken a useful first step toward addressing the problems that RCRA poses for recovery and recycling of critical minerals from LIBs. However, the bill needs important revisions. Three main areas of potential revisions are discussed separately below.

1. Revisions Related to Onsite Storage of LIBs at Recycling Facilities

Section 2(b)(2) of the draft legislation addresses the rule that unnecessarily pushes recyclers to store batteries offsite, but it does so in a way that could perversely leave onsite storage less regulated than offsite storage. In Subparagraph (A), it directs EPA to authorize destination facilities to store LIBs prior to recycling “in accordance with accumulation time limit requirements ... similar to what is provided in [40 C.F.R.] section 273.15 or section 273.35.” The two referenced regulations establish time limits for accumulation at waste battery generation and collection facilities. They are substantively the same and generally limit accumulation to 1 year. It seems appropriate to apply the same time limitation at recycling facilities that store LIBs onsite prior to recycling, as specified in Subparagraph (A).

However, Subparagraph (B) appears to introduce a paradox. While the language is not entirely clear, it seems to direct EPA to regulate destination facilities storing LIBs onsite under Subparagraph (A) (*i.e.*, for less than 1 year) “as a destination facility described in [40 C.F.R.] section 273.60(b) ... as in effect on the date of enactment.” The referenced provision applies to destination facilities that “recycle[] universal waste [including LIBs] *without* storing that universal waste before it is recycled” (emphasis added). And, since that provision applies to facilities that don’t store, it not surprisingly does not contain any requirements for storage. Instead, it refers to Section 261.6(c)(2), which, in turn, requires only notification, biennial reporting, compliance with any applicable manifest requirements (although LIBs generally do not require manifests), and compliance with certain air emission requirements for recycling units (only at facilities that are otherwise required to have a hazardous waste permit, which LIB recycling facilities without storage generally do not require).

The result is that Subparagraph (B) would likely leave onsite storage at recycling facilities entirely unregulated, except for the 1-year time limitation under Subparagraph (A). It is hard to justify such a broad exemption from storage requirements, when generators and collectors of waste LIBs are subject to significant requirements for the same activity, such as requirements for containment, labeling, employee training, and release response. *See generally* 40 C.F.R. Part 273, Subparts B and C. Moreover, Subparagraph (B) does not incorporate other requirements that currently apply to all destination facilities, regardless of whether they store the wastes onsite or not. *See* 40 C.F.R. §§ 273.61 and 273.62.

This is probably not what was intended. Fortunately, there is a simple solution. Section 2(b)(2)(B) of the bill should be redrafted to specify that destination facilities storing LIBs onsite under Subparagraph (A) (*i.e.*, for less than 1 year) shall be subject to the same requirements that would apply if the storage and recycling activities were at separate facilities (as they typically are today). In particular, for their storage activities, the facilities should be subject to the same universal waste “handler” requirements as collection-only facilities (*i.e.*, Subpart C of 40 C.F.R. Part 273, assuming the recyclers would be storing sufficient quantities to qualify as large handlers of universal wastes). And, for all other activities, the facilities should be subject to same requirements as recycling facilities that do not store up-front (*i.e.*, 40 C.F.R. § 273.60(b) and the other provisions of Subpart E). Since a few of the handler requirements in Subpart C (*e.g.*, notification, limits on off-site shipments, and tracking) are duplicative of the requirements under § 273.60(b) and the rest of Subpart E, or otherwise would not make sense for a destination

facility, a few provisions of Subpart C should not be included. The relevant provisions of Subpart C that should apply appear to be Sections 273.33(a)(1), 273.34(a), 273.35, 273.36, and 273.37.

2. Revisions Related to Development of Special Universal Waste Standards for LIBs

As discussed above, the Battery Act states that the collection, storage, and transport of rechargeable batteries (including LIBs) shall be regulated under the 1995 universal waste rule, and thus it is questionable whether EPA currently has legal authority to change the existing rules for such activities. Section 3 of the draft BRACE Act would amend the Battery Act explicitly to allow the Agency to amend such rules, and would make any amendments effective in all states, without the need for adoption by authorized states. In addition, Section 2(b)(1) would direct EPA within 1 year to “establish universal waste standards specially tailored for lithium-ion batteries, separate from the existing general battery universal waste category.”

