



# DISPOSING OF E-CIGARETTE WASTE

## FAQ for Schools and Others



Schools and other public institutions are coping with many unforeseen consequences as a result of the e-cigarette epidemic.<sup>1</sup> From installing costly bathroom monitors to redirecting counselor time to deal with the ramifications of addiction, schools are expending significant resources to respond to an industry-created crisis.

An additional — yet often overlooked — consequence of the youth vaping epidemic is the fact that institutions like schools have to deal with increasing amounts of dangerous waste. This waste stream comes from the accumulation of e-cigarette devices, e-liquid containers, and cartridges or “pods” that contain liquid nicotine, and devices that contain lithium ion batteries and other e-waste. The additional burden on public institutions can be overwhelming.



Photo: Jeremiah Mock<sup>2</sup>

Importantly, under federal law,<sup>3</sup> e-cigarette devices, e-liquid containers, and batteries are likely to be<sup>4</sup> hazardous waste when schools, courts, and airports confiscate and dispose of them. These wastes therefore need to be handled and disposed of in accordance with federal and state laws.

This publication provides a brief summary of considerations for schools, airports, courts, and other institutions subject to the Resource Conservation and Recovery Act (RCRA) when dealing with how to handle and dispose of

mounting piles of e-cigarette hazardous waste.<sup>5</sup> This resource primarily answers some pressing questions about how to classify and dispose of mounting accumulations of e-cigarette waste, and does not cover every important question administrators might be dealing with. It first explains why e-cigarettes are hazardous waste, then outlines the steps RCRA-regulated entities are required to take under the law to ensure the health and safety of students, employees, and the public.

### Q: Is liquid nicotine a hazardous waste?

**A:** Yes, nicotine (including nicotine salts) is a listed hazardous waste under RCRA. While the ins and outs of hazardous waste regulation are beyond the scope of this publication, the fundamental takeaway for schools is that in 1980, the Environmental Protection Agency (EPA) listed “nicotine & salts”<sup>6</sup> as an “acute hazardous waste.”

An acute hazardous waste is defined as hazardous waste that is fatal to humans in low doses, has demonstrated toxicity to test subjects, or is “otherwise capable of causing or significantly contributing to an increase in serious irreversible, or incapacitating reversible, illness.” The serious risks of exposure to acute hazardous waste are mitigated by the legal requirements to handle, treat, and dispose of liquid nicotine properly.

EPA’s listing of nicotine as acute hazardous waste occurred before liquid nicotine was used in JUUL pods and other e-cigarettes — but EPA affirmed its application to nicotine e-liquids in 2015 and again in 2019. Most recently, the vaping industry asked EPA to exempt e-liquids from the definition of acute hazardous waste and the agency refused to do so.

### Q: What responsibilities does RCRA place on schools that accumulate hazardous waste in the form of e-cigarette devices and e-liquids?

**A:** Schools and other entities that accumulate RCRA-listed chemicals and then need to dispose of them as waste — designated as “generators” of waste under RCRA’s terminology — are assigned special responsibilities to ensure that this waste is handled and disposed of in a way that will not place human health or the environment at risk. Because nicotine is an acute hazardous waste, a generator can accumulate only 1 kilogram of this listed waste before being treated as a “large quantity generator.” Even if they accumulate less than that amount, or have e-cigarette devices without any nicotine, generators have legal duties under the law as sketched out below.

## Large Quantity Generators of Nicotine Waste

A large quantity generator must comply with special handling requirements, including:<sup>7</sup>

- Notifying your hazardous waste regulatory entity and filling out a special form in order to obtain an EPA identification number;
- Storing nicotine waste in properly constructed and labeled/marked storage containers that clearly identify the material and hazard and indicate the accumulation start date;
- Ensuring that this hazardous waste is not stored with other types of toxic or hazardous waste (e.g., specifically, waste with which it could potentially interact or react);<sup>8</sup>
- Carefully storing the container so that it does not rupture or leak, and ensuring that it remains closed except for when additional hazardous waste is added to the storage container;
- Training all employees involved in the management and/or documentation of hazardous waste activities on-the job and through classroom/online hazardous waste classes, covering job duties during normal operations and emergencies;
- Inspecting the hazardous waste on a weekly basis to make sure that there is no leakage, and that the labeling and handling requirements comply with federal standards.

