

UNDERSTANDING A SHAM: WHEN IS RECYCLING, TREATMENT?

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I. INTRODUCTION

Hazardous waste recycling meets one of the central objectives of the Resource Conservation and Recovery Act¹ (RCRA) and, after waste minimization,² is the preferred method of managing hazardous waste.³ This much cannot be debated.

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¹ 42 U.S.C. §§ 6901-6991i (1988). One of RCRA's objectives is to "promote the protection of human health and the environment and to conserve valuable material and energy resources by . . . minimizing the generation of hazardous waste and the land disposed of hazardous waste by encouraging process substitution, materials recovery, properly conducted recycling and reuse, and treatment." *Id.* § 6902(a)(6).

² Waste reduction sits at the top of the waste management hierarchy. In the Pollution Prevention Act of 1990, 42 U.S.C.A. §§ 13101-13109 (Supp. II 1990), Congress made it a national policy of the United States that

pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Id. § 13101(b). *See also* 57 Fed. Reg. 37,194, 37,195 (1992). In recent rulemakings, EPA has reported on its general progress in furthering waste minimization. *See, e.g.*, 55 Fed. Reg. 22,520, 22,527 (1990).

³ After waste generation is reduced, the remaining material must still be managed. Therefore, the next steps in the waste management hierarchy are recycling, then treatment, and, as a last resort, land disposal. *See supra* note 2. The EPA also gives this clear description of the waste management hierarchy:

[T]he Agency generally favors recycling/recovery as the best method for treating a waste, eliminating or reducing the residual to be disposed. Where recycling is unavailing or ineffective, the Agency prefers technologies resulting in the destruction of hazardous constituents, where such destruction may be either thermal (i.e., incineration or burning) or chemical especially for organics where neither recovery nor

When this praiseworthy objective is taken down from the drawing board, however, a problem develops. Despite RCRA's ambitious goals and its interlocking web of definitions and subparagraphs,⁴ the RCRA regulations contain no objective test to distinguish recycling from treatment. The United States Environmental Protection Agency's (EPA) efforts to promote recycling, therefore, are often frustrated by uncertainty over who should benefit from its promotional efforts.⁵

The lack of a recycling definition is serious for another reason. RCRA exempts a recycling process from the requirement of having either a pre-construction or an operating permit;⁶ a treatment process must have both permits.⁷ As discussed in more detail below, recycling status not only saves a facility the time and expense of enduring the three to twelve-year⁸ RCRA permitting process, but also may reward a facility with a more favorable public perception.⁹ Recycling is considered a social good; treatment, such as incineration, is often considered a social evil.

Without a clear line separating treatment from recycling, however, the EPA has struggled to differentiate the respectable citizens from the villains. "Sham recycling," a form of unregulated treatment,¹⁰ may be illegal, but with no definition, prosecutions are difficult. Because the regulations contain no recycling definition, some operators have taken the initiative and defined it themselves. No better example could be cited than Marine Shale Processors located in Morgan City, Louisiana.

Marine Shale uses a converted lime kiln to burn a variety of hazardous wastes, including creosote.¹¹ The primary kiln at the fa-

destruction is available or appropriate, immobilization (stabilization) is often effective, especially for inorganic constituents.

53 Fed. Reg. 31,138, 31,181 (1988).

⁴ See *infra* notes 51-103 and accompanying text.

⁵ See *EPA Task Force to Develop Strategy for Improving Definition of Solid Waste*, Daily Env't Rep. (BNA) No. 195, at A-1 (Oct. 7, 1992).

⁶ 40 C.F.R. § 261.6(c)(1) (1991).

⁷ *Id.* § 270.1(c). Under § 270.10(f), no person shall begin physical construction of a new hazardous waste management facility without first receiving a finally effective RCRA permit. *Id.* § 20.10(f).

⁸ Waste Technologies Industries, a commercial hazardous waste company, has spent approximately 12 years permitting and constructing a hazardous waste incinerator in East Liverpool, Ohio, but as of January 1993, still does not have the right to burn hazardous waste. See *Waste Industry Fears Gore WTI Decision Signals Tough Time Ahead for Incineration*, 23 Env't Rep. (BNA) No. 36, at 2220 (Jan. 1, 1993).

⁹ See generally Sarah Crim, *The NIMBY Syndrome in the 1990s: Where Do You Go after Getting to 'No'?*, 21 Env't Rep. (BNA) 132 (May 4, 1990).

¹⁰ See *infra* note 50 and accompanying text.

¹¹ *EPA's Handling of the Marine Shale Case: Hearing before the Subcomm. on Environ-*

cility is 275 feet long,¹² making it the largest hazardous waste incinerator in the United States,¹³ except for the fact that Marine Shale has no incinerator permit.¹⁴

Marine Shale entered the hazardous waste business under a 1985 EPA regulation¹⁵ that gave unregulated industrial furnaces,¹⁶ such as cement kilns and aggregate kilns,¹⁷ the right to store¹⁸ and burn¹⁹ hazardous waste without undergoing the full RCRA permitting program.²⁰ To enter the RCRA program under this regulation, the industrial furnace only could burn hazardous waste to recover energy.²¹ This restriction meant that the waste must have sufficient heat value to replace the normal fuel feed.²²

Shortly after commencing hazardous waste burning activities, Marine Shale began accepting a variety of low-energy²³ hazardous wastes, such as creosote sludges.²⁴ Marine Shale claims to recycle

mental, Energy, and Natural Resources of the House Comm. on Government Operations, 101st Cong., 1st Sess. 41 (1990) (statement of Roy Varando, Coordinator of Louisiana Department of Environmental Quality) [hereinafter *Marine Shale Hearing*].

¹² *Marine Shale Hearing*, *supra* note 11, at 108 (statement of Edward E. Reich, Acting Assistant Administrator for Enforcement and Compliance Monitoring of the United States Environmental Protection Agency).

¹³ *U.S. Files Civil Suit against Incinerator of Hazardous Wastes*, WALL ST. J. (June 5, 1990) at C5. [hereinafter *U.S. Files Civil Suit*].

¹⁴ *Id.* See Complaint filed in *United States of America v. Marine Shale Processors*, Civil Action No. CV 90-1240 (W.D. La. filed June 14, 1990).

¹⁵ 50 Fed. Reg. 49,204 (1985), (to be codified at 40 C.F.R. §§ 266.30-.35); see *Marine Shale Hearing*, *supra* note 11, at 23 (statement of Elizabeth Megginson, Assistant Secretary of Louisiana Department of Environmental Quality).

¹⁶ An industrial furnace is an enclosed device that is an integral part of a manufacturing process and that uses thermal treatment to accomplish recovery of materials or energy. 40 C.F.R. § 260.10 (1991). Industrial furnaces include cement kilns, aggregate kilns, and coke ovens. *Id.*

¹⁷ *Id.*

¹⁸ 40 C.F.R. § 266.101(c).

¹⁹ *Id.* § 266.100(c).

²⁰ See *infra* notes 111-30 and accompanying text.

²¹ 40 C.F.R. § 266.100(c)(2)(i)(B); see also *infra* notes 150-64 and accompanying text.

²² See *infra* notes 153-59 and accompanying text.

²³ "Low-energy" means that the waste does not possess sufficient heat value to replace fossil fuel. See *infra* notes 153-59 and accompanying text.

²⁴ *Marine Shale Hearing*, *supra* note 11, at 41 (statement of Roy Varando, Coordinator of Louisiana Department of Environmental Quality), 108 (statement of Edward E. Reich, Acting Assistant Administrator for Enforcement and Compliance Monitoring of the United States Environmental Protection Agency). The creosote sludge is designated as EPA listed hazardous waste "K001," defined as "bottom sediment from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol." 40 C.F.R. § 261.32 (1991). Under the federal land disposal restrictions program, K001 must be incinerated in a facility permitted under RCRA, which then must stabilize the residual ash to concentration-based standards. See 53 Fed. Reg. 31,138, 31,153-54 (1988); 40 C.F.R. §§ 268.41, 268.43; See also *infra* notes 68-78 and accompanying text. Fuels substitution is not a permissible form of treatment for K001. See 40 C.F.R. § 268.43.

the hazardous waste into aggregate for use as road-base material.²⁵ Soon the list of hazardous wastes Marine Shale was willing to accept grew to over 240 different materials,²⁶ many more than could be used only as fuel substitutes.²⁷ Thus, Marine Shale parlayed a federal right limited to burning hazardous waste for energy recovery into the largest hazardous waste incineration operation in the country.²⁸

Marine Shale's avoidance of the RCRA permitting scheme has produced both environmental detriment and economic benefit for itself.²⁹ A RCRA incineration permit regulates not only the burning process,³⁰ but also the manner in which wastes are analyzed,³¹ stored,³² and fed into the burning device.³³ Without controls on these activities, the potential threat to human health and the environment increases.³⁴

Environmental problems at Marine Shale did not take long to surface. During its first inspection conducted in August 1985, the Louisiana Department of Environmental Quality (DEQ) found fifteen RCRA violations,³⁵ including the unauthorized storage of hazardous

²⁵ See *Marine Shale Hearing*, *supra* note 11, at 108 (statement of Edward E. Reich, Acting Assistant Administrator for Enforcement and Compliance Monitoring of the United States Environmental Protection Agency).

²⁶ *Id.* at 42 (statement of Roy Varando, Coordinator of the Louisiana Department of Environmental Quality).

²⁷ Under the federal land disposal restrictions program, "fuels substitution" in an aggregate kiln is an acceptable form of treatment for only about 70 different hazardous wastes. See 40 C.F.R. § 268.42, tbl. 2 (1991).

²⁸ See *U.S. Files Civil Suit*, *supra* note 13, at C5.

²⁹ As of April 1988, Marine Shale reported hazardous waste revenues of over 14 million dollars, over one hundred times as much as it made from selling aggregate. *Marine Shale Hearing*, *supra* note 11, at 112 (statement of Edward E. Reich, Acting Assistant Administrator for Enforcement and Compliance Monitoring of the United States Environmental Protection Agency). In 1992, Marine Shale's hazardous waste revenues were expected to rise to 55 million dollars. See *Marine Shale CEO Acquitted*, *ENGINEERING NEWS REC.*, Nov. 2, 1992, at 24.

³⁰ 40 C.F.R. § 264.343 (1991).

³¹ *Id.* § 264.341.

³² *Id.* §§ 264.170–178, 264.190–199.

³³ *Id.* §§ 264.342–344.

³⁴ *Marine Shale Hearing*, *supra* note 11, at 24–26 (statement of Elizabeth Megginson, Assistant Secretary of the Louisiana Department of Environmental Quality)

The failure to require a facility wide permit by [Marine Shale] resulted in operation by trial and error. They were not required to plan ahead before beginning to operate. The business of handling large volumes of hazardous wastes of all sorts is too dangerous to be conducted without a permit prior to operation. Such a permit would have prevented the many problems we identified involving storage, handling, placarding, buffer zones, runoff, air and water discharges.

Id.

³⁵ See *Marine Shale Hearing*, *supra* note 11, at 41 (statement of Roy Varando, Coordinator

waste and the release of hazardous waste onto the ground and into an adjacent waterway.³⁶ Subsequent inspections by the DEQ uncovered a host of additional problems, including the lack of a waste analysis plan,³⁷ fires in the container processing area, and the doubling of storage and treatment capacity without a permit.³⁸ As of June 1990, the DEQ had cited Marine Shale for fifty-five violations of RCRA and five violations of the Clean Water Act for which the DEQ was seeking over five million dollars in penalties.³⁹

Marine Shale's problems are not limited to the State of Louisiana. In June 1989, Marine Shale entered a guilty plea in federal court and paid a one million dollar penalty⁴⁰ for criminal violations of RCRA, the Refuse Act of 1899,⁴¹ and the Rivers and Harbors Act of 1899.⁴² One year later, the United States, on behalf of the EPA, sued Marine Shale alleging five claims under RCRA and one claim under the Clean Water Act,⁴³ including operating an unpermitted hazardous waste treatment and storage facility.⁴⁴ In November 1991, the EPA debarred the company from bidding on government contracts or participating in federal assistance programs until November 22, 1994.⁴⁵ Marine Shale's activities also have been the subject of the television news magazine "20/20",⁴⁶ and a Congressional Hearing.⁴⁷

A federal judge may someday determine whether Marine Shale is engaged in hazardous waste recycling. Little doubt exists, however,

of Louisiana Department of Environmental Quality), 107-08 (statement of Edward E. Reich, Acting Assistant Administrator for Enforcement and Compliance Monitoring of the United States Environmental Protection Agency).

