Polychlorinated Biphenyls and the "Mega Rule:" Will it Have the Mega-Impact the EPA Desired?

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I. Introduction

Polychlorinated biphenyls ("PCBs") are synthesized compounds, consisting of two benzene rings connected to each other with chlorine molecules attached to the rings.1 Companies first marketed these compounds in electrical equipment, paints and pesticides.2 The chemicals proved to have several valuable characteristics, including non-flammability, stability, low solubility in water, and low electrical conductivity.3

Then, scientists discovered that PCB residues had accumulated in the fat tissues of fish and wildlife.4 In 1976, Congress enacted the Toxic Substances Control Act ("TSCA") in response to the dangers posed by various hazardous chemicals, especially PCBs.5 Congress demanded a total ban on the manufacture, processing and distribution of PCBs by 1979, and authorized the Environmental Protection Agency ("EPA") to promulgate rules regulating PCBs and permitting exceptions to the ban

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* Ms. MacLanahan received her B.S. from the University of Tennessee, Knoxville in 1997 with a major in biology, and her J.D. from the College of William & Mary School of Law in 2000.


4 See WILDAVSKY, supra note 2, at 38. Tests revealed that animals given a diet containing only a small concentration of PCBs developed tumors. See Environmental Defense Fund, Inc. v. EPA, 10 Envtl. L. Rep. 20,972 (D.C. Cir. 1980). Scientists also discovered that aquatic life and birds experienced reproductive failure when exposed. See id. To compound the problem, PCBs accumulated in the animals' tissues, passing on the chemical's effects to predators. See id.

only in circumstances that pose limited risks to humans and the environment.\(^6\)

Industries utilizing PCBs resisted replacing the banned chemicals.\(^7\) In addition to the excessive costs of actually replacing the equipment, the stability and fire-resistant nature of PCBs made the chemical perfect for use in industry.\(^8\) However, the very characteristics that make the chemical so appealing for industrial use contribute to its disastrous effects on the environment.\(^9\) Because PCBs are so stable, they do not degrade in the environment.\(^10\) Thus, even the pollution resulting from the unregulated dumping of PCBs that occurred years ago persists in the environment and is still a major problem today.\(^11\)

Despite these obstacles, the utility industry succeeded in greatly reducing the amount of PCBs in use in their electrical equipment. Although some old equipment is still in use, oils and fluids found in new equipment contain substances that are safer for the environment.\(^12\) However, the trend in bulk solid wastes has not followed the same pattern. Solid wastes and contaminated soils continue to accumulate, while safe disposal alternatives diminish.\(^13\)

In June 1998, the EPA amended the regulations of PCBs and PCB-contaminated equipment; these amended regulations were nicknamed the

\(^6\) See § 2605(e)(2)(B).

The Administrator may by rule authorize the manufacture, processing, distribution in commerce or use (or any combination of such activities) of any polychlorinated biphenyl . . . if the Administrator finds that such manufacture, processing, distribution in commerce, or use (or combination of such activities) will not present an unreasonable risk of injury to health or the environment.

\(^7\) See Industry Sees Steep Costs, Practical Obstacles to Controlling PCBs, ELECTRICAL WEEK, Apr. 19, 1982, at 5 [hereinafter Industry Sees Steep Costs].

\(^8\) In fact, many insurance policies and fire codes required the use of PCBs. See Zielbauer, supra note 1, at A5; Industry Sees Steep Costs, supra note 7.


\(^10\) See id.

\(^11\) See Cairns, supra note 1, at 2.

\(^12\) See Aaron Wagner, Engineered Fluid is Key to Environmentally Friendly Distribution Transformer, ELECTRICAL WORLD, Apr. 1997, at 24 ("Edisol TR transformer fluid biodegrades much more rapidly and completely than conventional transformer oil.").

“Mega Rule.” Due to concerns that the old rules were too complex and outdated, the EPA intended for its new regulations to provide “substantial cost savings to the regulated community while protecting against unreasonable risk of injury” from exposure to PCBs. However, the rules regarding utility equipment and bulk solid waste overlook the recent trends in the industries. Instead of deregulating and encouraging an industry that is moving away from such hazardous materials, the amendments result in stricter regulations on the utility companies. The EPA’s focus should have been the industries and companies producing and disposing of solid waste contaminated with PCBs. In this area, the EPA seemed to turn a deaf ear, actually relaxing the regulation of bulk solid wastes.

This Note will examine the impact of the new rules on various regulated industries. The Note begins with a discussion of the background of PCBs. Part II reviews the old and new regulations under 40 C.F.R. part 761. This section focuses on the rules regarding electrical equipment, such as transformers and capacitors, and bulk solid wastes. Part III also analyzes the probable effects of the rules on industry practices, and compares the practical implications with the EPA’s intended consequences. In Part IV, the Note discusses the potential solutions to the PCB pollution problem. Part V concludes by giving an evaluation of PCB pollution and the possible steps to combat the problem.

II. BACKGROUND OF PCB USE

In the 1930’s, factories began using PCBs in various applications. PCBs are stable, nonconductive, and fire-resistant, making them perfect for use in utility equipment such as transformers and capacitors. However, scientists knew nothing of the chemical’s toxic nature at the time. Thus, companies discarded their PCBs at the factory or dumped

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15 Id.
16 For a description of the trend in disposal needs in the utility and bulk solid industries, see generally EI Study, supra note 13.
18 See id.; The Toxic Effect of PCBs, supra note 9.
them into a local river or landfill without regard to the potential hazards.\textsuperscript{19} In the 1970’s, scientists discovered that PCB’s were unsafe and a suspected carcinogen.\textsuperscript{20} Since then, numerous other studies link the compound to other adverse health effects.\textsuperscript{21} In response to these studies, Congress passed the Toxic Substances and Control Act (“TSCA”) in 1976, which strictly regulates the use, manufacture, and disposal of PCBs.\textsuperscript{22}

