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Sustainable Development Law & Policy

Exploring How Today's Development Affects Future Generations Around the Globe

In This Issue:

Issues in Waste Management

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American University Washington College of Law

Program on Environmental and Energy Law

Editors' Note

Dear Readers,

For more than two decades, the *Sustainable Development Law and Policy Brief* (*SDLP*) has published works analyzing emerging legal and policy issues within the fields of environmental, energy, sustainable development, and natural resources law. *SDLP* has also prioritized making space for law students in the conversation. We are honored to continue this tradition in Volume XXIII.

This first Issue focuses on legal issues around waste management ranging from extended producer responsibility ("EPR") for plastic packaging waste, to prosecutions for hazardous and non-hazardous waste violations under the Resources Conservation and Recovery Act ("RCRA"), to challenges in remediating and revitalizing brownfields contaminated by hazardous waste, pollutants, and other contaminants. The Petrucci article looks at the laws and regulations addressing brownfields including RCRA, the Comprehensive Environmental Response Compensation and Liability Act ("CERCLA"), and Environmental Protection Agency ("EPA") regulations; the implementation of federal and state brownfield redevelopment incentive programs; and efforts to address challenges to brownfield redevelopment and revitalization through Ohio state legislation. Petrucci proposes additional measures to incentivize brownfield redevelopment, particularly in low-market-value areas, to address the negative impacts of industrialization in historically underserved communities. The Ozymy & Jarrell Ozymy article examines the criminal provisions of RCRA and the enforcement and prosecutorial structure within the EPA and the Department of Justice ("DOJ"), and does a statistical analysis of RCRA prosecution data between 1983 and 2022. The authors identify significant trends in prosecution and make recommendations to enhance RCRA enforcement. The Issue is rounded out with the Mozak feature which advances the need for thoughtful EPR legislation to address the externalities created by hard-to-recycle plastic waste.

We would like to thank all the article and feature authors for their insights and dedication to raising important legal issues. We would also like to thank the faculty advisors, executive board, staff, and publisher of *SDLP* for making this publication possible. Finally, we would like to thank our readers, whose involvement and investment in *SDLP* are the reason we have been able to continue this publication for more than twenty years.

Sincerely,

Rachel Keylon and Meghen Sullivan

To subscribe to the Sustainable Development Law & Policy Brief, email our Managing Editor at sdlp.wcl@gmail.com

About SDLP

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Because our publication focuses on reconciling the tensions found within our ecosystem, it spans a broad range of environmental issues such as sustainable development; trade; renewable energy; environmental justice; air, water, and noise regulation; climate change; land use, conservation, and property rights; resource use and regulation; and animal protection.

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Ohio House Bills 168 and 110: Just Another Drop in the Bucket for Brownfield Redevelopment?

Mia Petrucci

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Abstract

This article examines Ohio House Bills 168 and 110.[1] These House Bills provide liability protection to purchasers of brownfield sites, allocate $500 million dollars to brownfield funding—with $350 million allotted for investigation, cleanup, and revitalization of brownfield sites and $150 million for demolition of vacant/abandoned buildings—and create a new Building Demolition and Site Revitalization Program, for the revitalization of properties surrounding brownfield sites.[2] In the first three Sections of this article, the concept of brownfield redevelopment is introduced, the associated challenges with brownfield projects are discussed, and attempts by federal and state governments to address brownfield remediation challenges in the past is explained. In Section IV, this article analyzes the legislative framework set forth in House Bills 168 and 110 and discusses how Ohio is attempting to address the associated brownfield challenges. Finally, recommendations are made for future Ohio brownfield redevelopment legislation. This article argues that Ohio should continue to regulate brownfield redevelopment through emulating other state's low interest loan programs or create brownfield-specific tax credits to developers. While incentivizing development will always be a step in the right direction, not every brownfield site is in an area where developers want to build. Thus, Ohio should further allocate funds for the purposes of revitalizing low-to-no market value brownfield sites in historically underserved communities.[3] This can be done through partnering with land banks, creating community land trusts, or partnering with environmental advocacy organizations. Redevelopment of brownfield sites in such areas would work to create green spaces in historically underserved communities, countering environmental justice concerns and providing further access to clean environment, as well as bolstering community engagement and health.

I. Introduction

A brownfield is "a property, [where] the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[4] The Environmental Protection Agency ("EPA") estimates that there are more than 450,000 brownfields in the United States.[5] National redevelopment programs for brownfield sites did not begin until the mid-1990's with the creation of the EPA's Brownfield and Land Revitalization Program in 1995.[6] Communities during this time "began to recognize that the fear and uncertainty associated with potential environmental contamination was seriously undermining efforts to keep urban areas vital" and habitable.[7] In the 1990s, then-Mayor of Cleveland, Michael White, characterized environmental contamination as "the number one obstacle facing the development community."[8] Along with the creation of the EPA's brownfield program, the EPA also created a National Priorities List ("NPL") in which it identifies sites that need further investigation.[9] Sites are added to the list after a preliminary Hazard Ranking Screening ("HRS") and a notice-and-comment period.[10] Identifying these sites guides the EPA in determining "which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site."[11] In addition, the identification of sites helps the EPA identify potential remedial actions, alert the public of such sites, and serve as notice for responsible parties.[12] It was also during the 1990s that individual states began to develop voluntary cleanup programs and the EPA partnered with twenty other federal agencies, including the Economic Development Administration ("EDA"), the Army Corps of Engineers, the Department of Housing and Urban Development ("HUD"), to further its brownfield redevelopment goals.[13]

So why remediate brownfields? Brownfields pose health risks; contamination can lead to "respiratory, 'liver, diabetes, stroke, [chronic obstructive pulmonary disease] COPD, [and] heart disease.'"[14] Brownfields can also contribute to urban sprawl, because developers would rather avoid these properties.[15] Urban sprawl causes many indirect societal and environmental harms, such as increased wealth disparities, threats to biodiversity, deterioration of water quality, and increased air pollution from transportation.[16] Brownfields also devalue the property around them, and they have particular influence over residential prices.[17]

Furthermore, brownfield redevelopment poses various legal and financial risks for developers. First, there are questions of liability for brownfield purchasers. Moreover, cleanup can take an extended amount of time, project scheduling can be extremely hard to predict, regular financing may be hard to find, and brownfield sites are often in underdeveloped and weak market areas.[18] These risks seriously impact the willingness of developers to take on brownfield redevelopment projects.

Despite these risks, the revitalization and redevelopment of these properties protects the environment from further harm, can foster economic growth, and utilizes existing infrastructure to reduce pressure to develop undeveloped land, preventing the development of open land.[19] The EPA identifies three major reasons why redevelopment is a good opportunity for communities: (1) it reduces environmental and health harms, (2) it sustainably reuses existing infrastructure, and (3) it can lead to community revitalization and involvement.[20]

II. Regulatory Challenges To Brownfield Redevelopment

At the federal level, legislators have attempted to control brownfield redevelopment through several statutory and regulatory schemes. Some of these schemes have been incorporated into state programs.[21] The three main sources of regulations are (1) the Comprehensive Environmental Response Compensation and Liability Act ("CERCLA"), (2) the Resource and Conservation Recovery Act ("RCRA"), and (3) EPA regulations and grant programs. These programs attempt to tackle liability concerns of brownfield purchasers, proper disposal requirements for hazardous waste to protect the environment and human safety, and the flexibility of brownfield purchasers to operate under multiple sources of law.

CERCLA has liability provisions that inhibit brownfield redevelopment.[22] CERCLA "treat[s] *current owners* of contaminated properties as potentially liable parties even if they demonstrably did not contribute to the contamination. Because developers often purchase the sites that they intend to redevelop, developers can become automatically liable for all the contamination present on the property."[23] Developers under CERCLA could also be liable for hazardous materials that migrated from their property onto others, regardless of whether the developer created the hazard.[24] At the turn of the new millennium, this provided a strong disincentive for developers to take on brownfield projects.

The Small Business Liability Relief and Brownfields Revitalization Act ("SBLRBR") removed a lot of the brownfield problems present in CERCLA prior to 2002.[25] SBLRBR was created to provide relief to small businesses: it (1) provides for financial support in the "cleanup and reuse of brownfields, (2) provides financial assistance for brownfields revitalization, and (3) enhances State response programs.[26] The SBLRBR amends Section 107 of CERCLA through the inclusion of two liability defenses and a new ability-to pay settlement procedure.[27] These liability defenses are extended to not only small businesses, but also to parties who contributed marginal amounts of hazardous or non-hazardous waste to brownfield sites.[28] These defenses are the "*de micromis* exception" and the "municipal solid waste exemption."[29]

The *de micromis* exception is backwards facing. It details that a potentially responsible party ("PRP") who generates or transports hazardous waste will not be liable for response costs at facilities identified on the NPL if "the total amount of material containing hazardous substances that the person arranged for disposal or treatment of or . . . accepted for transport . . . at the facility was less than 110 gallons or less than 200 pounds of solid waste materials."[30] The exception applies if the disposal, treatment, or transport of the hazardous materials occurred prior to April 1, 2001.[31] Notably, this exception has its own exceptions. The *de micromis* exception does not apply if "EPA determines that hazardous substances disposed of 'have contributed significantly, either individually or in the aggregate, to the costs of the response action or natural resource restoration with respect to the facility.'"[32] In the case of a contributory action with a third party, the third party bears the burden of proof to establish that the conditions of the exception were not met; in a cost-recovery action by the government, the PRP bears that burden.[33]

The municipal solid waste exception is similar in that it provides liability exemption for PRP disposal of municipal solid waste at an NPL.[34] However, this exception regulates generators of waste, not transporters.[35] Municipal waste is defined as waste "generated by a household . . . commercial, industrial, or institutional entity, to the extent that the waste is" essentially the same as normal household waste, disposed of as normal household waste, and is as hazardous as normal household waste.[36] This exemption is available to (1) "an owner, operator, or lessee of residential property from which all . . . waste was generated,"[37] (2) "a business entity . . . that . . . employ[s] on average not more than 100 full-time individuals [during the last three years],"[38] or (3) a "501(c)(3) non-profit organization employing not more than 100 employees at the location where the waste was generated."[39] This exemption is not available to municipalities.[40] Again, the exception does not apply if the EPA has determined that the PRP has significantly contributed to the costs of the redevelopment, the PRP has failed to comply with information requests, or the PRP has hindered the process of the response action, as in the *de micromis* exception.[41]

Title II establishes additional liability protections for owners and developers of brownfield sites, including the contiguous property owner defense and the bona fide prospective purchaser defense.[42] The contiguous property owner defense is for people whose property "is or may be contaminated by a release or threatened release of a hazardous substance from real property that is not owned by that person."[43] For the contiguous property owner defense, the property owner "shall not be considered liable as an owner or operator under CERCLA Section 107(a)(1) or (2)."[44] To avail themselves of this defense, the owner must prove eight elements, that they: (1) did not cause, contribute, or consent to the waste, (2) are not affiliated with the person who did cause the waste, (3) are taking reasonable steps to stop the continuing waste releases, (4) are taking reasonable steps to prevent future releases, (5) are attempting to prevent human, environmental, or other exposure, (6) are cooperating with response activity, (7) are providing all legally required notices, and (8) comply with any land use restrictions.[45] The bona fide purchaser exception defines a bona fide purchaser as:

> [A] person (or a tenant of a person) who acquires ownership of a facility after enactment of the Act and who (1) acquires ownership after all disposal of hazardous substances occurred at the facility; (2) made all appropriate inquiry into the former uses and ownership of the facility (again consistent with the revised innocent landowner provisions contained in section 101(35) of CERCLA); (3) provided all legally required notices with respect to the release of hazardous substances at the facility; (4) cooperated with persons performing response actions at the facility; (5) complied with land use restrictions and institutional controls at the facility; (6) responded to EPA information requests; and (7) stopped continuing releases, prevented future releases, and prevented or limited exposure to hazardous substances at the facility.[46]

With these exceptions to liability, bona fide purchasers, innocent landowners, and contiguous property owners can more readily take on remediation projects. CERCLA's main impact on brownfield remediation is the liability protection that it creates under federal law. This is important because one of the main concerns of brownfield purchasers is the potential to incur liabilities from past pollution on the property that they inherited with their purchase. Of course, this only protects purchasers at the federal level, so purchasers may still be liable under state laws.

RCRA is the statute that "creates the framework for the proper management of hazardous and non-hazardous solid waste."[47] RCRA gives the EPA the authority to regulate the "generation, transportation, treatment, storage, and disposal of hazardous waste."[48] The EPA, in June of 1998, incorporated RCRA in its brownfield initiative through the creation of the RCRA Brownfields Prevention Initiative work group.[49] RCRA was included within this initiative because the EPA recognized that brownfields usually result in a multitude of issues across multiple jurisdictions and permitting schemes.[50] RCRA may apply to many brownfield properties since many waste management facilities and activities are required to obtain a RCRA permit, under which "the facility and all contiguous properties identified within it remain subject to the permit conditions—including facility-wide corrective action until EPA (or the authorized state) terminates the permit."[51] Of course, that means subsequent purchasers of brownfield properties will be subject to any previous RCRA permit, which often discourages potential buyers, as a RCRA permit is just one more set of rules and conditions potential buyer have to follow.[52] Also, a previously un-permitted brownfield site may potentially come under the jurisdiction of RCRA when a brownfield purchaser begins cleanup activities.[53] The work group's goal is to remove any RCRA red-tape from redevelopment while ensuring that the project still protects the health of both the environment and humans.[54] The RCRA Brownfields Prevention Initiative addresses facilities that are subject to RCRA by allowing flexibility in the cleanup process, to attempt to ease the ability of purchasers to remediate their property.[55]

The EPA has implemented several regulatory initiatives to facilitate brownfield redevelopment. In the rule entitled the Hazardous Remediation Waste Management Requirements, the EPA codified a permitting provision eliminating "the requirement for facility-wide corrective action at cleanup-only sites that are not otherwise subject to RCRA permit requirements."[56] In the Post-Closure Rule, the EPA allowed storage, closing treatment, or disposal facilities to be cleaned under approved or "alternative mechanisms without having to obtain a post-closure permit."[57] In both preambles to these rules, the EPA discussed the relationship of these rules to the RCRA program, expressing an intent to continue building flexibility into the RCRA framework.[58]

Ultimately, there are several legal frameworks under which brownfield redevelopment occurs. Although the EPA has attempted to make it easier for brownfield purchasers to wade through the statutory red-tape of both CERCLA and RCRA, there is still a lot for purchasers to consider even before the cleanup process can begin. Once purchased, brownfield purchasers must design and implement cleanup in a way that ensures compliance with Tribal, Federal, State, and local regulations and regulatory guidelines.[59] Purchasers must also keep an eye out for any regulations that could become effective in the middle of the project, ensure coordination with state voluntary cleanup programs, and develop cleanup and subsequent monitoring plans.[60] Additionally, they must demonstrate that they "exercise 'appropriate care' with respect to hazardous substances found at the facility by (1) taking reasonable steps to contain contamination, (2) preventing any threatened future release, and (3) preventing or limiting human environmental, or natural resource exposure to a previously released hazardous substance," in addition to compliance with Institutional Controls,[61] to establish a CERCLA bona fide prospective purchaser defense, amongst a multitude of other considerations.[62] Thus, brownfield redevelopment projects remain a headache to take on.

III. Additional Challenges to Brownfield Redevelopment

A. Financial Challenges to Brownfield Redevelopment

Another large barrier to brownfield redevelopment is simply the cost and duration of cleanup projects. The Northeast Midwest Institute ("NEMW") estimates the average cost of brownfield cleanup to be $602,000 based on cleanup data provided by the EPA.[63] It can cost $15,000 to $35,000 to remediate one acre of contaminated land.[64] Hidden cleanup costs are not uncommon in the late stages of the redevelopment process, which leads to more budgeting problems and unpredictability down the line.[65] The unpredictability of costs of cleanup is an effective deterrent, as it "affect(s) a property's marketability before remediation."[66] The marketability of Brownfields after remediation is also a concern for purchasers. Studies suggest long-term stigmatization of land affects property values after remediation.[67] Therefore, even when a property is cleaned and no longer toxic, the memory of hazardous conditions remains and may impact the ability of brownfield purchasers to profit from their newly remediated land. Another component affecting post-cleanup marketability is that brownfields are often located in "weak real estate market areas," where "sellers far outweigh buyers and prices are in a general state of decline, or where there is little demand for a property."[68] This makes the likelihood of profitability much lower post-redevelopment, which disincentivizes purchasers from taking on such costly projects.

On top of those factors, these projects also take a long time to complete. Investigations of the property typically last 90–180 days; full cleanup can potentially take over three years to complete.[69] Environmental assessments, cleanup durations, and other federally or state mandated evaluations complicate projects because each step requires documentation and oversight from different governmental agencies, which makes actual timelines for projects tricky to predict.[70] The duration of the cleanup is only one part of the project; further development of the land—once the land is habitable—takes additional time.

Another problem for purchasers is that financial institutions have historically been unwilling to take on the risk of brownfield redevelopment projects, due to factors causing anticipated costly setbacks.[71] This leaves brownfield purchasers at a disadvantage in comparison to non-hazardous land purchasers. Brownfield purchasers typically must finance remediation projects through federal or state grants or loan programs, which may be hard to

acquire and likely come with more strings attached than regular grants or loans.[72] The bar is higher to acquire brownfield redevelopment grants and loans because of the hazardous nature of the project. This higher bar also works to ensure the safety of the redeveloper, the employees conducting the cleanup, and public health. More bureaucratic red tape and oversight exists for the same reason.

