Memorandum: Analysis of the Resource Conservation and Recovery Act

New York City's Department of Design and Construction

Town+Gown: NYC Water In and Water Out Innovative Water Research Working Group and Urban Resource Recovery Working Group

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November 5, 2025

To: Town+Gown:NYC Water In and Water Out Innovative Water Research Working Group Urban Resource RecoveryWorking Group

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Re: Analysis of Resource Conservation and Recovery Act

I. Intro

The Resource Conservation and Recovery Act (RCRA), enacted in 1976, established the first comprehensive federal framework for the management of solid and hazardous waste. Designed to fill gaps left by earlier statutes, RCRA ensures that waste is managed from "cradle to grave" in an effort to protect human health and the environment. Administered by the U.S. Environmental Protection Agency (EPA), RCRA authority has developed into a permitting and enforcement regime which also has the capacity to fund projects that specifically address waste management. Modern amendments to RCRA have focused on sustainable development and waste minimization, emphasizing recycling and the efficient use of resources. While the EPA oversees compliance, states may seek authorization to implement their own programs in lieu, provided that the state standards are at least as stringent as the promulgated minimum national standards. This delegation allows for flexibility according to local needs, while maintaining a consistent program across the nation. New York operates one such EPA authorized program, which means the primary enforcement responsibility rests with the state. RCRA continues to play a significant role in New York with projects such as the Northrop Grumman Bethpage site.

II. Analysis of RCRA

A. Legislative History and Purpose

The Solid Waste Disposal Act of 1965 (SWDA) was the first piece of federal legislation aimed at addressing solid waste disposal. Like other early attempts at environmental regulation, the SWDA relied heavily on state and local implementation and provided limited federal oversight.[1] The original framework of the SWDA did not establish binding national standards, nor did it require states to adopt uniform disposal practices. Thus, without sufficient enforcement mechanisms, the law proved inadequate for managing the growing complexity of industrial waste in the modern age.

Though limited in scope, SWDA laid the groundwork for more comprehensive federal legislation. However, by the 1970s the inadequacies of the SWDA became increasingly evident. In response to the escalating volume of industrial and chemical waste, and growing public concern about environmental degradation, Congress passed RCRA in 1976 as a major amendment to the SWDA. While later statutes like CERCLA focused on the cleanup of existing contamination, RCRA's purpose was preventive, designed to regulate the active generation, transportation, treatment, storage, and disposal of hazardous waste under a unified federal framework.

Environmental disasters during this period highlighted the lack of federal authority to manage hazardous waste in real time. For example, at the Valley of the Drums site near

[1] WPCA, CWA, SWDA and CERCLA heavily relied on state level implantation and were thus limited in scope and enforcement, *see* https://www.nyc.gov/site/ddc/about/IWR-workinggroup.page

Louisville, Kentucky, thousands of leaking barrels of toxic industrial waste were dumped over a 23-acre area throughout the 1960s and 1970s without regulation or oversight.[2] The site became a symbol of federal inaction after a 1979 fire drew national attention. Unlike the Love Canal disaster which helped catalyze CERCLA, the Valley of the Drums demonstrated the regulatory failure to control hazardous waste at the point of generation and disposal, underscoring the need for a cradle-to-grave system of oversight. RCRA was enacted to fill that gap.[3]

B. Adoption of RCRA in 1976

Driven by mounting public concern over unchecked industrial waste practices and fueled by high-profile incidents like the Valley of the Drums, Congress enacted the RCRA in 1976. Prior to 1976, federal environmental laws were aimed at regulating future pollution, with no comprehensive system to track or regulate the generation and disposal of hazardous at active sites. The final legislation transformed the prior framework of voluntary state participation into a mandatory, enforceable federal–state regulatory partnership for waste management.

Pursuant to RCRA § 2002(a), RCRA empowers the U.S. Environmental Protection Agency (EPA), to administer, implement and enforce standardized waste disposal practices across the nation. [4] Unlike the later adopted Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Congress intentionally designed RCRA as a preventive regulatory program which explicitly delegated its administration to the EPA from the outset.[5] While the EPA has primary enforcement authority, under RCRA § 3006(b), states can

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[2] John T. Cumbler, *Environmental History*, Kentucky Institute for the Environment and Sustainable Development, Fall 2009
[3] ACTenviro, *Understanding the Key Differences in the Superfund and Waste Management Acts*, https://www.actenviro.com/rcra-vs-cercla
[4] Codified at 42 U.S.C. § 6912(a)
[5] *Types of and Approaches to RCRA Corrective Action Enforcement Actions*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/enforcement/types-and-approaches-rcra-corrective-action-enforcement-actions

apply to implement their own hazardous waste programs, if the state rules were no less stringent than the federal standard.[6] State programs can differ from the federal standard, provided that the State enforces hazardous waste requirements that are "more stringent" than the federal standards.[7]

RCRA enforcement authority is shared among the federal government, states, and private citizens. States with EPA-authorized RCRA programs have primary enforcement responsibility and may bring actions in either state or federal court. Nevertheless, EPA retains broad authority under Subtitles C and I to compel compliance, enforce permit conditions, and halt the unlawful treatment, storage, or disposal of hazardous waste. Private enforcement is authorized under RCRA § 7002, which allows any person to bring suit against an alleged violator of RCRA requirements, subject to a 60-day notice requirement. However, a citizen suit is barred if the EPA or a state is "diligently prosecuting" a civil or criminal action for the same violation. RCRA § 7002 also authorizes suits for imminent and substantial endangerment to health or the environment, even where no specific regulatory violation has occurred.