³⁶ See *id.* at 41 (statement of Roy Varando, Coordinator of Louisiana Department of Environmental Quality).

³⁷ *Id.*

³⁸ See *id.* at 42 (statement of Roy Varando, Coordinator of Louisiana Department of Environmental Quality).

³⁹ *U.S. Seeks to Close Louisiana Incinerator, Charges Company Engaged in 'Sham Recycling'*, 21 Env't Rep. (BNA) No. 8, at 356-57 (June 22, 1990).

⁴⁰ See Plea Agreement, *United States of America v. Marine Shale Processors, Inc.*, (W.D. La., filed July 24, 1989); see also *supra* note 39.

⁴¹ 33 U.S.C. §§ 407, 411 (1988).

⁴² *Id.* §§ 403, 406.

⁴³ *Id.* §§ 1251-1387.

⁴⁴ See *supra* note 9. This action, filed in June, 1990 seeks \$25,000 per day in penalties and is apparently still pending.

⁴⁵ See *The Matter of Marine Shale Processors, Inc.*, Case No. 88-0033-00 (EPA Nov. 22, 1991)(Determination). The notice and debarment was issued under the authority of 40 C.F.R. Part 32, and the Federal Acquisition Regulations, 40 C.F.R. Subpart 9.4. *Id.* at 2.

⁴⁶ 20/20 (A.B.C. television broadcast, Aug. 4, 1989).

⁴⁷ See generally, *Marine Shale Hearing*, *supra* note 11.

that this question would be simpler to answer, and some of the controversy with the facility abated, if RCRA clearly distinguished recycling from treatment.

The confusion between recycling and treatment also harms those facilities that comply with the hazardous waste treatment laws. Regulated treatment facilities suffer from the absence of a recycling definition because of the perception that the waste they treat should be recycled.⁴⁸ Hazardous waste incinerators are the prime example. Much public opposition to these units is based upon the view that hazardous wastes should be reduced or recycled, rather than destroyed.⁴⁹ These management options, however, are sequential, not concurrent, steps in the waste management hierarchy.⁵⁰ A clear definition of "recycling" not only would channel regulatory incentives to legitimate operators, but it may also help reduce, if only marginally, public opposition to necessary treatment processes that handle hazardous wastes that cannot otherwise be recycled.

This Article discusses the definitional and practical problems inherent in distinguishing "treatment" from "recycling." Section II draws the framework to the RCRA program. Section III reviews the EPA's attempts to distinguish treatment from recycling, and discusses how the lack of an objective standard for recycling has helped keep open one of RCRA's major loopholes. Following this review, Section IV proposes a formula to distinguish recycling from treatment based on "re-use efficiency." Finally, Section V suggests that the EPA can further promote recycling by easing permitting procedures for storage units ancillary to recycling processes.

II. RCRA'S HAZARDOUS WASTE MANAGEMENT SYSTEM

A. Overview

To understand recycling, it is first necessary to place it into the framework of the hazardous waste management regulatory system.⁵¹

⁴⁸ See Crim, *supra* note 9, at 133 & 134.

⁴⁹ See *id.* at 134.

⁵⁰ After waste reduction efforts have ended, and a decision made that recycling is not feasible, the next step in the hierarchy is to treat the waste. See *supra* note 2.

⁵¹ See Resource, Conservation and Recovery Act, 42 U.S.C. §§ 6901-6991K (1988). The RCRA regulations are divided into nine main parts. Part 260 provides definitions of key terms, except for the definitions of "solid" and "hazardous" waste which are defined in Part 261, and general information applicable to the other parts. 40 C.F.R. §§ 260.1-.41 (1991). Part 261 defines the terms "solid waste" and "hazardous waste" and lists exclusions from both. *Id.*

Regulation of hazardous waste begins at the point of generation.⁵² At that point, the generator⁵³ has the duty⁵⁴ to determine whether the solid waste⁵⁵ it generates is a hazardous waste.⁵⁶ If a generator

§§ 261.1–.35. Part 262 sets forth the standards applicable to generators of hazardous waste, *id.* §§ 262.10–.70, and Part 263 gives the standards for transporters. *Id.* §§ 263.10–.30.

Parts 264 and 265 are roughly parallel. Both parts provide operating standards for owners and operators of hazardous waste treatment, storage, and disposal facilities. *Id.*, §§ 264.1–.1079, 265.1–.1079. Part 264, which is generally more stringent, applies to owners and operators who have been issued a final permit under Subpart B of Part 270. *Id.*, §§ 264.1(b), 264.3, 270.1(b). RCRA § 3005(e); § 265.1(b). Part 265, referred to as the “interim status” standards, 42 U.S.C. § 6905(e), Part 265 (heading), § 264.3, applies to owners and operators pending final administrative disposition of their Subpart B permit application. *Id.* To avoid redundancy, citations to RCRA regulations throughout this Article will be made only to Part 264, unless a Part 265 standard is relevant.

Part 266 provides standards for recyclable materials used in a manner constituting disposal, 40 C.F.R. §§ 266.20–23; used oil burned for energy recovery, *id.* §§ 266.40–.44; recyclable materials used for precious metal recovery, *id.*, § 266.70; spent lead acid batteries being reclaimed, *id.*, § 266.80; and hazardous waste burned in Boilers and Industrial Furnaces. *Id.* §§ 266.100–.112.

Part 267 sets out the interim standards for new hazardous waste land disposal facilities. *Id.* §§ 267.20–.65. Part 268 implements the federal land disposal restrictions program mandated by Section 3004(d)–(m) of RCRA. *See generally* 51 Fed. Reg. 40,573 (1986) (gives framework of program); *Chemical Waste Management, Inc. v. U.S.E.P.A.*, 976 F.2d 2 (D.C. Cir. 1992).

⁵² *Chemical Waste Management*, 976 F.2d at 13. The “point of generation” is the location where a material becomes part of the “waste disposal problem” and is intended for discard. *American Mining Congress v. EPA*, 824 F.2d 1177, 1186 (D.C. Cir. 1987); *see also* *American Mining Congress v. EPA* (II) 907 F.2d 1179, 1185–86 (D.C. Cir. 1990); *American Petroleum Institute v. U.S.E.P.A.*, 906 F.2d 729, 741 (D.C. Cir. 1990). In *Chemical Waste Management*, the court said: “The key provisions of [RCRA] support the view that hazardous waste becomes subject to the land disposal program as soon as it is generated.” 976 F.2d at 13. “The power to manage waste is created [a]t [the] point’ a waste is defined as hazardous and discarded.” *Id.* (citing *Shell Oil v. EPA*, 950 F.2d 741, 754 (D.C. Cir. 1991)).

⁵³ 40 C.F.R. § 260.10 (1991). “Generator” means “any person, by site, whose act or process produces hazardous waste identified or listed in Part 261 of this chapter or whose act first causes a waste to be subject to regulations.” *Id.*

⁵⁴ Under 40 C.F.R. § 262.11, a generator must first determine whether the waste it generates is excluded from regulation under 40 C.F.R. § 261.4. *Id.* § 262.11. If the waste is not excluded, the generator then determines whether the waste is listed in subpart D of 40 C.F.R. part 261. *Id.* If the waste is not listed, the generator then determines whether the waste exhibits a hazardous characteristic under subpart C of Part 261. *See id.*

⁵⁵ 42 U.S.C. § 6903(27) (1988). This section defines a “solid waste” as “any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).” *Id.* The EPA defines “solid waste” more completely at 40 C.F.R. § 261.2. *See infra* notes 171–99 and accompanying text.

⁵⁶ 42 U.S.C. § 6903(5). Under RCRA, a “hazardous” waste is a “solid waste . . . which . . . may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or

determines it has produced a hazardous waste,⁵⁷ other legal duties immediately attach.

The generator may store the material on-site for up to ninety days with neither a permit⁵⁸ nor a grant of interim status.⁵⁹ After on-site storage, the generator must prepare the waste for shipment by first packaging it in containers⁶⁰ approved by the Department of Transportation.⁶¹ The generator then must properly label⁶² and mark⁶³ the containers. A generator may not offer hazardous waste for off-site transportation without first obtaining an EPA identification number⁶⁴ and completing a shipping document known as a manifest.⁶⁵ The

disposed of, or otherwise managed." *Id.* The EPA's regulations establish two categories of hazardous wastes: characteristic wastes, 40 C.F.R. §§ 261.20–24, and listed wastes, *id.* §§ 261.30–33. To date, the EPA has established four hazardous waste characteristics: ignitability, corrosivity, reactivity, and toxicity. 40 C.F.R. § 261, subpart C. The EPA has established three categories of listed wastes: wastes from nonspecific sources, wastes from specific sources, and discarded commercial chemical products. *Id.* §§ 261.31–33; *see also* Hazardous Waste Treatment Council v. EPA, 861 F.2d 270, 271 (D.C. Cir. 1988), *cert. denied*, 109 S.Ct. 3157 (1989).

⁵⁷ A generator may detect a hazardous characteristic in its waste by either testing according to specified methods, 40 C.F.R. § 262.11(c)(1)(1991), or by "applying knowledge of the hazardous characteristics of the waste in light of the materials or the processes used." *Id.* § 262.11(c)(2). A generator decides if it has generated a listed hazardous waste by examining the lists of hazardous wastes in subpart D of 40 C.F.R. part 261. *Id.* § 262.11(b).

⁵⁸ *Id.* § 262.34. RCRA generally requires a permit for the treatment, storage and disposal of hazardous waste. 40 C.F.R. § 270.1(c). A generator's ability to store hazardous waste generated on site for up to 90 days is one exception to this general requirement. *Id.* § 270.1(c)(2). "Permit" is defined as "an authorization, license, or equipment control document issued by EPA or an approved State to implement the requirements of this part and parts 271 and 124. Permit does not include RCRA interim status (or any permit which has not been the subject of final agency action, such as a draft permit or proposal permit)." *Id.* § 270.2.

⁵⁹ "Interim status" is a temporary operating authorization granted to hazardous waste management facilities that are "in existence" on the date they become newly-subject to regulations. *See* 42 U.S.C. § 6905(e)(1988); 40 C.F.R. § 270.70 (1991). Once the interim status criteria are satisfied, the facility "shall be treated as having been issued . . . a permit." 42 U.S.C. § 6905(e). These facilities operate under the Part 265 interim status regulations until the final "Part B" permit is issued. 40 C.F.R. § 265.1(b). The interim status program gives the EPA general authority over newly-regulated facilities until the Agency is able to issue a site-specific permit. For example, at the original promulgation of the RCRA regulations, the EPA noted that it was facing up to 26,000 potential permit applications and that it would take a "considerable time" for the Agency to act on them. 45 Fed. Reg. 33,158 (1980).

⁶⁰ 40 C.F.R. § 260.10 (1991). A "container" is "any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled." *Id.*

⁶¹ *Id.* § 262.30.

⁶² *Id.* § 262.31.

⁶³ *Id.* § 262.32.

⁶⁴ *Id.* § 262.12.

⁶⁵ *Id.* § 262.20. The generator must designate on the manifest one facility permitted to accept the material, *id.* § 262.20(b); obtain the signature of the initial transporter, *id.* § 262.23(a)(2); and sign the manifest. *Id.* § 262.23(a)(1). "Designated facility" is a term of art under RCRA; it means a hazardous waste treatment, storage, or disposal facility that has

manifest system implements RCRA's "cradle-to-grave"⁶⁶ tracking system by ensuring that hazardous waste reaches its intended destination.⁶⁷

But the generator's job is not yet over. Through regulations promulgated under the Hazardous and Solid Waste Amendments of 1984, the EPA imposed an additional duty upon generators of hazardous waste.⁶⁸ Once the generator determines that its waste is hazardous, the generator must then determine⁶⁹ whether the waste is subject to a treatment standard⁷⁰ under the land disposal restrictions program.⁷¹ To limit reliance upon land disposal as the sole waste management option, Congress directed the EPA to set pretreatment standards for roughly 450⁷² different hazardous wastes, according to five statutory deadlines⁷³ ending on May 8,

received a permit or interim status, or is operating as an exempt recycling facility. *Id.* § 260.10. The definition of designated facility is important because it means the generator has a duty to ensure the receiving facility is properly permitted. *See* U.S. v. Hayes Int'l Corp., 786 F.2d 1499, 1503-04 (11th Cir. 1986) (generator held criminally liable under RCRA for shipping hazardous waste to unpermitted facility).

