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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/873f27dd61c54389852564cd00482176.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. 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-oeeca> (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 I (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't, 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. Schimpff, *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’T 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’T 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.publi-health.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); Clodhna 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 Arcangelo*, 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 statutes 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 Intrabranh 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>.

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).

⁴⁶ Fox, *supra* note 28, at 24–25.

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>.

⁵⁰ *Id.*

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-Enviro-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. §§ 9601, 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).

⁸⁷ Vera, *supra* note 13, at 829.

⁸⁸ *Id.*

⁸⁹ Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348 (2018).

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).

⁹¹ *Overview of EPA's Brownfields Program*, EPA (May 4, 2022), [gov/brownfields/overview-epas-brownfields-program](https://www.epa.gov/brownfields/overview-epas-brownfields-program).

⁹² *Id.*

⁹³ Bartsch, *supra* note 7, at 16.

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).

⁹⁶ *Id.*

⁹⁷ IND. BROWNFIELDS PROGRAM, LOW-INTEREST LOAN GUIDELINES 1 (2018) <https://www.in.gov/ifa/brownfields/files/LIL-Guidelines-May-2018-Update-FINAL.pdf>.

⁹⁸ WIS. DEP'T NAT. RES., PUB. NO. RR-753, WISCONSIN READY FOR REUSE PROGRAM: HAZARDOUS SUBSTANCE LOANS & GRANTS.

⁹⁹ *Id.* at 1.

- 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>.
- ¹⁰³ *Id.* at 7–9.
- ¹⁰⁴ *Id.* at 5.
- ¹⁰⁵ Vera, *supra* note 13, at 830–31 (citing EPA, STATE BROWNFIELDS AND VOLUNTARY RESPONSE PROGRAMS, 51 (2017), https://www.epa.gov/sites/production/files/2017-12/documents/state_brownfields_voluntary_response_program_report_508_11-2017_web.pdf).
- 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).
- ¹⁰⁷ *Id.*
- 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/>.
- ¹⁰⁹ *Id.*
- 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>.
- ¹¹² *Id.*
- ¹¹³ *Id.*
- ¹¹⁴ *Id.*
- ¹¹⁵ *Id.*
- 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>.
- ¹³⁸ H.R. 110, 134th Gen. Assemb., Reg. Sess. § 122.6511(b)–(c) (Ohio 2021); H.R. 110, 134th Gen. Assemb., Reg. Sess. § 122.6512(a)–(b) (Ohio 2021).
- 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>.
- ¹⁴⁰ H.R. 110, 134th Gen. Assemb., Reg. Sess. § 122.6512(a) (Ohio 2021).
- 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
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- ¹⁵⁷ See discussion *infra* Section IV.B.2; N.Y. DEP’T OF TAX’N AND FIN., *supra* note 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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- ¹⁶⁰ *Ohio Poverty Rate by County*, INDEXMUNDI, <https://www.indexmundi.com/facts/united-states/quick-facts/ohio/percent-of-people-of-all-ages-in-poverty#map> (last visited Nov. 20, 2022) (utilizing data from the U.S. Census Bureau’s Small Area Income and Poverty Estimates (“SAIPE”) program).
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¹⁶² CLEVELAND.COM, *supra* note 158.

¹⁶³ *Id.*

¹⁶⁴ Lucas County, OH, DATA USA, <https://datausa.io/profile/geo/lucas-county-oh#:~:text=18.7%2025%20of%20the%20population%20for,and%20then%20Females%2035%20%20D%2044> (last visited Feb. 26, 2022).

¹⁶⁵ EPA OFF. OF LAND AND EMERGENCY MGMT., POPULATION SURROUNDING 27,030 BROWNFIELD SITES (2020), <https://www.epa.gov/sites/default/files/2015-09/documents/webpopulationbrownfieldsites.9.28.15.pdf> (using the 2015–2018 American Community Survey populations data and FY 2019 Brownfields to summarize the population living within three miles of Brownfield sites that receive EPA funding).

¹⁶⁶ *Id.*

¹⁶⁷ Krista Yacovone, *Brownfields and the Poor: Is Cleanup a Hazardous Waste of Time?*, 35 FORDHAM INT. L.J. 201, 220 (2016) (citing to Samara F. Swanston, *Race, Gender, Age, and Disproportionate Impact: What Can We Do about the Failure to Protect the Most Vulnerable?*, 21 FORDHAM URB. L.J. 577, 591 (1994)).

¹⁶⁸ *Id.* at 221.

¹⁶⁹ *Id.* at 222.

¹⁷⁰ See *infra* Section V.A.

¹⁷¹ Nancy Green Leigh, *Promoting More Equitable Brownfield Redevelopment*, LINCOLN INST. OF LAND POL'Y (Sept. 2000), <https://www.lincolninst.edu/es/publications/articles/promoting-more-equitable-brownfield-redevelopment>.

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¹⁷³ Leigh, *supra* note 171.

¹⁷⁴ *Environmental Groups in Ohio*, EARTH FOCUS GRP., <https://www.environmentalgroups.us/ohio/> (last visited Apr. 3, 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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