There are several reasons why such special standards may not be necessary or appropriate. As an initial matter, as noted above, there are already extensive requirements under other regulatory programs that address fire and other safety risks associated with LIBs, including but not limited to NFPA and related fire codes and DOT transport requirements. Having separate standards for lithium-ion batteries and all other battery types seems likely to result in confusion, especially in cases where handlers manage both battery categories or are not sure which type(s) of batteries they manage. The confusion may also be aggravated by DOT rules, which generally require lithium battery labels on packages of lithium-ion batteries, lithium metal batteries, and devices containing both types of batteries – without regard to whether they are wastes – and prohibit lithium battery labels on packages that do not contain such batteries (*i.e.*, over-labeling in an effort to ensure compliance). *See generally* 49 C.F.R. § 173.185 (DOT rules for lithium batteries) and § 172.401 (prohibiting use of labels for materials that are not present or labels that could be “confused with or conflict with a [required] label”). Moreover, now that innovative LIBs, such as solid-state LIBs, with little or no fire risks are coming onto the market, imposing new fire protection standards for LIBs as a class may no longer make sense. Finally, if the new standards are along the lines of what some ASTSWMO members have proposed (as discussed above), they may be tantamount to full hazardous waste permitting and could serve as a major disincentive to collection and recycling of LIBs.

In short, the specially tailored LIB standards that would be mandated under the draft BRACE Act may be controversial. They may not be warranted and could be counterproductive. Congress should not prejudge the desirability of new standards, much less dictate that EPA issue such rules on a tight timeline. Indeed, the Subcommittee should reconsider the advisability of granting EPA authority to make changes to the current rules at all.

To the extent that the Subcommittee decides to move forward in authorizing and mandating a new rulemaking, it should not direct the *establishment* of new rules, but rather direct EPA to *consider* whether new rules are warranted. In addition, there should be clear guardrails on EPA’s efforts, for example directing that the Agency take into account existing fire and safety standards, so as to avoid duplicative, conflicting, or unnecessary requirements. EPA should also

take into account the effect that potential new rules may have on national goals for recovery and recycling of critical minerals from LIBs.

3. Revisions Related to Other Obstacles Created by RCRA to Recovery of Critical Minerals from LIBs

The draft BRACE Act does not touch on the myriad other issues highlighted above. It should be revised to do so, so that this is not a lost opportunity to make real changes that could significantly advance the cause of critical minerals recovery. One option might be simply to direct EPA to address these issues. However, as discussed above, it could take years for the Agency to undertake a rulemaking. In addition, unless the legislation makes any final federal rules applicable nationwide, it could take several more years for authorized states to then adopt such rules (with the possibility that some states might never adopt them).

There may be a better way. For many, if not most or even all, of the issues, there are simple, commonsense solutions that Congress itself could enact and apply nationwide in all states. A few examples are provided below:

- Exclude black mass, like other partially reclaimed materials that are commodity-like, from the definition of solid (and potentially hazardous) waste.
- Change LDR requirements so that non-hazardous residues from recycling LIBs, like those from recycling other batteries, can be land disposed without additional restrictions.
- Exclude used LIBs destined for repair/refurbishment from the definition of solid waste, in the same manner as used electronics sent for similar processing, so as to facilitate “second-life use” of the batteries.
- Allow non-intact LIBs to be managed under the universal waste rules in the same manner as intact LIBs, so that they are not unnecessarily required to be separately managed in accordance with full hazardous waste requirements.
- Exempt SMRFs that recycle LIBs from the rules for industrial furnaces, in the same manner as SMRFs that recycle other types of batteries.

Measures such as these would go a long way in supporting the domestic supply chain for critical minerals, while continuing to protect human health and the environment.

IV. CONCLUSION

As discussed above, the existing RCRA regulatory framework was not established with lithium-ion batteries in mind. It misclassifies used lithium-ion batteries and the initial product of recycling such batteries (*i.e.*, black mass) as wastes, rather than as valuable resources, and consequently creates numerous obstacles to recovery of critical minerals from such materials. A rulemaking planned by EPA has the potential to aggravate the problem, rather than fix it. Other actions by the Agency (apparently not currently in the works) could conceivably provide some

measure of relief. However, only changes to the RCRA statute have the potential to provide a timely and comprehensive solution.

The draft BRACE Act is a good first step in this direction. However, it needs important revisions. With appropriate changes, the bill should be moved forward and enacted as an important means to support the domestic supply chain for critical minerals, while maintaining and even enhancing protection of human health and the environment.