⁶⁶ *See, e.g.,* Chemical Waste Management, Inc. v. U.S.E.P.A., 976 F.2d 2, 8 (D.C. Cir. 1992).

⁶⁷ *See generally* sources cited *supra* note 65.

⁶⁸ Pub. L. No. 98-616, 98 Stat. 3221 (1984).

⁶⁹ 40 C.F.R. § 268.7(a) (1991).

⁷⁰ Under Section 3004(m) of RCRA, the EPA was required to "promulgate regulations specifying those levels or methods of treatment, if any, which substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized." 42 U.S.C. § 6294(m)(1) (1992). Treatment standards under the land disposal restrictions program are either performance-based or technology-specific. With a performance-based standard any technology may be used to meet the standard, which itself is based on the performance of the "best demonstrated available technology," a term of art under RCRA. *See* 51 Fed. Reg. 40,580; 40,588-92 (1986). EPA generally prefers performance-based standards, *id.* at 40,580, because they "maximize flexibility in one's choice of treatment technology." 55 Fed. Reg. 22,536 (1990). A technology-specific standard means that only the specified technology may be used to treat the waste. *See* 40 C.F.R. § 268.42(a); 55 Fed. Reg. 22,520, 22,536.

⁷¹ The land disposal restrictions program is founded on Sections 3004(d)-(m) of RCRA, and 40 C.F.R. §§ 268.1-.50 (1992). When it adopted the program, Congress faced what a House Committee said was a "growing body of evidence that land disposal of hazardous waste is not providing, and in some cases cannot provide, protection against ground water contamination and in many cases poses grave threats to public health and the environment." H.R. Rep. No. 98-198 Part 1, (Energy and Commerce Committee) May 17, June 9, 1983.

⁷² *See generally* 40 C.F.R. §§ 261.21-.24, §§ 261.31-.33 (1992).

⁷³ *See id.* §§ 268.10-.12. The first phase of the restrictions took effect on November 7, 1986 and covered those wastes thought to pose the greatest threat if disposed of untreated—spent solvents and dioxins. 42 U.S.C. § 6924(e) (1988); 51 Fed. Reg. 40,573 (1986). Following the second phase of the program, which took effect on July 8, 1987 and covered primarily liquid hazardous wastes (the "California List"). 42 U.S.C. § 6924(d), 52 Fed. Reg. 25,760 (1987). Congress next directed the EPA to divide all remaining hazardous wastes into three subsets, or "thirds." 42 U.S.C. § 6924(g). Treatment standards for the "thirds" were then phased in

1990.⁷⁴ Typically, a generator must incinerate⁷⁵ or burn organic hazardous waste as fuel.⁷⁶ A generator usually must stabilize inorganic hazardous wastes⁷⁷ unless the waste's metal content is high enough to justify metal recovery.⁷⁸

The EPA requires all entities in the chain of managing a prohibited waste⁷⁹ to document compliance with the treatment requirements.⁸⁰

with effective dates of August 8, 1988, 53 Fed. Reg. 31,138 (1988); June 8, 1989, 54 Fed. Reg. 26,594 (1989); and May 8, 1990, 55 Fed. Reg. 22,520 (1990), respectively. As of today, all hazardous wastes that the EPA listed or identified as of November 8, 1984 are subject to a treatment standard. See 40 C.F.R. §§ 268.10-.12 (1991). Only those wastes listed or identified after that date—the so-called “newly-listed” wastes, 40 C.F.R. § 268.13 (1992)—still are awaiting the assignment of treatment standards. See 40 C.F.R. § 268.13.

⁷⁴ 42 U.S.C. § 6924(g)(4)(C) (1988); 55 Fed. Reg. 22,520 (1990). Although May 8, 1990 was the last statutory deadline for the EPA to establish treatment standards, the Agency is authorized to issue one two-year variance from the treatment requirement if it finds that a shortfall in nationwide treatment capacity exists. 42 U.S.C. § 6924(h)(2) (1988). The EPA regularly has made use of this variance for wastes such as contaminated soil and debris for which there has been a general lack of incineration capacity. See 40 C.F.R. §§ 268.33(c), 268.34(d), 268.35(e) (1992). The EPA also may issue two consecutive one-year “case-by-case” extensions after the expiration of the nationwide variance. 42 U.S.C. § 6924(h)(3).

⁷⁵ An “incinerator” is “any enclosed device that: (1) Uses controlled flame combustion and neither meets the criteria for classification as a boiler, sludge dryer, or carbon regeneration unit, nor is listed as an industrial furnace; or (2) Meets the definition of infrared incinerator or plasma arc incinerator.” 40 C.F.R. § 260.10 (1992). Operating and permit standards for hazardous waste incinerators are set forth at 40 C.F.R. §§ 264.340-.351 and 40 C.F.R. § 270.19, respectively.

⁷⁶ Hazardous waste may be used to supplement or replace the fossil fuel feed in a boiler or industrial furnace if the waste possesses adequate heat value, see *infra* notes 153-59 and accompanying text.

⁷⁷ Stabilization is “designed to chemically bind metal constituents of the waste into the microstructure of a cementitious matrix. The purpose of stabilization is to immobilize the metal constituents and thereby reduce their leaching potential.” 53 Fed. Reg. 17,578, 17,588 (1988).

⁷⁸ For example, the EPA originally proposed to establish a treatment standard of metal recovery for lead-bearing wastes (EPA code D008; 40 C.F.R. § 261.24) containing over 2.5% lead. 54 Fed. Reg. 48,372, 48,438-39 (1989). Many commenters noted that it was not economically feasible to recycle lead from wastes with less than 25% lead. 55 Fed. Reg. 22,520, 22,565 (1990). Accordingly, the EPA removed the metal recovery standard and based the treatment standard solely on stabilization. *Id.* at 22,565-67; see also 56 Fed. Reg. 41,164, 41,166 (1991); 57 Fed. Reg. 37,194, 37,206-09 (1992).

⁷⁹ The EPA has distinguished between a restricted waste and a prohibited waste. See 53 Fed. Reg. 31,138, 31,208-09 (1988). In general, a restricted waste is a hazardous waste for which the applicable treatment deadline has passed, but which may be eligible for a variance or other exemption from the treatment requirement. *Id.* A prohibited waste is a restricted waste that is ineligible for a variance or exemption and therefore must be treated prior to land disposal. *Id.*

⁸⁰ 40 C.F.R. § 268.7 (1992).

This documentation is accomplished through a notification and certification scheme that tracks over the manifest system.⁸¹

After making the hazardous waste and restricted waste determinations and filling out the requisite paperwork, the generator gives the waste to a hazardous waste transporter⁸² who delivers it to the designated facility,⁸³ or to another transporter.⁸⁴ Once the waste shipment arrives at the treatment⁸⁵ facility,⁸⁶ the facility must analyze⁸⁷ the waste to ensure it can properly manage the waste. After the treatment facility treats the waste to the specified treatment standard,⁸⁸ the treater then undertakes the role of a generator⁸⁹ and ships the treatment residuals to its ultimate resting place—the land disposal facility.⁹⁰

All off-site disposal facilities must provide security from unknowing entry,⁹¹ maintain an inspection plan,⁹² establish a contingency plan for emergencies,⁹³ and conduct personnel training.⁹⁴ Facilities

⁸¹ Under the land disposal restrictions, once a generator produces a hazardous waste, it must determine whether the waste is restricted. *Id.* If the waste is restricted, the generator must then determine whether the waste is eligible for a variance from the treatment requirement, or whether the waste meets the applicable treatment standard without treatment. *Id.* § 268.7(a)(2)–(3). If neither of these conditions apply, then the generator must ensure the waste is treated to the treatment standard. *Id.* § 268.7. For off-site shipments, the generator must notify the treatment or storage facility of the treatment standard applicable to its waste. *Id.* § 268.7(a)(1). The treatment facility then treats the waste to the specified treatment standard, and accompanies any off-site shipment of treatment residuals with a certification that the waste meets the applicable treatment standard. *Id.* § 268.7(b). The land disposal facility receiving the treatment residuals must keep copies of any notifications or certifications that accompany restricted waste shipments. *Id.* § 268.7(c).

⁸² “Transporter” means a “person engaged in the off-site transportation of hazardous waste by air, rail, highway, or water.” 40 C.F.R. § 260.10 (1992); *see* 42 U.S.C. § 6923 (1988).

⁸³ 40 C.F.R. § 263.21(a)(1) (1992); *see also supra* note 65. The generator may designate an alternate facility if an emergency prevents the waste’s shipment to the designated facility. *Id.* § 263.21(a)(2).

⁸⁴ *Id.* § 263.21(a)(3).

⁸⁵ *See infra* note 143 and accompanying text.

⁸⁶ “Facility” means “all contiguous land and structures, or other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. . . .” 40 C.F.R. § 260.10 (1992). *See also* 50 Fed. Reg. 28,702, 28,712 (1985); *United Technologies Corp. v. U.S.E.P.A.*, 821 F.2d 714, 721 (D.C. Cir. 1987) (upholding EPA’s July 1985 interpretation of “facility” as used in Section 3004(u)).

⁸⁷ 40 C.F.R. § 264.13 (1992).

⁸⁸ *Id.* § 268.7(b).

⁸⁹ *Id.* § 262.10(f).

⁹⁰ *Id.* § 268.7(c).

⁹¹ *Id.* § 264.14.

⁹² *Id.* § 264.15.

⁹³ *Id.* §§ 264.50–.56.

⁹⁴ *Id.* § 264.16.

also must have a corrective action⁹⁵ plan to address any releases⁹⁶ from solid waste management units located on-site.⁹⁷

All off-site facilities also must have a closure plan⁹⁸ and, if the facility includes a land disposal unit, a post-closure plan as well.⁹⁹ A closure plan describes the actions the facility's owner will take to close the facility once waste acceptance activities cease.¹⁰⁰ Finally, the facility's owner or operator must furnish financial assurance¹⁰¹ to demonstrate its ability to undertake the activities set forth in the closure plan¹⁰² and, if applicable, the post-closure plan.¹⁰³

RCRA thus controls waste from the point of generation through the closing of the waste's final resting place. Through this compre-

⁹⁵ Corrective action is founded on three subsections in RCRA. Section 3004(u) requires that every hazardous waste permit issued after November 8, 1984 impose "corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility. . . ." 42 U.S.C. § 6924(u) (1988). Section 3004(v) requires an owner or operator of a facility to undertake corrective action beyond the facility boundary, provided the adjacent land owner gives permission to enter. *Id.* § 6924(v). For those facilities still operating under interim status, Section 3008(h) gives the EPA the authority to issue an interim status corrective action order whenever there has been a release of hazardous waste into the environment. *Id.* § 6928(h).

⁹⁶ The term "release" is not defined in RCRA. To carry out the broad purposes of the corrective action program, the EPA has said the term should be "at least as broad as the definition of release under" the Comprehensive Environmental Response and Compensation Act, 42 U.S.C. §§ 9601-9675 (1988). 50 Fed. Reg. 28,702, 28,713 (1985). Accordingly, release means "all spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment." *Id.*

⁹⁷ The term "solid waste management unit" is not defined in the regulations. Relying upon legislative history, the EPA has defined the term to include any unit at the facility "from which hazardous constituents might migrate, irrespective of whether the units were intended for the management of solid and/or hazardous wastes." *Id.* at 28,712 (quoting H.R. Rep. No. 198, 98th Cong., 1st Sess., Part 1, 60 (1983)).

⁹⁸ 40 C.F.R. § 264.112 (1992).