B. How Challenges Have Been Addressed through Past Programs

There have been several federal and state incentive programs created since national attention turned towards brownfield redevelopment in the 1990s. Federal programs include: (1) the Small Business Liability Relief and Brownfields Revitalization Act, (2) the Brownfields Expensing Tax Incentive, and (3) the Consolidated Omnibus Appropriations Act of 2018, along with several EPA Brownfield grant programs.[73] State incentive programs include low-interest loans, grants, and tax credits.[74] Ultimately, these incentives all aim to lower the financial burden on purchasers to remediate brownfield properties.

A. Federal Economic Incentive Programs

There are three main federal incentive programs adopted in recent years: (1) the Small Business Liability Relief and Brownfields Revitalization Act, (2) the Brownfields Expensing Tax Incentive, and (3) the Consolidated Omnibus Appropriations Act of 2018.[75]

The Small Business Liability Relief and Brownfields Revitalization Act creates an ability-to-pay settlement.[76] This settlement is for PRPs who can demonstrate an inability to pay.[77] This section aims to expedite settlement procedures detailed in Section 122(g) of CERCLA.[78] It attempts to accomplish this goal by considering alternative payment methods and mandates that EPA balance the ability of the PRPs to maintain their basic business functions and pay the response costs.[79] The PRP must "waive all claims against other PRPs, not impede response actions at the site, and comply with EPA's requests for access or information. As with the Act's liability exemptions, EPA's decisions regarding whether to enter a limited ability-to-pay settlement are not subject to judicial review."[80]

Title II of the Act is the "Brownfields Revitalization and Environmental Restoration Act of 2001."[81] Subtitle A details funding for brownfield redevelopment.[82] The Act amends Section 104 of CERCLA.[83] Eligible recipients include units of local governments, land clearance authorities, government entities created by state legislatures, and states.[84] Grants are generally capped at $200,000.[85] Grant applicants are ranked by the Administrator of the EPA in regards to identified criteria that weigh the potential of the projects: to stimulate subsequent reuse of the site; to stimulate the economy; to reduce threats to human health or the environment; and/or to facilitate the creation of a park, greenway, or some other nonprofit purpose, etc.[86]

The Consolidated Omnibus Appropriations Act of 2018 was created to "inject flexibility into the existing grant programs."[87] The Act aims to do this by allowing contaminated properties to access certain types of funding despite not meeting the eligibility requirements.[88] It also increased the maximum amount of grants available for brownfield sites to $500,000.[89] Additionally, it "allows grants that cover characterization, assessment, and remediation, whereas the previous statute required that separate grants be awarded for characterization/assessment and remediation."[90] The combination of different allocations of the grant money makes it easier for purchasers to obtain funding for all or most parts of the redevelopment process.

The EPA's Brownfields Program has a variety of brownfields grants.[91] These include: Brownfields Assessment Grants, which "provide funding for brownfield inventories, planning, environmental assessments, and community outreach"; Brownfields Revolving Loan Fund Grants, which "provide funding to capitalize loans that are used to clean up brownfield sites"; Brownfields Cleanup Grants, which "provide funding to carry out cleanup activities at brownfield sites owned by the applicant"; Multipurpose Grants, which "provide funding to conduct a range of eligible assessment and cleanup activities at one or more brownfield sites in a target area"; Job Training Grants, for environmental training "for residents impacted by brownfield sites in their communities"; Technical Assistance, Training and Research Grants, for conducting research and to provide training to address brownfield sites; and State and Tribal Response Programs Grants, to "establish or enhance State and Tribal Brownfields response programs."[92] Brownfield assessment grants, brownfields job training and redevelopment grants, and brownfield cleanup grants typically are awarded for up to $200,000.[93] There are also brownfield cleanup revolving loan fund grants to "capitalize loan funds to make loans to public and private sector recipients for the environmental cleanup of brownfields. Since 2003, community RLF recipients may use up to forty percent of these resources to provide direct cleanup subgrants," which can be awarded for up to $1 million for use over five years.[94]

2. State Economic Incentive Programs

There are multiple ways that states encourage brownfield redevelopment, the first of which is low-and-zero interest loans. The Indiana Brownfields Program has a low-interest loan incentive program.[95] The identified purpose of the loan program is "to facilitate public or private redevelopment of brownfield sites throughout the state by making low-to-zero interest loans with flexible repayment terms available to eligible Indiana political subdivisions, non-profits, and private, for-profit entities to finance environmental cleanups."[96] Loan rates range from zero percent to three percent and up to twenty percent of the loan can be forgiven if specific economic development goals are met.[97]

Cleanup grants are also utilized by states to incentivize brownfield redevelopment. For example, Wisconsin's Ready for Reuse Program provides up to $200,000 for cleanup activities.[98] The grants are for applicants that own the property who can complete projects in two years.[99] There are required criteria for applicants, including that the sites have to "meet the federal definition of 'eligible brownfield site,'"[100] the applicant cannot

be liable under CERCLA, the grantor must be able to provide a minimum of twenty-two percent of the requested funds as a match, the applicant must not have caused the contamination, and cleanup must be for hazardous contamination only.[101]

Brownfield-specific tax credits for developers are another incentive states utilize to encourage brownfield redevelopment. New York's Brownfield Cleanup Program provides a brownfield redevelopment tax credit for "taxpayers who incur costs for the remediation or redevelopment of a brownfield site in New York State that is, or will become, a qualified site."[102] For a qualified site, the base tax credit is ten percent.[103] The tax credit has three credit components for site cleanup, groundwater cleanup, and development of the site.[104] Colorado has a similar program that offers a forty percent tax credit for cleanup expenses up to $750,000 and thirty percent credit on projects that cost greater than $750,000 to $1,500,000.[105]

IV. Ohio House Bills 168 And 110

A. Brownfield Redevelopment in Ohio Prior to House Bills 168 and 110

Ohio currently has over 300 federal brownfield sites, with the highest concentration (twenty-nine brownfield sites) located in Cuyahoga County.[106] Other counties–Lucas, Summit, and Franklin–have twenty-two, twenty-seven, and twenty sites, respectively.[107] In 2019, only nine brownfield cleanups were completed in Ohio.[108] At the peak of brownfield redevelopment in Ohio, thirty-five projects were completed in one year.[109] EPA has identified thirty-seven national priority sites within Ohio.[110]

Until House Bills 168 and 110, Ohio's brownfield redevelopment was primarily regulated and incentivized through Ohio's Voluntary Action Program ("VAP").[111] VAP was "created to give companies a way to investigate possible environmental contamination, clean it up if necessary, and receive a legal release from the State of Ohio [indicating] that no more cleanup is needed."[112] The Program allows brownfield property owners to opt-in and receive protections from further legal responsibilities.[113] VAP assigns a certified professional ("CP") to a project to verify that the property is cleaned to the standards required by VAP, without ongoing Ohio EPA involvement.[114] When a CP determines that the property meets the cleanup standards contained in Ohio's Administrative Code chapter 3745-300,[115] they prepare a No Further Action ("NFA") letter that describes "the environmental problems found at the site, how those environmental problems were investigated and how the site was cleaned up," as well as "information concerning the CP's investigation of historical and current uses of the property."[116] This information is gathered before the creation of the NFA letter and used to determine whether Phase II property assessment is required; Phase II property assessment is required when a CP believes that hazardous substances or petroleum has been released from the property.[117] Phase II involves "collecting soil, ground water, surface water and sediment samples from the site as necessary" and comparing that data to the appropriate VAP cleanup standards to determine if a NFA letter can be prepared.[118]

If the participant, called "volunteer" by Ohio EPA, wants a legal release from liability they then have to send the NFA letter to Ohio EPA for review.[119] Review consists of a VAP staff member comparing the NFA letter to program standards to determine if the site is "protective of public health, safety and the environment."[120] If the VAP staff determines such, then the director of the Ohio EPA issues a covenant not to sue ("CNS"); this protects the property owner, operator, and future owners from being legally responsible for further investigation and cleanup of the property.[121]

B. Ohio House Bill 168

Ohio House Bill 168 is a part of Ohio's newfound focus on brownfield redevelopment.[122] The Ohio Legislature unanimously passed House Bill 168 May of 2020, Governor Mike DeWine signed it in June, and it took effect on September 14, 2020.[123] This unanimous decision reflects the recent Ohioan trend towards more efficient and incentivized brownfield redevelopment.

So, what does Ohio House Bill 168 do? It "provides purchasers of brownfield properties who meet certain criteria outlined in the bill with bona fide prospective purchaser defenses."[124] It incorporates the concepts of "bona fide prospective purchasers" from CERCLA into Ohio state law.[125] This means that in asserting their defense, a defendant must first prove that they are a "bona fide prospective perspective purchaser" of the site, by demonstrating that they meet the criteria listed in Section 101(40) of CERCLA.[126] This applies retroactively, protecting all bona fide purchasers of brownfield properties after January 11, 2002.[127] Unlike CERCLA, House Bill 168 does not apply to private citizen's claims against property owners, and it does not protect "from common law claims if contamination is migrating from the property."[128] The legislature, in creating House Bill 168, made it clear that this new provision is meant to be "remedial in nature" for the purposes of making affirmative defenses under CERCLA available in civil actions.[129]

Beyond the VAP program, until the passage of House Bill 168, Ohio did not have any mechanisms that would allow buyers of brownfield sites to assert any legal immunity for the historic release of toxic substances from their property under state law.[130] House Bill 168 is self-implementing, meaning that brownfield property owners do not have to sign up for a program to access defenses in court, and there is no required approval by a government agency.[131] This frees property owners from the steps mandated by the VAP program, a step in the right direction for Ohio in terms of making property liability protection easier to access.[132]

Ohio House Bill 168 places Ohio "on equal footing with neighboring states."[133] Through its Baseline Environmental Assessment program, Michigan – Ohio's neighbor and athletic rival – averaged 1,032 issuances per year between 1995 and 2015; whereas Ohio's VAP only averaged twenty-six per year during that same time.[134] House Bill 168 helps speed up the process by "offering a more cost-effective means for returning brownfields to productive use."[135]

While Ohio House Bill 168 fills an important gap between Ohio state law and federal law and brings Ohio closer to neighboring programs, it does not guarantee protections for brownfield property owners in private actions, fails to protect from common law claims where toxic substances are migrating out of the property, and it does not monetarily incentivize the purchase of brownfield properties.[136] All these factors are serious barriers to redevelopment.

C. Ohio House Bill 110

Governor Mike DeWine signed House Bill 110 on June 30, 2021.[137] Ohio House Bill 110 created and funded the Building Demolition and Site Revitalization Program and the Brownfield Remediation Program.[138] Ohio's Department of Development ("ODOD") administers this program.[139] The Building and Site Revitalization Program is also given the ability to award grants, but for the "demolition of commercial and residential buildings and revitalization of surrounding properties on sites that are not brownfields."[140] In House Bill 110, $150 million is allocated to the Building Demolition and Site Revitalization Fund.[141]

The Brownfield Remediation Program is tasked with "award[ing] grants for the remediation of brownfield sites throughout Ohio," which is funded through the Brownfield Remediation Fund.[142] The Director of ODOD was directed to reserve $1 million per each of the eighty-eight counties in Ohio.[143] The funds are reserved for one calendar year, after which funds become available to the public.[144] House Bill 110 allocates $350 million to the newly created Brownfield Remediation Fund.[145] Approximately $262 million is available on a first-come, first-served basis.[146] Grants provide for up to seventy-five percent of the project's total cost; applicants are required to provide the other twenty-five percent.[147]

All types of property owners are eligible to apply for Brownfield Remediation Program grant money. These include "[u]nits of local government, including counties, townships, municipal corporations, port authorities, conservancy districts, park districts, or other similar park authorities . . . [and others like] county land reutilization corporations, nonprofit organizations, or organizations for profit."[148] Only polluting entities that contributed to the contamination of the properties are barred from applying.[149] Round one of applicants has been initiated.[150]

Ohio House Bill 110 also appropriates $2.5 million to the Brownfields Revolving Loan Program to be awarded by ODOD.[151] ODOD "administers this program in conjunction with . . . Ohio Water Development Authority."[152] This program "provides low interest loans to private and public entities for demolition, cleanup, and remediation projects on brownfield sites."[153] Funds for this program are typically received by ODOD through grants from the EPA.[154]

V. Recommendations

Both House Bills further strengthen the ability of property purchasers to remediate brownfield sites. The new grant money available under House Bill 110, coupled with liability defenses awarded to property owners in House Bill 168, will likely bolster Ohio's brownfield remediation numbers to compete with neighbors like Michigan and Indiana.[155]

There is, of course, always room for improvement. A low interest loan program modeled after the Indiana Brownfields Program could augment brownfield purchasers' ability to secure independent funding outside of federal and state grants.[156] Similarly, brownfield-specific tax credits for developers, as seen in New York and Colorado,[157] would aid Ohio in incentivizing brownfield redevelopment.

Ohio's brownfield sites are near historically underserved communities. According to U.S. Census Bureau data from 2018, Ohio's brownfield sites are concentrated in localities that experience extremely high child poverty rates in the State.[158] Cuyahoga and Lucas counties—which contain 49 of Ohio's 311 brownfield sites[159]—have 17.9% and 18.7% of their populations living below the national poverty line.[160] In 2014, Case Western Reserve University reported that nearly one in three children under the age of six lives in poverty in Cuyahoga Country,[161] which ranks eighteenth out of eighty-eight counties in Ohio in highest child poverty as of 2018.[162] Lucas county ranks sixteenth out of eighty-eight counties on Ohio in highest child poverty,[163] and as of 2020, almost twenty percent of Lucas' population lives below the poverty line.[164] Therefore, the potential to revitalize these communities is high.

Having brownfield sites concentrated in impoverished areas is not a phenomenon unique to Ohio. About 27 million people in America live within 0.5 miles from a brownfield site.[165] People residing near brownfield sites are "*more minority, low income, linguistically isolated, and less likely to have a high school education* than the U.S. population as a whole."[166] On top of environmental justice concerns, these sites have a negative effect on the surrounding communities in terms of health contaminations affecting vulnerable populations, such as minorities, women, and children.[167] For example, some environmental toxins "may aggravate osteoporosis, a disease more common in women . . . [and] many environmental toxins aggravate biological predispositions in minority populations, such as diabetes, chronic liver disease, cardiovascular disease, and chronic respiratory disease."[168] Brownfield sites also tend to be surrounded by areas of increased crime rates and drug use.[169] As previously discussed, brownfield sites in weak market areas are hard to incentivize for redevelopment due to their low demand and the lower possibility of profitability post-redevelopment.[170] Any additional economic incentives to revitalize these communities would certainly help in the long run, but economic incentives to brownfield redevelopment, alone, may not be enough to overcome developers' concerns.

There are additional promising approaches to revitalization of low-to-no market value brownfield sites, where even grants cannot incentivize private brownfield purchasers. These include partnering with land banks, the creation of community land trusts, and partnering with environmental advocacy organizations. Land banks are typically "nonprofit entit[ies] established by either a city or county to address the problems of urban blight and to promote redevelopment"; community land

trusts are generally "private non-profit corporations . . . engaged in social and economic activities, such as to acquire and hold land for affordable housing development."[171] Either of these types of organizations would be great choices for lower-market-value brownfield properties. For example, Scenic Hudson, an environmental organization located in Poughkeepsie, New York, worked with the Village of Irvington to redevelop contaminated waterfront land to create a public riverfront park.[172] Scenic Hudson has an "urban initiative to acquire, remediate and develop environmentally friendly reuses for derelict riverfront sites."[173] By working with environmental organizations, particularly challenged or low-market-value brownfield sites are able to be redeveloped and preserved as parks, rather than contributing to further negative impacts of the industrialization of historically underserved communities.

Ohio could work with a similar Ohio-based organization to remediate brownfield sites for environmentally friendly purposes. Ohio has a plethora of environmental groups to collaborate with.[174] In Toledo, one of the larger cities in Lucas County, there are two environmental groups, in particular, that may be especially interested in redeveloping brownfield sites to create parks – Lake Erie Waterkeeper and Toledo Naturalist Association.[175] Ohio could work with either or both of these organizations to get the ball rolling on the redevelopment of brownfields where developers are not interested in purchasing due to a weak market, or where the property is located in riparian or other geographically hard to develop areas. Ultimately, the creation of green spaces in historically underserved communities works to counter environmental justice concerns and generates community interest in brownfield redevelopment projects. Increased access to green spaces in these areas would be extremely beneficial to these communities. Increased access to green spaces can (1) provide mental health benefits,[176] (2) decrease the disparities in access to clean environment across racial and economic lines,[177] and (3) function to rehabilitate the natural resources of Ohio in areas left behind in the wake of industrial expansion.

VI. CONCLUSION

Ohio is on the right track for now. Greater liability protection for brownfield purchasers and expanded statewide grant programs are good first steps to strengthen Ohio's brownfield redevelopment goals. To keep the ball rolling on increased brownfield remediation, Ohio can draw from additional financial incentives modeled by other states across the nation. As Ohio continues towards further redevelopment, it is extremely important not to leave behind the communities that bear the greatest burden of brownfield sites. In addition to providing economic incentives for development, Ohio should create and implement partnership programs to allow for brownfield redevelopment on behalf of non-profit and environmental groups. This would further allow for undesirable, or low-market-value brownfields to be remediated, as well. Ohio should use this momentum to alleviate pressure on low-income communities and increase access to green spaces. This will ultimately lead to a cleaner Ohio.

Endnotes

1 *See*, H.B. 168, 134 Gen. Assemb., Reg. Sess., (Ohio 2021); H.B. 110, 134 Gen. Assemb., Reg. Sess., (Ohio 2021).

2 H.B. 168, 134 Gen. Assemb., Reg. Sess., (Ohio 2021); H.B. 110, 134 Gen. Assemb., Reg. Sess., (Ohio 2021).

3 This article chooses to use the term "historically underserved communities" to refer to "populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civil life," such as people of color, members of religious minorities, LGBTQ+ persons, persons with disabilities, rural communities, and persons otherwise adversely affected by persistent poverty or inequality. *See*, Exec. Order No. 13,985, 86 Fed. Reg. 7009 (Jan. 25, 2021).