The studies regarding PCBs’ toxicity and the implementation of the act drove the electrical industry to modify its equipment. Utility companies responded to the increased cost of disposal of PCB fluid and equipment by removing electrical equipment heavily contaminated with PCBs.\textsuperscript{23} Increased use of environmentally-conscious chemicals in new equipment allowed companies to avoid the burdens of regulated disposal.\textsuperscript{24} Thus, PCB-filled electrical equipment in the utility industry is increasingly uncommon, and the need for disposal methods is on the decline.\textsuperscript{25}

While companies treating and disposing of PCBs handle fewer and fewer transformers and capacitors, the volume of PCB-containing “bulk solid wastes” is on the rise.\textsuperscript{26} Bulk solid waste includes items such as household electrical equipment, automobile scrap, and contaminated soils, such as those dredged from the Hudson River.\textsuperscript{27} Landfills and

\textsuperscript{19} See William J. Angelo, Big Profits, Big Bills, ENGINEERING NEWS-RECORD, Aug. 11, 1997, at 44.

\textsuperscript{20} See id. Concentrations as low as 100 parts per million (ppm) caused tumors in animals. See Environmental Defense Fund, 10 Envtl. L. Rep. at 20,973.

\textsuperscript{21} See id. For instance, studies have linked low concentrations of PCBs to impaired reproductivity in aquatic animals and birds. See id.


\textsuperscript{23} See EPA Commends Utilities for PCB Removal Efforts, ELECTRIC LIGHT & POWER, Feb. 1995, at 18 (reporting that most utilities removed PCB transformers and capacitors from residential areas).

\textsuperscript{24} See Robert B. Moran, Guidelines for Transformer Application Designs, ELECTRICAL CONSTRUCTION & MAINTENANCE, May 1996, at 34. Fire-resistant silicones and hydrocarbons are examples of such environmentally-friendly fluids. See id.

\textsuperscript{25} See Wagner, supra note 12, at 24; see also EI Study, supra note 13.

\textsuperscript{26} See Anderson, supra note 13 (“the PCB treatment and disposal marketplace has changed its focus from treatment of PCB fluids contained in capacitors and transformers to the treatment and disposal of contaminated soils and other bulk solids.”) Id.

incinerators dispose of much of this solid waste. However, space in landfills is disappearing and the safety of incinerators is now being questioned. Thus, finding safe locations for disposal of hazardous compounds is a top priority.

III. OVERVIEW AND IMPACT OF THE PCB RULES

A. Transformers and Capacitors

1. Transformers

Transformers and capacitors are two types of electrical equipment used by many types of companies, from giant utility companies to companies involved in manufacturing. Transformers convert electrical energy from one circuit into the same, higher, or lower voltage. For instance, utility companies use transformers to convert electricity from the power plant into a usable form for customers. Transformers can be divided into two types, categorized by the type of insulation they contain: liquid-filled and dry-types. Dry-type transformers can contain varnish, epoxy, or some type of resin as insulation. On the other hand, liquid-filled transformers have insulation composed of liquid or oil. Because of their greater electric capacity, longer life, and greater efficiency, liquid-
filled transformers are more common.\textsuperscript{36} However, they also pose a greater threat of fire and leaks.\textsuperscript{37}

Under both the old and new regulations, the code generally regulates both dry- and liquid-filled transformers according to the concentration of PCBs found in transformer oil.\textsuperscript{38} For instance, a transformer escapes regulation if it contains less than 50 parts per million (ppm) of PCBs in the fluid of the equipment.\textsuperscript{39} If it contains more than 50 ppm of PCBs, but less than 500 ppm, then the transformer is PCB-contaminated.\textsuperscript{40} If it contains 500 ppm or greater, then the equipment is a PCB-transformer and is highly regulated.\textsuperscript{41}

2. Concentration Determinations

If the machine has a label, deciding which category of regulation the equipment falls under is simple: the concentration announced on the label determines the level of concentration in the equipment.\textsuperscript{42} However, if no label is present, EPA's old policy was to assume that the equipment contained a certain concentration of PCBs.\textsuperscript{43} This policy established the concentration at 500 ppm if there was no label.\textsuperscript{44} However, if the equipment was found to have a manufacture date before July 2, 1979, the EPA assumed it contained more than 50 ppm of PCBs, but less than 500 ppm.

\begin{footnotes}
\item [\textsuperscript{36}] See id.
\item [\textsuperscript{37}] See id. High-energy arcs from the transfer of electricity can occur in the transformer, which can ignite the flammable liquid cooling medium inside a liquid-filled transformer. See id. Dry-filled transformers leak less because, by definition, they do not contain liquids for insulation and are insulated by air and gas. See id.
\item [\textsuperscript{38}] See 40 C.F.R. §§ 761.1(a)(4), 761.3 (1999).
\item [\textsuperscript{39}] See 40 C.F.R. § 761.2(a)(2).
\item [\textsuperscript{40}] See I. Webber, \textit{The Polychlorinated Biphenyl (PCB) Decontamination of Transformers}, \textit{Toxic and Hazardous Wastes} 526, 527 (Gregory D. Boardman ed., 1986).
\item [\textsuperscript{41}] See 40 C.F.R. § 761.3.
\item [\textsuperscript{42}] See \textit{In re} The Celotex Corporation Peoria, Illinois, No. TSCA-V-C-022-88 (E.P.A. Dec. 16, 1991), available in 1991 WL 284619, ("'A transformer must be assumed to be a PCB transformer if . . . the nameplate indicates that the transformer contains PCB dielectric fluid . . . .'" (quoting 44 Fed. Reg. 31,517 (1979))).
\item [\textsuperscript{43}] The assumptions for use were part of EPA's policy in Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions, 44 Fed. Reg. 31,514, 31,517 (1979).
\item [\textsuperscript{44}] See id.
\end{footnotes}
If the equipment’s manufacture date was after July 1979, the transformer presumably contained less than 50 ppm.46