⁹⁹ See *id.* § 264.118. The purpose of a "post-closure" plan is to minimize the potential for releases of hazardous wastes from disposal units after closure. See *id.* §§ 264.117-120. Special closure and post-closure requirements exist for each type of waste management unit. See *id.* § 264.197 (tank systems); § 264.228 (surface impoundments); § 264.258 (waste piles); § 264.280 (land treatment); § 264.310 (landfills), and § 264.351 (incinerators). Closure activities for non-land disposal units generally involve decontaminating all equipment and structures and removing hazardous wastes. See *id.* § 264.114. For disposal units such as landfills, however, hazardous waste will necessarily remain on-site. See *id.* § 264.310. To guard against potential releases the EPA has set a time period of 30 years for these landfills to conduct post-closure care. *Id.* § 264.117.

¹⁰⁰ *Id.* § 264.112(b).

¹⁰¹ *Id.* § 264.143.

¹⁰² See *id.* § 264.143.

¹⁰³ *Id.* § 264.145.

hensive "cradle-to-grave" tracking and treatment program,¹⁰⁴ RCRA promotes the protection of human health and the environment.¹⁰⁵

B. The Advantages of Being a Recycler

Once waste is generated there is no better way to manage it than by recycling.¹⁰⁶ The recycling process, at least in theory, uses what would otherwise be a waste material to make a product.¹⁰⁷ The recycling process benefits the public by preserving landfill capacity for non-recyclable materials and by producing a good from used material, instead of scarce natural resources.¹⁰⁸

As noted above,¹⁰⁹ the EPA's regulations give recycling processes a fundamental advantage over treatment processes and land disposal in that the recycling process does not require a RCRA hazardous waste permit.¹¹⁰ Under federal law, the permitting of a new treatment process, such as an incinerator at an existing facility, requires a "Class 3" modification.¹¹¹ This permitting process consists of two stages. The first stage requires the submission of a modification request to the EPA describing the planned change;¹¹² an initial public notice describing the modification;¹¹³ a preliminary sixty-day comment period;¹¹⁴ the convening of a public meeting within fifteen days after the initial public notice;¹¹⁵ and the EPA's response to all significant comments received during the sixty-day public comment period.¹¹⁶

After this sixty-day comment period expires, the permit applicant is not even half done. In the second stage the EPA must grant or deny the permit modification request according to additional permit modification procedures¹¹⁷ that include the submittal of a permit

¹⁰⁴ *Chemical Waste Management v. EPA*, 976 F.2d 2, 4 (D.C. Cir. 1992).

¹⁰⁶ 42 U.S.C. § 6902(a) (1988).

¹⁰⁶ According to the waste management hierarchy as expressed in the Pollution Prevention Act of 1990, "pollution that cannot be prevented should be recycled." Pollution Prevention Act, 42 U.S.C. § 13101(b) (1990).

¹⁰⁷ See 40 C.F.R. § 261.2(e) (1992).

¹⁰⁸ See 42 U.S.C. § 6902(a)(6) (1988).

¹⁰⁹ See *supra* notes 6-7 and accompanying text.

¹¹⁰ 40 C.F.R. § 261.6(c)(1) (1992).

¹¹¹ *Id.* § 270.42, App. I.

¹¹² *Id.* § 270.42(c)(1).

¹¹³ *Id.* § 270.42(c)(2).

¹¹⁴ *Id.* § 270.42(c)(2)(i).

¹¹⁵ *Id.* § 270.42(c)(4).

¹¹⁶ *Id.* § 270.42(c)(6).

¹¹⁷ *Id.*

application;¹¹⁸ the EPA's preparation of a draft permit,¹¹⁹ statement of basis,¹²⁰ or fact sheet;¹²¹ public notice concerning issuance of the draft permit,¹²² announcement of a forty-five-day public comment period, and a public hearing;¹²³ and finally issuance of a final permit¹²⁴ together with a response to comments.¹²⁵

Construction of a new treatment process cannot occur until the permittee receives an effective RCRA permit.¹²⁶ The permit's finality may be stayed, however, if a commenter files a "request for review."¹²⁷ The stay remains in effect until the EPA decides whether to hear the appeal.¹²⁸

Taken together, these Class 3 procedures in theory should require roughly two years to implement.¹²⁹ In practice, however, four or more years may elapse before ground is broken on a new treatment facility.¹³⁰ These federal permitting procedures are in addition to various state and local approvals governing zoning, siting, and air and water discharges with which a facility also must comply.¹³¹

Recycling processes, in contrast, are not usually subject to the same delays in construction and start-up because RCRA does not require a permit for these recycling activities.¹³² In addition, because

¹¹⁸ *Id.* § 124.3(a).

¹¹⁹ *Id.* § 124.6.

¹²⁰ *Id.* § 124.7.

¹²¹ *Id.* § 124.8.

¹²² *Id.* § 124.10.

¹²³ *Id.* § 124.12(a)(3). For RCRA permits, a public hearing "shall" be held whenever the Director "receives written notice of opposition to a draft permit and a request for a hearing within 45 days of public notice." *Id.*

¹²⁴ *Id.* § 124.15.

¹²⁵ *Id.* § 124.17.

¹²⁶ *Id.* § 270.10(f).

¹²⁷ *Id.* § 124.16.

¹²⁸ *Id.*

¹²⁹ Predicting the time frame for receiving a RCRA permit is far from an exact science. The chief problem is that though RCRA limits the length of some phases of the permitting process, no time limits exist for some of the most important steps. For example, the regulations give the EPA 60 days to review an application for completeness. *Id.* § 124.3(c). If the EPA finds that the application is incomplete and requests additional information, however, the regulations impose no limits either on the time frame for providing the information, or on the number of similar EPA requests. *See id.* Similarly, the regulations require a 30 day notice of a public hearing, *id.* § 124.10(b)(2), and a 45 day comment period, *id.* § 124.10(b)(1), but they provide no deadline by which the EPA must issue the final permit. With this point made, the two-year estimate is based on adding together the regulatory time periods and then assuming a reasonable period for the EPA to make its necessary decisions.

¹³⁰ *See supra* note 8.

¹³¹ For example, a local citizens' committee must approve the siting of a new hazardous waste facility. CAL. HEALTH & SAFETY CODE § 25199.7 (Deering 1993).

¹³² 40 C.F.R. § 261.6(c)(1) (1992).

a RCRA permit is not required for their operation, recycling processes are not subject to RCRA operating standards.¹³³ With regard to thermal recycling processes, such as smelters and aggregate kilns, this is a great advantage because the "recycling processes" status exempts them from the stringent operating standards otherwise applicable to incinerators.¹³⁴ Thermal recycling processes are also exempt from operating standards for boilers and industrial furnaces if they are engaged in materials recovery, as opposed to energy recovery.¹³⁵

Therefore, consistent with one objective of RCRA,¹³⁶ the EPA has tailored its regulatory program to encourage the recycling of hazardous waste. These recycling facilities enjoy a competitive advantage over treatment facilities by avoiding the RCRA permitting program.¹³⁷

Recycling facilities also enjoy intangible benefits. They are likely to meet with more favorable public perception, be less vulnerable to the NIMBY¹³⁸ syndrome, and receive less attention from groups opposed to hazardous waste treatment or disposal facilities.¹³⁹ Given the option, it is certainly preferable to be classified as a "recycler" rather than a "treater."

III. THE PROBLEM OF DEFINING RECYCLING

A. *Definition of Treatment*

As discussed above, it is not difficult to contrast conceptually the permitting procedures and operating standards for recycling facilities and treatment processes.¹⁴⁰ Recycling processes undoubtedly

¹³³ See *id.* RCRA subjects recycling processes to only two operating requirements: air emission standards for process vents, *id.* § 264.1030-.1036; and air emission standards for equipment leaks, *id.* § 264.1050-.1065. See *id.* § 261.6(c).

¹³⁴ *Id.* §§ 264.340-.351.

¹³⁵ *Id.* §§ 266.100-.112. As discussed below, the BIF rule regulates only the energy recovery process, not the materials recovery process. See *id.* § 266.100(c). Note further that facilities that store hazardous waste prior to recycling must nonetheless obtain a RCRA storage permit, see *id.* § 261.6(c)(1), which in many instances entails the same permitting procedures applicable to treatment processes and disposal units. See *id.* § 270.42, App. I., ¶ F.1.a.

¹³⁶ 42 U.S.C. § 6902(a)(6) (1988).

¹³⁷ 40 C.F.R. § 261.6(c) (1992); see *U.S. Files Civil Suit*, *supra* note 13, at C5.

¹³⁸ This well-known acronym stands for "not-in-my-backyard." When the "backyard" of opposition groups expands unchecked, the acronym becomes "NOPE," standing for "not on my planet earth."

¹³⁹ See Crim, *supra* note 9, at 133-34.

¹⁴⁰ See *supra* notes 110-35 and accompanying text.

are given significant regulatory advantages.¹⁴¹ But it is at the threshold question of what features distinguish “recycling” from “treatment” that the RCRA program breaks down.

A source of the problem is rooted in the EPA’s definition of “treatment” which confuses the issue by encompassing processes that recover energy and material, the two chief forms of recycling.¹⁴² According to the EPA, treatment regulated under RCRA includes

any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.¹⁴³

This regulatory definition is broader than the statutory version which does not contain the emphasized clause.¹⁴⁴ The broader regulatory definition was upheld in the case of *Shell Oil v. Env’tl Protection Agency*,¹⁴⁵ better known as the decision that struck down the EPA’s “mixture”¹⁴⁶ and “derived-from” rules.¹⁴⁷

The inclusion of the terms “energy” and “material” recovery in the definition of treatment means that the EPA has the authority to regulate these activities under RCRA.¹⁴⁸ The EPA did not decide to

¹⁴¹ Chief among these advantages is that no permit is required for the recycling process. See 40 C.F.R. § 261.6(c) (1992).

¹⁴² See 42 U.S.C. § 6903(22) (1988).

¹⁴³ 40 C.F.R. § 260.10 (1992).

¹⁴⁴ Cf. 42 U.S.C. § 6903(34) (1988).

¹⁴⁵ 950 F.2d 741 (D.C. Cir. 1991).

¹⁴⁶ *Id.* at 744–45. Under the mixture rule, the combination of a listed hazardous waste with a solid waste is a hazardous waste irrespective of the concentration of toxic constituents in the resultant mixture. *Shell Oil*, 950 F.2d at 744–45; 40 C.F.R. § 261.3(a)(2)(iii)–(iv) (1992).

¹⁴⁷ *Shell Oil*, 950 F.2d at 745. Under the derived-from rule, any solid waste generated from the treatment, storage, or disposal of a listed hazardous waste is a hazardous waste irrespective of the concentration of toxic constituents in the derived-from waste. *Id.*; 40 C.F.R. § 261.3(c)(2) (1992). The *Shell Oil* court found that as part of a rulemaking conducted in the late 1970’s, the EPA had failed to give sufficient notice and opportunity for comment in issuing the two rules. *Shell Oil*, 950 F.2d at 752, 765. The court therefore vacated the rules on procedural grounds. *Id.* at 752, 765. Following the court’s suggestion, the EPA reinstated the rules on an interim basis under the “good cause” exemption of the Administrative Procedures Act. *Id.* at 752; 57 Fed. Reg. 7628 (1992). Presumably to placate critics of the two rules, the EPA, at the time it reinstated the rules, set a self-imposed sunset provision of April 28, 1993, after which the rules would be void. 57 Fed. Reg. at 7628. Following an unsuccessful attempt to replace the two rules with one of a variety of optional approaches, see 57 Fed. Reg. 21,451 (1992), the EPA eliminated the April 28, 1993 sunset provision and reinstated the rules. 57 Fed. Reg. 49,278, 49,280 (1992).

¹⁴⁸ See 40 C.F.R. § 260.10 (1992).

regulate the "energy recovery" process, however, until February 21, 1991¹⁴⁹ and has never regulated the materials recovery process.¹⁵⁰ Consequently, materials recovery remains a form of unregulated treatment. Without objective standards to mark the point where materials recovery becomes treatment, however, doubts persist over which activities are potentially regulated and which are not. To gain a better understanding of what materials recovery should be, the Article next looks at energy recovery, a form of recycling with a clear boundary line separating it from treatment.