4 Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118, tit. II, § 2011, 115 Stat. 2356, 2361, 2367 (2002) (amending 42 U.S.C. § 9601 and adding 42 U.S.C. § 9628).

5 *Overview of EPA's Brownfields Program*, EPA (May 4, 2022), https://www.epa.gov/brownfields/overview-epas-brownfields-program.

6 *Id.*

7 Charles Bartsch et al., Unlocking Brownfields: Keys to Community Revitalization 3 (2005), https://www.csu.edu/cerc/documents/Unlocking-Brownfields.pdf.

8 *Id.*

9 *Superfund: National Priorities List ("NPL")*, EPA (Mar. 11, 2022), https://www.epa.gov/superfund/superfund-national-priorities-list-npl.

10 *Basic NPL Information*, EPA (Mar. 22, 2022), https://www.epa.gov/superfund/basic-npl-information.

11 *Id.*

12 *Id.*

13 Bartsch, *supra* note 7, at 3.

14 Luis Inaraja Vera, *Assessing the Performance of Voluntary Env't Programs*, 2020 Utah L. Rev. 795, 814 (2020) (citing Jill S. Litt et al., *Examining Urban Brownfields Through the Public Health "Macroscope,"* 110.2 Env't Health Persp. 183, 189 (2002)).

15 *Id.* at 814.

16 William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 Fordham L. Rev. 57, 59 (1999).

17 Oana Mihaescu & Rainer vom Hofe, *The Impact of Brownfields on Residential Property Values in Cincinnati, Ohio: A Spatial Hedonic Approach*, 42(3) J. Reg'l Analysis & Pol'y 223, 234 (2021).

18 EPA, Off. Brownfield & Land Dev., Anatomy of Brownfields Redevelopment 1–2 (2019), https://www.epa.gov/sites/default/files/2015-09/documents/anat_bf_redev_101106.pdf.

19 *Overview of EPA's Brownfields Program*, EPA (May 4, 2022), https://www.epa.gov/brownfields/overview-epas-brownfields-program.

20 EPA, Off. Brownfield & Land Dev., *supra* note 18, at 1–2.

21 *See* discussion *infra* Section V.B.2

22 Comprehensive Environmental Response Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9607 (2001).

23 Vera, *supra* note 14, at 816–17 (emphasis added).

24 *Id.* at 816–18.

25 *See*, Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107–118, 115 Stat. 2356, 2356 (2002) (codified as amended at 42 U.S.C. §§ 9601, 9604, 9605, 9607, 9622, 9628).

26 *Id.* § 102 et seq.

continued on page 27

It's Time to Trash Consumer Responsibility for Plastics: An Analysis of Extended Producer Responsibility Laws' Success in Maine

*Marina Mozak**

Consumer responsibility for waste is a historic relic, dating back to a time when nearly all of a consumer's waste was compostable, reusable, or marketable.[1] Today, with the rise of plastics and complex goods like electronics, consumers lack the expertise, time, and ability to personally break down the products they consume for reuse.[2] Much of our household waste goes to the curb and into a single stream of municipal solid waste ("MSW"). This includes a variety of wastes which each require specialized processing.[3] Recycling this complex waste falls to municipalities which are woefully underfunded and underqualified to process such complex and dangerous waste.[4] Solutions beyond consumer responsibility, like Extended Producer Responsibility ("EPR"), are needed to mitigate the costs and environmental impacts associated with modern MSW.[5]

MSW is an externality of product production and consumption.[6] Though there is a known cost associated with MSW,[7] it is not taken into account in the producer to consumer transaction, with costs to manage waste falling to the consumer and subsequently to municipalities.[8] These costs can prove prohibitive in the volatile recyclables market, which has changed dramatically since China stopped buying most U.S. recycling in 2017.[9] EPR is a waste cost management system, which reassigns responsibility for waste from consumers to the product producers.[10] In this way, it takes the economic externality of post-consumer waste, and internalizes it to the producing company.[11] By internalizing the externality in production, EPR can save municipalities money, encourage recycling, and discourage companies from producing waste.[12]

The EPR system's effectiveness has been proven in the U.S. by the success in twenty-five states (and the District of Columbia) of EPR laws for electronic waste ("E-Waste").[13] One of the first states to implement EPR was Maine with passage of its E-Waste law in 2005, which has served as a test for the potential efficacy of EPR in more states.[14] These E-Waste laws apply to a significant portion of MSW (including everything from televisions to 3D printers), requiring producers to take financial responsibility for the hard to recycle waste that they produce.[15] Under the Maine law, producers of products which become E-Waste are required to pay municipalities based on the costs associated with recycling and their market share of their products.[16] This system has proven effective, with the program facilitating the recycling of thirty-seven million pounds of E-Waste in the first six years of operation.[17] This saved Maine municipalities a total of $11 million over that same period of time, alleviating some of the pressure on municipal budgets and the local taxpayers.[18]

EPR has proven an effective means for reducing E-Waste going into landfills. Based on this success, it follows that EPR for plastic packaging would also be effective in reducing plastic waste. *A Stewardship Program for Packaging*, passed in Maine in 2021, established an EPR system similar to the existing program for E-Waste.[19] This new law will apply to all products "used for the containment, protection, delivery, presentation or distribution of a product."[20] These categories are not narrowed to plastic waste but instead are broadly inclusive. Packaging materials of all sorts comprises twenty-eight percent of all MSW, including much of the most difficult to recycle plastic waste.[21]

A Stewardship Program for Packaging creates a fee hierarchy, charging producers a varying amount depending on the volume, toxicity, and recyclability of the materials.[22] In this way, the new system accounts for environmental and public health needs, analogizing cost with adverse impacts, which more accurately internalizes the externalities of waste.[23] These cost increases will incentivize the use of less packaging, or at least less toxic packaging materials by businesses selling products in Maine.[24]

Other states are taking notice of this law's widespread support.[25] In 2021 and 2022 Oregon, California, and Colorado passed EPR for packaging waste, and fifteen additional states have also proposed similar legislation.[26] However, many of these EPR bills fall into common traps of poor legislative drafting, such as: copywriting errors, inconsistencies within the legislation, and conflict with existing law.[27] The most egregious failures are the bills' numerous exemptions and lack of attention to detail on the part of legislators.[28] These flaws are illustrated by the major exemption carved out for blueberry producers in the Illinois bill.[29] Directly copied from the Maine law, where blueberries are a major industry,[30] Illinois legislators failed to tailor the program to their state's specific needs,[31] allowing once significant exemptions to become meaningless loopholes and reducing public confidence in the program before it passes.[32] It is this kind of careless legislating that results in unsuccessful programs.[33]

Existing E-Waste EPR programs prove EPR as a successful means of simultaneously limiting production of hard-to-recycle waste and further funding the recycling of what is produced.[34] Application of this system is an effective step toward managing

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the massive problem of consumer waste. However, thoughtful legislation, tailored to the needs of individual states, is imperative for these programs to succeed.[35] Finally resolving the issue of plastic waste is critical, as are programs designed to do so. EPR is an effective method to solve the waste crisis and more states must implement well-drafted legislation inspired by *A Stewardship Program for Packaging* to effect change in our waste systems.[36]

Endnotes

1 Susan Strasser, Waste and Want: A Social History of Trash 69–109 (1999) (highlighting the pre-plastic role of peddlers in trading new and repaired goods to agrarian families in return for their waste goods, such as damaged pots and rags, which they would subsequently repair or repurpose and resell).

2 *Id*.; Marc Fawcett-Atkinson, *The insidious side effects of recycling plastic*, Canada's National Observer (Dec. 14, 2021), https://www.nationalobserver.com/2021/12/14/news/insidious-side-effects-recycling-plastic; Anthony Austin, *Article: Where Will All The Waste Go?: Utilizing Extended Producer Responsibility Framework Laws To Achieve Zero Waste*, 6 Golden Gate U. Env't. L.J. 221 (2013).

3 *See* Fawcett-Atkinson, *supra* note 2 (explaining that complex waste often takes the form of plastics, which based on their composition must be broken down differently; moreover, the level of expertise required to break down this waste and the toxins created during the process constitutes a significant barrier to their recycling).

4 *See* Fawcett-Atkinson, *supra* note 2; *see also* Austin, *supra* note 2.

5 Louis Dawson, *Steering Extended Producer Responsibility for Electric Vehicle Batteries*, 23 Env't L. Rev. 128 (2021); Hannah Elisha, *Addressing the E-Waste Crisis: The Need for Comprehensive Federal E-Waste Regulation Within the United States*, 14 Chap. L. Rev. 195 (2010); Fawcett-Atkinson, *supra* note 2; Austin, *supra* note 2; Strasser, *supra* note 1.

6 Winston Choi-Schagrin, *Maine Law Could Revive Recycling,* N.Y. Times (Jul. 23, 2021), https://www.nytimes.com/2021/07/21/climate/maine-recycling-law-EPR.html; *see also* Austin, *supra* note 2; Thomas Helbling, *Externalities: Prices Do Not Capture All Costs International Monetary Fund* (Feb. 24, 2020), https://www.imf.org/external/pubs/ft/fandd/basics/external.htm (defining an externality as "the indirect effects [which] have an impact on the consumption and production opportunities of others, but the price of the product does not take those [costs] into account").

7 *See* City of Portland Municipal Budget, July 1, 2009 – June 30, 2010 at 77 https://content.civicplus.com/api/assets/a423e042-64e6-4716-94a5-2c4c9293a7c8?cache=1800 (showing, in Portland, Maine in 2010 $6.7 million was appropriated toward MSW management).

8 *See* Choi-Schagrin, *supra* note 6; Natural Resource Council of Maine [hereinafter "NRCM"], *Extended Producer Responsibility (EPR) for Packaging*, https://www.nrcm.org/programs/sustainability/extended-producer-responsibility-packaging/ (last visited Oct. 18, 2022).

9 *See* Choi-Schagrin, *supra* note 6.

10 *See* Austin, *supra* note 2.

11 *Id*.

12 *Id*.; *See* NRCM, *supra* note 8.

13 Env't Prot. Agency, *Regulations, Initiatives and Research on Electronics Stewardship,* https://www.epa.gov/smm-electronics/regulations-initiatives-and-research-electronics-stewardship https://www.maine.gov/dep/waste/ewaste/comply.html (last visited Oct. 8, 2022) (E-Waste, short for electronic waste, is a category of products that end up in the MSW stream. It includes: "televisions, portable DVD players, game consoles, computer monitors, laptops, tablets, e-readers, 3D printers, desktop and portable printers, digital picture frames, and other visual display devices with screens of at least four inches, measured diagonally, and one or more circuit boards").

14 Electronic Waste, Me. Rev. Stat. Ann., tit. 38, § 1610 (2021); NRCM, *Product Stewardship: A Success for Maine*, https://www.nrcm.org/wp-content/uploads/2014/03/ewaste_case_study_sm.pdf (last visited Oct. 8, 2022).

15 *See* EPA, *supra* note 13.

16 Electronic Waste, Me. Rev. Stat. Ann., tit. 38, § 1610 (2021); Me. Dep't of Env't Prot., *Manufacturer Recycling Share Responsibilities in Maine's Extended Producer Responsibility Program for E-Waste Recycling* (2022) https://www.maine.gov/dep/waste/ewaste/documents/2022%20recycling%20shares%206%20for%20Feb%20billing%20.pdf (last visited 8 Oct. 2022).

17 *See* NRCM, *supra* note 14.

18 *Id*.

19 A Stewardship Program for Packaging, Me. Rev. Stat. Ann., tit. 38 § 2146 (2021).

20 *Id.* at (1)(I).

21 *See* Austin, *supra* note 2; Env't Prot. Agency, *Containers and Packaging: Product-Specific Data*, https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific (last visited Oct. 8, 2022).

22 *See* Austin, *supra* note 2; Me. Dep't of Env't Prot., *Extended Producer Responsibility Program for Packaging,* https://www.maine.gov/dep/waste/recycle/epr.html (last visited Oct. 18, 2022).

23 *Id*.; *See* Choi-Schagrin, *supra* note 6.

24 *See* Me. Dep't of Env't Prot., *supra* note 22.

25 Patrick Gleason, *2021 Saw Two States Enact A New Plastic Packaging Fee Program, A Proposal That Will Be Debated In More State Capitals In 2022*, Forbes (Dec. 31, 2021, 8:12 PM), https://www.forbes.com/sites/patrickgleason/2021/12/31/how-a-maine-centric-exemption-wound-up-in-illinois-legislation-that-would-further-inflate-food-prices/?sh=32a4706764b8.

26 Sustainable Packaging Coalition, *Guide to EPR Proposals,* https://epr.sustainablepackaging.org/policies (last visited 8 Oct. 2022).
Passed laws: S.B. 54, Reg. Sess. (Cal. 2022); H.B. 1355, 73rd Gen. Assemb., 2nd Sess. (Colo. 2022); S.B. 582 , 81st Leg. Assemb., Reg. Sess. (Ore. 2021).
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27 *See* Gleason, *supra* note 25. Arthur Rynearson, *Legislative Drafting Step-by-Step* 125 (2013).

28 *See* Gleason, *supra* note 25; Carole Excell, *127 Countries Now Regulate Plastic Bags. Why Aren't We Seeing Less Pollution?*, World Resources Institute (Mar. 11, 2019), https://www.wri.org/insights/127-countries-now-regulate-plastic-bags-why-arent-we-seeing-less-pollution (analyzing why, despite best intentions in banning plastic bags, there has been little to no success in seeing less of them due to poor draftsmanship).

29 *See* Gleason, *supra* note 25; H.B. 4258, 102nd Gen. Assemb. (Ill. 2022).

30 Margaret Lawrence, *Wild Blueberries—The Maine Event*, USDA Nat'l Inst. of Food and Agric. (July 14, 2022), https://www.nifa.usda.gov/about-nifa/blogs/wild-blueberries-maine-event (highlighting the significance of the blueberry industry in Maine).

31 Joe McFarland, *Illinois' Blueberry Hills*, Ill. Dep't of Nat. Res., https://www2.illinois.gov/dnr/OI/Pages/BAIllinois%E2%80%99BlueberryHills.aspx (illustrating how uncommon blueberries are in Illinois) (last visited Oct. 26, 2022).

32 *See* Gleason, *supra* note 25; H.B. 4258, 102nd Gen. Assemb. (Ill. 2022).

33 *See* Excell, *supra* note 28.

34 *See* NRCM, *supra* note 14.

35 *See* Excell, *supra* note 28. Megan Quinn, 2021 Could be Year for Packaging EPR, Nearly A Dozen State Bills in Play, WasteDive (Feb. 11, 2021), https://www.wastedive.com/news/2021-state-extended-producer-responsibility-recycling/594873/.

36 A Stewardship Program for Packaging, Me. Rev. Stat. Ann., tit. 38, § 2146 (2021).

Toxic Criminals: Prosecuting Individuals for Hazardous Waste Crimes Under the United States Resource Conservation and Recovery Act

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Abstract

The U.S. Resource Conservation and Recovery Act ("RCRA") contains criminal provisions which allow prosecutors to seek substantial penalties when individuals commit hazardous waste crimes involving significant harm or culpable conduct. However, our empirical understanding of enforcement outcomes is limited. We used content analysis of 2,728 criminal prosecutions derived from U.S. EPA criminal investigations from 1983 to 2021 and examined all prosecutions of individual defendants for RCRA violations. Our results show that 222 prosecutions were adjudicated, with over $72.9 million in monetary penalties, 755 years of probation, and 451 years of incarceration levied at sentencing. Seventeen percent of prosecutions centered on unlawful disposal of hazardous waste, sixteen percent unlawful storage, nine percent unlawful transport, and fifty-six percent a combination of these crimes. We conclude with recommendations to enhance criminal enforcement efforts via increased budgetary appropriations.

I. Introduction

Roy Hart owned North American Environmental, Inc a business that accepted hazardous waste in Clearfield, Utah.[1] Hart was ordered by The Environmental Protection Agency ("EPA") to not accept additional polychlorinated biphenyl ("PCBs") waste, but chose to ignore the order, eventually abandoning the facility and leaving behind a million pounds of PCB oil and drums of hazardous waste.[2] A federal judge found Hart in violation of the United States Resource Conservation and Recovery Act ("RCRA") for knowingly storing or disposing of hazardous waste without permit.[3] Hart plead guilty and the United States District Court sentenced him to six months of incarceration, thirty-six months of probation, and to pay over $1.3 million in restitution for cleanup.[4]

When individuals violate hazardous waste laws, environmental agencies generally take the approach of using administrative or civil measures to help regain compliance. However, in the case of criminal action against perpetrators, like Roy Hart, that involve significant harm or culpable conduct, for example, intentional or "knowing" violations of the law, criminal enforcement tools may be used to punish offenders and deter future offenses.[5] Hazardous waste crimes often cause significant harm to those living near chemical plants or other industrial facilities. Similarly, hazardous waste crimes are particularly heinous for workers especially when company officers knowingly fail to protect them from harm.[6] Congress inserted criminal provisions into RCRA in 1984 to send a clear deterrence message to environmental criminals, and such provisions are typically incredibly important for protecting people, animals, and the natural environment from harm. However, there is still little empirical knowledge of the success of prosecutions under RCRA for hazardous waste crimes over time.[7]

This Article seeks to investigate this knowledge gap through content analysis of 2,728 criminal investigations undertaken by the EPA from 1983 to 2021. This Article's analysis considers all criminal prosecutions for hazardous waste crimes charged under RCRA, and then further analyzes all cases where individuals were prosecuted for hazardous waste crimes. This approach allows us to examine broad trends in prosecutions and sentencing since federal processes for policing and prosecuting environmental crimes were established in the early 1980s, as well as to discuss large penalty cases that affect these trends and to organize prosecutions across general themes to illustrate patterns in prosecutions. This Article begins with an overview of RCRA and a discussion of the evolution of criminal enforcement tools for the environment. Next, this Article discusses compliance versus deterrence in the context of sanctioning environmental violations. Last, this Article provides an analysis of RCRA hazardous waste prosecutions and conclusions.