The new modifications do not drastically change these concentration assumptions. The EPA simply codified its “assumption policy” in the new rules, in addition to supplying some clarifications.47 Transformers are categorized according to the date of manufacture, and type of fluid in the equipment. The rules designate mineral-oil filled equipment, manufactured before July 2, 1979, as PCB-contaminated (has a PCB concentration of between 50 ppm and 500 ppm).48 Oil-filled electrical equipment is presumed to contain less than 50 ppm of PCBs if it was manufactured after July 2, 1979 according to the new rule.49 A transformer whose manufacture date and type of dielectric fluid is unknown is presumed to be a PCB-transformer (contains more than 500 ppm of PCBs).50 If the transformer fluid is not mineral oil, but weighs three pounds or more, and was manufactured before July 2, 1979 is a PCB transformer.51

These assumptions only operate while the transformer is in use. When the transformer is ready for disposal or storage, the owner must obtain a specific determination of the concentration of the equipment.52 Of course, labels provide an accurate determination of PCB concentration; however, testing the electrical equipment is necessary in the absence of a label.53 Section 761.60(g) describes the proper testing procedures.54 The dielectric fluid is separated from the total fluid in the equipment and tested.55 Alternatively, “representative samples” of the fluid can determine the actual concentration in the equipment.56 Using either method, the rules absolutely forbid dilution of the fluid to alter the disposal requirements.57

45 See id.
46 See id.
49 See id.
50 See 40 C.F.R. § 761.2(a)(3).
51 See id.
53 See id.
54 See 40 C.F.R. § 761.60(g) (1999).
55 See 40 C.F.R. § 761.60(g)(i).
56 40 C.F.R. § 761.60(g)(ii).
57 See 40 C.F.R. § 761.60(g)(i); see also 40 C.F.R. § 761.1(b)(5).
The amendments modify these procedures only to add that the chemical analysis must be done by gas chromatography.\textsuperscript{58}

Although the assumptions appear to alleviate the initial need to test equipment, the overall burden of testing still exists. Though labels eliminate the need for testing, many transformers lack labels indicating when they were manufactured, or their PCB concentration.\textsuperscript{59} Thus, testing is quite often a prerequisite for disposal. The EPA argued that routine testing could establish the concentration of hazardous chemicals.\textsuperscript{60} However, companies often lose, destroy, or even fail to create appropriate paperwork during routine maintenance that can establish the concentrations.\textsuperscript{61} Additionally, small transformers in some types of equipment are difficult to locate, making testing without destroying the equipment nearly impossible.\textsuperscript{62} Thus, the assumptions do not entirely eliminate the need for testing.

3. Disposal of Transformers

Under the disposal requirements, the old rules provided for disposal of all PCB-laden transformers in an incinerator.\textsuperscript{63} Owners could also choose to dispose of their PCB-transformers in chemical waste landfills, provided that the free-flowing liquid is first drained from the equipment.\textsuperscript{64} Draining a transformer involves draining the equipment, refilling it with a non-PCB solvent and allowing the fluid to soak for 18

\begin{footnotes}
\item[58] See 40 C.F.R. § 761.60(g)(iii). Gas chromatography is a method for separating and identifying a particular chemical or compound in a mixture. A substance is directed through a column and separated by size, charge or other such characteristic. See \textit{Start GC! Gas Chromatography and its Applications} (last modified Mar. 30, 2000) \texttt{<http://members.iworld.net/guesu/gs/a_introduction/whatisgc.html>}.\textsuperscript{65}
\item[59] Only PCB electrical equipment (containing more than 500 ppm) must have markings. See 40 C.F.R. § 761.40(k)(2) (1999); Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,401 (1998). Some owners of electrical equipment removed labels to avoid regulation, and older pieces of equipment often lacked labels. See \textit{Utilities, Manufacturers Decry EPA PCB Proposal}, \textit{THE ENERGY DAILY}, June 15, 1995.\textsuperscript{66}
\item[61] The defendant in \textit{In re Celotex Corp.} is an example. See \textit{In re Celotex Corp.}, No. TSCA-V-C-022-88 (E.P.A. Dec. 16, 1991), \textit{available in} 1991 WL 284619. ("Streeper stated that he conducted monthly inspections but did not maintain any records of those inspections nor had any annual documents been maintained."). Id.\textsuperscript{67}
\item[63] See 40 C.F.R. § 761.60(b)(1)(A) (1996).
\item[64] See 40 C.F.R. § 761.60(b)(1)(B) (1996).
\end{footnotes}
hours, and then re-draining the transformer.\textsuperscript{65} However, most utilities opted to incinerate their PCB-equipment.\textsuperscript{66} As for PCB-contaminated equipment (containing between 50 and 500 ppm of PCBs), companies could dispose of drained PCB-contaminated articles without regulation.\textsuperscript{67}

The new rules still allow disposal of PCB-transformers in an incinerator or in a chemical waste landfill.\textsuperscript{68} The EPA modified those choices for PCB-transformers only slightly. To dispose of a transformer in a chemical waste landfill, the free-flowing liquid now must be removed by pumping or vacuum, instead of simply draining the equipment.\textsuperscript{69} Additionally, the EPA "suggests" repeating the process (a "second removal action") to remove as much liquid as possible.\textsuperscript{70}

The changes for PCB-contaminated equipment are more drastic. The EPA added rules for PCB-contaminated equipment due to comments regarding potentially dangerous methods of disposal.\textsuperscript{71} Reports of equipment prepared for smelting by open burning caused concern about burning that releases hazardous secondary chemicals.\textsuperscript{72} The EPA also received reports of drained transformers used as barbecue grills.\textsuperscript{73} Thus, the EPA completely banned open burning,\textsuperscript{74} and required disposal of drained equipment in municipal solid waste landfills, another type of TSCA-approved facility, or in a scrap metal recovery oven that complies


\textsuperscript{66} See EPA Considering Changing PCB Rules; Seeks Comment on Disposal Options, ELECTRIC UTILITY WEEK, July 1, 1991, at 16 [hereinafter EPA Considering Changing PCB Rules].