B. Energy Recovery

The terms "energy recovery" and "materials recovery" denote two distinct forms of recycling and must be considered separately. "Energy recovery," as the name implies, is the recovery of energy from solid waste.¹⁵¹ "Burning for energy recovery" means that solid wastes are burned to recover energy or are used to produce a fuel.¹⁵²

When does solid waste have enough energy such that its burning constitutes "recovery" as opposed to "treatment?" This question was answered in EPA's often-quoted "sham recycling" policy, published in the Federal Register on March 16, 1983.¹⁵³ The policy's purpose was to establish a standard delineating when a hazardous waste is "legitimately" or "beneficially" burned for energy recovery.¹⁵⁴

Expressed another way, the sham recycling policy's purpose is to help in ascertaining when hazardous waste is being destroyed rather than recycled. The EPA noted that the energy value of a waste is the most significant measurement in assessing whether energy recovery is occurring.¹⁵⁵ Burning hazardous waste with little or no heat value is not recovery, but rather destructive incineration.¹⁵⁶

In settling upon a threshold energy value to qualify a waste as a "recyclable material," the Agency looked to the heating values of common fuel such as wood or coal, and established the level of 5,000 to 8,000 British Thermal Units (BTUs) per pound.¹⁵⁷ The 5,000 BTU

¹⁴⁹ See Burning of Hazardous Waste in Boilers and Industrial Furnaces Rule, 40 C.F.R. §§ 266.100-.112 (1992).

¹⁵⁰ See, e.g., *id.* § 266.100(c).

¹⁵¹ See 42 U.S.C. § 6903(22) (1988).

¹⁵² 40 C.F.R. § 261.2(c)(2) (1992).

¹⁵³ Enforcement Guidance, 48 Fed. Reg. 11,157 (1983).

¹⁵⁴ *Id.*

¹⁵⁵ *Id.* at 11,158.

¹⁵⁶ *Id.*

¹⁵⁷ *Id.* at n.3.

per pound level became the accepted standard for determining when energy recovery ends and treatment through destructive incineration begins.¹⁵⁸ The 5,000 BTU standard also drew a line between facilities that required RCRA permits and those that did not.¹⁵⁹

As noted above, on February 21, 1991, in accordance with section 3004(q) of RCRA,¹⁶⁰ the EPA promulgated a final rule¹⁶¹ that for the first time regulates the burning of hazardous waste for energy recovery.¹⁶² Prior to this rule, the burning of high BTU hazardous waste for energy recovery was considered a form of recycling exempt from RCRA regulation.¹⁶³ As noted elsewhere,¹⁶⁴ the EPA's February 21, 1991 rule, however, regulates only energy recovery, not materials recovery.¹⁶⁵

C. Materials Recovery

This Section considers the qualitative guidance for defining materials recovery and then reviews the available quantitative or objective guidance. As noted above, the EPA's authority to regulate a hazardous waste begins at the point of generation.¹⁶⁶ Once a waste is generated, the EPA has the authority to regulate any process meeting the definition of "treatment,"¹⁶⁷ which includes the recycling process.¹⁶⁸ Because the EPA has the authority to regulate both treatment and recycling processes, the Agency also must have the authority to distinguish one from the other.¹⁶⁹ Distinguishing the terms would be helpful because treaters require RCRA permits and recyclers do not.¹⁷⁰

¹⁵⁸ See *Burning of Hazardous Waste in Boilers and Industrial Furnaces*, 56 Fed. Reg. 7134, 7184 n.76 (1991); *Hazardous Waste Management System; Definition of Solid Waste*, 50 Fed. Reg. 614, 630 (1985).

¹⁵⁹ See, e.g., *Hazardous Waste Management System; Burning of Waste Fuel and Used Oil Fuel in Boilers and Industrial Furnaces*, 50 Fed. Reg. 49,164, 49,190 (1985).

¹⁶⁰ 42 U.S.C. 6924(q) (1988).

¹⁶¹ *Burning of Hazardous Waste in Boilers and Industrial Furnaces*, 56 Fed. Reg. 7134 (1991).

¹⁶² 40 C.F.R. § 266.100(a) (1992).

¹⁶³ 50 Fed. Reg. 49,164, 49,191 (1985).

¹⁶⁴ See *supra* note 150, *infra* note 298 and accompanying text.

¹⁶⁵ 40 C.F.R. § 266.100(c) (1992).

¹⁶⁶ See *supra* note 52 and accompanying text.

¹⁶⁷ See *supra* notes 143-50 and accompanying text.

¹⁶⁸ See *supra* notes 142-43 and accompanying text.

¹⁶⁹ See *Shell Oil v. Env'tl Protection Agency*, 950 F.2d 741, 753-55 (D.C. Cir. 1991).

¹⁷⁰ See *supra* note 6 and accompanying text.

1. How "Recycling" Is Described in the Definition of "Solid Waste"

Rather than foster recycling by setting standards to distinguish it from treatment, however, the EPA has attempted to advance recycling efforts through the definition of "solid waste."¹⁷¹ In this definition, the EPA focuses on describing the circumstances by which a secondary material¹⁷² that would otherwise be a solid and hazardous waste, avoids RCRA regulation if it is recycled in a variety of ways.¹⁷³ This approach not only produces a regulatory section notorious for its obliqueness,¹⁷⁴ but also has done little to further recycling efforts.¹⁷⁵

A look at the definition of solid waste may help illustrate the problem. In general, a solid waste is a discarded material.¹⁷⁶ Three types of "discard" exist. A material may be discarded if it is abandoned,¹⁷⁷ inherently waste-like,¹⁷⁸ or recycled in a number of ways.¹⁷⁹

¹⁷¹ See 40 C.F.R. § 261.2 (1992); see also *supra* note 5.

¹⁷² Though a "secondary material" is not defined in the regulations, the EPA uses it as a catch-all term to refer to a "material that potentially can be a solid and hazardous waste when recycled." Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 616 n.4 (1985). Four categories of secondary materials are defined in the regulations. A "spent material" is "any material that has been used and as a result of contamination can no longer serve the purpose for which it was produced without processing." 40 C.F.R. § 261.1(c)(1) (1992). A "sludge" is "any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant." *Id.* § 260.10. Many listed hazardous wastes are sludges generated by wastewater treatment processes. See generally *id.* § 261.32. A "by-product" is a "material that is not one of the primary products of a production process and is not solely or separately produced by the production process." *Id.* § 261.1(c)(3). An example is slag. *Id.* Next are "commercial chemical products," which include a chemical substance manufactured or formulated for commercial or manufacturing use consisting of the pure or technical grade of the chemical, or a formulation in which the chemical is the sole active ingredient. *Id.* § 261.33(d) (comment). An example is formaldehyde. *Id.* § 261.33(f). The last "secondary material" is "scrap metal," which is defined according to its ordinary meaning. *Id.* § 261.1(c)(6).

¹⁷³ See *id.* §§ 261.2(c), 261.2(e).

¹⁷⁴ In *American Mining Congress*, the United States Court of Appeals for the District of Columbia Circuit referred to the statute underlying the definition of "solid waste" as a "labyrinthine maze." *American Mining Congress v. U.S.E.P.A.*, 824 F.2d 1177, 1187 (D.C. Cir. 1987); see also *supra* note 171.

¹⁷⁵ See *supra* note 171.

¹⁷⁶ 40 C.F.R. § 261.2(a)(1) (1992).

¹⁷⁷ *Id.* § 261.2(a)(2)(i). Materials can be abandoned by disposal; burning or incineration; or accumulation or treatment (but not recycling) before disposal, burning, or incineration. *Id.* § 261.2(b)(1)-(3).

¹⁷⁸ *Id.* § 261.2(d). Listed dioxins are a type of material that is "inherently waste-like." *Id.* § 261.2(d)(1).

¹⁷⁹ *Id.* § 261.2(c).

For present purposes, the last form of "discard" is the important one. The definition of solid waste sets up a dichotomy between two types of recycling processes.¹⁸⁰ If a secondary material is managed by a recycling process falling within the first category, the material is generally a solid waste¹⁸¹ and hence, potentially a hazardous waste.¹⁸² But if a secondary material is managed by a recycling process falling within the second category, the material is generally exempt from the definition of solid waste¹⁸³ and hence, cannot be a hazardous waste.¹⁸⁴

In the first recycling category are burning for energy recovery;¹⁸⁵ reclamation;¹⁸⁶ use in a manner constituting disposal;¹⁸⁷ and speculative accumulation.¹⁸⁸ Secondary materials managed in one of these ways are, with some limited exceptions¹⁸⁹ solid wastes and hence, potentially hazardous wastes.¹⁹⁰

The second recycling category covers situations where the secondary material is used or reused as an ingredient in an industrial process to make a product;¹⁹¹ used or reused as an effective substitute for a commercial product;¹⁹² or returned to the original process from which it was generated.¹⁹³ Examples of a material being used or reused as an ingredient is the use of distillation bottoms from the production of carbon tetrachloride as a feedstock in producing tetrachloroethylene, and the use of fly ash to make cement.¹⁹⁴ Examples of using a secondary material as a substitute for a commercial product are the use of hydrofluorosilicic acid¹⁹⁵ as a drinking water fluor-

¹⁸⁰ *Id.* §§ 261.2(c), 261.2(e).

¹⁸¹ *See id.* § 261.2(c).

¹⁸² *Id.* §§ 261.3, 262.11.

¹⁸³ *Id.* § 261.2(e).

¹⁸⁴ *Id.* §§ 261.3, 262.11.

¹⁸⁵ *Id.* § 261.2(c)(2).

¹⁸⁶ *Id.* § 261.2(c)(3). A material is "reclaimed" if it is "processed to recover a usable product or if it is regenerated. Examples are recovery of lead values from spent batteries and regeneration of spent solvents." *Id.* § 261.1(c)(4).

¹⁸⁷ *Id.* § 261.2(c)(1); *see infra* notes 231-57 and accompanying text.

¹⁸⁸ *Id.* § 261.2(c)(4). The regulations give a formula for determining when storing hazardous waste for future recycling is legitimate and when it is speculative only, based on the rate of turnover. *Id.* § 261.1(c)(8).

¹⁸⁹ *See id.* § 261.2(c), tbl. 1.

¹⁹⁰ *Id.* § 261.2(c).

¹⁹¹ *Id.* § 261.2(e)(1)(i).

¹⁹² *Id.* § 261.2(e)(1)(ii).

¹⁹³ *Id.* § 261.2(e)(1)(iii).

¹⁹⁴ *Id.* § 261.1(c)(5)(i); *see also* 50 Fed. Reg. 614, 619 (1985).

¹⁹⁵ Hydrofluorosilicic acid is an air emission control dust. 50 Fed. Reg. 614, 637 (1985).

idation agent, or use of spent pickle liquor as a wastewater conditioner.¹⁹⁶ In the last recycling category, also known as "closed-loop" recycling,¹⁹⁷ the material must substitute for a raw material feedstock, and the process must use raw materials as principal feedstocks.¹⁹⁸

But the definition of solid waste did not earn its reputation for complexity simply by establishing a dichotomy between two different types of recycling processes. After the EPA states that secondary materials recycled by a process defined in the second category are not solid wastes, the Agency then changes its mind and states that most of them are in fact solid wastes.¹⁹⁹ Materials burned for energy recovery, accumulated speculatively, or used in a manner constituting disposal are still solid wastes even if they are used, reused, or returned to the original process as described above.²⁰⁰

What difference does it make whether a secondary material becomes a solid waste if destined for recycling? If the secondary material is in fact a solid waste, the generator must then determine whether it is a hazardous waste.²⁰¹ If the solid waste is a hazardous waste, the generator subjects itself and the "designated facility" to the full panoply of RCRA regulation.²⁰² Again, however, the recycling process will not require a permit.²⁰³ The recycling facility receiving the material must be permitted or authorized to store the material,²⁰⁴ and must manage any residuals the process generates as hazardous wastes through the derived from rule.²⁰⁵

If, in the rare case, the secondary material is not a solid waste when recycled, then both the generator and recycler are exempt from RCRA regulation, at least for this activity.²⁰⁶ The generator need not comply with the RCRA storage and manifesting require-

¹⁹⁶ *Id.*

¹⁹⁷ See *American Mining Congress v. U.S.E.P.A.*, 824 F.2d 1177, 1180 (D.C. Cir. 1987); Identification and Listing of Hazardous Waste; Amendments to Definition of Solid Waste, 53 Fed. Reg. 519, 520 (1988).