II. RCRA Overview

Public concerns over hazardous waste prompted the passage of RCRA in the 1970s alongside a number of new environmental statutes covering a wide variety of environmental issues, including the Clean Water Act ("CWA"), the Safe Drinking Water Act ("SDWA"), the Toxic Substances Control Act ("TSCA"), the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA"), and the Clean Air Act ("CAA").[8] RCRA empowered the EPA to develop "cradle-to-grave" regulations over entities that generate, store, treat, transport, or export hazardous waste.[9] Additionally, RCRA empowers the EPA to promulgate rules for managing solid waste throughout the country.[10] RCRA's greatest regulatory success was arguably the development of a national permitting system for the lifecycle of hazardous waste and provision for solid waste.[11] Despite these regulatory successes, some major RCRA concerns remain unaddressed, including (1) how EPA classifies hazardous and other wastes for regulation under RCRA and (2) the exemptions Congress added in 1980 that cover much of the extractive industry that remain in force.[12]

EPA's authority under RCRA is organized under Subchapter I–X, including: (I) rules and guidelines for interstate cooperation and various definitions; (II) the establishment of the Office of Solid Waste; (III) recordkeeping requirements and authority over the lifecycle of hazardous waste; (IV) the framework for managing nonhazardous waste; (V) the duties of the Secretary of Commerce; (VI) federal responsibilities; (VII) miscellaneous provisions; (VIII) provisions for research and development; (IX) the regulation of underground storage tanks; and (X) standards for tracking and managing medical waste.[13]

III. The Evolution of Environmental Crime Enforcement

By the 1970s, a global movement began affecting the way many countries, including the United States, saw environmental crime, in which many countries sought to provide additional tools to police, prosecute, and punish serious environmental crimes that went beyond civil remedies typically focused on regaining legal compliance with the law.[14] Earlier efforts, such as the Rivers and Harbors Act of 1899[15] and Lacy Act,[16] were among the first statutes to penalize environmental

violations;[17] but otherwise, the U.S. lacked environmental criminal law provisions.[18] Major change occurred in the early 1980s when Congress began adding criminal provisions to major environmental laws: RCRA in 1984, followed by the CWA in 1987, and then the CAA in 1990.[19] Around the same time, Congress granted the EPA authority to institutionalize environmental policing resources and the agency organized the Office of Enforcement 1982 that later evolved into the Office of Compliance Assurance.[20] In 1981, the EPA hired two criminal investigators.[21] After 1982, the EPA hired an additional twenty investigators. In 1988, the Medical Waste Tracking Act granted these investigators full law enforcement authority, and in 1989, the U.S. Attorney General authorized them to carry firearms in their official capacity.[22] Congress further enhanced resources for fighting environmental crimes in 1990, with the passage of the Pollution Prosecution Act, which expanded the total number of investigative staff to at least 200 individuals.[23] The EPA Criminal Investigation Division ("CID") currently oversees policing of federal environmental crimes in the United States.[24]

While the EPA is tasked with investigating and policing environmental crimes, it is not the only federal agencies tasked with environmental law enforcement. The Department of Justice ("DOJ") is responsible for prosecuting environmental offenders. DOJ added the Public Lands Division in 1909, as a specialized three-attorney unit focused on environmental crime prosecution, which evolved into the Environmental and Natural Resource Division ("ENRD").[25] In 1982, DOJ founded the Environmental Crimes Unit, which became the Environmental Crimes Section ("ECS") in 1987, a five-attorney unit enlisted to prosecute environmental crimes.[26] The ECS currently employs forty-three attorneys and a dozen support staff.[27] The process for policing environmental crimes is very collaborative, with EPA criminal investigators often working with local, state, and to build cases.[28] Investigations of potential environmental crimes may originate from civil inspectors and reports, regulatory filings, former employees of a company, or other sources.[29] When criminal investigators at both the state and federal level build a case, they pass along this information to federal prosecutors, who file a criminal investigation or convene a grand jury.[30]

IV. Sanctioning Hazardous Waste Crimes

When an individual transgresses hazardous waste laws, regulators typically seek to help the individual regain compliance with the law using administrative or civil enforcement tools, rather than applying criminal enforcement tools.[31] Utilizing administrative tools, the EPA or state agencies may issue individual notices of violation, orders of correction, and fines, or they may pursue a civil judicial remedy.[32] Civil remedies may include: issuing administrative orders of consent (where EPA reaches an agreement with a violator) or issuing a unilateral administrative order, either of which requires violators to pay to clean up pollution or to perform a series of actions to remedy pollution; temporary or injunctive relief; or environmental monitoring or mitigation plans.[33] EPA and DOJ can pursue a civil lawsuit and an individual can be found guilty in court and liable for damages.[34]

Criminal enforcement for the environment is one of many tools. While civil and administrative remedies focus on regaining compliance, criminal remedies center on punishment and deterrence.[35] Today, criminal provisions of RCRA provide for significant penalties for the following hazardous waste offenses: knowing endangerment; illegal export of hazardous waste; making false statements or omission of material information; transportation of hazardous waste without a manifest or to an unpermitted facility; the treatment, storage, or disposal of hazardous waste without a permit or in violation of a permit; knowing destruction, concealment, or alteration of records.[36] Of particular note is the crime of knowing endangerment, defined as the defendant knowing at the time of the crime in question that their actions placed another person in imminent danger of death or serious bodily injury.[37] Penalties for knowing endangerment are the most significant penalties under RCRA's criminal provisions.[38] Holding companies and their supervisors or corporate officers accountable for such actions was difficult before Congress amended RCRA in 1984.[39] These amendments triggered broader questions regarding what obligations companies and their supervisors have to abide by to safeguard workers and the general public from exposure to hazardous and other toxic materials and how these companies should combat intentional offenses under the law.[40]

The value of criminal enforcement for deterring hazardous waste crimes is still under debate.[41] By creating criminal provisions in environmental statutes, Congress has demonstrated position that environmental crimes are serious violations of law deserving of significant penalties, even incarceration, which sends a clear deterrent message for environmental criminals.[42] Despite a lack of enhanced funding over time from Congress, prosecutions have commenced and remained consistent over time, achieving significant penalty outcomes at sentencing.[43] Research shows that prosecutors are not afraid to seek significant penalties or pursue corporations and other well-resourced defendants in environmental crime prosecutions.[44] Furthermore, research demonstrates that aggregating factors are linked to both case selection and punishment severity in environmental crime prosecutions.[45] There are still few empirical studies of the prosecution of hazardous waste crimes under RCRA present in the scholarly literature, and we aim to fill this gap through an analysis of prosecutions and sentencing. This allows for a presentation of general themes for the prosecution of individuals for hazardous waste crimes since the institutionalization of the criminal enforcement process in the United States.[46]

V. Data and Method

All data for our analysis comes from the EPA's Summary of Criminal Prosecutions Database, which provides case summaries of all EPA-CID environmental crimes prosecutions that result in criminal prosecution.[47] After experimenting with numerous search strategies, we found the most accurate method to capture all of the cases was to search by fiscal year (FY). We gathered

a total of 2,728 criminal cases from the first adjudicated case in 1983 to the conclusion of data collection on April 30, 2022. Once we recorded all prosecutions, we selected cases prosecuted under RCRA and then further filtered for all cases where only individual defendants (but not companies or corporations) were named defendants in the prosecution. Once we selected for these characteristics, we had 222 adjudicated environmental crimes prosecutions during this period. We then collected the following data from each of the 222 case summaries: fiscal year identifier; narrative summary of the prosecution; charging statutes; whether a company was a named defendant in the case; state identifier where the crime took place; number of named defendants in the prosecution; docket number; presence of any contributing crimes, such as false statements, conspiracy, fraud, or otherwise; and then sentencing outcomes, including probation and incarceration in months; and all monetary penalties including fines, fees, assessments, community service payments, restitution, or otherwise levied at sentencing.

Our analytical strategy was to use content analysis to record, interpret, and code the data. Two individuals coded data independently of one another and undertook a test pilot for four weeks to better understand patterns in the data and identify common problems in data collection.[48] Once we were confident moving forward, the individuals commenced coding the data and we met to find consensus when discrepancies arose. Cases involving ambiguous data or complex charging and sentencing data were often to blame for differences in the data gathered by the coders. Our inter-coder reliability for the dataset as a whole was roughly ninety-five percent. [49]

VI. Results

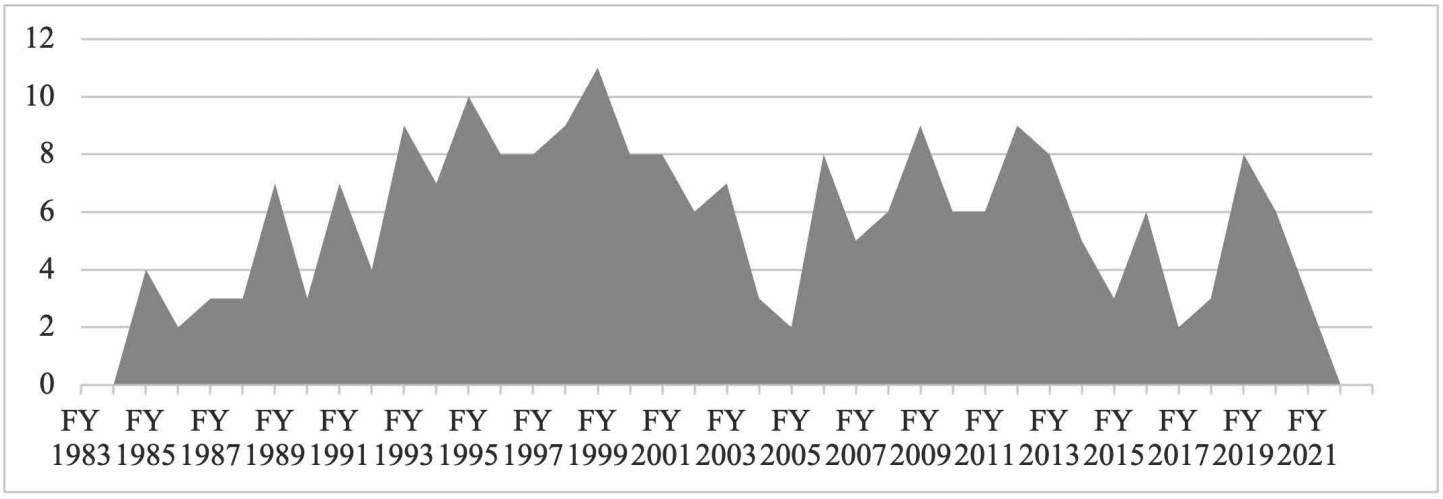
Our analysis is broken down into three parts. In the first section, we explore trends in prosecutions and sentencing. In the next section, we describe large penalty sentences for incarceration and monetary penalties that affect the overall totals described in the first section to give context for those figures. In the final section, we order prosecutions by the primary crime in the case to explore dominant themes in prosecutions since the criminal enforcement apparatus institutionalized in the early 1980s.

A. Trends in Prosecutions and Sentencing

In the first section of the analysis, we explore trends in prosecutions and sentencing of RCRA crimes committed by individual offenders.

In Figure 1, we display the number of prosecutions adjudicated by fiscal year, from 1983 to 2021. The first prosecutions were adjudicated in 1985 and across that decade, a total of nineteen prosecutions were adjudicated. Prosecutions increase significantly through the 1990s, when a total of seventy-six were adjudicated during the decade. Prosecutions dip a bit from 2000 to 2009, when sixty-two prosecutions were adjudicated; from 2010 to 2021, we see a slight increase to sixty-five prosecutions. The general trend appears to be a rising number of adjudicated prosecutions through the 1990s that dips in the early 2000s, but regains momentum over time, without reaching the former peak. We catalog a grand total of 222 prosecutions of individual defendants in our analysis.

Figure 1. Total RCRA Prosecutions of Individual Defendants Adjudicated by Fiscal Year.

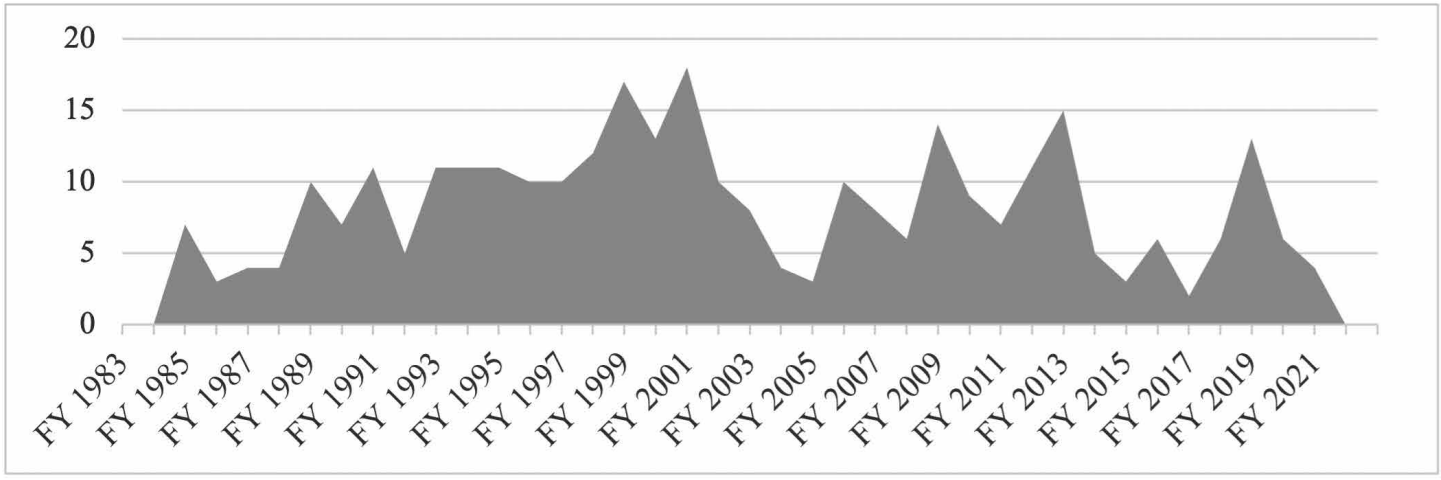


Source: *EPA Summary of Criminal Prosecutions Database*

In Figure 2, we display the total number of individual defendants prosecuted under RCRA from 1983 to 2021. Through the 1980s, a total of twenty-eight individual defendants were prosecuted. During the 1990s, a total of 105 defendants were prosecuted. From 2000 to 2009, the total number of defendants prosecuted dropped a bit to ninety-four, and from 2010 to 2021, the total number of individual defendants dropped again to eighty-seven. As with Figure 1, the general trend here is a rise in prosecutions through the 1990s, a drop in the early 2000s, with some momentum gained, but not to the high point reached in the 1990s. Our data shows a grand total of 314 defendants were prosecuted from 1983 to 2021.

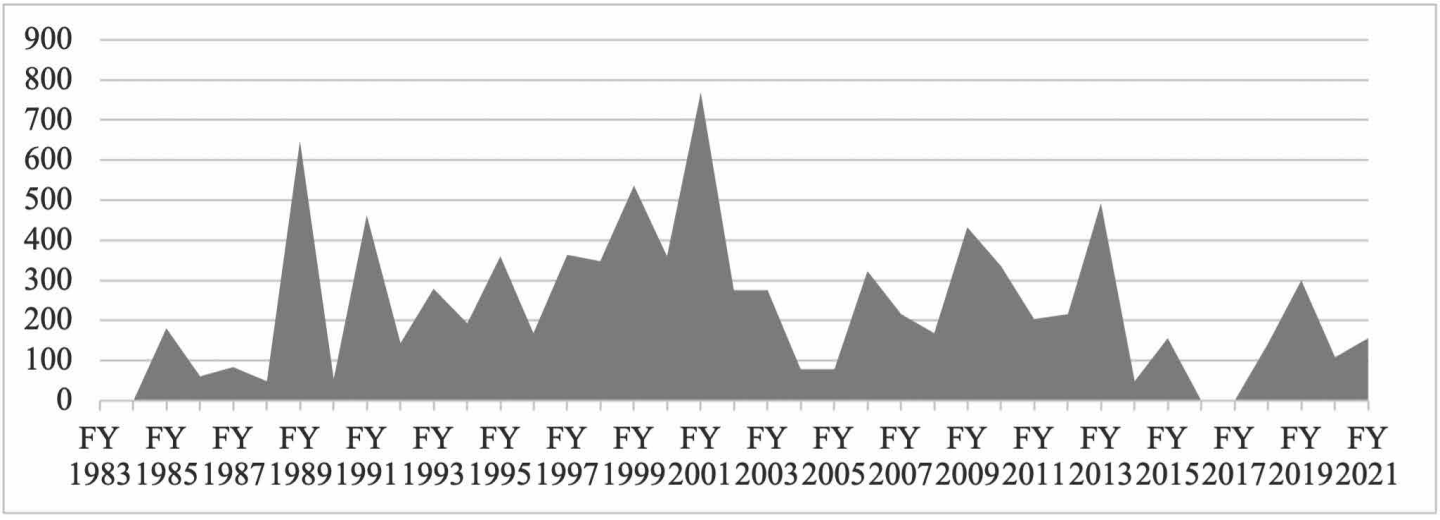
In Figure 3, we illustrate sentencing patterns, with an analysis of total probation time (in months) calculated at sentencing to individual defendants in RCRA prosecutions from1983 to 2021. Courts assessed a total of 1,020 months of probation to individual defendants in RCRA prosecutions in the 1980s. That number more than doubles in the 1990s, where courts assessed a total of 2,907 months of probation to individual defendants for hazardous waste crimes under RCRA. Total probation climbed slightly to 2,978 months from 2000 to 2009, and then decreased to 2,160 months from 2010 to 2021. As with the previous trends in Figures 1 and 2, by the early 2000s, total probation started to decrease. While this figure does not drop precipitously over the following two decades, it does not reach the high point of the 1990s. We catalog a grand total of 9,065 months of probation from 1983 to 2021.