\textsuperscript{67} A PCB-contaminated transformer (those containing between 50 and 500 ppm of PCBs) that is properly drained avoids any restrictions on disposal methods. See 4 ENVIRONMENTAL LAW PRACTICE GUIDE: STATE AND FEDERAL LAW, 27-62 (Michael B. Gerrard ed., 1998); 40 C.F.R. § 761.60 (b)(4) (1996). See also EPA Considering Changing PCB Rules, supra note 66, at 16 ("Under existing law, disposal of these carcasses is not regulated"). Id.

\textsuperscript{68} See 40 C.F.R. § 761.60(b)(1)(i)(B) (1999).

\textsuperscript{69} See id.


\textsuperscript{71} See id.

\textsuperscript{72} See id. Burned toxic wastes generate chemicals such as mercury, lead, cadmium, and other such hazardous organic compounds, which pose real dangers to health and the environment. For example, mercury causes neurological damage and blindness. See Kostmayer, supra note 28, at 21.

\textsuperscript{73} See EPA Considering Changing PCB Rules, supra note 66, at 16.

\textsuperscript{74} See 40 C.F.R. § 761.50 (1999); see also Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,402 (1998); Details of the Decommissioning Process, ELECTRICAL WORLD, Mar. 1993, at 56.
with section 761.72. The EPA proposed adding a requirement that all equipment be drained for 48 hours before disposal, but did not finalize the proposal due to comments that extra time will not drain a significantly greater amount of fluid.

The EPA also added the requirement that paperwork for tracking purposes accompany drained equipment upon disposal. Thus, although disposal of drained equipment in a municipal solid waste landfill is possible, many landfills now may not accept the equipment with the added paperwork. Consequently, many companies will choose not to dispose of drained electrical equipment in landfills.

4. Registration Requirements

All owners of PCB transformers must register their equipment, supplying information such as location, number and weight of all transformers located in a building. Under the old system, the local fire department, and in some cases the building owners, received the information about local equipment. This system provided the response personnel who actually control spills and fires with the information they need to properly respond to chemical disasters. However, the EPA expressed concern about the large number of transformers not registered.

75 See 40 C.F.R. §§ 761.60(b)(4), 761.72 (1999); see also Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,402 (1998). The scrap metal recovery option provides for two combustion chambers to control the release of secondary hazardous material caused by burning the PCBs.


78 See id. An EPA official even admitted that landfills are now “unlikely” to accept transformers with the manifests.


80 See 40 C.F.R. § 761.30(a) (1996).

81 See Utilities, Manufacturers Decry EPA PCB Proposal, supra note 59.

Thus, the EPA eliminated the local registration system. Under the new system, the EPA requires all PCB transformers to be registered with the EPA itself. Local fire departments are no longer required to accept information about their PCB transformers. Now, the EPA accumulates the registrations and forwards the information to local response teams.

The EPA rationalized the change to a federal reporting system by asserting that a uniform system provides a centralized and more accurate, complete compilation of data regarding the transformers. The collection of information from all areas enables the EPA to better address the industry’s needs with respect to regulation. A national system could prove valuable for a national or larger scale disaster. The EPA could disseminate the pertinent information much more rapidly to diverse locations affected by a spill than local officials.

However, a national registration system hinders, instead of improves, compliance and safety. One of the EPA’s chief concerns was failure to comply with the regulations. Yet the Agency seems to overlook this concern in promulgating the final rules. The new amendments requiring transformers to be registered with the EPA will not encourage compliance. In fact, the amendment encourages owners to avoid registering equipment. Local officials know the owners and businesses in their area, placing them in a better position to monitor compliance than a federal agency. A national agency has only a limited number of staff to monitor compliance across our vast nation. Likewise, local officials probably will not monitor the companies to ensure compliance, as localities have little incentive to enforce a federal

86 See id. at 35,393.
87 See id.
88 Cf. Glen Bramley & Gavin Smart, Modeling Local Income Distributions in Britain, 30 REGIONAL STUDIES 239 (1996). National information provides a more accurate picture. See id. at 240. Data obtained at the local level sometimes lacks reliable information, is based on limited samples, or is impartial. See id. Thus, with information about contaminated equipment from across the country, the EPA can more accurately decide what type of regulation best suits the situation. See id.
90 See Utilities, Manufacturers Decry EPA PCB Proposal, supra note 59.
registration system. Thus, failure to comply with registration requirements will go unanswered.

Another problem is deterioration in safety. Firefighters will be hesitant to enter a building suspected to contain PCB-contaminated equipment without adequate information. The new system adds a potential for delay of the dissemination of information to those who really need it. This is because of the time required for the EPA to not only collect and sort the information, but also to send it to the individual localities. Considering the large volume of information collected by the EPA and the limited number of staff, delays in sending the appropriate registration information to local fire departments is not only possible, but quite likely.

The cost of the new registration system, according to the EPA’s own estimates, totals over $590 million. Those who have already registered with the local fire department will register again. Owners cannot simply send the forms already collected by the fire departments because the EPA wants additional information. This will undoubtedly result in added paperwork. As a result, companies total operating costs will rise.

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92 See *EPA to Propose Listing Transformer Oil Containing PCBs as a Hazardous Waste, ELECTRICAL UTILITY WEEK*, Nov. 11, 1985, at 3.