¹⁹⁸ 40 C.F.R. § 261.2(e)(iii) (1992).

¹⁹⁹ *Id.* § 261.2(e)(2).

²⁰⁰ *Id.*; see *supra* notes 191-93 and accompanying text.

²⁰¹ 40 C.F.R. § 262.11 (1992).

²⁰² See *supra* notes 53-103 and accompanying text.

²⁰³ See *supra* note 6 and accompanying text.

²⁰⁴ See *supra* note 65.

²⁰⁵ See *supra* note 147. The derived-from rule applies because the recycling process constitutes the treatment of a hazardous waste. See *supra* note 143 and accompanying text; see also *Shell Oil v. Env'tl Protection Agency*, 950 F.2d 741, 752-57 (D.C. Cir. 1991).

²⁰⁶ 40 C.F.R. § 261.1(a) (1988).

ments,²⁰⁷ and the recycling facility need not obtain a storage permit²⁰⁸ or manage its residuals as hazardous wastes.²⁰⁹

Several deficiencies are readily apparent with this approach to furthering recycling efforts. First, few secondary materials survive the regulatory gauntlet set out in the definition of solid waste for receiving an exemption.²¹⁰

Second, although the EPA provides a few examples of activities that would theoretically constitute use or reuse, the Agency offers no yardstick to gauge the effectiveness or legitimacy of the process. The Agency simply states that a secondary material must be used as an ingredient, or as an "effective" substitute for a commercial product.²¹¹ The EPA's current approach therefore falls short because it attempts to encourage recycling by defining "solid waste," not by defining "recycling." The EPA states that certain materials escape hazardous waste regulation if they are recycled in a limited number of ways, but then says little more.²¹² No objective standard is offered. Generators, recyclers, and treaters are left to determine for themselves the line separating exempt recycling from regulated treatment.

2. Qualitative Guidance

Aware that ambiguities in the solid waste definition might leave room for sham operators to claim they are engaged in recycling, not waste management, the EPA has for several years attempted to establish a set of criteria to distinguish recycling from treatment.

a. January 1985 Guidance

In the final rulemaking on the definition of "solid waste," the EPA attempted to set forth a series of tests to distinguish recycling from treatment.²¹³ The first test centers on how effectively the secondary

²⁰⁷ *Id.* § 262.10(a).

²⁰⁸ *Id.* § 264.1(b).

²⁰⁹ *Id.* § 261.3(c)(2)(i). This rule applies only to the treatment of a "hazardous waste." *Id.*

²¹⁰ A secondary material would have to be used or reused without being burned for energy recovery, recycled on the ground, or accumulated speculatively. *Id.* § 261.2(e)(2). If the material were reclaimed, it still remains a solid waste unless it is a sludge or by-product exhibiting a hazardous characteristic, or a listed commercial chemical product. *Id.* § 261.2(c).

²¹¹ *Id.* § 261.2(e).

²¹² See *supra* notes 171-209 and accompanying text.

²¹³ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 638 (1985).

material acts as a substitute for a typical virgin raw material.²¹⁴ If the secondary material is ineffective or only slightly effective for the claimed use, then according to the EPA, the practice is a sham—"not recycling but surrogate disposal."²¹⁵

An example the EPA gives is the use of certain heavy metal sludges in the production of concrete.²¹⁶ Because the sludges do "not contribute any significant element to the concrete's properties," the EPA said it would not consider this legitimate recycling.²¹⁷ An example the Agency gives of legitimate recycling is the use of spent pickle liquor as a phosphorous precipitant in wastewater treatment.²¹⁸

The second test is whether the amount of secondary materials used is more than normally required to make a product or to operate a process.²¹⁹ According to the EPA, a sign that a recycler is using an appropriate amount of secondary materials is if the recycler requires product specifications accepted in the industry.²²⁰

According to the EPA, a procedural sign of sham recycling is the absence of records documenting "how, where, and in what volumes the materials are being used and reused."²²¹ Lastly, if the secondary materials are not handled in a manner to protect their value in the same way as raw materials or commercial product substitutes, the activity also may be considered a sham.²²²

b. January 1988 Guidance

Three years later, in amendments to the definition of "solid waste,"²²³ the EPA refined the criteria for assessing whether an operator is engaged in recycling, and for the first time added a financial test.²²⁴ Now the criteria were expressed as follows: whether the operator of the device is paid to burn wastes and the percentage of income derived from burning wastes as opposed to producing a product; whether the wastes are selected to meet specifications re-

²¹⁴ *Id.* at 638.

²¹⁵ *Id.*

²¹⁶ *Id.*

²¹⁷ *Id.*

²¹⁸ *Id.*

²¹⁹ *Id.*

²²⁰ *Id.*

²²¹ *Id.*

²²² *Id.*

²²³ Identification and Listing of Hazardous Waste, Amendments to Definition of Solid Waste, 53 Fed. Reg. 519 (1988).

²²⁴ *Id.* at 522.

lated to a recycling purpose or rather are simply solicited and accepted indiscriminately; the energy value of the wastes (if burning is for energy recovery); how much energy or material value each waste constitutes to the recycling purpose; whether each waste burned is as effective for the claimed recycling purpose as the raw materials normally processed in the device; and whether the toxic constituents in the waste contribute to the recycling objective or simply are being destroyed.²²⁵

c. April 1989 Guidance

One year later, through a memorandum from Sylvia Lowrance, Director of the Office of Solid Waste, to the EPA Regions (Lowrance memo), the EPA further elaborated upon the recycling criteria in the context of various recycling schemes proposed for listed waste F006.²²⁶ The waste in questions is a metal-bearing sludge from electroplating operations.²²⁷

As noted above, one indicia of a sham is the use of secondary materials in excess of that needed to make a product, or to operate a production process.²²⁸ As also noted above, this excess may mean that volume of the secondary materials is more than the raw materials normally used,²²⁹ or that the secondary material contains hazardous constituents not found in the raw material.²³⁰ In the Lowrance memo, the EPA specifically directs a would-be recycler, concerned about excess hazardous constituents, to the Appendix VIII toxic constituents found in Part 261 as the list of chemicals to consider when comparing a waste material to a raw material.²³¹ The EPA's reference to the comprehensive list of Appendix VIII constituents furnishes a standard source from which to determine the excess constituents of concern.²³²

But though the Lowrance memo shows the EPA giving somewhat more detail to the recycling criteria, it still does not quantify the criteria. Key questions, such as the acceptable level of "along-for-

²²⁵ *Id.*

²²⁶ Letter from Sylvia Lowrance, Director Office of Solid waste, to the EPA Hazardous Waste Management Divisions Directors (June 5, 1989) (on file with author).

²²⁷ See 40 C.F.R. § 261.31(a) (1992).

²²⁸ See *supra* note 218 and accompanying text.

²²⁹ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 638 (1985).

²³⁰ *Id.*

²³¹ *Id.*

²³² 40 C.F.R. pt. 261, App. VIII (1992).

the-ride" Appendix VIII constituents and the effectiveness of the raw material substitute, remain unanswered. Without answers to these questions, those desiring to engage in recycling are left to rely upon the subjective judgment of the EPA Regional Offices.

3. The Use Constituting Disposal Loophole

Before considering the available quantitative guidance for recycling, a digression is in order. Not only has the lack of an objective measurement for recycling hindered the practice, it also has helped keep open one of the major loopholes in the RCRA program. The regulation in question addresses waste-derived products used in a manner constituting disposal.²³³ Why this provision is a loophole is discussed below.

a. Hazardous Waste-Derived Products Spread on the Ground Are Regulated

In the definition of the "solid waste" EPA describes the circumstances under which secondary materials are solid wastes if they are recycled in various ways.²³⁴ If the recycling of a secondary material consists in a party placing the material on the land, or using the material to make products that are then placed on the land, then the secondary materials are solid wastes.²³⁵ In other words, if a facility makes a product out of a secondary material that would otherwise be a hazardous waste if disposed neither the secondary material nor the product is regulated under RCRA.²³⁶ But, if the end use of this waste-derived product is ground application, the secondary material is a solid waste.²³⁷ This conclusion is important because if the solid waste is also a listed hazardous waste, the resulting "product" placed on the ground is defined as a hazardous waste under RCRA.²³⁸

An example of such material is furnace slag or ash that has been used historically as road base or "anti-skid" material.²³⁹ If the smelter producing the material burns, for metals recovery, a secondary material that would otherwise be a listed hazardous waste, then the

²³³ 40 C.F.R. § 266.20(b) (1992).

²³⁴ See *supra* notes 172-200 and accompanying text.

²³⁵ 40 C.F.R. § 261.2(c)(1) (1992).

²³⁶ *Id.* § 261.2(e)(1)

²³⁷ *Id.* § 261.2(c)(1).

²³⁸ *Id.* § 261.3(c)(2)(i); see also *supra* notes 147 & 204.

²³⁹ See 56 Fed. Reg. 41,164 (1991). The EPA notes that the main use of slag from electric arc furnace dust is as road base or anti-skid material. *Id.* at 41,172.

secondary material is a "solid waste" and the "anti-skid" material is considered a hazardous waste under the derived-from rule.²⁴⁰

The rationale for this exception is fairly obvious. Little difference may exist between incinerator ash, which by definition is a hazardous waste,²⁴¹ and ash produced from the smelting of raw materials mixed with hazardous wastes.²⁴² To require one type of ash, incinerator ash, to be disposed of in a double-lined hazardous waste landfill,²⁴³ but the other ash, from a metals recovery furnace, to be applied indiscriminately on the roadways,²⁴⁴ appears incongruous. Accordingly, hazardous waste-derived products placed on the ground are regulated just like listed hazardous waste treatment residuals—both are listed wastes until delisted,²⁴⁵ or so it would seem.

b. Hazardous Waste-Derived Products Spread on the Ground Are Not Regulated

This story, however, does not end here. After concluding that listed waste-derived products placed on ground should be regulated as hazardous wastes, the EPA then proceeded to defer regulating them as hazardous wastes.²⁴⁶ At the same time the EPA stated that waste-derived products placed on the ground are solid wastes,²⁴⁷ the Agency also promulgated section 266.20(b), which provides that "products produced for the general public's use that are used in a manner that constitutes disposal and that contain recyclable materials are not presently subject to regulations if the recyclable materials have undergone a chemical reaction in the course of producing the product so as to become inseparable by physical means."²⁴⁸

Now it is difficult to imagine how a listed hazardous waste that is burned at 2000 degrees in an industrial furnace will not undergo

²⁴⁰ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 628 (1985); see *American Petroleum Institute v. U.S.E.P.A.*, 906 F.2d 729, 738-42 (D.C. Cir. 1990) (vacated EPA rule that slag produced from metal recovery furnace is exempt from derived-from rule).

²⁴¹ 40 C.F.R. § 261.3(c)(2)(i) (1992). This rule applies to incinerator ash derived from the treatment of listed hazardous waste. *Id.*

²⁴² See *American Petroleum Institute*, 906 F.2d at 741-42.

²⁴³ See 42 U.S.C.A. § 6924(o) (1988).

²⁴⁴ 40 C.F.R. § 261.2(c)(1) (1992).

²⁴⁵ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 628 (1985).

²⁴⁶ *Id.* at 646.

²⁴⁷ *Id.* at 664 (to be codified at 40 C.F.R. § 261.2(c)(1) (1992)).

²⁴⁸ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 666 (1985).

some type of chemical reaction. In fact, because the "chemical reaction" test is so easy to satisfy, section 266.20(b) has had the effect of giving facilities that recycle hazardous waste on the ground²⁴⁹ the same exemption from RCRA available to facilities unquestionably engaged in beneficial recycling activities, such as spent solvent recyclers.²⁵⁰

The EPA deferred action because the Agency believed that the chemical and physical changes occurring in the process make waste-derived products less of a risk than unaltered wastes placed directly on the land.²⁵¹ Further, the EPA needed more time to determine when use of these waste-derived products could present a substantial hazard to human health and the environment.²⁵²

Seven years after this statement, the EPA has developed no such regulatory system. After the land disposal restrictions (LDR) program²⁵³ got underway, however, the incongruity between regulations covering incinerator ash and those for waste-derived products became so great that the EPA had to do something. The LDR program mandates rigorous, technology-based standards that incinerated listed hazardous wastes must meet.²⁵⁴ These incinerator residuals must meet these standards as a precondition to disposal in a modern engineered landfill.²⁵⁵ In contrast, under section 266.20(b), products made from the same hazardous wastes that are used in a manner constituting disposal may be spread on the ground simply if some vague, undefined "chemical reaction" occurs.²⁵⁶

c. Hazardous Waste-Derived Products Are Partially Regulated

The EPA, recognizing this widening disparity in regulatory treatment between two similar materials, strengthened section 266.20(b)

²⁴⁹ Marine Shale is one such facility. As discussed above, this facility produces aggregate from the burning of listed hazardous wastes. See *supra* notes 11-47 and accompanying text. Without the "chemical reaction" test of 40 C.F.R. § 266.20(b), this aggregate would be a hazardous waste through the derived-from rule. See *American Petroleum Institute v. U.S.E.P.A.*, 906 F.2d 729, 738-42 (D.C. Cir. 1990).