Figure 2. Number of Individual Defendants in RCRA Prosecutions by Fiscal Year.



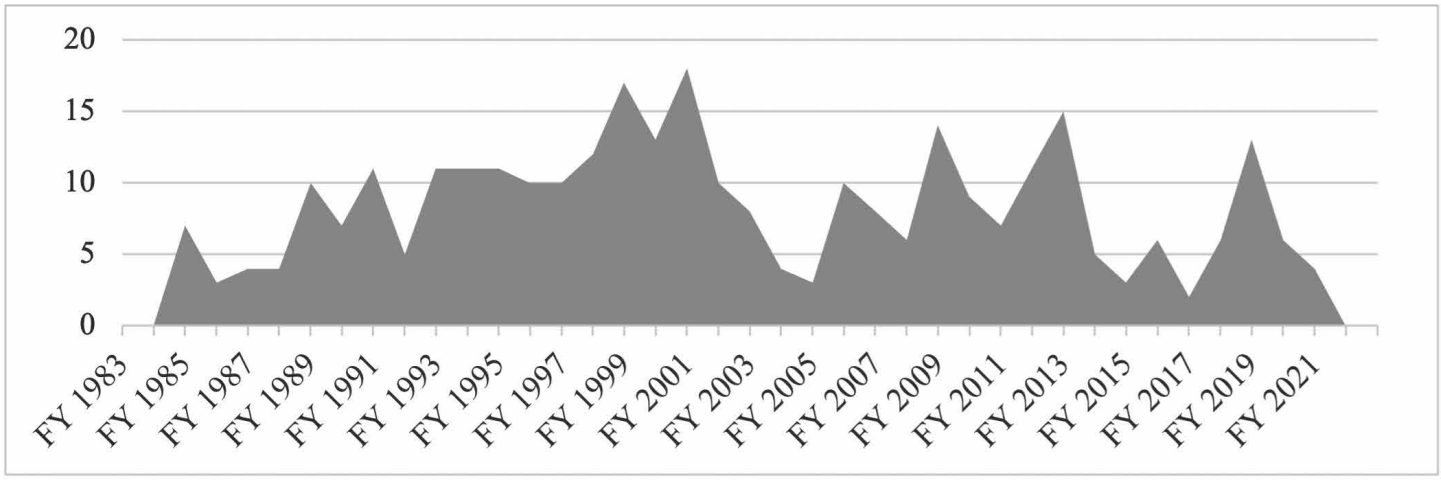
Source: *EPA Summary of Criminal Prosecutions Database*

Figure 3. Total Probation Time in Months Assessed to Individual Defendants in RCRA Prosecutions by Fiscal Year.



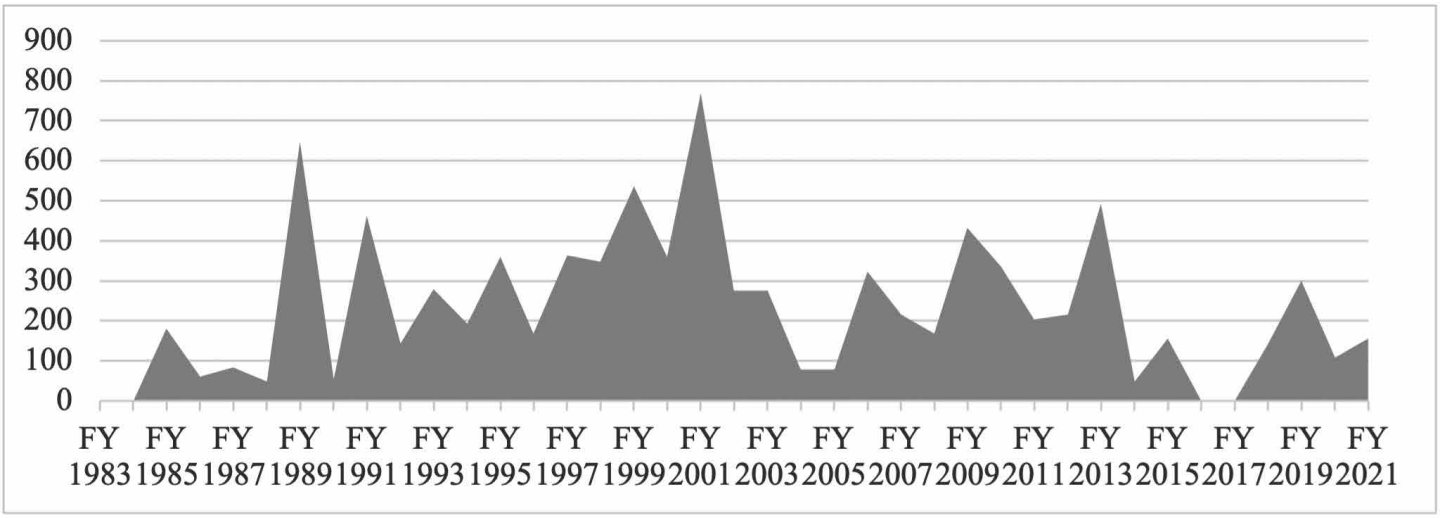
Source: *EPA Summary of Criminal Prosecutions Database*

Figure 4. Total Monetary Penalties Assessed to Individual Defendants in RCRA Prosecutions by Fiscal Year.



Source: *EPA Summary of Criminal Prosecutions Database*

Figure 5. Incarceration Assessed to Individual Defendants in RCRA Prosecutions by Fiscal Year.



Source: *EPA Summary of Criminal Prosecutions Database*

In Figure 4, we display total monetary penalties assessed to individual defendants in RCRA prosecutions from 1983 to 2021. During the 1980s, we find in excess of $836,000 in monetary penalties assessed to defendants at sentencing. In the 1990s, these numbers increased substantially to over $5.8 million in monetary penalties. From 2000 to 09, courts secured over $11 million in penalties at sentencing; from 2010 to 2021, the courts assessed over $54 million in monetary penalties at sentencing.[50] Courts assessed over $72.9 million in monetary penalties to individuals for RCRA crimes in our data from 1983 to 2021.

In Figure 5, we illustrate total incarceration penalties assessed at sentencing from RCRA crimes, 1983-2021. Incarceration at sentencing grew steadily throughout the 1980s, with a total of 843 months assessed at sentencing. In the 1990s, incarceration continued to grow significantly, with 1,336 months assessed at sentencing. From 2000 to2009, incarceration grew again, exceeding 2,244 months. Reversing previous trends in the analysis, from 2010 to 2021, incarceration shrank significantly to about 994 months during this period. We catalog a grand total of 5,417 months of incarceration assessed at sentencing in our data.

B. Large Penalty Outliers

We now move to the second section of our analysis, where we discuss significant outliers in incarceration and monetary penalties that affect the results of the figures in the previous section. In Table 1, we illustrate four cases organized by primary defendant, fiscal year, RCRA crime, and total incarceration assessed. These four cases alone total 1,946 months of incarceration or about thirty-six percent of all incarceration assessed at sentencing in our data.

The Eastern District of Missouri prosecuted M. Dorner along with eight co-defendants for the production of methamphetamines.[51] The defendants produced a significant amount of methamphetamines on an eighty-acre site and illegally disposed of hazardous chemicals from their drug lab. Prosecutors charged C. Arcangelo and nine co-defendants for illegal disposal of hazardous waste under RCRA, alongside a fifteen-count indictment under the Racketeer Influenced and Corrupt Organization Act (RICO) for a variety of other criminal activity.[52] C. Callihan was prosecuted alongside four other co-defendants for his role in a criminal conspiracy that defrauded the United States Army, involved the illegal transport of hazardous waste, and caused an explosion at a military basis and subsequent evacuation of a nearby town.[53] A. Elias was prosecuted for knowing endangerment and illegal disposal under the RCRA when he directed employees to clean a 25,000 gallon tank that contained sludge mixed with cyanide, which left one employee with permanent brain damage.[54]

In Table 2, we display the largest monetary penalties assessed to individual defendants in our analysis. The courts levied the largest penalty against C. Callihan and his co-defendants, of over $35 million in restitution.[55] K. Gravitt pled guilty to conspiracy for crimes related to the unlawful handling and storage of hazardous waste.[56] Prosecutors charged J. Cooke for illegally storing vinyl acetate in aboveground storage tanks in Houston, Texas.[57] Prosecutors charged T. Toy for illegally storing hazardous waste.[58] Prosecutors charged A. Hersh for abandoning thousands of barrels of hazardous waste at a former company site.[59] These five cases amount to over $51 million in monetary penalties, or about seventy-one percent of total monetary penalties, in our analysis. This shows that the broader trends in penalties are significantly impacted by a few outliers in the data.

C. Themes in Prosecutions

In the final section of the analysis, we place each case into a typology, to better organize the themes that define historical RCRA criminal prosecutions. Since RCRA crimes revolve around a set of crimes related to illegal storage, production, transport, or disposal of hazardous waste, the nature of the crimes is very similar. We list these in Table 3.

Environmental criminals in our analysis are either engaged in unlawful disposal, storage, or transport of hazardous waste,

Table 1. Largest Incarceration Sentences Assessed to Individual Defendants in RCRA Prosecutions.

Defendant	Fiscal Year	Crime	Total Incarceration (Months)
M. Dorner	2001	Unlawful Disposal	953
C. Arcangelo	1989	Unlawful Disposal	564
C. Callihan	2019	Unlawful Storage + Transport + Disposal	225
A. Elias	2003	Unlawful Disposal	204

Source: *EPA Summary of Criminal Prosecutions Database*

Table 2. Largest Monetary Penalties Assessed to Individual Defendants in RCRA Prosecutions.

Defendant	Fiscal Year	Crime	Total Monetary Penalties
C. Callihan	2019	Unlawful Storage + Transport + Disposal	35,397,347
K. Gravitt	2019	Unlawful Storage + Transport + Disposal	5,540,709
J.Cooke	2000	Unlawful Storage + Transport + Disposal	4,844,244
T. Toy	2020	Unlawful Storage	4,200,000
A.Hersh	2009	Unlawful Storage + Transport + Disposal	1,700,000

Source: *EPA Summary of Criminal Prosecutions Database*; *** Numbers are rounded**

Table 3. Dominant Themes that Emerge when Individuals are Prosecuted for RCRA Crimes.

Theme	Number of Prosecutions	Percentage of Total
Unlawful Storage + Transport + Disposal	125	56
Unlawful Disposal	37	17
Unlawful Storage	35	16
Unlawful Transport	21	9
False Statements	3	1
Unclear*	1	
Total	222	

*Percentages are rounded

or a combination of one or more of these crimes. In three cases, we felt that giving false statements was the central crime in the prosecution[60] In one prosecution, the central crime was unclear from the case summary.[61] By far the most common theme that emerged is that in 125 prosecutions, or roughly fifty-six percent of the data, defendants engaged in one or more crimes involving production, storage, or transport under RCRA's cradle-to grave regulations involving hazardous waste.[62] In thirty-seven cases, or seventeen percent of the prosecutions in the analysis, the case centered on the unlawful disposal of hazardous waste.[63] In thirty-five cases, or sixteen percent of the prosecutions in the analysis, the prosecution centered on unlawful storage of hazardous waste.[64] In twenty-one prosecutions in our analysis, or nine percent, the crime centered on unlawful transport of hazardous waste.[65]

VII. Discussion

Our findings provide insights into the criminal prosecution of hazardous waste crimes under RCRA in the United States. We find that prosecutors were able to pursue and obtain significant penalties against offenders. With 755 years of probation, 451 years of incarceration, and over $72.9 million in monetary penalties assessed at sentencing, hazardous waste prosecutions of individuals since 1983 have yielded substantive results. Yet to place this in context, while probation is more evenly distributed over time, prison time is affected by a few outliers. A few key prosecutions significantly affected trends in monetary penalties, and some of the stiffer penalties assessed came from hazardous waste crimes under RCRA that were committed in conjunction with drug crimes, fraud, or other criminal acts. This does not diminish the significance of these cases or the broader trends in the first part of our analysis, but speaks more to the nature of inter-agency cooperation between EPA-CID and other federal law enforcement agencies working in tandem with each other and prosecutors to collaborate and secure important victories at sentencing.[66]

A second finding of import is that prosecutors pursued crimes involving aggravating factors and significant harm and or culpable conduct. Additionally, we found quite a few prosecutions involved crimes of intent such as fraud, conspiracy, and false statements. In sixty-two cases, or roughly twenty-eight percent of the prosecutions in our data, the case involved one or more of these charges.[67]

A final key finding is that prosecutions do not follow a linear pattern over time. We find more of an uptick through the 1980s and a major evolution that occurs through the 1990s to the early 2000s. Yet by the early to mid-2000s, prosecutions begin to level out and decline a bit. This trend seems to hold through 2021.[68]

VIII. Recommendations

Criminal enforcement of hazardous waste crimes got off to a rocky start in the 1980s, but managed to gain traction and evolve over time. Political attacks by the Reagan Administration made it hard to institutionalize policing resources within EPA and prosecutorial resources in DOJ and to enhance criminal provisions within major environmental statutes. This evolution was aided by limited bipartisanship over enhancing punishments for a range of crimes, but it was also bolstered by the efforts of Congress to enhance and standardize punishments for federal crimes generally via the United States Sentencing Guidelines.[69]

By the end of the 1990s, added financial resources were no longer increasing in real budgetary terms under either Republican or Democratic Parties. Any remaining bipartisanship waned, alongside concerns from the business and legal community that prosecutors may have gone too far in prosecuting corporate officers and businesses for criminal offenses under RCRA and other statutes.[70] We see these trends within individuals convicted of hazardous waste crimes in our data, where prosecutions reach a high point in the Clinton Administration and begin a subsequent decline and leveling off and this may be attributed in great part to the organizational missions and strength of environmental law enforcement agencies to meet their objectives within an increasingly difficult political environment, colored by long-term budgetary underinvestment by both political parties.[71] Now for EPA in particular, the idea of working under a hostile political regime like the Trump Administration was nothing new: criminal enforcement came of age in a similar environment.[72] Criminal enforcement has operated without significant investment for some time and an infusion of budgetary support is warranted.[73]

One can see this underinvestment by adjusting EPA's budget for inflation, where the high point of investment in the EPA was in 1980 when its budget appropriation was $16 billion and staffing was at its peak in 1999 at 18,110 personnel.[74] ENRD's budget has also been stagnant for a number of years in real terms.[75] A related problem is increases to the mission of these agencies without enhancing funding in a significant manner for their core functions. While the Biden Administration has infused funding in the EPA and DOJ for enhanced enforcement in environmental justice communities. These investments are positive steps but should not compete with existing priorities for funding or staffing.[76]

Funding should be enhanced for environmental law enforcement. The first change is to set goals returning EPA staffing to its highest level of 18,110 in FY 1999. The second change is to bring back its budget to inflation-adjusted highs from FY 1980, when Congress was more generous and recognized the complexity and importance of the agency's mission. A third change is that funding can be used in target ways outside of enhancing EPA or ENRD's budget and one direction is to create funding for environmental enforcement associations and funds for state-level policing and prosecution of environmental crime.[77] The current FY 2022 budgetary appropriation is a step in the right direction, but still remains insufficient to the task.[78] Priorities will shift in Congress towards mitigating the effects of climate change as they grow and become more pernicious, and the costs of complying with laws targeted at reducing carbon emissions will likely increase, as will the incentives for environmental crime-criminal enforcement needs. Significant funding is needed now to help contain these problems.

Endnotes

[1] Associated Press, *Waste-Disposal Owner Assessed $1.35 Million*, Deseret News (June 23, 1997), https://www.deseret.com/1997/6/23/19319474/waste-disposal-owner-assessed-1-35-million.

[2] *Id.*; News Release, EPA, Utah Man Sentenced for Illegal [Polychlorinated Biphenyl] PCB Storage (June 27, 1997) https://www.epa.gov/archive/epapages/newsroom_archive/newsreleases/873f27dd61c5438985256 4cd00482176.html.

[3] Associated Press, *supra* note 1. *See* Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6901 (1976); *Resource Conservation and Recovery Act (RCRA) Overview*, EPA (June 29, 2022), https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview [hereinafter RCRA Overview]. *See generally* James S. Lynch, *The Criminal Provisions of RCRA: Should Strict Liability be Applied to its Permit Requirement*, 5 J. Civ. Rts. & Econ. Dev. 127 (1989) (providing an overview of RCRA criminal enforcement).

[4] *Summary of Criminal Prosecutions: Roy Hart*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=888 (last visited December 13, 2022) (discussing Hart's charges under the Toxic Substances Control Act ("TSCA"), 15 U.S.C. §§ 2601, 2614–15 (1976), for the illegal storage of PCBs). *See also Learn about Polychlorinated Biphenyls (PCBs)*, EPA, https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs (last updated June 5, 2022); *Summary of the Toxic Substances Control Act*, EPA, https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act (last updated Oct. 4, 2022).