93 See id.

94 See Utilities, Manufacturers Decry EPA PCB Proposal, supra note 59.

95 See id. ("Using EPA's own estimate of one technical hour per notification, the cost of such a registration program would be $591,300,000 before any fee levied by the state").


97 See 40 C.F.R. § 761.30(a)(1)(vi)(B) (1999). Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,394 (1998). The owners of transformers can send the registration forms given to the fire officials. See id. at 35,393. Yet the rules specify additional information that was not required under the old rules. See id. at 35,394. Thus, reliance on old paperwork is not an option.
5. Regulation of Capacitors

Capacitors are devices that regulate the flow of electricity, storing electrical energy. They consist of conducting plates, oppositely charged, separated by a dielectric. The PCB rules define capacitors as a “device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric.”

Regulation of capacitors is similar to that of transformers. Like transformers, a capacitor’s PCB concentration determines what level of regulation is necessary. If the equipment has not been tested or has no label, the regulations allow assumptions to be made regarding concentration. The assumption policy regarding capacitors states:

Any person must assume that a capacitor manufactured prior to July 2, 1979, whose PCB concentration is not established contains \( \geq 500 \) ppm PCBs. Any person may assume that a capacitor manufactured after July 2, 1979, is non-PCB (i.e., \(< 50 \) ppm PCBs).

In addition to division according to concentration, the size of the capacitor further divides the disposal and use requirements. For example, the regulations allow for disposal of small capacitors in municipal solid waste landfills, while other PCB capacitors call for more stringent disposal methods.

Disposal options of PCB capacitors are governed by section 761.60(b)(2). A small capacitor can generally be disposed of in a
municipal solid waste landfill. Large capacitors must be discarded in an incinerator or chemical waste landfill. The new rules do not change these disposal options.

B. Solid Wastes

The amount of solid wastes that America produces, which includes wastes such as waxes and plastics, dredged soils, and household wastes, is steadily increasing. In fact, for many cities and locales, the increase in trash is a major problem. For instance, several Connecticut towns cannot properly recycle or dispose of the trash quickly enough to manage the influx. Some disposal facilities even refuse to accept household appliances and other such waste for disposal. The problem is not only space in landfills, but also a concern and lack of other options for the disposal of the wastes containing PCBs.

1. Bulk product wastes

The rules define PCB bulk product wastes as "waste derived from manufactured products containing PCBs in a non-liquid state." The definition limits the waste covered to items such as plastics, varnishes and waxes, automobile shredder fluff, and industrial appliances. Wastes that are regulated under another section of the EPA's PCB rule are excluded from this definition.

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106 See 40 C.F.R. § 761.60(b)(2)(ii) (1999). However, if the capacitor is owned by a manufacturer of capacitors or is a manufacturer of items containing small capacitors, it must be disposed of in an incinerator or chemical waste landfill. See 40 C.F.R. § 761.60(b)(2)(iv) (1999).
109 See El Study, supra note 13. Environmental Information, a research firm specializing in the pollution-control industry, found facilities prosper that are capable of shifting their business to handling bulk solid wastes. See id.
110 See Madden, supra note 28, at 2B.
111 See id. The reason the facilities reject certain waste is concern about liability, dangers, and cost associated with the disposal of PCBs and PCB-contaminated items. See id.
112 See id.
113 40 C.F.R. § 761.3 (1999).
114 See id.
115 See id. The definition of PCB household waste specifically excludes items regulated under 40 C.F.R. §§ 761.60 (a) through (c), 761.61, 761.63, and 761.64 (1999). These sections refer to PCB liquids, articles, and containers; remediation waste (defined in 40
The old rules failed to distinguish bulk product wastes from other PCB waste. The old rules commingled appliances, paints and waxes, etc. with the disposal requirements for transformers and liquids. Automobile shredder waste went to incinerators or a municipal solid waste landfill. The rules required liquids, such as paints and varnishes, to be disposed in a high efficiency boiler, incinerator, or chemical waste landfill, depending on the concentration.

The amendments add section 761.62 to regulate “large volume PCB wastes,” or bulk product waste. Unlike other PCB rules, section 761.62 regulates based on risk of exposure, instead of concentration of PCBs. The new rule expands the disposal options for certain types of bulk product wastes. More choices for disposal of different types of solid wastes now exist in the EPA’s rules.

The first option, entitled “performance-based disposal,” gives an owner or dealer the choice of disposal among a Resource Conservation and Recovery Act (“RCRA”) or hazardous waste landfill, incinerator, or chemical waste landfill. The second option is disposal of bulk solids in a solid waste landfill. This choice is available only if the amount of PCB leached into the soil is very low (less than 10 μg per liter). However, some bulk product wastes, such as some plastics, applied dried paints, varnishes, waxes, and caulking, presumably meet this leachability-

C.F.R. § 761.3 as PCBs from spills or other unauthorized disposal); household wastes; and PCB waste generated during research and development activities.

117 See id.
120 See EPA Amends PCB Management and Disposal Rules, supra note 116.
121 See id.
122 See Greczyn, supra note 118, at 2.
123 See generally 40 C.F.R. § 761.62 (1999). The four categories in the rule are performance-based disposal, disposal in solid waste landfills, risk-based disposal, and disposal as landfill cover or under road beds. See id.
126 See 40 C.F.R. § 761.62(a)(2) (1996). Subsection (a) lists a few other options besides the ones just listed.
127 See 40 C.F.R. § 761.62(b) (1999).
128 See id.
Other types of bulk product waste not listed require either sampling and testing, or disposal in a landfill that separates PCB wastes from the organic wastes.\(^{130}\)