Large quantity generators also must ensure that the accumulated hazardous waste does not remain on site for more than 90 days. The generator (e.g., a school) is responsible for shipping the storage container to a properly permitted hazardous waste treatment, storage, or disposal facility. While recycling the e-cigarettes would make them no longer subject to RCRA hazardous waste requirements, the problem is that, to date, no network of legitimate recycling facilities that recycle nicotine for later re-use appear to exist.

## Very Small Quantity Generators of Nicotine Waste

Even if a school is not a large quantity generator, storing any amount of e-liquid for disposal makes the school a “very small quantity generator,” which still requires the school to comply with some of the requirements above, as well as any other applicable local or state management requirements. A very small quantity generator still must ensure that the waste is delivered to a hazardous waste collection facility authorized to accept the waste in accordance with hazardous waste standards.

## Generators of Universal Waste Batteries

Lithium-ion batteries, which are found in rechargeable e-cigarettes, are problematic in that they are known to explode and catch fire,<sup>9</sup> putting both the public and workers at risk. While e-cigarettes' batteries and others do not need to be stored and disposed of in the same way as nicotine-containing waste, they should be handled carefully, and battery storage containers should be kept in good condition and properly labeled with a description of the type of waste. Check directly with your state's hazardous waste regulatory agency for standards applicable to universal waste and batteries.

### Q: Why can't schools just throw e-liquid in the garbage with other (non-hazardous) waste products?

**A:** Federal law treats consumer products that are designed for use at a consumer's residence, used in the residence, and disposed of by residents as not being hazardous waste — instead, calling this carve-out “household hazardous waste.” Household hazardous waste is subject to state regulation.<sup>10</sup>

That said, schools do not qualify for this treatment — they are not residents or residences under the law — and federal law uniformly treats this form of waste, when used away from the home and/or accumulated by entities that are not households, as hazardous waste. For this reason, schools and other public entities are treated the same as businesses under RCRA's classification and treatment of hazardous waste generators. Even “used” (or “spent”) pods contain unused nicotine and should be treated carefully and not discarded in the regular trash.

The school-based challenges associated with the accumulation of e-cigarette waste, treatment, and disposal are relatively new and rapidly evolving. Given that federal law treats nicotine as hazardous waste, to comply with the law and best protect the environment and human health, best practices for schools include:

- Public health officials and educators consulting with state and local government hazardous waste experts to determine the best way to comply with federal, state, and local hazardous waste requirements; and
- Providing schools with state-specific guidance and resources, prepared by state and/or local government agencies charged with regulating hazardous waste.

## Q: Can e-cigarette batteries also be hazardous waste?

**A:** Yes, batteries are also often a type of hazardous waste. State laws might differentiate how particular types of batteries are treated (Colorado, for example), but federal standards treat rechargeable lithium-ion batteries as universal waste, a type of hazardous waste under RCRA. Given the difficulty in determining which types of batteries various e-cigarettes may contain, and the prevalence of lithium-ion batteries in popular products, it is a best practice to comply with universal waste requirements and ensure that they are disposed of at hazardous waste facilities that accept universal waste.

## Q: What other information is available on these issues?

- The State of Colorado recently issued a detailed guidance on these issues for schools and other entities: <https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/434101>.
- Minnesota also has an established guidance for “businesses” (which could apply equally to schools as fellow non-household waste generators): <https://www.pca.state.mn.us/sites/default/files/w-hw4-65.pdf>.
- EPA has issued an opinion letter on e-liquid as a hazardous waste: <https://rcrapublic.epa.gov/files/14850.pdf>.
- EPA has also issued an opinion letter on the recycling of e-liquid wastes: <https://rcrapublic.epa.gov/files/14851.pdf>.
- EPA has created a comparison chart of some of the requirements for different levels of generators of acute hazardous wastes and universal wastes: <https://www.epa.gov/hw/differences-between-universal-waste-and-hazardous-waste-regulations>.
- The Public Health Law Center’s policy resources on the environmental impacts of the tobacco industry are available on our website: <https://www.publichealthlawcenter.org/topics/commercial-tobacco-control/commercial-tobacco-pollution>.