Congress intended the statute to have a broad definition of "waste" to encompass local realities across the nation. Under RCRA §1004 (27), solid waste is understood to be:

> "any garbage, refuse, sludge... and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities"[8]

[6] Codified at 42 U.S.C. § 6926(b)
[7] Codified at 42 U.S.C. § 6929
[8] Codified at 42 U.S.C. § 6903(27)

Importantly, the term "solid waste" is not limited to physically solid material as the operative concept is "discarded."[9] Once a material is deemed a solid waste, the EPA must then assess its hazardous characteristics, which determines whether the waste falls under Subtitle C or Subtitle D of RCRA. Subtitle C governs hazardous waste, while Subtitle D applies to non-hazardous solid waste.

i. *Subtitle C: Hazardous Waste Management*

Subtitle C was enacted to prevent the mismanagement of hazardous waste by regulating its entire life cycle under enforceable federal law. It established a comprehensive federal system in which the generation, transportation, treatment, storage, and disposal of hazardous waste are tracked and regulated from "cradle to grave."

Under RCRA § 3002, facilities that generate hazardous waste are required to identify, label, and manage such waste in accordance with federal standards.[10] Before any regulation attaches, a facility must determine whether it generates a material that qualifies as hazardous waste. If the material meets the definition of a "solid waste" under EPA guidance, the generator must then assess whether it exhibits one of four hazardous characteristics: ignitability, corrosivity, reactivity, or toxicity; or whether it appears on one of EPA's hazardous waste lists.[11] This self-determination is the generator's responsibility and forms the legal basis for compliance with Subtitle C.

Once hazardous waste generation has been confirmed, the facility must notify EPA and obtain a unique site identification number, which is used in all subsequent tracking and reporting.

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[9] EPA regulations further define "solid waste" *See* 40 C.F.R. § 261.2(2)(i)(A-D) which states that discarded materials include any material which are abandoned, recycled, considered inherently waste like, or a military munition.
[10] Codified at 42 U.S.C. § 6922
[11] Codified at 40 C.F.R. §§ 261.21–261.24, §§ 261.31–261.33

Generators are subject to different levels of regulation based on the volume of hazardous waste they generate in a calendar month.[12] Generators are then regulated according to the volume of hazardous waste they produce in a calendar month, with tiered requirements applying to very small, small, and large quantity generators.[13] All generators must store hazardous waste in designated accumulation areas, with proper labeling that includes the waste type and the date accumulation began. When hazardous waste is ready for off-site shipment, the generator must complete a Uniform Hazardous Waste Manifest and ensure the waste is delivered to a permitted Treatment, Storage, and Disposal Facility (TSDF) that has the capacity to receive and monitor the waste.

RCRA § 3003 directs the EPA to establish enforceable standards for transporters within the cradle-to-grave framework. This section provides the statutory basis for holding transporters liable for mishandling or abandoning waste in transit.[14] Due to their mobility and the interstate nature of their operations, transporters are subject to specific identification and tracking rules, as well as emergency response protocols. In addition, RCRA § 3003 requires transporters to comply with applicable provisions of the Hazardous Materials Transportation Act (HMTA). As a result, transporters must adhere to the statutory safety standards for packaging, labelling and routing under Department of Transportation (DOT) rules. In the event of a spill or accidental discharge, transporters must take immediate action to protect human health and the environment. Transporters must also ensure that each hazardous waste shipment is accompanied by a uniform manifest and that the manifest is properly signed carried and submitted to TSDFs which have the capacity to receive the hazardous material.

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[12] EPA rules establish three tiers of generators, *see* 40 C.F.R. §§ 262.14, 262.16, 262.17
[13] For specific implementing rules depending on generator size, *see* 40 C.F.R. §§ 262.16(b) & 262.17(a)
[14] Codified at 42 U.S.C. § 6923 with Regulations implemented at 40 C.F.R. Part 263

RCRA §3004 requires the EPA to promulgate minimum national performance standards for TSDFs.[15] These facilities must be designed and operated to prevent the release of hazardous waste into the environment. To detect and respond to leaks or spills, TSDFs are subject to groundwater monitoring requirements. Additionally, they must demonstrate financial assurance to cover the costs of closure, post-closure care, and potential cleanup. RCRA § 3005 prohibits the ownership or operation of a TSDF without a valid permit issued by EPA or an authorized state program.[16] These permits impose legally binding conditions based on the nature of the facility and the types of waste it handles.