[5] Memorandum from Earl E. Devaney, Dir., Off. of Crim. Enf't, on the Exercise of Investigative Discretion 3–4 (Jan. 12, 1994), https://www.epa.gov/sites/production/files/documents/exercise.pdf; *Types of and Approaches to RCRA Corrective Action Enforcement Actions*, EPA (Jan. 14, 2022), https://www.epa.gov/enforcement/types-and-approaches-rcra-corrective-action-enforcement-actions.

[6] *See generally* Barbara DiTata, *Proof of Knowledge Under RCRA and Use of the Responsible Corporate Officer Doctrine*, 7 Fordham Env't L. Rev. 795, 806–14 (1996) (discussing the corporate officer doctrine regarding worker safety stating that corporate officers and company managers have the responsibility to protect their staff, and not negligently nor knowingly engage in actions that violate hazardous waste laws that put their works at risk; this creates a burden of knowledge and obligation). For an important discussion of "knowing" violations in environmental criminal prosecutions, *see generally* Karen M Hansen, *"Knowing" Environmental Crimes*, 16 Wm. Mitchell L. Rev. 987. 988–90 (1997) (indicating a "'knowing' state of mind" is "conscious" of circumstance "but not necessarily [] purposeful . . . .").

[7] For empirical research on RCRA criminal enforcement, *see generally* Kathleen F. Brickey, *Charging Practices in Hazardous Waste Crime Prosecutions*, 62 Ohio State L.J. 1077 (2001); Joshua Ozymy & Melissa L. Jarrell, *The Toxic Offenders: Charging and Sentencing Patterns in Criminal Prosecutions*, 51 Tex. Env't L.J. 1, 1–26 (2021) [hereinafter Ozymy & Jarrell, *Toxic Offenders*]; Joshua Ozymy & Melissa L. Jarrell, *Does the Criminal Enforcement of Federal Environmental Law Reduce Crime? The Case of the Resource Conservation and Recovery Act*, 11 Env't & Earth L.J. 65, 65–88 (2021) [hereinafter. Ozymy & Jarrell, *Case of RCRA*].

[8] Clean Water Act, 33 U.S.C. § 1251 (1972); Safe Drinking Water Act, 42 U.S.C. § 300f (1974); TSCA, 15 U.S.C. § 2601; Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§ 136, 136a-1 (1972); Clean Air Act, 42 U.S.C. § 7401 (1970).

[9] RCRA Overview, *supra* note 3 (defining "cradle-to-grave" under RCRA to authorize the EPA to regulate the lifecycle of hazardous waste, including storage, treatment, transport, or export of hazardous waste).

[10] EPA, EPA530-R-14-002, RCRA's Critical Mission & the Path Forward 6 (2014). As a consequence of this broad authority, EPA oversees 6,600 facilities and 20,000 processing units across the United States under its RCRA authority and manages almost three billion tons of solid, industrial, and hazardous waste. *See* Thomas P. Eichler, *Hazardous Waste: The Status of RCRA in the Mid-Atlantic States*, 26 Env't: Sci. & Pol'y. for Sustainable dev., no.5, 1984, at 2–3 (July 8, 2010); *see also* Russell Phifer, *RCRA–The First 30 Years of Hazardous Waste Regulation*, 17 J. Chem. Health & Safety 4, 4–7 (2010) (discussing the history of hazardous waste regulation); *RCRA Correction Action Cleanup Enforcement*, EPA, https://www.epa.gov/enforcement/rcra-corrective-action-cleanup-enforcement (last updated July 25, 2022); RCRA Overview, *supra* note 3.

[11] Lynn L. Bergeso, *EPA Proposes Standardized RCRA Permits*, 33 Pollution Eng'g 24 (2001). What qualifies as hazardous waste under RCRA rules and regulations is important, for example, *see* Jim Nickovich, *EPA Broadens RCRA Definition of "Hazardous Waste" to Include Mixtures and Derivatives*, 31 Ecology L.Q. 781 (2004). RCRA focuses more on permitting, rather than reducing hazardous waste, *see* Casey Roberts, *D.C. Circuit Affirms EPA Trend Towards Reducing RCRA Requirements for Recycling of Hazardous Secondary Materials*, 32 Ecology L.Q. 749 (2005).

[12] In 1980, Congress passed the Hazardous and Solid Waste Disposal Act Amendments, Pub. L. No. 96-482, § 3001(b)(2)(A), (b)(3)(A) (codified as amended at 42 U.S.C. § 6921), exempting the extractive industry from much of RCRA's reach. *See also Special Wastes*, EPA (June 22, 2022), https://www.epa.gov/hw/special-wastes (discussing the history of "special wastes" and noting the amendments are also known as Bentsen and Bevill amendments for their authors); David L. Hippensteel, *The RCRA Exemption for Oil and Natural Gas Exploration and Production Wastes-What you may not Know*, 6 Env't Geosciences 106, 106–09 (1999); Lynn L. Bergeson, *Re-Re-Re Defining RCRA Solid Wastes*, 36 Eng'g 32 (2004).

[13] RCRA Overview, *supra* note 3; *see generally* RCRA, 42 U.S.C. § 6901 (1976).

[14] *See, e.g.*, Michael R. Pendleton, *Beyond the Threshold: The Criminalization of Logging*, 10 Soc'y & Nat. Res. 181, 181 (1997) (listing countries that demonstrate trend of establishing criminal sanctions for environmental crimes). The trend was also evident in states, including Ohio, for example, *see* Anthony J. Celebrezze, Jr., E. Dennis Muchnicki, J. Michael Marous & Mary Kay Jenkins-Smith, *Criminal Enforcement of State Environmental Laws: The Ohio Solution*, 14 Harv. Env't L. Rev. 217, 218, 225, 225 n.26 (1990), which discusses the importance of criminal enforcement of state environmental laws.

[15] Pub. L. No. 97-322, § 107(b), 30 Stat. 1151 (codified as amended at 33 U.S.C. § 403). Enacted in 1899, this Act prohibits the unpermitted obstruction, alteration, or other such actions that impede in the navigable waters of the United States.

[16] 16 U.S.C. § 3372 (1900). This Act bans the unpermitted, interstate trade in wildlife.

[17] The Refuse Act of 1899, 43 U.S.C. § 407, was the first federal statute to criminalize environmental violations. It was passed as a section of the Rivers and Harbors Act. *Historical Development of Environmental Criminal Law,* U. U.S. Dep't of Just, Env't & Nat. Res. Div. (May 13, 2015), https://www.justice.gov/enrd/about-division/historical-development-environmental-criminal-law [hereinafter *Historical Developments*].

[18] It took more than half a century for policymakers and the public to understand the scope of the environmental problems that they faced, and that lead to the development of the major environmental statutes passed by Congress in the 1970s. Christopher C. Dykes & Daniel G. Donahue, Environmental Law: A Legal Research Guide 3 (2018). In the 1970s and 1980s, it became apparent that individuals and companies would commit serious environmental crimes or engage in willful violations of environmental law, which warranted stiffer penalties and the institutionalization of a system to police and prosecute criminal offenses. *Id. See generally* Raymond W. Mushal, *Up From the Sewers: A Perspective on the Evolution of The Federal Environmental Crimes Program*, Utah L. Rev. 1103, 1109–14 (2009).

[19] Prior to the 1980s, the general approach taken by the federal government to environmental enforcement was centered on securing injunctive relief or civil sanctions. Congress realized in the 1970s that environmental law needed sharper teeth and move to enhance penalties in federal statutes, rather than focusing only on civil enforcement. The passage of the CAA in 1970 was an important milestone, because it contained criminal enforcement provisions, but still only misdemeanor penalties for environmental crimes. It was not until the 198-s that Congress recognized the need to add felony provisions in most environmental laws to punish chronic and serious offenses. FIFRA, for example, does not contain felony provisions and scholars have argued the criminal enforcement of pesticide crimes lacks deterrent value as a result. *See* Robert I. McMurry & Stephen D. Ramsey, *Environmental Crime: The Use of Criminal Sanctions in Enforcing Environmental Laws,* 19 Loy. L. A. L. Rev.

1133, 1136-1141 (1986); Richard J. Lazarus, *Assimilating Environmental Protection into Legal Rules and the Problem with Environmental Crime*, 27 Loy. L. A. L. Rev. 867, 867-870 (1994); Michael J. McClary & Jessica B. Goldstein, *FIFRA at 40: The Need for Felonies for Pesticide Crimes*, 47 Env't L. Rep. 10767 (2017); *Historical Developments*, *supra* note 17.

[20] *About the Office of Enforcement and Compliance Assurance (OECA)*, EPA, https://www.epa.gov/aboutepa/about-office-enforcement-and-compliance-assurance-oeca (last visited Nov. 17, 2022).

[21] Mushal, *supra* note 18, at 1109.

[22] *Id*. at 1109, 1111; Medical Waste Tracking Act of 1988, Pub. L. No. 100-582 (codified as amended at 18 U.S.C. § 3063(a)) (conferring law enforcement powers to the EPA); Memorandum from John Peter Suarez, EPA Assistant Administrator, to the Off. Crim. Enf't, Forensics, and Training 7 (Dec. 15, 2003), https://www.epa.gov/sites/production/files/documents/oceft-review03.pdf (containing the management review report); Lazarus, *supra* note 19, at 870–71.

[23] The Pollution Prosecution Act of 1990, Pub. L. No. 101-593 (codified at 42 U.S.C. § 4321 note), set a minimum of 200 investigative staff. Today the number of criminal investigators varies from 145 to around 200. *See* EPA America's Environmental Crime Fighters 2, https://www.epa.gov/sites/production/files/documents/oceftbrochure.pdf; Pub. Emps. for Env't Resp., EPA-CID Agent Count (2019), https://www.peer.org/wp-content/uploads/2019/11/11_21_19-Federal_Pollution_EPA_CID_Agent_Count.pdf.

[24] EPA Criminal Investigation Division ("CID") houses criminal investigators—also referred to as Special Agents—to investigate serious violations of environmental law, and functions as the law enforcement arm of EPA. *See Criminal Enforcement: Special Agents*, EPA (Aug. 26, 2022), https://www.epa.gov/enforcement/criminal-enforcement-special-agents.

[25] *History*, U.S. Dep't of Just. (May 18, 2021), https://www.justice.gov/enrd/history (describing the history of the Environmental and Natural Resources Division ("ENRD")); *Historical Developments*, *supra* note 17.

[26] Joseph B. Block, *Environmental Criminal Enforcement in the 1990s*, 3 Vill. Env't L.J. 33, 34 (1992); *Historical Developments*, *supra* note 17.

[27] *Environmental Crimes Section*, U.S. Dep't of Just., https://www.justice.gov/enrd/environmental-crimes-section (last updated July 2, 2021).

[28] *Id*. Mushal, *supra* note 18, at 1103–07; EPA, Off of Crim. Enf't, Forensics & Training, CEFT At a Glance 1 (2017), https://www.epa.gov/sites/default/files/2019-05/documents/oceft-at-a-glance-aug2017.pdf (stating that the seven signs of an environmental crime include: "Strong, offensive, or unusual chemical odors; Large numbers of dead birds, fish or other animals; Pipes or valves that bypass waste treatment systems; Tank trucks discharging into drains, manholes or surface waters; Oily slicks on bodies of water; Corroded, leaking waste containers; and Drums or containers dumped at odd hours in out-of-the-way places." According to EPA: "federal law enforcement agents - with full Federal authority to conduct investigations, carry firearms, make arrests, and execute search and arrest warrants, investigate environmental crimes, as do "specially trained investigators, chemists, engineers, technicians….and attorneys with environmental crimes expertise…EPA special agents talk and listen to suspects and witnesses, conduct surveillance, seize and analyze records, find people and information, work with forensics experts, prosecutors and other police involved, analyze evidence and data and testify in court).

[29] Joel A. Mintz, *Some Thoughts on the Interdisciplinary Aspects of Environmental Enforcement*, 36 Env't L. Rep. 10495, 10496 (2006).

[30] *Id*. at 10497; Michael Herz, *Structures of Environmental Criminal Enforcement*, 7 Fordham Env';t L.J. 679, 702 (1996).

[31] As an overarching enforcement philosophy, EPA seeks the regulated community to remain in compliance with the law. Most violations of environmental law do not lend themselves to criminal prosecution. In most cases violations are not significant or willful actions. For those that commit the latter, EPA may seek that criminal remedies are applied to violators, in order to punish offenders and deter future offenses. *See* Michael L. Rustad, Thomas H. Koenig, & Erica R. Ferreira, *Restorative Justice to Supplement Deterrence-Based Punishment: An Empirical Study and Theoretical Reconceptualization of the EPA's Power Plant Enforcement Initiative*, 65 Okla. L. Rev. 427 (2013); *Types of Approaches to RCRA Corrective Action Enforcement Actions*, EPA, https://www.epa.gov/enforcement/types-and-approaches-rcra-corrective-action-enforcement-actions (last visited Oct. 22, 2022) (identifying the types of remedies available following a violation of environmental law such as administrative, civil, and criminal enforcement tools); *see also Basic Information on Enforcement*, EPA, https://www.epa.gov/enforcement/basic-information-enforcement (last visited Oct. 22, 2022) (noting civil administrative actions, civil judicial actions, and criminal action options as appropriate responses to varying degrees of violations and highlighting that criminal actions are "usually reserved for the most serious violations, those that are willful, or knowingly committed.").

[32] *See generally* Memorandum from Lawrence E. Starfield, Acting Assistant Adm'r, Off. of Enf't and Compliance Assurance, on Using All Appropriate Injunctive Relief Tools in Civil Enforcement Settlements (Apr. 26, 2021), https://www.epa.gov/enforcement/using-all-appropriate-injunctive-relief-tools-civil-enforcement-settlements (outlining the full array of injunctive relief tools that could provide a civil remedy in enforcement settlements).

[33] Many of these tools are likely applied to companies or other organizations, rather than individuals, *see generally* Memorandum from Robert Van Heuvelen, Dir., Off. of Regul. Enf't, on Guidance on Use of Penalty Policies in Administrative Litigation (Dec. 15, 1995), https://www.epa.gov/enforcement/guidance-use-penalty-policies-administrative-litigation (generally outlining the guidance for EPA on "how penalty amounts should be pled and argued in administrative litigation and how penalty policies should be used in this process"); Memorandum from Susan Shinkman, Dir., Off. of Civ. Enf't, on Securing Mitigation as Injunctive Relief in Civil Enforcement Settlements (Nov. 14, 2012), https://www.epa.gov/enforcement/securing-mitigation-injunctive-relief-certain-civil-enforcement-settlements-2nd-edition (defining the civil remedy of mitigation as an injunctive relief "sought by the government to remedy, reduce or offset past—and in some cases ongoing—harm caused by alleged violations in a particular case."); *Supplemental Environmental Projects (SEPs)*, EPA, https://www.epa.gov/enforcement/supplemental-environmental-projects-seps (last visited Oct. 22, 2022) (summarizing the use of supplemental environmental projects as a factor of an enforcement agreement in response to an alleged environmental violation that has affected a community or the environment). Cleaning up hazardous waste found under "imminent hazard" provisions of RCRA means that responsible parties are subject to strict and severable liability for the costs of such cleanup. See Kenneth K. Kilbert, *Re-Exploring Contribution under RCRA's Imminent Hazards Provisions*, 87 Neb. L. Rev. 420, 422 (2008) (highlighting how RCRA is used to hold parties responsible for cleanup costs of a contaminated site, however, does not impose joint and several liability upon defendants).

[34] EPA is authorized under RCRA to issue orders that are unilateral or on consent (i.e., with agreement) and unilateral orders demand that an entity comply with permit regulations under RCRA. EPA can issue administrative orders under RCRA or under enforcement authority granted under CERCLA. If a facility fails to comply with an order, EPA can seek to have it enforced in federal court and seek penalties for non-compliance. EPA also maintains authority to perform cleanup, remediation, or other work under the order and seek reimbursement for costs. Civil judicial actions can be sought by EPA or a state agency against a person or company that has not complied with a permit under RCRA, an administrative order, caused the release of hazardous waste, or caused substantial and imminent endangerment to a person(s) or the environment. Civil judicial actions tend to follow administrative actions or for cases of serious non-compliance, whereas criminal judicial actions can be sought for knowing violations. RCRA authorizes citizens to bring enforcement actions against violators or against EPA in federal court. *Types and Approaches to RCRA Corrective Action Enforcement Actions*, EPA, https://www.epa.gov/enforcement/types-and-approaches-rcra-corrective-action-enforcement-actions#type (last visited Oct. 22, 2022) (conveying a brief summary of options for civil judicial actions may be brought against an alleged violator in state and federal court). *See generally* Timothy O. Schimpf, *Unleash RCRA! Letting Loose the Corrective Action Process of RCRA can Change the World*, 29 Wm. & Mary Env't L. & Pol'y Rev. 481, 484–85, 489–92 (2005) (outlining the details of RCRA corrective action procedure and the role of the EPA in holding alleged violators accountable under RCRA, including the authorization of citizen suits); Kundai Mufara, *RCRA Facts: An Overview of the Hazardous Waste Management Law*, ERA Env't Mgmt., https://www.era-environmental.com/blog/rcra-facts-an-overview-of-the-hazardous-waste-management-law (explaining how the EPA utilizes various measures to enforce RCRA, including but not limited to the issuing of permits); Memorandum from Thomas T. Traceski, Dir., RCRA/CERCLA Div., Off. of Crim. Enf't Guidance, on Comparison of the RCRA Corrective Action and CERCLA Remedial Action Processes (Feb. 15, 1994), https://www7.nau.edu/itep/main/HazSubMap/docs/RCRA-CERCLA/DOE_RCRAvsCERCLA%20Comparison.pdf (providing a comprehensive overview of the RCRA Corrective Action and CERCLA's remedial response programs). An individual may

enter into a consent decree to avoid pleading guilty and to regain compliance, *see* Memorandum from Lawrence E. Starfield, *supra* note 32 (outlining the array of injunctive relief tools possible to enforce environmental laws and regulations such as advanced monitoring, audits and independent third-party verification, electronic reporting, and increased transparency of compliance data). Many cases are settled by administrative orders or consent decrees. For recent examples, *see Civil Cases and Settlements*, EPA, https://cfpub.epa.gov/enforcement/cases/ (last visited Oct. 22, 2022) (listing the numerous currently available cases utilizing administrative orders or consent decrees).