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The Public Health Law Center provides information and legal technical assistance on issues related to public health. The Center does not provide legal representation or advice. This document should not be considered legal advice.

## Endnotes

- 1 The Public Health Law Center recognizes that traditional and commercial tobacco are different in the ways they are planted, grown, harvested, and used. Traditional tobacco is and has been used in sacred ways by Indigenous communities and tribes for centuries. Comparatively, commercial tobacco is manufactured with chemical additives for recreational use and profit, resulting in disease and death. For more information, visit the National Native Network website: <http://www.keepitsacred.itcmi.org>. When the word “tobacco” is used throughout this document, a commercial context is implied and intended.
- 2 Photo depicts e-cigarette and vape device waste collected on one day at one Bay Area high school’s student parking lots. Mock J, Hendlin YH. *Notes from the Field: Environmental Contamination from E-cigarette, Cigarette, Cigar, and Cannabis Products at 12 High Schools — San Francisco Bay Area*, 2018–2019. *MMWR Morb Mortal Wkly Rep* 2019;68:897–899: [https://www.cdc.gov/mmwr/volumes/68/wr/mm6840a4.htm?s\\_cid=mm6840a4\\_x](https://www.cdc.gov/mmwr/volumes/68/wr/mm6840a4.htm?s_cid=mm6840a4_x).
- 3 This provision is implemented by states that meet federal requirements. More information is available on the EPA website: <https://www.epa.gov/rcra/state-authorization-under-resource-conservation-and-recovery-act-rcra>.
- 4 Under the Resource Conservation and Recovery Act, the burden is on schools and other entities to determine whether their solid waste qualifies as a hazardous waste. See the EPA website for more details: <https://www.epa.gov/hw/criteria-definition-solid-waste-and-solid-and-hazardous-waste-exclusions>. As EPA explains: “Once a generator determines that their waste meets the definition of a solid waste, they investigate whether or not the waste is a listed or characteristic hazardous waste.” More information is available on the EPA website: <https://www.epa.gov/hw/learn-basics-hazardous-waste#hwid>.
- 5 This resource is unable to address the details and particularities of each jurisdiction, and it should not be considered a substitute for obtaining legal advice from an attorney familiar with your jurisdiction’s laws.
- 6 For more on nicotine salts and the specialized reaction developed by JUUL to create them, see Rachel Becker, *JUUL’s Nicotine Salts Are Dominating the Market — And Other Companies Want In*, *The Verge*, (Nov. 21, 2018) <https://www.theverge.com/2018/11/21/18105969/juul-vaping-nicotine-salts-electronic-cigarettes-myblu-vuse-markten>.
- 7 For a full list compiled by one state agency, see this guidance from the Colorado Department of Public Health and Environment: <https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/434101>.
- 8 RCRA was initially passed, in part, to deal with the vexing problem of interacting hazardous wastes—particularly those wastes that could ignite or cause a chemical reaction. While many of the waste products accumulated by schools are the cartridges that can be removed from the battery-containing device, or “e-juice” containers of liquid nicotine, there are some disposable versions of e-cigarettes that contain liquid containers integral to the device. This presents a dangerous problem as the wastes build up, as it is more difficult to ensure that potentially explosive batteries are separated from the e-liquid itself.
- 9 Lithium ion batteries have caused numerous garbage truck and recycling facility fires, not to mention the long history of lithium-ion battery fires on planes tracked by the Federal Aviation Administration. More information is available on the FAA website: [https://www.faa.gov/hazmat/resources/lithium\\_batteries/media/Battery\\_incident\\_chart.pdf](https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf). For a list of e-cigarette-related property damage and injuries, see the American Nonsmokers’ Rights Foundation’s tracker of news reports of e-cigarette explosions and fires: <https://no-smoke.org/wp-content/uploads/pdf/E-Cigarette-Explosions-and-Fires.pdf>.
- 10 Since 1988, the EPA has stated its position that states can and should choose to apply all hazardous waste legal standards to household hazardous waste, even if the EPA cannot mandate it directly. More information can be found in the EPA’s 1988 Memorandum to the Waste Management Division Directors: <https://rcrapublic.epa.gov/files/11377.pdf>.