RCRA § 3008 defines EPA's enforcement authority and broadly applies to any person or entity who violates Subtitle C requirements.[17] The EPA may issue administrative compliance orders that compel generators, transporters, or TSDFs to comply with applicable requirements and civil penalties may be issued for up to $25,000 per day, per violation.[18] Pursuant to RCRA § 3008(g), EPA is also authorized to bring civil enforcement actions in federal court to obtain injunctive relief or monetary penalties.[19] In cases of knowing violations, such as illegal transport, unauthorized storage, manifest fraud, or export violations, the EPA may pursue criminal sanctions, including fines and imprisonment for up to five years. If a violation involves the knowing endangerment of human life, the maximum prison sentence increases to fifteen years.

[15] Codified at 42 U.S.C. § 6924
[16] Codified at 42 U.S.C. § 6925
[17] Codified at 42 U.S.C § 6928
[18] $59,017 adjusted for inflation in accordance with Federal Civil Penalties Inflation Adjustment Act of 2015, which requires EPA to adjust penalties for inflation annually
[19] U.S. ENVTL. PROT. AGENCY, *Resource Conservation and Recovery Act Civil Penalty Policy*, *see* https://www.epa.gov/enforcement/resource-conservation-and-recovery-act-rcra-civil-penalty-policy

ii. *Subtitle D: Solid Non-Hazardous Waste Management*

Where Subtitle C focused on hazardous waste, Subtitle D addresses non-hazardous municipal and industrial waste.[20] Pursuant to RCRA § 4001, instead of relying on direct federal permitting or enforcement, the core function encourages state and local governments to develop comprehensive plans themselves.[21] Pursuant to RCRA § 4002(b), EPA was required to issue guidelines for state planning and management of solid waste which focuses on methods for collection and disposal, resource recovery and reuse, and landfill design and operation.[22] EPA regulations established criteria to distinguish "open dumps", which are prohibited, from "sanitary landfills", which are permitted if they meet specific performance standards.[23] These criteria serve as a condition for federal approval of state plans. RCRA § 4005(a) makes open dumping of solid waste unlawful, unless the disposal site meets EPA's sanitary landfill criteria. [24] Federal facilities generating or managing solid waste must comply with state and local requirements to the same extent as private entities.

C. The Solid Waste Disposal Act Amendments of 1980

The Solid Waste Disposal Act Amendments of 1980 were enacted to revise and refine the hazardous waste management program, addressing implementation challenges that emerged after the initial regulations under Subtitle C were promulgated.[25] In response to the significant implementation challenges, Congress established two new exemptions, the Bevill and Bentsen

[20] Codified at U.S.C. §§ 6921–6939g, with implementing regulations found at 40 C.F.R. Parts 260–279
[21] Codified at 42 U.S.C. § 6941
[22] Codified at 42 U.S.C. § 6942(b)
[23] Codified at 42 U.S.C § 6944, with implementing regulations found at 40 C.F.R. Part 257 and 40 C.F.R. Part 258.
[24] Codified at 42 U.S.C. § 6945(a)
[25] Pub. L. No. 96-482 was enacted by President Jimmy Carter on October 21, 1980

exclusions, which reduced requirements for small-quantity generators, streamlined state program authorization, and expanded EPA's inspection and enforcement authority.

Following the early years of Subtitle C implementation, Congress concluded that certain large-volume industrial wastes, such as coal combustion residuals (CCR), posed different risk profiles than typical hazardous wastes. The Bevill Amendment temporarily excluded certain "special wastes" from Subtitle C hazardous waste regulation, directing EPA to study these wastes and report to Congress before deciding on permanent regulatory action.[26] While Bevill focused on large-volume industrial wastes, the Bentsen Amendment addressed energy exploration wastes from oil, gas, and geothermal sources.[27] Like Bevill, it temporarily excluded these wastes from Subtitle C regulation, required EPA to study them and submit a regulatory determination to Congress, and provided an interim exemption allowing states and industry to continue managing the wastes under existing practices.[28]

The Bevill and Bentsen provisions illustrated Congress's recognition that a "one-size-fits-all" approach under Subtitle C would be too rigid. Beyond carving out temporary exclusions for special wastes, the 1980 amendments also addressed implementation challenges by providing regulatory flexibility for certain actors, increased. RCRA § 3001(d)(4) required the EPA to set protective but flexible standards for small generators producing 100–1,000 kg of hazardous waste per month, including rules for reuse, recycling, and reclamation.[29] In addition to these temporary exclusions, the 1980 amendments provided regulatory flexibility and new oversight