[35] *See* Memorandum from Director Earl E. Devaney, *supra* note 5, at 2–3 (distinguishing how environmental criminal provisions target the most egregious violations and are "intended to prevent abuses of the permit system by those who obtain and then knowingly disregard them" while also punishing criminal wrongdoing). Enforcement staff are also more likely to pursue civil remedies for non-compliance, because the burden of proof is lower. Mushal, *supra* note 18, at 1105–06 (supporting the assertion that the lower burden of proof in civil court makes the judicial enforcement more likely to be civil rather than criminal). For research on state and local level environmental criminal enforcement, *see generally* Joshua C. Cochran, Michael J. Lynch, Elisa L. Toman & Ryan T. Shields, *Court Sentencing Patterns for Environmental Crimes: Is there a "Green" Gap in Punishment?*, 34 J. Quantitative Criminology 37, 37–39 (2018); Michael J. Lynch, *County-Level Environmental Crime Enforcement: A Case Study of Environmental/Green Crimes in Fulton County, Georgia, 1998-2014*, 40 Deviant Behav. 1090, 1090 (2018) (examining the kinds of crimes and responses to those crimes at the county level); Brickey, *supra* note 7, at 1084 (discussing how prosecutors have used RCRA as a criminal enforcement tool for hazardous waste violations).

[36] *See generally Criminal Provisions of the Resource Conservation and Recovery Act (RCRA)*, EPA, https://www.epa.gov/enforcement/criminal-provisions-resource-conservation-and-recovery-act-rcra (last visited Oct. 22, 2022) [hereinafter *Criminal Provisions of RCRA*].

[37] *See* Robert G. Schwartz, Jr, *Criminalizing Occupational Safety Violations: The Use of "Knowing Endangerment" Statutes to Punish Employers for Maintaining Toxic Working Conditions*, 14 Harv. Env'l L. Rev. 487, 493 (1990) (highlighting that the RCRA uses the "knowingly" standard to determine criminal culpability of alleged violators); Turner T. Smith Jr. & Roszell D. Hunter, *Hazardous Wastes: The Knowing Endangerment Offense*, 262 J. Env'l L. 264 (1990) (explaining the implications of the United States Code's "knowing" culpability standard within the RCRA); Hansen, *supra* note 6, at 989–90, 1017 (defining the "knowing" standard of criminal culpability and its implications under the RCRA).

[38] *Criminal Provisions of RCRA*, *supra* note 36 (establishing that penalties for knowing endangerment include up to 15 years of incarceration and fines up to $250,000 for an individual violator).

[39] *See generally* The Hazardous and Solid Waste Amendments of 1984, Pub. L. No. 98-616, 98 Stat. 3221 (1984); Robert T. McGovern, *United States v. Johnson & Towers, Inc.: Corporate Employee Criminal Liability under RCRA*, 2 Pace Env't L. Rev. 316 (1985); Andrew M. Fike, *A Mens Rea Analysis for the Criminal Provisions of the Resource Conservation and Recovery Act*, 6 Stan. Env't L.J. 174 (1986-1987); David T. Barton, *Corporate Officer Liability Under RCRA: Stringent but not Strict*, 1991 BYU L. Rev. 1547, 1548–52 (1991).

[40] This concern sparked a series of articles on the Responsible Corporate Officer Doctrine and related issues. McGovern, *supra* note 39, at 325–31 (discussing the Responsible Corporate Officer Doctrine); Fike, *supra* note 39, at 186, 195 (discussing the necessary level of intent for conviction under the RCRA); Barton, *supra* note 39, at 1548–52 (1991) (discussing the Responsible Corporate Officer Doctrine as a substitute for scienter); Ronald M. Broudy, *RCRA and the Responsible Corporate Officer Doctrine: Getting Tough on Corporate Offenders by Sidestepping the Mens Rea Requirements*, 80 KY. L.J. 1055, 1072 (1992) (discussing the circuit split regarding the application of the Responsible Corporate Officer Doctrine); Kevin A. Gaynor & Thomas R. Bartman, *Criminal Enforcement of Environmental Laws*, 10 Colo. J. Int'l Env't L. & Pol'y 39, 54–73 (1999) (discussing the Responsible Corporate Officer Doctrine and intent); Clare Condon, *7 RCRA Violations that Will Send you to Jail*, EHS Daily Advisor (Aug. 22. 2017), https://ehsdailyadvisor.blr.com/2012/08/7-rcra-violations-that-will-send-you-to-jail/; Sidney M. Wolf, *Finding an Environmental Felon Under the Corporate Veil: The Responsible Corporate Officer Doctrine and RCRA*, 9 J. of Land Use & Env't L. 1, 1–58 (1993) (discussing the application of the Responsible Corporate Officer Doctrine).

[41] For a discussion of RCRA criminal deterrence, *see* Maura M. Okamoto, *RCRA's Criminal Sanctions: A Deterrent Strong Enough to Compel Compliance*, 19 U. Haw. L. Rev. 425 (1997). For a general discussion of deterrence and the value environmental law enforcement, *see* Larry D. Wynne, *A Case for Criminal Enforcement of Federal Environmental Law*, 38 Naval L. Rev. 105 (1989). For a discussion of deterrence, *see* Carole M. Billiet & Sandra Rousseau, *How Real is the Threat of Imprisonment for Environmental Crime*, 37 Eur. J. L. and Econ. 183 (2014); Raymond Paternoster, *How Much Do We Really Know about Criminal Deterrence*, 100 J. Crim. L. & Criminology 765, 765–68 (2010). For a broad discussion of deterrence theory, *see Five Things About Deterrence*, Nat'l Inst. Just. (June 5, 2016), https://nij.ojp.gov/topics/articles/five-things-about-deterrence. Criticisms levied against criminal enforcement focus on the lack of significant penalties, and resources to police and prosecute criminals effectively, the degree that these efforts provide for sufficient deterrence. *See* Gary S. Becker, *Crime and Punishment: An Economic Approach*, in Essays in the Economics of Crime and Punishment 1,1 (1974); Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 Colum. L. Rev. 1193, 1193-1200 (1985) (discussing criticisms levied against criminal enforcement focus on the lack of significant penalties, and resources to police and prosecute criminals effectively, the degree that these efforts provide for sufficient deterrence); Michael J. Lynch et al., *The Weak Probability of Punishment for Environmental Offenses and Deterrence of Environmental Offenders: A Discussion Based on USEPA Criminal Cases, 1983-2013*, 37 Deviant Behav. 1095 (2016) (discussing criticisms levied against criminal enforcement focus on the lack of significant penalties, and resources to police and prosecute criminals effectively, the degree that these efforts provide for sufficient deterrence); Michael J. Lynch, *The Sentencing/Punishment of Federal Environmental/Green Offenders, 2000-2013*, 38 Deviant Behav. 991 (2017) (discussing criticisms levied against criminal enforcement focus on the lack of significant penalties, and resources to police and prosecute criminals effectively, the degree that these efforts provide for sufficient deterrence); Joshua Ozymy & Melissa L. Jarrell, *Sub-Optimal Deterrence and Criminal Sanctioning under The U.S. Clean Water Act*, 24 Univ. Denv. Water L. Rev. 159 (2021) (discussing criticisms levied against criminal enforcement focus on the lack of significant penalties, and resources to police and prosecute criminals effectively, the degree that these efforts provide for sufficient deterrence). For companies, low fines and penalties can create incentives to see compliance as the cost of doing business, *see* Daniel P. Fernandez, Alex Figares & H. Wayne Cecil, *Monetary Consequences of Environmental Regulations: Cost of Doing Business or Non-Deductible Penalties or Fines*, 9 Am. U. Bus. L. Rev. 123 (2020) (discussing companies, low fines and penalties can create incentives to see compliance as the cost of doing business).

[42] Mushal, *supra* note 18, at 1105, 1120.

[43] *See* Joshua Ozymy, Bryan Menard, & Melissa L. Jarrell, *Persistence or Partisanship: Exploring the Relationship between Presidential Administrations and Criminal Enforcement by the U.S. Environmental Protection Agency 1983-2019*, 81 Pub. Admin. Rev. 49, 53–62 (2021); *EPA's Budget and Spending*, EPA (May 16, 2022), https://www.epa.gov/planandbudget/budget.

[44] *See* David M. Uhlmann, *Prosecutorial Discretion and Environmental Crime*, 38 Harv. Env't. L. Rev. 159, 161–64 (2014) [hereinafter Uhlmann, *Environmental Crime*]; David M. Uhlmann, *Prosecutorial Discretion and Environmental Crime Redux: Charging Trends, Aggravating Factors, and Individual Outcome Data For 2005-2014*, 8 Mich. J. Env't. & Admin. L., 297, 299–303 (2019) [hereinafter Uhlmann, *Crime Redux*].

[45] *See* Joshua Ozymy and Melissa Jarrell, *Why do Regulatory Agencies Punish? The Impact of Political Principals, Agency Culture, and Transaction Costs in Predicting Environmental Criminal Prosecution Outcomes in the United States*, 33 Rev. of Pol'y. Rsch. 71, 71–73 (2016); Uhlmann, *Crime Redux, supra* note 44, at 301–02, 307–10 (showing that prosecutors tend to pursue cases involving aggregating factors, such as willful conduct, criminal behaviors, and crimes with serious consequences).

[46] For studies on RCRA criminal enforcement, *see generally* Brickey, *supra* note 7; Ozymy & Jarrell, *Toxic Offenders*, *supra* note 7; Ozymy &. Jarrell, *Case of RCRA*, *supra* note 7 (discussing prosecution of and enforcement for environmental crimes under the RCRA).

[47] *Summary of Criminal Prosecutions Database*, EPA (Oct. 26, 2022, 10:34 PM), https://www.epa.gov/enforcement/summary-criminal-prosecutions.

[48] Columbia School of Public Health, 2022, *Population Health Methods: Content Analysis*, Colum. Pub. Health (Jan. 10, 2023) https://www.publichealth.columbia.edu/research/population-health-methods/content-analysis.

[49] *See* Ole R. Holsti, Content Analysis for the Social Sciences and Humanities, 139 (1969) (indicating that he agreed upon items are divided by non-agreed items); Cliodhna O'Connor & Helena Joffe, *Intercoder Reliability in Qualitative Research: Debates and Practical Guidelines*, 19 Int'l J. Qualitative Methods 1 (2020).

[50] These numbers, as with incarceration totals in the next figure, are affected by outliers discussed in the next section.

[51] In these prosecutions, the heavy penalties assessed at sentencing are related to aggregating factors in addition to the environmental crimes that carry stiff punishments. These factors include drugs (M. Dorner), criminal conspiracy (C. Arcangelo), defrauding the United States (C. Callihan), and in the case of A. Elias, knowing endangerment. *Summary of Criminal Prosecutions: Mark A. Dorner*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=1871 (last visited November 14, 2022) (defendant was sentenced to 953 months of incarceration, probation, and charged various fees for illegal disposal of hazardous waste without a permit under RCRA, along with violations of the Drug Control Prevention Act).

[52] *Summary of Criminal Prosecutions: Charles Arcrangelo*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=358 (last visited November 14, 2022) (defendants sentenced 564 months of incarceration, fines, probation, and various assessments for engaging in a multi-year criminal conspiracy that included numerous violations of environmental and other criminal statutes).; *see also* Racketeer Influenced and Corrupt Organizations Act of 1970, P.L. 91-452.

[53] *Summary of Criminal Prosecutions: Charles F. Callihan*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=3108 (last visited November 14, 2022) (defendants were convicted for defrauding the United States by submitting false certificates to the U.S. Army, transporting hazardous wastes to unpermitted facilities, and improperly storing explosives).

[54] *Summary of Criminal Prosecutions: Alan Elias*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=847 (last visited November 14, 2022) (defendant was convicted on three counts of violating RCRA and making false statements and was sentenced to 204 months of incarceration, 36 months of probation, and to pay $364,750 in restitution to the U.S. EPA and "almost $6 million" in restitution to his victims) Because the case summary is unclear about the actual amount of restitution, we do not include it in total monetary penalty figures in our analysis.

[55] *See* Callihan supra note 53; *Summary of Criminal Prosecutions: David A. Smith*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=3108 (last visited November 14, 2022) (ordered to pay $34,798,761 restitution for participating in criminal conspiracy which included transporting hazardous wastes to unpermitted facilities).

[56] *Summary of Criminal Prosecutions: Kenneth Gravitt*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=3107 (last visited November 14, 2022) (defendant was sentenced to 36 months of incarceration and to pay over $5.5 million in restitution for crimes related to the handling of hazardous waste and one count of illegal storage of hazardous waste).

[57] *Summary of Criminal Prosecutions: John R. Cooke*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=1045 (last visited November 14, 2022) was sentenced to 36 months of incarceration, 60 months of supervised release, and over $4.8 million in restitution for illegally storing hazardous waste which led to a spillage).

[58] *Summary of Criminal Prosecutions: Thomas Toy*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=3194 (last visited November 14, 2022) (defendant was ordered to pay $4.2 million in restitution, serve 30 days incarceration, and three years of supervised release after he was convicted for illegally storing waste at Superior Barrel and Drum Company's facility without a permit which led to EPA conducting a removal of 1,800 drums of waste).

[59] *Summary of Criminal Prosecutions: Alan D. Hersh*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=1871 (last visited October 30, 2022). (defendant abandoned thousands of drums of hazardous waste on abandoned company facility which prompted a cleanup action by EPA).

[60] *See, Summary of Criminal Prosecutions: Kenneth R. Nugent*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=437 (last visited October 30, 2022) (defendant was prosecuted for submitting false documentation to EPA in permit applications); *Summary of Criminal prosecutions: Steven R. Ricci*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=1936 (last visited October 30, 2022) (defendant was prosecuted for making false statements on weekly hazardous waste inspection reports); *Summary of Criminal Prosecutions: Donna M. Howe*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=2401(last visited on October 30, 2022) (defendant was prosecuted for falsifying hazardous waste storage inspection logs).

[61] *Summary of Criminal Prosecutions: David L. Frisby*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=2850 (last visited October 30, 2022) (defendant was sentenced to 18 months in prison for conspiracy to commit wire fraud in a scheme in which he falsely claimed to be authorized by EPA to dispose of metal waste).

[62] *See, e.g., Summary of Criminal Prosecutions: Jay A. Johnson*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=900 (last visited October 30, 2022) (defendant was prosecuted for various crimes including illegally disposing of hazardous waste and making false statements to government agents about the disappearance of laboratory samples of radioactive and hazardous waste).

[63] *See, e.g., Summary of Criminal Prosecutions: Donald Rogers*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=603 (last visited October 30, 2022) (defendant pled guilty for illegal disposal of hazardous waste).

[64] *See, e.g., Summary of Criminal Prosecutions: Windsor W. Hodge*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=2270 (last visited October 30, 2022) (defendant was charged with one count of improper storage of hazardous waste).

[65] *See, e.g., Summary of Criminal Prosecutions: Michael J. Redding II*, EPA, https://cfpub.epa.gov/compliance/criminal_prosecution/index.cfm?action=3&prosecution_summary_id=2443 (last visited on October 30, 2022) (defendant was prosecuted for transporting drums containing hazardous waste without a manifest to a facility not permitted to accept hazardous waste).

[66] *See generally* Herz, *supra* note 30, at 693–717, (discussing the role of agency collaboration in enforcing environmental crimes); *see also* Joel A. Mintz, *supra* note 29, at 10923–10925 (explaining EPA's institutional enforcement relationships in President George W. Bush's tenure).

[67] *See* Uhlmann, *Environmental Crime*, *supra* note 44, at 193–205 (2014) (discussing the role of aggravating factors in environmental criminal prosecutions).

[68] *See* Joel A. Mintz, *Running on Fumes: The Development of New EPA Regulations in an Era of Scarcity*, 46 Env't L. Rep. 10510, 10518 (concluding that EPA civil enforcement cases have dropped significantly).

[69] *See* Mushal, *supra* note 18, at 1108–1110 (explaining that "amendments to the RCRA created a substantially stronger and more comprehensive felony enforcement" scheme).

[70] Criminal enforcement found itself located within the broader movement to be tough on crime and enhance sentencing for a range of crimes during the War on Drugs in the 1980s. As prosecutors applied statues to particular situations and criminal enforcement agents learned to build more complex cases against a range of companies and individuals, many Republicans in Congress and the White house began to lose faith in criminal enforcement to a degree and felt it had become too punitive. *See generally*, Theodora Galacatos, *The United States Department of Justice Environmental Crimes Section: A Case Study of Inter- and Intrabranch Conflict over Congressional Oversight and the Exercise of Prosecutorial Discretion*, 64 Fordham L. Rev. 587, 590 (1995); Judson W. Starr, *Turbulent Times at Justice and EPA: The Origins of Environmental Criminal Prosecutions and the Work that Remains*, 59 Geo. Wash. L. Rev. 900, 900–02 (1990); Timothy E. Shanley, *Applying a Strict Limitations Period to RCRA Enforcement: A Toxic Concept with Hazardous Results*, 10 Pace Env't. L. Rev. 275 (1992); Richard J. Lazarus, *supra* note 19, at 867–70.

[71] Enforcement was still productive and received support during the George W. Bush Administration, but these budgetary and staffing resources became strained and redirected to the War on Terror. *See generally* David M.