Another option is approval through the EPA according to a risk-based assessment.\(^{131}\) Anyone wishing to dispose of solid wastes in a manner other than those designated in the rules can apply to the EPA for permission.\(^{132}\) The EPA evaluates the application and determines whether the location and manner of the proposed disposal would impose an unreasonable risk to health or the environment.\(^{133}\) The new rules fail to enumerate specific criteria for this evaluation.\(^{134}\) The possible factors the EPA could consider include safety and cost of alternative disposal methods, quality of the soils present and materials used to protect from leakage, and any other factors that might affect the amount of seepage from the waste.\(^{135}\)

The last option is disposal as daily landfill cover or under roadbeds.\(^{136}\) If "wind or other action" is likely to disperse the dumped waste, then the risk of exposure is too great and this method of disposal is not an option.\(^{137}\)

The added options for disposing of automobile shredder waste appear to have a positive effect on the companies that dispose of bulk solid wastes. The amendments enable a disposal company to choose the method most suited to their needs. An owner can give his waste to the department of transportation for disposal under a highway, or attempt to seek approval for a safe alternative form of disposal. These options allow a company to move away from depositing the waste in a landfill and adding to the growing amount of trash.

\(^{129}\) See 40 C.F.R. § 761.62(b)(1)(i) (1999). This paragraph lists the types of waste that can be disposed in a solid waste landfill without testing under this assumption.

\(^{130}\) See 40 C.F.R. § 761.62(b)(1)(ii) and (b)(2) (1999). 40 C.F.R. § 761.62(b)(2) requires the landfill to collect the leachate from the landfill and monitor for the presence of PCBs as an added precaution to ensure PCBs are not released. See also Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,411-412 (1998).

\(^{131}\) See 40 C.F.R. § 761.62(c) (1999).

\(^{132}\) See id.

\(^{133}\) See 40 C.F.R. § 761.62(c) (1999).


\(^{135}\) See id. at 35,411-412.

\(^{136}\) See 40 C.F.R. § 761.62(d) (1999).

\(^{137}\) Id.
Nevertheless, although the number of disposal options appears promising at first glance, the actual feasibility of exercising each of these options is limited. For instance, the procedures for utilizing the risk-based plan of disposal could discourage its use. The EPA must first approve the proposed method before commencement of any disposal activities. Through written application, the agency reviews information needed to determine whether the method poses an unreasonable threat to health or the environment. The rules give little in the way of guidance as to the required content of the application. Lack of specified criteria, combined with a delay of disposal, could discourage companies from exercising this option.

Another potential problem is disposal under roads. Disposal on road beds provides a safe, advantageous option for bulk solid wastes that meet the specified requirements. This form of disposal permitted disposal facilities in other states to handle some of their trash problems. However, the willingness of other transportation departments may not predict the acceptance of PCB-laden articles. Previously, transportation departments accepted waste that was non-hazardous, such as glass or shredded tires. Thus, the department of transportation may fear exposure to its workers and road site from the hazardous waste.

Additionally, transportation departments worry about unstable fill from "chunks and other material" that can cause the roadway to develop "dips and doodles." To prevent a road or bridge from deteriorating, the road crew must properly compact the road bed. Compacting trash to the proper consistency may not be possible, and may expose workers to the

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139 See id.
140 See id. "Each application must contain information indicating that, based on technical, environmental, or waste-specific characteristics or considerations, the proposed sampling, disposal; or storage methods or locations will not pose an unreasonable risk of injury to health or the environment." Id.
141 See Steve Snyder, PennDOT to Pave Way for Recyclers. New Rules Likely to Give Mixed- Glass Market a Lift, THE HARRISBURG PATRIOT, Oct. 5, 1998, at B16, available in 1998 WL 6481720. The Pennsylvania DOT announced that their attempt to use glass as road fill has been successful thus far. See id. The recycling industry also expressed excitement over the new-found outlet for their unwanted trash. See id.
143 George Foster, DOT Staff Concerned Over Bridge Ram; Claims of Faulty Fill Material at First Avenue South, SEATTLE POST-INTELLIGENCER, Jan. 6, 1999, at B1, available in 1999 WL 6579158.
144 See id.
PCBs trapped inside. Consequently, companies may face opposition from construction crews when attempting to discard their waste as road fill.

The EPA was hoping to move away from incinerators as the solution to disposal of PCBs and add flexibility in disposal options. Incinerators have caused concerns other than the problems associated with the lack of space for disposal. One such fear in connection with incinerators is the release of elements and other components that can be dangerous to humans and the environment into the air in smoke. Unless carefully monitored, burning hazardous waste in incinerators can release equally hazardous compounds into the environment. Another problem with incinerators is disposal of the by-products. Ash is generated from the burned trash, which must be discarded in landfills. So the dependence on landfills is not alleviated. Many landfills will not even accept the burned ash for fear that the ash contains hazardous materials that did not disintegrate. Operation of incinerators is also expensive. Incinerators are very large pieces of equipment, requiring a huge quantity of fuel to obtain the high temperatures necessary to burn off the chemicals. Building and maintaining incinerators is very costly, with New York spending an estimated $1 billion for a proposed incinerator. They also destroy valuable recyclable materials, and thus pose a threat to recycling businesses.