[26] Codified at 42 U.S.C. § 6921(b)(3)
[27] Codified at 42 U.S.C. § 6921(b)(2)
[28] Linda Luther, *Background on and Implementation of the Bevill and Bentsen Exclusions in the Resource Conservation and Recovery Act: EPA Authorities to Regulate "Special Wastes"*, CONG. RESEARCH SERV., R43149 (2013), https://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43149.pdf
[29] Codified at 42 U.S.C. § 6921(d)(4)

mechanisms to make Subtitle C more practical for states and smaller generators. The act allowed states to implement parts of their hazardous waste programs before full EPA approval, which ultimately facilitated quicker program revisions, enabling states to adopt EPA-equivalent regulations more efficiently.[30]

D. Hazardous and Solid Waste Amendments of 1984

By the early 1980s, it became evident that the original RCRA framework was insufficient to prevent hazardous waste mismanagement, as EPA's implementation was slow, limited in scope, and vulnerable to regulatory loopholes. Congress enacted the Hazardous and Solid Waste Amendments of 1984 (HSWA) in response to early criticisms of the program, namely: EPA's slow rulemaking; continued unchecked land disposals; and a lack of statutory authority.[31]

i. Rulemaking and Enforcement Deadlines

Under the original RCRA, Congress gave the EPA broad authority to regulate hazardous waste. However, the absence of binding timelines ultimately led to slow and incomplete implementation.[32] HSWA directly addressed this with statutory deadlines and enforceable timelines, forcing the agency to issue corrective action regulations promptly. At the time of HSWA's enactment in 1984, the EPA had not yet issued treatment standards for most hazardous wastes. Rather than wait for the agency to act all at once, Congress imposed the deadlines in stages. EPA was required to phase in treatment standards for hazardous waste by dividing all regulated streams into a thirds schedule.[33] The "thirds" system gave EPA time to evaluate waste

[30] Codified at 42 U.S.C. § 6926(b)–(d)
[31] P.L. No. 98-616 was signed into law by President Ronald Reagan on October 17, 1986
[32] U.S. GEN. ACCOUNTING OFF,, *Hazardous Waste: New Approach Needed to Manage the Resource Conservation and Recovery Act* (GAO/RCED-88-115, July 19, 1988)
[33] Codified at 42 U.S.C. § 6924 (g)(4)

streams scientifically but set fixed timelines for issuing regulations. RCRA § 3004(g)(6)(A) required the EPA to issue new treatment standards within 6 months of listing any hazardous waste listed or identified after HSWA.[34] If the EPA failed to follow any of the statutorily proposed deadlines, then land disposal of that hazardous waste was automatically prohibited until such standards were promulgated.[35]

ii. Land Disposals Restrictions

Despite RCRA Subtitle C's permitting system, most waste was being disposed of in the ground, often in unlined or poorly designed facilities that posed a direct threat to groundwater and drinking water sources. In response, HWSA directed EPA to set treatment standards, either based on specific concentration levels or newly approved treatment technologies, before any land disposal could occur.[36] For the purposes of these provisions, the term "land disposal" broadly includes "any placement of such hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt belt formation, salt bed formation, or underground mine or cave."[37]

The Land Disposal Restrictions (LDR) program created by HSWA fundamentally changed RCRA's approach to land disposal by prohibiting it, unless the waste has been treated to meet EPA's standards, is placed in a unit that can demonstrate "no migration" of hazardous constituents or is properly disposed of per EPA guidelines.[38] The LDR program requires that hazardous wastes be treated to reduce their toxicity or mobility before disposal, thereby lessening

[34] Codified 42 U.S. Code § 6924(g)(6)(A)
[35] Codified 42 U.S. Code § 6924(g)(5)
[36] U.S. ENVTL. PROT. AGENCY, *Introduction to Land Disposal Restrictions,* (Sept. 2005) (EPA-530-K-05-013)
[37] Codified at 42 U.S. Code § 6924
[38] U.S. ENVTL. PROT. AGENCY, *Land Disposal Restrictions for Hazardous Waste*, https://www.epa.gov/hw/land-disposal-restrictions-hazardous-waste

the potential for leaching and groundwater contamination.[39] In pursuit of this goal, Congress imposed immediate land-disposal prohibitions on certain dioxins, listed spent solvents, and high-risk constituents identified on the "California list."[40] For all other hazardous wastes, HSWA required EPA to evaluate and phase in land-disposal restrictions on a statutory schedule. To ensure prompt implementation, HSWA included a statutory provision which automatically prohibits disposal if EPA fails to act by the prescribed deadlines.[41] Together, the HWSA provisions form the backbone of the modern LDR regime.[42]

iii. Corrective Action Authority for Waste Releases

The Corrective Action Program (CAP), added under HSWA, significantly expanded RCRA's unilateral enforcement power by authorizing EPA to compel investigation and cleanup of releases from any solid or hazardous waste management unit at a regulated facility. CAP was essential for revitalizing communities and spurring economic development by enabling the reuse of land previously affected by hazardous wastes. CAP requires remediation of contamination from spills, leaks, or other releases at TSDFs, with RCRA permits or interim status.[43] Pursuant to RCRA § 3004(u), EPA may incorporate corrective action requirements directly into permits, using schedules of compliance to ensure timely remediation.[44] RCRA § 3008(h) separately authorizes EPA to issue administrative orders requiring corrective action at interim status