Uhlmann, Strange Bedfellows, 25 Env't L.F., at 40–44 (2008); Mushal, *supra* note 18, at 1107; Joel A. Mintz, *Neither the Best of Times nor the Worst of Times: EPA Enforcement during the Clinton Administration*, 35 Env't. L. Rep. News & Analysis 10390 (2005).

[72] Cally Carswell, *How Reagan's EPA Chief Paved the Way for Trump's Assault on the Agency*, The New Republic (Mar. 21, 2017), https://newrepublic.com/article/141471/reagans-epa-chief-paved-way-trumps-assault-agency.

[73] Joel A. Mintz, *supra* note 68, at 10510. A major drop occurred under Trump, when 700 EPA employees left the agency and were not replaced, dropping the number to 14,172 until the most recent budgetary appropriation. *See generally 700+ Employees have Left the EPA Under Trump: Loss of Scientists, Staffers Undermines Agency's Purpose*, Pub. Emps. for Resp. (Dec. 28, 2017).

[74] *EPA's Budget and Spending*, *supra* note 43; *see also U.S. Inflation Calculator*, https://www.usinflationcalculator.com/.

[75] *See generally Budget and Performance*, U.S. Dep't of Just., https://www.justice.gov/doj/budget-and-performance (providing annual budget summary for ENRD); *Justice Management Division Archive*, U.S. Dep't of Just. Archives, https://www.justice.gov/archives/jmd/justice-management-division-archive (last visited Dec. 11, 2022). (hosting a searchable archive of budget summaries back to 2005).

[76] *See generally* News Release, EPA, *Environmental Justice in Enforcement and Compliance Assurance* (Nov. 28, 2022), https://www.epa.gov/enforcement/environmental-justice-enforcement-and-compliance-assurance; *see also New Enforcement Strategy Advances President Biden's Environmental Justice Agenda*, EPA (May 5, 2022) https://www.epa.gov/newsreleases/new-enforcement-strategy-advances-president-bidens-environmental-justice-agenda.

[77] Mushal, *supra* note 18, at 1113–16.

[78] The FY 2022 enacted budget was for $9.5 billion in funding and 14,581 staff for EPA and $133 million for ENRD, neither of which, when adjusted for inflation, is historically significant. *See generally* News Release, EPA, *Statement by Administrator Regan on the President's FY 2022 Budget* (June 2, 2021) https://www.epa.gov/newsreleases/statement-administrator-regan-presidents-fy-2022-budget.

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[27] Small Business Liability Relief and Brownfields Revitalization Act § 102(a)–(b); CERLA § 107, 42 U.S.C. § 9607.
[28] Robert D. Fox & Paul McIntyre, *A Summary and Analysis of the Federal Small Business Liability Relief and Brownfields Revitalization Act*, 21 Temp. Env't L. & Tech. J. 19, 20 (2002) (explaining the liability defenses of the *Federal Small Business Liability Relief and Brownfields Revitalization Act* and their consequences).
[29] *See*, Small Business Liability Relief and Brownfields Revitalization Act, 42 U.S.C. § 102 (a)(o), (a)(p) (2002).
[30] *Id*. § 102(a)(o)(1)(A).
[31] *Id*. § 102(a)(o)(1)(B).
[32] Fox, *supra* note 28, at 21 (citing the Small Business Liability Relief and Brownfields Revitalization Act 42 U.S.C. § 102(a)(o)(2)(i)).
[33] Small Business Liability Relief and Brownfields Revitalization Act, 42 U.S.C. § 102 (o)(4) (2002).
[34] *Id*. § 102(a)(p)(1)
[35] *See*, *Id.* § 102(a)(p)(1)(A).
[36] *Id*. § 102(a)(p)(4).
[37] *Id*. § 102(a)(p)(1)(A).
[38] *Id*. § 102(a)(p)(1)(B).
[39] Fox, *supra* note 28, at 21 (citing Small Business Liability Relief and Brownfields Revitalization Act, 42 U.S.C. § 102(a)(p)(1)(C) (2002)).
[40] *Id*.
[41] Small Business Liability Relief and Brownfields Revitalization Act, 42 U.S.C. § 102 (a)(p) (2) (2002).
[42] *See id.* § 221, 222.
[43] *Id*. § 221(q)(1)(A).
[44] Fox, *supra* note 28, at 23.
[45] Small Business Liability Relief and Brownfields Revitalization Act § 221(q)(1)(A).
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[47] *Resource Conservation and Recovery Act (RCRA) Laws and Regulations*, EPA (Nov. 15, 2022), https://www.epa.gov/rcra.
[48] *Resource Conservation and Recovery Act (RCRA) Overview*, EPA (June 29, 2022), https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview#how%20does%20rcra%20work.
[49] EPA, RCRA Enters Brownfield Arena as Major Player 2 (1999), https://archive.epa.gov/epawaste/hazard/web/pdf/news1199.pdf.
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[51] *Id*. at 2–3.
[52] *Id*. at 3.
[53] *Id*.
[54] *Id*.
[55] *Id*. at 2–3.
[56] EPA, *supra* note 49, at 3. (citing to Hazardous Remediation Waste Management Requirements ("HWIR-Media") Rule, 63 Fed. Reg. 65874 (Nov. 30, 1998) [hereinafter Post-Closure Rule]).
[57] *Id*. (citing to Post-Closure Rule, 63 Fed. Reg. 56710 (Oct. 22, 1998)).
[58] *Id*.
[59] James T. O'Reily, *Steps in a Brownfields Project*, 1 Superfund & Brownfields Cleanup § 2:6 (2021).
[60] *Id*.
[61] Institutional Controls ("ICs") are "various administrative and legal tools to help minimize the potential for exposure to residual contamination and to protect physical cleanup measures at contaminated sites. ICs work by limiting land or resource use or by providing information that helps modify or guide human behavior at a site." O'Reily, *supra* note 59, at n.39 (citing EPA, Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites (2012)).
[62] O'Reily, *supra* note 59, § 2:6.
[63] Kevin Haninger et. al., *The Value of Brownfield Remediation*, 24 (Nat'l Bureau of Econ. Rsch., Working Paper No.20296, July 2014). (citing Evans Paull, *The Environmental and Economic Impacts of Brownfields Redevelopment*, Ne. Midwest Inst. (2008), https://www.nemw.org/wp-content/uploads/2015/06/2008-Environ-Econ-Impacts-Brownfield-Redev.pdf).
[64] Greater Ohio Policy Center, *Redeveloping Brownfields: Increasing Opportunities for Job Growth and Econ. Dev.*, https://www.greaterohio.org/redeveloping-brownfields (last visited Nov. 22, 2022).
[65] Vera, *supra* note 13, at 815–16.
[66] Scott Sherman, *Government Tax and Financial Incentives in Brownfields Redevelopment: Inside the Developer's Pro* Forma, 11 N.Y.U. L.J. 317, 333 (2003).
[67] Jill J. McCluskey & Gordon C. Rausser, Stigmatized Asset Value: Is it Temporary or Long-Term, 85 Rev. Econ. and Stat. 276, 285 (Rev. Econ. & Stat., 2003) (describing that in the years directly following cleanup, properties within a two-mile radius of the previously contaminated land sold at significantly lower prices than properties located farther away).
[68] EPA, Off. Brownfield & Land Dev., *supra* note 18, at 7.
[69] Joseph Koncelik, *Rethinking Brownfield Redevelopment in Ohio*, Ohio Env't L. Blog (May 2, 2016), https://www.ohio-environmentallawblog.com/2016/05/brownfields-transactions/rethinking-brownfield-redevelopment-in-ohio-part-3-of-4/.
[70] EPA, Off. Brownfield & Land Dev., *supra* note 18, at 2.
[71] Vera, *supra* note 13, at 815–16.
[72] Bartsch, *supra* note 7, at 16 (detailing examples of federal loans included in the EPA brownfield grant programs: (1) brownfield assessment grants, (2) brownfield job training and redevelopment grants, (3) brownfield cleanup grants, and (4) brownfield cleanup revolving loan fund grants).
[73] Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107–118, 115 Stat. 2356 (2002) (codified as amended at 42 U.S.C. §§ 9 601, 9604, 9605, 9607, 9622, 9628); *see also* EPA, A Guide To Federal Tax Incentives for Brownfields redevelopment 2–3 (2011), https://www.epa.gov/sites/production/files/2014-08/documents/tax_guide.pdf; *see also* Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348 (2018).
[74] EPA, *supra* note 73, at 2–3.
[75] Small Business Liability Relief and Brownfields Revitalization Act, §§ 9601, 9604, 9605, 9607, 9622, 9628; EPA, *supra* note 73, at 2–3.
[76] Small Business Liability Relief and Brownfields Revitalization Act § 102(b)(7).
[77] *Id*.
[78] *Id*. § 102(b).
[79] *Id*. § 102(b)(7)(B).
[80] Fox, *supra* note 28, at 22 (citing Brownfields Revitalization and Environmental Restoration Act § 102(b)(7)).
[81] Brownfields Revitalization and Environmental Restoration Act § 201 *et seq.*
[82] *Id*. § 211.
[83] *Id*. § 211(b).
[84] *Id*. § 211(b)(k)(1)(A)–(C), (F).
[85] *Id*. § 211(b)(k)(4)(A)(i)(I).
[86] *Id*. § 211(b)(k)(5)(C)(i)–(x).
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[88] *Id*.
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[90] Consolidated Appropriations Act, 2018, Division N—BUILD Act § 9(3), 132 Stat. at 1056 (codified as amended at 42 U.S.C. § 9604(k)(4) (2018). (creating the multipurpose brownfield grants).
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[92] *Id*.
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[94] Bartsch, *supra* note 7, at 16.
[95] Ind. Fin. Auth., *Financial Assistance*, https://www.in.gov/ifa/brownfields/financial-assistance/#taxincentives%20 (last visited Nov. 22, 2022).
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[100] *Id.* at 1–2 (explaining that the federal definition is "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.").
[101] *Id*.
[102] N.Y. Dep't of Tax'n and Fin., Pub. 300, New York State Tax Credits Available for Remediated Brownfields 6 (2010), https://www.tax.ny.gov/pdf/publications/multi/pub300.pdf.
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[106] *Ohio Brownfield Inventory Database*, Ohio Env't Prot. Agency, http://epawwwextp01.epa.ohio.gov:8080/ords/epaxp/f?p=109:1:0 (last updated Aug. 3, 2022).
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[108] Joseph Koncelik, *Brownfield Redevelopment and Ohio's Legacy Cities*, Ohio Env't L. Blog (Jan. 26, 2020), https://www.ohioenvironmentallawblog.com/2020/01/brownfields-transactions/brownfield-redevelopment-and-ohios-legacy-cities/.
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[110] EPA, *National Priorities List (NPL) Sites-By State*, https://www.epa.gov/superfund/national-priorities-list-npl-sites-state (last visited Nov. 22, 2022).
[111] Ohio Env't Prot. Agency, Voluntary Action Program 1 (2019), https://epa.ohio.gov/static/Portals/30/vap/docs/Fact%20Sheet.pdf.
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[116] *Id*.
[117] *Id*.
[118] *Id.* (describing the process for the Phase II assessment).
[119] *Id*. at 2 (explaining the volunteer process for obtaining a covenant not to sue).
[120] *Id*.
[121] *Id*. (noting that the bill protects purchasers by providing them with an affirmative defense).
[122] *Governor DeWine Announces 112 Brownfield Remediation Projects Throughout Ohio,* Mike DeWine: Governor of Ohio (June 17,2022), https://governor.ohio.gov/media/news-and-media/governor-dewine-announces-112-brownfield-remediation-projects-throughout-ohio-06172022.
[123] Aaron Clapper, *Governor DeWine Signs HB168; New Law Takes Effect September 14*, Greater Ohio Pol'y Ctr. (June 18, 2020), https://www.greaterohio.org/blog/2020/6/18/governor-dewine-signs-hb168-new-law-takes-effect-september-14 (explaining the next steps in implementing key provisions in the bill).
[124] Heather A. Richardson et al., *New Ohio Law Provides Legal Protections to Brownfield Developers*, Lexology (June 29, 2020), https://www.lexology.com/library/detail.aspx?g=bb1e6069-3e5e-4a50-98cf-7e7d780ca310 (comparing affirmative defenses for otherwise eligible developers with those at the federal and state levels).
[125] 42 U.S.C. § 9601(40) (defining "bona fide prospective purchaser" as "(i) a person who—(I) acquires ownership of the facility after January 11, 2002 (II) establishes by a preponderance of the evidence each of the criteria described in clauses (i) through (viii) of subparagraph (b); and (ii) a person—(I) who acquires a leasehold interest in the facility after January 11, 2002; (II) who establishes by a preponderance of the evidence that the leasehold interest is not designed to avoid liability under this chapter by any person; and (III) with respect to whom any of the following conditions apply: (aa) the owner of the facility that is subject to the leasehold interest is a person described in clause (i),(bb)(AA) the owner of the facility that is subject to the leasehold interest was a person described in clause (i) at the time the leasehold interest was acquired, but can no longer establish by a preponderance of the evidence each of the criteria described in clauses (i) through (viii) of subparagraph (B) due to circumstances unrelated to any action of the person who holds the leasehold interest; and (BB) the person who holds the leasehold interest establishes by a preponderance of the evidence each of the criteria described in clauses (i), (iii), (iv), (v), (vi), (vii), and (viii) of subparagraph (B), (cc) the person who holds the leasehold interest establishes by a preponderance of the evidence each of the criteria described in clauses (i) through (viii) of subparagraph (B).").
[126] Richardson, *supra* note 124 (acknowledging key limitations of House Bill 168).
[127] 42 U.S.C. § 9601(40).
[128] *See* Richardson, *supra* note 124 (explaining when the affirmative defense may be asserted).
[129] *Id*.
[130] *Id.* (examining the federal affirmative defense in Ohio).
[131] *Id.* (acknowledging that developers seeking a CNS from the state of Ohio still have the option of going through the state's voluntary action program).
[132] *See* Ohio Env't Prot. Agency, *supra* note 111.
[133] *#GOPCThread: Taking a Look at House Bill 168 and Brownfield Redevelopment in Ohio*, Greater Ohio Pol'y Ctr. (June 19, 2020), https://www.greaterohio.org/blog/2020/6/18/gopcthread-taking-a-look-at-house-bill-168-and-brownfield-redevelopment-in-ohio.
[134] *Id*.
[135] *Id*.
[136] *See generally* H.R. 168, 134th Gen. Assemb., Reg. Sess. (Ohio 2021).
[137] *See* Clapper, *supra* note 116; *see also New Opportunities for Ohio Brownfield and Site Demolition & Redevelopment*, Vorys (July 26, 2021), https://www.vorys.com/publications-2969.html.
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[139] *Governor DeWine Launches Program to Help Communities Clean Up Hazardous Brownfield Sites,* Mike DeWine: Governor of Ohio (Dec. 14, 2021), https://governor.ohio.gov/media/news-and-media/governor-dewine-launches-program-to-help-communities-clean-up-hazardous-brownfield-sites-12142021.
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[141] Camryn Justice, *Ohio Lawmakers Pass State Budget Bill Including School Funding Reform, Tax Cuts,* News 5 Cleveland (June 28, 2021, 11:17 PM), https://www.news5cleveland.com/news/state/ohio-lawmakers-pass-state-budget-bill-including-school-funding-reform-tax-cuts.
[142] H.R. 110, 134th Gen. Assemb., Reg. Sess. § 122.6511(b)–(c) (Ohio 2021).
[143] *Id*. § 122.6511(c)(2).
[144] *Id*.
[145] Justice, *supra* note 134.
[146] *Brownfield Remediation Program*, Ohio Dep't of Dev., https://development.ohio.gov/community/redevelopment/brownfield-remediation-program. (last visited Feb. 25, 2022).
[147] H.R. 110, 134th Gen. Assemb., Reg. Sess. § 122.6511(c)(3) (Ohio 2021).
[148] Mike DeWine: Governor of Ohio, *supra* note 132.
[149] *Id*.
[150] *See* Ohio Dep't of Dev., *supra* note 138 (announcing that Round One applicants received the first awards in April and the second awards in June).
[151] H.R. 110, 134th Gen. Assemb., Reg. Sess. § 259.10 (Ohio 2021).
[152] Vorys, *supra* note 137.
[153] *Id*.
[154] *Id*.
[155] *See* discussion *infra* Sections IV.B.2, V.B., V.C
[156] *See* discussion *infra* Section IV.B.2; *Financial Assistance*, Ind. Fin. Auth., https://www.in.gov/ifa/brownfields/financial-assistance/#taxincentives%20[https://perma.cc/Q4SW-GUBY] (last visited Nov. 14, 2021).
[157] *See* discussion *infra* Section IV.B.2; N.Y. Dep't of Tax'n and Fin., *supra* not 102, at 6; Vera, *supra* note 13, at 830–31 (citing EPA, EPA F-560-17-212, State Brownfields and Voluntary Response Programs 51 (2017)).
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[163] *Id.*
[164] *Lucas County, OH*, Data USA, https://datausa.io/profile/geo/lucas-county-oh#:~:text=18.7%2025%2020of%2020the%2020population%2020for,and%2020then%2020Females%202035%2020%2D%202044 (last visited Feb. 26, 2022).
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[176] Richard Florida, *The Inequality of America's Parks and Green Space*, Bloomberg CityLab (Mar. 19, 2019, 8:00 AM), https://www.bloomberg.com/news/articles/2019-03-19/access-to-green-space-varies-by-class-race-in-the-u-s (explaining that "parks and green space are not just nice to look at: [t]hey influence health and well-being. A large body of research shows that green space tempers climate extremes and mitigates the urban heat-island effect, and access to it improves physical and mental health by providing more spaces to walk, relax, and play. It's important for everyone in a city to have access to those benefits, not just the affluent and highly educated.").
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