The EPA, in attempting to add flexibility in disposal options, hoped to allow companies to dispose their waste in landfills. This is evident from the expansion of the options for disposal for bulk solid wastes, exemption for household wastes, and regulation of drained electrical equipment carcasses. However, encouraging disposal in

146 See Kostmayer, supra note 28.
147 See Disposal of Polychlorinated Biphenyls (PCBs), 63 Fed. Reg. at 35,402 (1998). Burning can convert PCBs to partially degraded products that are just as dangerous. See also Kostmayer, supra note 28, at 21.
148 See id. ("Every 100 tons of incinerated garbage generates about 30 tons of ash"). Id.
149 See id.
151 See Kostmayer, supra note 28, at 21.
152 See id.
153 See Thurin Rollin, supra note 77.
156 See 40 C.F.R. § 761.60(b)(4) (1999).
landfills is not necessarily the answer to easier, safer, and more efficient disposal methods. Mounds of waste across the country continue to grow, and space in landfills vanishes just as quickly.\textsuperscript{157} New landfills are not likely a hot commodity—many localities strongly object to the establishment of new landfill sites.\textsuperscript{158} Thus, disposal facilities soon will be forced to refuse the waste, and companies will be at a loss for a solution to their disposal problems.\textsuperscript{159}

2. Dredged materials

Section 761.60(a)(5) governs disposal of dredged materials containing PCBs in concentrations over 50 ppm.\textsuperscript{160} This subsection provides for disposal of dredged materials in an incinerator, a chemical waste landfill, or according to another, pre-approved plan of disposal.\textsuperscript{161} EPA approves of such a plan by means of an application submitted by the disposer.\textsuperscript{162} The application should contain information about the type of contamination and the plan’s safeguards to health and the environment.\textsuperscript{163}

3. Household Wastes

The old rules contained no exclusion from regulation for household wastes.\textsuperscript{164} Disposal of household wastes fell into the general disposal rules of section 761.60—no specific category for such waste existed.\textsuperscript{165} However, the RCRA, did (and still does) contain a household waste exclusion.\textsuperscript{166} Thus, the EPA amended its rules to include an exemption

\textsuperscript{157} See Madden, supra note 28, at 2B.
\textsuperscript{159} See Congressmen Question Burning of PCBs, U.P.I., Feb. 27, 1991 (“[i]f landfills continue to close at today’s rate, the country will have no place to put its trash by the turn of the century”).
\textsuperscript{162} See 40 C.F.R. § 761.60(e) (1999).
\textsuperscript{165} See 40 C.F.R. § 761.60 (1996).
from regulation of disposal for household wastes in section 761.63 to more closely resemble the RCRA provision.\textsuperscript{167}

The new definition of household waste encompasses waste generated by consumers in their residences, but excludes identical wastes that are generated in a commercial building.\textsuperscript{168} Additionally, the concentration of PCBs must be less than 50 ppm to qualify for the exclusion.\textsuperscript{169} The definition states that "PCB household waste includes unwanted or discarded non-commercial vehicles (prior to shredding), household items, and appliances or appliance parts and wastes generated on the premises of a residence for individuals as a result of routine maintenance."\textsuperscript{170} If the waste meets these requirements, the owner or dealer can send the waste to a municipal solid waste landfill without concern for compliance with the other provisions of the rule.\textsuperscript{171}

The EPA justified the exemption by concluding that the exemption poses no unreasonable risk to the environment.\textsuperscript{172} Most household appliances no longer contain PCB capacitors.\textsuperscript{173} The agency found no serious risk with the exemption because most household waste is bound in a solid matrix, making it unlikely that PCBs could leach into the surrounding area.\textsuperscript{174} Regardless of the new rule, many items listed in the exemption (waste containing PCBs less than 50 ppm, for example) would not be regulated anyway.\textsuperscript{175}


\textsuperscript{168} See 40 C.F.R. § 761.3 (1996).

\textsuperscript{169} See 40 C.F.R. § 761.3 (1996).

\textsuperscript{170} 40 C.F.R. § 761.3 (1996). Routine maintenance can include repainting a residence or small repairs and maintenance, and does not include wastes generated during the building of a home. \textit{Id.}

\textsuperscript{171} 40 C.F.R. § 761.63 states, "PCB household waste, as defined at § 761.3, managed in a facility permitted licensed, or registered by a State to manage municipal or industrial solid waste, or in a facility with an approval to dispose of PCB bulk product waste under § 761.62(c), is not subject to any other requirement of part 761 of this chapter." 40 C.F.R. § 761.3 (1996).


\textsuperscript{173} See \textit{id.} ("[d]ue to their age, many of the PCB-containing items that would be found in consumer households have been disposed of by now.").

\textsuperscript{174} See \textit{id.}

\textsuperscript{175} See, \textit{e.g.,} 40 C.F.R. § 761.62 (1999) (providing for disposal of bulk product waste, which is defined as waste with a concentration greater than 50 ppm).
Today, many people disregard the disposal requirements and simply "throw [their] appliances into ditches and ravines." Unfortunately, the exemption fails to encourage safer and more aesthetic modes of disposal. The average citizen knows nothing of the rules regarding their appliances, so reasoning that people throw their waste anywhere they can to avoid harsh regulations is a safe assumption. Homeowners probably leave their appliances in the environment out of sheer laziness. This new exemption is not necessarily a push toward increasing proper disposal.

IV. POSSIBLE SOLUTIONS AND CORRECTIONS

The call for reform in environmental law is loud and gaining momentum. The environmental rules are complex and often lead to loopholes that make the rules ineffective. The cost of complying with environmental regulations is quite high. Environmental laws also face criticism from environmentalists saying that threats to health and the environment persist despite the efforts of agencies. Thus, reform measures usually focus on ideas to make compliance easier and cheaper.

The characteristics of PCBs especially demand a change in the regulatory scheme governing the chemicals. Due to their stable nature, PCBs disposed years ago still persist in the environment today. For example, General Electric now faces the economic consequences from the dumping of toxic chemicals into the Hudson River that occurred years ago. Though the company cut the use of PCBs in its equipment and

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178 See id. at 375.
179 See id.
181 See Angelo, supra note 19, at 44.
manufacturing processes, the hazardous effects of decades of dumping remain in the river.\textsuperscript{182}

Efforts to clean the river are not cheap.\textsuperscript{183} Dredging can cost hundreds of millions of dollars to filter the river sediment and dispose of the contaminated soil.\textsuperscript{184} Thus, to prevent the results of exposure to PCBs and the tremendous cost of cleanup, pollution needs to be averted before becoming a problem at a later time.