[39] Codified at 42 U.S.C. § 6924(m)
[40] Modeled off California's state hazardous waste list, the "California List" is a set of particularly toxic, high risk chemicals that warranted immediate land disposal restrictions, such as heavy metals and Polychlorinated biphenyls (PCBs). For a detailed exploration of the "California List" *see,* U.S. ENVTL. PROT. AGENCY, Land Disposal Restrictions for Certain "California List" Hazardous Wastes and Modifications to the Framework (52 Fed. Reg. 25760, July 8, 1987)
[41] Codified at 42 U.S.C. § 6924(g)(1)–(6)
[42] Implementing regulations describing EPA's Land Disposal Restrictions program are codified at 40 C.F.R. pt. 268
[43] Legal basis for The Corrective Action Program is codified at 42 U.S.C. §§ 6924(u-v); with implementing regulations found at 40 C.F.R. Part 264, Subpart F.
[44] Codified at 42 U.S.C. § 6924(u)

facilities, enforceable with civil penalties, without first proceeding in court.[45] Under RCRA § 3004(v), when the contamination migrates beyond facility boundaries, the permittee must clean up off-site contamination, unless denied access by property owners.[46] These provisions collectively shifted EPA's authority from a prospective permitting program to one that also addresses past and ongoing contamination, ensuring that corrective measures accompany hazardous waste management operations.

Corrective action frequently overlaps with CERCLA in that both programs authorize the federal government to require cleanup of hazardous waste releases. However, RCRA does not have a fund, the polluter pays, where with CERCLA, EPA may use Superfund dollars if the potentially responsible party (PRP) is unknown or insolvent.

iv. Underground Storage Tank Regulation

Before 1984, most underground storage tanks (USTs) containing hazardous substances were largely unregulated from the federal level. As a result, widespread leaks from steel tanks led to significant soil and groundwater contamination. To address the gap Congress created RCRA Subtitle I, establishing the first comprehensive federal UST regulatory program.[47] This program regulates underground storage tanks that contain hazardous substances in an attempt to limit releases. USTs are required to have leak detection systems, with specific plans in place for when a leak occurs. Furthermore, the program enforces financial responsibility for all cleanup costs associated with any leak from a UST.

[45] Codified at 42 U.S.C. § 6928(h)
[46] Codified at 42 U.S.C. § 6924(v)
[47] Codified at 42 U.S.C. §§ 6991–6991m with implementing regulations found at 40 C.F.R. Part 280

E. Superfund Amendments Redistribution Act of 1986

In 1986, Congress amended Subtitle I of the Solid Waste Disposal Act through the Superfund Amendments and Reauthorization Act (SARA). Although SARA was primarily known for expanding the CERCLA Superfund, Congress simultaneously used the legislation to establish to establish a separate funding mechanism to address petroleum contamination from USTs. To the extent that petroleum contamination was not otherwise covered under CERCLA, Congress needed to create a dedicated cleanup authority under RCRA.

To fill this gap, Congress added RCRA § 9003(h), which authorized the EPA to undertake and fund the cleanup of petroleum releases from USTs.[48] Concurrently, Congress created a dedicated financing mechanism through the Leaking Underground Storage Tank (LUST) Trust Fund.[49] The fund is financed by a fuel excise tax of 0.1 cent tax on each gallon of motor fuel sold across the country.[50]

F. Federal Facility Compliance Act of 1992

Prior to 1992, federal agencies, especially the Department of Energy (DOE), often claimed sovereign immunity from penalties and enforcement actions under RCRA. As a result, federal agencies violated hazardous waste regulations, without facing civil or administrative penalties. For example, in *Department of Energy v. Ohio,* the Supreme Court held that federal agencies could not be subject to punitive fines under environmental statutes unless Congress clearly waives such sovereign immunity.[51] Frustrated by the ruling, Congress became concerned

[48] Codified at 42 U.S.C. § 6991b(h)
[49] Codified in the Internal Revenue Code at 26 U.S.C. § 9508
[50] The taxing authority for the LUST Fund has been reauthorized numerous times, most recently with the Investment Infrastructure and Jobs Act of 2021 (IIJA).
[51] *Department of Energy v. Ohio*, 503 U.S. 607, 634 (1992)

that federal facilities were being held to a lower standard than private industry. As a result, the Federal Facility Compliance Act (FFCA) was enacted as a targeted legislative fix that ensured federal agencies could be held legally accountable under RCRA.[52]

FFCA § 102 amended RCRA § 6001(a) to explicitly waive sovereign immunity for federal agencies under RCRA.[53] As a result, federal facilities became fully subject to civil, administrative, and monetary penalties for RCRA violations, just like private parties. Moreover, federal agencies are now required to obtain permits, submit to inspections, and comply with enforcement orders.