²⁵⁰ Spent solvent recyclers accept used solvents, remove the impurities through a distillation process, and then resell the regenerated solvents. See 51 Fed. Reg. 40,572, 40,607-08 (1986). These impurities are "still-bottoms," and classified as a listed hazardous waste. See 40 C.F.R. § 261.31(a) (1992).

²⁵¹ Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614, 646 (1985).

²⁵² *Id.* at 628.

²⁵³ See *supra* notes 68-81 and accompanying text.

²⁵⁴ See 40 C.F.R. §§ 268.41-.43 (1992).

²⁵⁵ 42 U.S.C. §§ 6924(m)(2), 6924(o) (1988).

²⁵⁶ 50 Fed. Reg. 614, 666 (1985).

in the "First-Third" rulemaking published on August 17, 1988.²⁵⁷ In that rulemaking, the EPA modified the provision so that not only must a "chemical reaction" occur, but the "products [must] meet the applicable treatment standards in Subpart D of Part 268."²⁵⁸

This regulation, which is still in place, equalized the treatment requirements for incinerator ash and waste-derived products placed on the ground, but left the disparity between permissible disposal methods.²⁵⁹ Specifically, after LDR treatment, incinerator ash derived from the treatment of listed hazardous wastes must be disposed of in a double-lined landfill; waste residuals meeting the same standards, if used to produce a product, may be spread on the ground.²⁶⁰

d. Partial Regulation Is Not Good Enough

The EPA's failure to do away entirely with section 266.20(b) in light of the mandates of the LDR program prompted a challenge to the provision by the National Resources Defense Council, the Hazardous Waste Treatment Council, and Chemical Waste Management, Inc. in *Chemical Waste Management, Inc. v. EPA*.²⁶¹ Before briefs were prepared on this issue, the parties agreed on proposed settlement terms.²⁶² Under the settlement the EPA was to propose a rule requiring all persons producing hazardous waste-derived products used in a manner constituting disposal to notify the Agency within six months after promulgation of the final rule.²⁶³ The notice was to include information concerning both the safety of disposing the material on the ground and the legitimacy of the recycling process.²⁶⁴ Factors that the EPA was to consider in determining the legitimacy of the recycling process were modelled after existing EPA guidance reviewed above.²⁶⁵

Specifically, the EPA was to consider the following factors: whether the producer selected the hazardous wastes to meet specifications related to the production process, rather than accepted the

²⁵⁷ 53 Fed. Reg. 31,138, 31,212 (1988) (to be codified at 40 C.F.R. § 266.20(b) (1992)).

²⁵⁸ 53 Fed. Reg. 31,138 (1988).

²⁵⁹ Compare 40 C.F.R. § 266.20(b) (1992) with 42 U.S.C.A. § 6924(m) & (o) (1988).

²⁶⁰ See *supra* note 257.

²⁶¹ Case No. 90-1209 and consolidated cases 90-1210 and 90-1211.

²⁶² See Proposed Settlement Agreement filed in *Chemical Waste Management, Inc. v. EPA*, No. 90-1209 (D.C. Cir. 1990).

²⁶³ *Id.*

²⁶⁴ *Id.*

²⁶⁵ See *supra* notes 213-31 and accompanying text.

wastes indiscriminately; whether the hazardous constituents in the waste legitimately contributed to the production process or the waste-derived product, rather than merely being incorporated into the waste-derived product or treated; whether hazardous constituents were present in the waste-derived product at levels higher than normally found in commercial products produced from virgin materials or non-hazardous wastes; whether the producer is paid to take or treat the hazardous waste; the percentage of income derived from taking or treating the hazardous waste as opposed to income derived from producing and selling products produced from the hazardous waste, and the value of the waste-derived product in relation to the cost of processing or treating the hazardous waste.²⁶⁶

The proposed settlement did not require the EPA to approve these demonstrations as a condition to the production of waste-derived product.²⁶⁷ Rather, the EPA was required only to publish in the Federal Register its receipt of the recycling demonstration in the Federal Register and indicate that information supporting the demonstration was available for public review.²⁶⁸ Under the proposed settlement, the EPA had no duty to determine whether a facility was engaged in legitimate recycling unless an interested party petitioned the Agency to make such a finding.²⁶⁹ After the EPA received the petition, the waste-derived product producer would be given an additional opportunity to support its recycling demonstration prior to the EPA's final determination, which was not required to be made for up to 270 days after all documentation had been submitted.²⁷⁰

e. Partial Regulation Is Good Enough

Although the proposed settlement did not establish an objective recycling test, it at least required those claiming to produce waste-derived product legitimately to furnish information supporting that claim.²⁷¹ Two subsequent developments, however, managed to derail the settlement before it was made final.

First, the Office of Management and Budget (OMB) opposed the criteria for determining the legitimacy of the recycling process.²⁷²

²⁶⁶ *Id.*

²⁶⁷ *Id.*

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ *Id.*

²⁷¹ *Id.*

²⁷² Letter from James B. MacRae, Jr., Acting Administrative and Deputy Administrators,

According to the OMB, the "proposed 'legitimacy' criteria will create an intrusive and burdensome process that will discourage efforts to recycle or recover hazardous wastes for socially beneficial uses."²⁷³ The OMB expressed concern over the "absence of a clear, objective method for weighing these criteria."²⁷⁴ For the most part, the OMB was concerned that the qualitative criteria set forth in the proposed rule would lead to arbitrary decision-making and thereby thwart the development of innovative products made from hazardous waste.²⁷⁵ In addition, the OMB objected to the absence of a risk-based comparison between the levels of hazardous constituents in products made from virgin material, and products made from hazardous wastes.²⁷⁶ Lastly, the OMB rejected the financial test as "irrelevant."²⁷⁷ Consequently, the OMB returned the proposed rule to the EPA,²⁷⁸ where by all accounts it remains.

The second development that has kept the proposed regulation from enactment is the United States Court of Appeals for the District of Columbia Circuit vacating of the derived-from rule in *Shell Oil v. Env't. Protection Agency*.²⁷⁹ In that case, the court found that the EPA had failed to give adequate notice and opportunity for comment during the derived-from rule's promulgation.²⁸⁰ The court therefore vacated and remanded the rule to EPA.²⁸¹

Under the derived-from rule, residuals generated from the treatment of listed hazardous wastes are themselves hazardous wastes by definition.²⁸² The EPA's ability to prescribe treatment standards for treatment residuals and waste-derived products is in large part founded on the derived-from rule.²⁸³ These materials are not listed²⁸⁴ and often do not exhibit a hazardous characteristic.²⁸⁵ Without the derived-from rule, the EPA's authority to regulate these residuals

Office of Information and Regulatory Affairs to William K. Reilly, EPA Administrator (Oct. 22, 1991) (on file with author).

²⁷³ *Id.*

²⁷⁴ *Id.*

²⁷⁵ *Id.*

²⁷⁶ *Id.*

²⁷⁷ *Id.*

²⁷⁸ *Id.*

²⁷⁹ 950 F.2d 741 (D.C. Cir. 1991); see *supra* note 97.

²⁸⁰ *Shell Oil*, 950 F.2d at 752.

²⁸¹ *Id.*; see also *supra* notes 147 & 205 and accompanying text.

²⁸² 40 C.F.R. § 261.3(c)(2)(i) (1992).

²⁸³ See *American Petroleum Institute v. U.S.E.P.A.*, 906 F.2d 729, 738-42 (D.C. Cir. 1990).

²⁸⁴ See generally 40 C.F.R. §§ 261.31-.33 (1992).

²⁸⁵ *Id.* §§ 261.21-.24; see 57 Fed. Reg. 21,450, 21,451 (1992).

under RCRA is put into question.²⁸⁶ Although the EPA has re-instituted the derived-from rule on at least an interim basis,²⁸⁷ questions concerning the rule's effectiveness in its current form have stalled a permanent fix to section 266.20(b).²⁸⁸

Therefore, under RCRA's current regulatory program, "recyclers" can spread hazardous waste-derived products on the ground if the products meet the same treatment standards for hazardous waste destined for disposal in a double-lined landfill.²⁸⁹ No recycling test, whether subjective or objective, is mandated. The lack of an objective test, thereby, not only has disabled the EPA and the regulatory community from defining the boundaries of "legitimate" recycling, it also has contributed to the perpetuation of the "use-constituting disposal" loophole.

4. EPA's First Attempt to Quantify the Maximum Allowable "Along-for-the Ride" Constituents

As the above discussion shows, the absence of an objective standard for defining hazardous waste recycling creates doubt over which processes are entitled to operate without a permit and which are not.²⁹⁰ The lack of such a standard also has hampered the EPA's efforts to regulate more closely the suspect practice of recycling hazardous waste-derived products on the ground.²⁹¹

As matters now stand, treatment and recycling shade into each other.²⁹² Treaters who can recycle have no solid ground upon which to stake a claim to recycling status.²⁹³ Recyclers who actually may treat are subject to no clear standard the EPA can use to cut back upon the unregulated activities.²⁹⁴ This leaves treaters who can recycle potentially over-regulated, and sham recyclers under-regulated. The result is that legitimate recycling is discouraged because of doubt over what activities the term covers.²⁹⁵

²⁸⁶ See 57 Fed. Reg. 21,450, 21,451 (1992).

²⁸⁷ 57 Fed. Reg. 49,278 (1992).

²⁸⁸ Tenth Status Report of Respondent Environmental Protection Agency, Chemical Waste Management Inc. v. EPA, No. 90-1209 (D.C. Cir. 1992) (unpublished document on file with author).

²⁸⁹ See 40 C.F.R. § 266.20(b) (1992).

²⁹⁰ See *supra* notes 15-28 and accompanying text.

²⁹¹ See 40 C.F.R. § 266.20(b) (1992).

²⁹² See generally *supra* notes 142-43 and accompanying text see also *Shell Oil v. Env'tl Protection Agency*, 950 F.2d 741, 752-57 (D.C. Cir. 1991).

²⁹³ See generally 40 C.F.R. § 261.2(e) (1992).

²⁹⁴ *Id.*; see also *supra* notes 15-28 and accompanying text.

²⁹⁵ See *supra* note 171-92.

The EPA made its first attempt to quantify the distinction between materials recovery and treatment in the Boiler and Industrial Furnace (BIF) rule.²⁹⁶ The BIF regulations apply, with a few exceptions, to "boilers and industrial furnaces" that burn hazardous waste.²⁹⁷ The exception relevant here is for certain furnaces that burn hazardous waste solely as an ingredient, or solely for metal recovery.²⁹⁸ According to the EPA, section 3004(q) of RCRA, which requires the Agency to regulate facilities burning hazardous waste for energy recovery, does not cover these furnaces.²⁹⁹ Although in a somewhat different context,³⁰⁰ the EPA in the BIF rule set a limit on the concentration of non-recyclable hazardous constituents that can be "along for the ride."³⁰¹ The limit is 500 parts per million (ppm) by weight of Appendix VIII nonmetal compounds.³⁰²

Because the furnace is supposed to be burning hazardous waste to recover metals, the presence of a significant amount of organic compounds indicates that some purpose other than metals recovery (i.e., destruction) is taking place.³⁰³ If this threshold is exceeded, then the "metal recovery furnace" is subject to regulation as an energy recovery furnace under the BIF rule.³⁰⁴

5. Summary of Existing Recycling Criteria

In the definition of solid waste³⁰⁵ and in subsequent discussions³⁰⁶ the EPA has set forth various qualitative criteria for distinguishing

²⁹⁶ 40 C.F.R. §§ 266.100-.112 (1992).