G. Land Disposal Program Flexibility Act of 1996

By the 1990s, the EPA and various regulated entities, identified several limitations with how RCRA Subtitle C's Land Disposal Restrictions (LDRs) and minimum technological requirements (MTRs) applied to cleanup sites, especially those managed under the Corrective Action Program or CERCLA. The need for clarification arose from a 1994 case, in which the court questioned whether EPA had statutory authority to exempt Corrective Action Management Units (CAMUs) and Temporary Units (TUs) from the requirements.[54] This decision created legal uncertainty and raised the risk that hazardous waste cleanups could be delayed or halted by litigation.

The Land Disposal Program Flexibility Act (LDPFA) was enacted to streamline specific RCRA Subtitle C requirements for the land disposal of hazardous wastes.[55] The purpose of these amendments was to ensure that remediation waste is not subject to the same regulatory treatment

[52] Pub. L. No. 102–386 was signed into law by George H. W. Bush on October 6, 1992
[53] Codified at 42 U.S.C. § 6961(a)
[54] *Environmental Defense Fund v. EPA*, 852 F. Supp. 1309 (D.D.C. 1994)
[55] Public Law 104-119, was signed into law by President Bill Clinton on March 26, 1996

as newly generated hazardous waste. It addressed technical and procedural issues related to how LDRs applied to waste managed in specific types of units, particularly hazardous waste landfills. The amendments clarified that EPA may authorize the use of CAMUs and TUs as part of corrective action plans and apply flexible standards appropriate to realities of local cleanup efforts.

H. Energy Policy Act of 2005

In response to mounting concerns over groundwater contamination caused by leaking USTs, the Energy Policy Act of 2005 (EPAct) amended RCRA Subtitle I to strengthen federal and state enforcement.[56] Congress was particularly seeking to address the threatened release of petroleum and benzene, which are known to contaminate drinking water aquifers and sought to remedy widespread deficiencies in program enforcement, especially in jurisdictions with limited regulatory capacity. Collectively, the reforms were designed to reduce the risk of contamination, promote long-term regulatory compliance, and enhance cooperative implementation between EPA and local governments.[57]

The EPAct amendments advanced these goals by emphasizing prevention, enforcement, and accountability. To improve prevention, EPAct transformed the LUST Trust fund from a reactive cleanup tool, into a comprehensive UST program funding tool. Through RCRA § 9010 Congress required EPA to issue operator-training guidelines, and mandated that states receiving Subtitle I funding adopt state-specific training programs consistent with those standards.[58] EPA guidelines distinguish between three operator categories, based on degree of responsibility and

[56] Pub. L. No. 109–58 was signed into law by President George W. Bush on August 8, 2005
[57] U.S. ENVTL. PROT. AGENCY, *Energy Policy Act of 2005 and Underground Storage Tanks,* https://www.epa.gov/ust/energy-policy-act-2005-and-underground-storage-tanks
[58] Codified at 42 U.S. Code § 6991i

training.[59] RCRA § 9005(c)(1) was amended to require that all federally regulated USTs be inspected at least once every three years.[60] For enforcement, RCRA § 9012 authorized EPA to prohibit fuel delivery to tanks that are ineligible because of significant violations.[61] The EPAct amended RCRA § 9011 to make UST compliance a condition of receiving federal grants for state programs, which requires states to meet inspection and enforcement benchmarks.[62] To strengthen state oversight of groundwater threats, RCRA § 9004(f), directed states receiving federal funding to develop strategies to address releases that pose threats to groundwater.[63] Taken together, the EPAct provisions reoriented Subtitle I toward proactive prevention and gave EPA and the states stronger tools to ensure consistent national standards for UST regulation.

I. e-Manifest Act of 2012

Under the original framework of Subtitle C, RCRA required hazardous waste to be tracked using a manifest system, which documented where waste was generated, transported, and ultimately treated, stored, or disposed. However, by 2012, the paper based manifest system became outdated, with slow, error-prone, and hard to audit records which created administrative burdens for both regulators and regulated entities. As a result, Congress enacted the Hazardous Waste Electronic Manifest Establishment Act (e-Manifest Act) to comprehensively modernize RCRA's manifest system by mandating an electronic infrastructure, funding mechanism, oversight structure, and regulatory framework to support accurate, efficient hazardous waste tracking nationwide.[64]

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[59] Implementing regulations describing EPA's classification of operator categories found at 40 C.F.R. §§ 280.240–.242 (2024).
[60] Codified at 42 U.S.C. § 6991d(c)(1)
[61] Codified at 42 U.S.C. § 6991k
[62] Codified at 42 U.S.C. § 6991(j)
[63] Codified at 42 U.S.C. § 6991c(f)
[64] Pub. L. No. 112-195 was signed into law by President Barack Obama on October 5, 2012

The e-Manifest Act amended Subtitle C in an attempt to bolster RCRA's core goal of ensuring a cradle-to-grave system for hazardous waste by strengthening EPA's enforcement capabilities and increasing transparency in the waste management process. Pursuant to RCRA § 3024(b), the EPA is required to establish a national electronic manifest system.[65] Under RCRA § 3024(g), the EPA must promulgate regulations within one year of enactment to implement the system, support transition from paper to electronic, ensure tracking and accessibility, and accommodate both paper and electronic submissions.[66]

Congress authorized $2 million per year from fiscal year 2013 through fiscal year 2015 to help fund start-up activities.[67] To help finance the development, operation, maintenance, and upgrades of EPA's nationwide hazardous waste tracking system, the e-Manifest act established a revolving fund in the treasury offset by user fees, so that net appropriations equal zero. Funds are strictly used to upgrade the existing paper-based system and only available by request.

J. Water Infrastructure Improvements for the Nation Act of 2016

The Bevill exclusion, established by the 1980 RCRA amendments, temporarily removed CCR from hazardous waste regulation under Subtitle C and directed EPA to study their risks before deciding on regulatory controls. As a result, CCR – byproducts of coal-fired power generation containing toxic constituents such as arsenic, mercury, and lead – were regulated solely under Subtitle D, where federal oversight was limited.[68] In 2015, EPA sought to address this gap by issuing the CCR Rule, which set national minimum criteria under Subtitle D for CCR

[65] Codified at 42 U.S. Code § 6939g (b)
[66] Codified at 42 U.S. Code § 6939g (g)(1)(A)
[67] Codified at 42 U.S. Code § 6939g (i)
[68] VA. CONSERVATION NETWORK, *Protection from Coal Ash*, https://vcnva.org/agenda-item/protection-from-toxic-coal-ash/#:~:text=Why%20It%20Matters,Current%20Landscape

disposal in landfills and surface impoundments, including location restrictions, liner requirements, groundwater monitoring, and closure standards. Persistent concerns over enforcement led Congress to pass the Water Infrastructure Improvements for the Nation Act of 2016 (WIIN), which responded to longstanding gaps in CCR management under Subtitle D by establishing a state- or EPA-run CCR permitting program.[69]

WIIN § 2301 added RCRA § 4005(d), which allowed states to submit a CCR permit program that, once approved by the EPA, can operate in lieu of direct federal regulation.[70] CCR was redefined as a "sanitary landfill" only when it operates under a valid CCR permit or complies with applicable criteria.[71] State programs can impose site-specific alternative requirements if EPA finds them "at least as protective" as the federal rule.[72] If a state does not adopt such a program, the EPA is directed to implement a federal CCR permit program, even with a lack of local approval.[73] Pursuant to the savings clause at RCRA § 4005(d)(6), the WIIN Act did not alter the Bevill exclusion and CCR remains excluded from regulation as hazardous waste under Subtitle C.[74] Instead, WIIN responded to regulatory gaps in Subtitle D by establishing a federally led state CCR permitting framework.

K. Infrastructure Investment and Jobs Act of 2021

The Infrastructure Investment and Jobs Act of 2021 (IIJA) amendments to the RCRA were primarily enacted to support the nation's shift toward a circular economy and modernize solid waste management infrastructure.[75] A circular economy "reduces material use, redesigns

[69] Pub. L. No. 114-322 was enacted on December 16, 2016, by President Donald J. Trump
[70] Codified at 42 U.S.C. § 6945(d)
[71] Codified at 42 U.S.C. § 6945(d)(5)
[72] Codified at 42 U.S.C. § 6945(d)(1)(B)(ii)
[73] Codified at 2 U.S.C. § 6945(d)(3)
[74] Codified at 2 U.S.C. § 6945(d)(6)
[75] Pub. L. No. 117-58 was signed into law by President Joe Biden on November 15, 2021

materials to be less resource intensive, and recaptures waste as a resource to manufacture new materials and products."[76] Congress used the IIJA to give EPA new RCRA-based authority and funding to strengthen recycling, reuse, and waste reduction programs through grants, education, and better materials tracking. IIJA did not amend the core RCRA Subtitle C hazardous-waste controls, instead the amendments were aimed at Subtitle D materials management and market development rather than hazardous-waste permitting or enforcement. For example, two new IIJA grant programs provide both funding and education outreach to strengthen municipal recycling systems.