²⁹⁷ *Id.* § 266.100(a).

²⁹⁸ *Id.* § 266.100(c).

²⁹⁹ 42 U.S.C. § 6924(q) (1988); 56 Fed. Reg. 7134, 7142-43 (1991). The EPA's other reasons for not regulating materials recovery include the lack of Agency study; the question of whether materials recovery is treatment (answered since then in the affirmative by the *Shell Oil* Court); and the Agency's view that such materials may be more appropriately regulated under the Clean Air Act. *Id.*

³⁰⁰ The question in the BIF rule is not what separates materials recovery from treatment but rather what separates materials recovery, which is unregulated by the BIF rule, from energy recovery, which is regulated. Compare 40 C.F.R. § 266.100(a) (1992) with § 266.100(c) (1992). In other words, the BIF rule addresses the situation where purported materials recovery is actually energy recovery and must be regulated as such; see *id.* § 266.103(a)(5)(ii); it does not address the question of when materials recovery constitutes a non-thermal form of treatment not subject to RCRA regulation. *Id.* § 266.100(b).

³⁰¹ *Id.* § 266.103(a)(5)(ii).

³⁰² *Id.*; see also 56 Fed. Reg. 7134, 7143 (1991).

³⁰³ See 40 C.F.R. § 266.103(a)(5)(ii)(A) (1992).

³⁰⁴ *Id.* §§ 266.100(a), 266.100(c)(2)(i).

³⁰⁵ See *supra* notes 171-200 and accompanying text.

³⁰⁶ See *supra* notes 213-31 and accompanying text.

recycling from treatment.³⁰⁷ Common to the criteria are two chief elements. First, the concentration of hazardous constituents in the secondary material that are intended to substitute for elements in the normal raw material must correlate.³⁰⁸ If the concentration of hazardous constituents are in excess of that normally used to make a certain product, then presumably the process is not reusing the excess constituents, but rather is treating them.³⁰⁹

Second, the secondary material also may contain hazardous constituents that are not found in the raw material and that do not contribute to the product.³¹⁰ Again, because these excess toxic constituents by definition are not recycled, some form of treatment must be occurring, such as destruction.³¹¹ The BIF rule quantifies the amount of excess or "along-for-the-ride" toxic constituents that a materials recycling process can treat without losing exempt recycling status.³¹²

Therefore, what appears to be missing in the recycling test is a standard for measuring how effectively constituents in a hazardous waste substitute for those in a raw material. There then should be a means to combine this value with the allowable quantity of excess constituents. A suggested formula for addressing this deficiency is proposed below.

IV. PROPOSED OBJECTIVE TEST FOR DIFFERENTIATING RECYCLING FROM TREATMENT

A recycling formula should rate the "re-use efficiency" of a purported recycling process. A facility's "re-use efficiency" would be calculated by following five steps.

The first step is to identify those constituents, whether hazardous or not, in the hazardous waste that are replacing constituents in the normal raw material. Unless there are at least some re-usable constituents in the hazardous waste, recycling clearly is not occurring.³¹³ For example, a hazardous waste may contain metals such as zinc, lead, and chromium that are found in, or can substitute for, the normal raw materials used to make a certain product, such as ce-

³⁰⁷ See, e.g., *supra* notes 223-24 and accompanying text.

³⁰⁸ See, e.g., 50 Fed. Reg. 614, 638 (1985).

³⁰⁹ *Id.*

³¹⁰ *Id.*

³¹¹ See 53 Fed. Reg. 519, 522 (1988).

³¹² 40 C.F.R. § 266.100(c)(2) (1992).

³¹³ See, e.g., 50 Fed. Reg. 614, 638 (1985).

ment.³¹⁴ The would-be recycler must first identify these reusable constituents.

The second step is to determine the concentration, or mass, of these common constituents found in both the hazardous waste and the normal raw material feed. For example, a hazardous waste may contain 1000 ppm of the metals zinc, lead, and chromium, all of which are necessary to make a product. The normal raw materials used for one facility, Facility A, may contain 1500 ppm of these metals. For another facility, Facility B, the concentration may be 5,000 ppm.

A ratio is then made between the concentration of re-usable constituents found in the secondary material and those found in the normal raw material feed. This ratio is expressed as x/y , where x equals the concentration, or mass, of the re-usable constituents found in the waste, and y equals the concentration, or mass, of these same constituents found in the raw material. Thus, in the above example, the ratio for Facility A is 1000/1500 and for Facility B, the ratio is 1000/5000. The higher the ratio, the better the candidate a certain hazardous waste is for recycling.

The next step is to identify those hazardous Appendix VIII constituents that are present in the hazardous waste, but not in the raw material, and that are *not* being re-used for their chemical properties. These are the excess or "along-for-the-ride" hazardous constituents. Suppose that the secondary material in the above example contains 1000 ppm of the hazardous constituents arsenic and mercury that are not present in the normal raw material feed. The quantity of the excess hazardous constituents is expressed in the formula as " z ."

The information obtained from following the above steps produces a simple formula: $y/x(z) = n$, where " n " expresses the EPA-established minimum re-use efficiency, or the numeric line separating recycling from treatment. By inverting the secondary material to raw material ratio, the formula rewards a facility that more effectively replaces a raw material with a secondary material and penalizes an operator with a poor substitution rate.

To illustrate, in the example given above, Facility A more effectively replaced its normal raw material than did Facility B. But both have the same quantity of "along-for-the-ride" hazardous constituents (1000 ppm). Assume the EPA has set 2000 as the maximum value of n ; a facility with an " n " rating over 2000 is a treater, not a recycler. For Facility A, the formula yields the following result: 1500/

³¹⁴ This example is hypothetical.

1000 (1000) = 1500. For Facility B, the formula yields this result: $5000/1000 (1000) = 5000$.

Thus, using 2000 as the maximum value for attaining recycling status, Facility A is an exempt recycler, but Facility B is not exempt. Under the formula, as the quantity of "along-for-the-ride" constituents decreases, a facility can be less effective in replacing its normal raw material feed with a secondary material. Conversely, the more effectively a facility replaces its raw material, the more excess constituents it legally can treat.

With regard to setting the standard value "n," the existing RCRA program offers some guidance.³¹⁵ For example, a fifty-percent substitution ratio of hazardous waste to normal raw material is the maximum allowed by boilers and industrial furnaces that desire to retain the exemption from hazardous waste regulation for their process residuals.³¹⁶ If these processes burn more than fifty percent hazardous waste, it is presumed that the character of their residuals will be affected adversely and that the residuals should therefore be managed as hazardous wastes.³¹⁷ Using similar reasoning, it may be presumed that if a would-be recycler substitutes a secondary material containing less than fifty-percent of a necessary chemical contributed by a normal raw material, the resulting product will be negatively affected. Therefore, a suggested value for the ratio x/y is 50/100, or when inverted, the number two. With regard to the value of "z," the BIF rule has already broken ground with the value of 500 ppm excess toxic constituents.³¹⁸ Thus, a suggested maximum value for n is 1000.³¹⁹

An advantage of the formula is that it allows the EPA to balance recycling efficiency against environmental impact. Or, put another way, the formula allows the EPA to encourage recycling by allowing those facilities that do a better job of recovering constituents to have more constituents "along for the ride." Conversely, a facility still can have recycling status even if it does not recycle efficiently, provided the concentration of "along-for-the-ride" constituents is relatively low.

One problem of the formula is that it requires analytical data. It is hard to conceive, however, how objective decisions can be made

³¹⁵ See 40 C.F.R. §§ 266.100(c)(2)(i), 266.122(a) (1992).

³¹⁶ See 40 C.F.R. § 266.112(a) (1992).

³¹⁷ *Id.*

³¹⁸ *Id.* § 266.100(c)(2)(i).

³¹⁹ $y/x \times z = n$; $100/50 \times 500 = 1000$.

on recycling status without analytical data. Under RCRA, a facility managing hazardous waste must perform analyses on incoming wastes to ensure they can be properly managed.³²⁰ No basis exists to exclude a would-be recycler accepting hazardous waste from this requirement. In addition, the formula assumes that a recycling facility will have available specifications on its raw material feed. Under the EPA's qualitative criteria, the absence of such data suggests that wastes are being accepted indiscriminately and, under those conditions, doubts must be raised over how anyone can determine whether treatment, recycling, or something else is occurring.

V. EASE THE PERMITTING PROCEDURES FOR STORAGE FACILITIES ANCILLARY TO RECYCLING PROCESSES

As discussed in Section II above, the recycling process does not require a RCRA permit.³²¹ Storage of hazardous waste prior to recycling, however, does require a RCRA permit.³²² Thus, what a legitimate recycling facility gains by avoiding RCRA permitting for the recycling process, it partially loses by being required to obtain such a permit for the storage of hazardous waste.

The lack of on-site storage forces a facility either to transfer directly hazardous waste from a truck to the recycling process, or to not recycle. "Storage" is the "holding of hazardous waste for a temporary period."³²³ Without a storage permit, any temporary holding of hazardous waste prior to recycling is illegal.³²⁴ The only practical alternative is to transfer hazardous waste directly from the delivery truck into the process.³²⁵ The EPA in the BIF rule for the first time regulates direct transfer,³²⁶ though expressing disapproval over the practice because of the lack of environmental controls.³²⁷

Once a recycling process has been shown to be legitimate, the EPA can further promote the success of this activity by easing the permitting process for storage conducted ancillary to recycling. Expedited permitting procedures, or at least a model for them, are already in place.³²⁸ For example, current regulations allow a per-

³²⁰ *Id.* § 264.13(a)(1).

³²¹ *Id.* § 261.6(c).

³²² *Id.* § 261.6(a).

³²³ *Id.* § 260.10.

³²⁴ 42 U.S.C. § 6928(g) (1988).

³²⁵ *See, e.g.*, 50 Fed. Reg. 7191, 7195 (1985).

³²⁶ 40 C.F.R. § 266.111 (1992).

³²⁷ *See* 56 Fed. Reg. 7134, 7195.40 (1991).

³²⁸ *See, e.g.*, 40 C.F.R. § 270.42, App. I. (1992).

mitted facility to install new storage or treatment units without following the onerous Part B permitting procedures, provided the new units will be used to treat hazardous wastes according to the land disposal restrictions program.³²⁹ Furthermore, the EPA is allowed to authorize for a period of 180 days, with one 180 day extension, the operation of a new storage or treatment unit for the management of restricted hazardous waste.³³⁰

If the expedited procedures are intended to promote treatment, similar procedures can be used to promote an activity higher up on the waste management hierarchy such as recycling. Without some steps to expedite the permitting of ancillary storage units, the EPA may wind up with only a theoretical solution to the problem: recycling will be defined but not enough waste can be handled to make the business a financial success.

VI. CONCLUSION

Hazardous waste recycling is a beneficial activity that should be encouraged. Everyone can agree on this point. Unless an objective measurement is used to distinguish recycling from treatment, however, policy initiatives building behind recycling are unlikely to change the way hazardous waste is managed. Without an objective standard, whether a certain process constitutes recycling is in the eye of the beholder. The current subjective, case-by-case recycling test has helped deter legitimate recycling and thereby frustrated efforts to carry out one of RCRA's central objectives.

Variations among recycling processes will undoubtedly exist, just as they do among incinerators. This does not mean, however, that recycling processes should not have to satisfy some minimum standard of re-use efficiency, just as all incinerators must satisfy the same destruction removal efficiency. Quantifiable criteria will promote recycling of hazardous waste by giving the treatment industry a clear target to direct its design and engineering efforts at. Quantifiable criteria also will arm the EPA with a clear standard to enforce against sham operators.

At the same time it is developing an objective standard for recycling, the EPA should modify its permitting program to ease the procedures for adding fixed storage units at recycling facilities. Stor-

³²⁹ *Id.* § 270.42; App. I, ¶ G.5.c.

³³⁰ *Id.* § 270.42(e).

age at a hazardous waste site is like inventory at a retail store; business will be slow if there is only room to store one item.

With these improvements to the existing program, the EPA will go a long way toward putting into action one of RCRA's central objectives—the conservation of natural resources and the promotion of resource recovery.