The first program, IIJA § 70401, created The Solid Waste Infrastructure for Recycling Grants (SWIFR) to incentivize states and local communities to implement the National Recycling Strategy and improve municipal management of recycled consumer materials.[77] The EPA has allocated SWIFR $55 million per year through fiscal year 2026.[78] The second program, IIJA § 70402(a), directed the EPA to establish competitive grants that promote the goal of building a circular economy through outreach and education. To improve residential and community recycling programs, states, tribes, municipalities, and nonprofits to improve consumer recycling participation, reduce contamination, and increase collection of recyclable materials.[79] Funds will not be dispersed for recycling programs that lack separate collections of residential solid waste unless in the process of transitioning. The provision further requires that at least 20% of annual funding go to low income, rural or native American communities.[80]

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[76] U.S. ENVTL. PROT. AGENCY, *New Recycling, Reuse and Waste Prevention Grant Programs and Initiatives*, https://www.epa.gov/newsreleases/biden-harris-administration-and-epa-announce-375-million-funding-bipartisan.
[77] https://www.epa.gov/circulareconomy/national-recycling-strategy
[78] https://www.epa.gov/circulareconomy/solid-waste-infrastructure-recycling-grant-program
[79] Codified at 42 U.S.C. § 6966d
[80] www.epa.gov/system/files/documents/2022-11/EPA-I-OLEM-ORCR-23-02.pdf

III. NY Case Study

A. Role of the States in RCRA Enforcement

While RCRA is a federal law administered by the EPA, it is designed to be carried out primarily by the states through an authorization program. State authorization is a rulemaking process where EPA delegates the primary responsibility of implementing the RCRA hazardous waste program to individual states.[81] Pursuant to 42 U.S.C. § 6926(b), New York is a fully authorized state, meaning it operates its own hazardous waste program subject to EPA oversight. New York is more stringent than the federal regulations as it requires more frequent reporting, with state specific waste designations.

B. Role of RCRA in New York

The New York State Department of Environmental Conservation (NYSDEC) runs the program and has adopted more stringent regulations than the federal baseline. Though EPA sets minimum federal criteria for municipal solid waste landfills under Subtitle D, the state is responsible for regulating solid waste facilities. NYSDEC administers a Solid Waste Management Program, including:

- Landfill design and operation permits
- Recycling mandates (under state law)
- Organic waste and food scrap diversion programs
- Compliance with the Climate Leadership and Community Protection Act (CLCPA)

[81] https://www.epa.gov/rcra/state-authorization-under-resource-conservation-and-recovery-act-rcra

C. Bethpage Groundwater Plume

The Bethpage groundwater plume originated from operations by Northrop Grumman and the U.S. Navy from the 1930s through the 1990s under both federal and commercial contracts.[82] The facilities were permitted hazardous waste facilities under RCRA. Under the RCRA, facilities that treat, store, or dispose of hazardous wastes are subject to corrective action authority.[83] As a result, the EPA retains enforcement under RCRA. The NYSDEC, rather than the EPA conducted the RI, FS, issued the ROD and actively manages the cleanup with cooperation from Northrop Gruman and the U.S. Navy.[84]

i. Relevance to NYC

NYSDOH and NYSDEC conducted a feasibility study to determine if NYC supplement Nassau County's water supply. The feasibility study identified two different approaches, a small- and large-scale approach.[85] The low bookend approach attempts to revitalize existing inactive interconnections to convey 20 million gallons per day (MGD) from NYC to Nassau County. The capital cost would be between $35 million and $53 million with estimated completion in two to five years. However, currently NYC has a surplus of 200 MGD in excess of the city's demand. The High bookend approach attempts to leverage this excess water supply and convey up to 180

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[82] Background of Bethpage Groundwater Plume, *see* https://www.epa.gov/hwcorrectiveactioncleanups/hazardous-waste-cleanup-naval-weapons-industrial-reserve-plant-and

[83] U.S. ENVTL. PROT. Agency, Hazardous Waste Cleanup: Naval Weapons Industrial Reserve Plant and Northrop Grumman Corporation Site (NWIRP) in Bethpage, New York, https://www.epa.gov/hwcorrectiveactioncleanups/hazardous-waste-cleanup-naval-weapons-industrial-reserve-plant and#:~:text=Volatile%20organic%20compound%2C%20mainly%20trichloroethylene,increasing%20in%20the%20well%20field

[84] N.Y. STATE DEP'T OF ENVTL. CONSERVATION, Record of Decision: Northrop Grumman – Bethpage Facility, Operable Unit 03, State Superfund Project, Bethpage, Nassau Cnty., Site No. 130003A (Mar. 2013), *see also* https://extapps.dec.ny.gov/docs/remediation_hudson_pdf/130003ou3rod.pdf

[85] N.Y. STATE DEP'T OF ENVTL. CONSERVATION, *Community Update: Northrop Grumman Bethpage Facility and Naval Weapons Industrial Reserve Plant Sites — Bethpage Community Park and Groundwater Plume Update* (July 2025)

MGD with mostly new infrastructure. While NYC has a current surplus of 200 MGD, projections indicate this surplus could be eliminated by 2040. The plan calls for NYC to install new wells, upgrade underground piping in residential areas and establish onsite treatment facilities. [86]

[86] New York City-Nassau County Water Supply Interconnection Feasibility Study, NEW YORK STATE DEPT' OF HEALTH, August, 2022