A. \textit{Command and Control}

The current mode of enforcement in the environmental law context is the "command and control" model.\textsuperscript{185} The legislature establishes a directive to reduce carbon dioxide emissions, and the agency creates a standard for attainment of the directive.\textsuperscript{186} Command and control methodologies set performance standards that are based on the best available technologies.\textsuperscript{187} The analysis of available technologies to determine the best possible method involves "assessment of available or foreseeable technologies" and "cost considerations" for implementation.\textsuperscript{188}

Command and control regulations successfully achieved many of the gains in combating pollution realized thus far.\textsuperscript{189} For example, this

\begin{footnotesize}
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\item See id. General Electric recently conducted a study of the concentrations of PCBs in and near the Hudson. Scientists found one spot on the river to contain 7,550 ppm of PCBs at the bank and 1,550 ppm in the sediment.
\item See id.; see also Larry Sandler and Tom Vanden Brook, \textit{Cleaning Fox River to Cost Millions, DNR Says Project Could Cost Up to $720.9 Million and Take Up to 10 Years; Some Environmentalists Say Plan is Not Enough}, MILWAUKEE J. SENTINEL, Feb. 26, 1999, at 1, available in 1999 WL 7662882. The estimate for the cost of the Fox River cleanup is between $143.2 million and $720.9 million.
\item See Mark A. Stach, \textit{The Gradual Reform of Environmental Law in the Twenty First Century: Opportunities Within a Familiar Framework}, 22 J. CORP. L. 621 (1997); Michael P. Vandenbergh, \textit{An Alternative to Ready, Fire, Aim: A New Framework to Link Environmental Targets in Environmental Law}, 85 KY. L. J. 803, 835 (Summer 1996/1997). Congress announced the high goals to be achieved, then left the agencies to make the hard choices on how to implement the goals. This allowed Congress to avoid the brunt of the criticism regarding the huge costs associated with the attainment of those goals.
\item See Vandenbergh, \textit{supra} note 186, at 807.
\item Id. at 834.
\item See Davis, et al., \textit{supra} note 185, at 11.
\end{itemize}
\end{footnotesize}
method was very successful in several cities in reducing air pollution under the Clean Air Act. Sulfur dioxide emissions decreased ten tons in twenty years and carbon monoxide emissions were cut in half.

However, command and control methodologies result in piecemeal regulation, and transferring problems with pollution from one location or source to another. Many pollution problems remain unresolved. The costs and inefficiencies resulting in such a system are often high. Command and control regulation also has a tendency to "freeze technology." These methodologies overlook consideration of the entire picture and overall impact. This is especially true for long-term impacts on the environment, such as those caused by the PCBs already polluting the environment from years of uncontrolled disposal.

B. The Netherlands Solution

The Netherlands has implemented one possible solution. In the Dutch system, the first step is to determine a national goal. Then, the overall goal must translate to more specific standards necessary to achieve the national goals. Finally, dividing the reductions and regulations among the industries involved accomplishes an even distribution of responsibility. For example, the government decides that pollution on a river needs to be abated. The desired goal is waters suitable for fishing, swimming and other recreation. Data and studies indicate that attaining

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190 See Vandenbergh, supra note 186, at 815-816.
191 See id. at n.45.
192 See John P. Cahill, Proposals for Environmental Regulatory Reform Colloquim: Regulatory Reform in the Department of Environmental Conservation, 15 PACE ENVTLL. L.R. 67, 68-69 (1997). The problem with the Hudson River and regulation of the transformers and bulk solid wastes is illustrative. The pollution caused by the PCBs is simply moved from the river to the landfills. See The Hudson's Heritage, supra note 27, at B4.
193 See id.
194 See Vandenbergh, supra note 186, at 842; Stach, supra note 186.
195 See Vandenbergh, supra note 186, at 842-843.
196 See id. at 846-847.
197 See id. at 818. This article categorizes these types of pollution as second generation problems. Second generation problems "arise from multiple, diffuse sources" and "involve long-term impacts dispersed across regions." Id.
198 See id. at 867.
199 See id. at 871-72.
200 See id. at 873.
201 See Vandenbergh, supra note 186, at 876.
that goal will require a 75% reduction in chemical emissions by the various companies located along the river. The government thus divides the proposed regulation equally among all the companies. Those whose contribution to the pollution was greater receive more of the burden.

The amendments of the PCB rules can be further altered by the Netherlands's method of regulation to more efficiently control the disposal of PCBs. The problems associated with PCBs are easy to define. PCBs are toxic and a known carcinogen, which are hazardous to people, wildlife, and the environment. Additionally, pre-existing pollution remains and is a danger that needs to be alleviated and properly disposed. Though accurate and reliable data can be an obstacle to proper decisions, PCBs' effects on the environment have been thoroughly studied and understood.202

The standards that the amendments apply to the regulated industries fail to attain adequately the desired goal or solve the problems the industries face. The current amendments discourage compliance and largely rely on unwarranted risk perceptions. Also, the burden of regulation seems to fall unequally among the various industries. Thus, the utility industry shoulders costs disproportionate to their contribution to the PCB pollution. Thus, some of the disposal options can be altered to better reflect the industries' various needs.

C. Overall Solutions for the Utility Industry

The utility industry responded very positively to the EPA's demands to reduce the amount of PCBs in the environment.203 Utility companies drastically reduced the number of PCB-laden transformers and capacitors in use.204 Despite these efforts, the new regulations for drained equipment and registration actually add burdens to the industry, rather than reflect the improvements in the industry.

To more accurately reflect the utility industry's current situation, the EPA should relax the overall regulations for these companies. However, other types of businesses have failed to make similar improvements and still use PCBs in their equipment. It is these businesses that are responsible for the lack of compliance with the existing PCB

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202 In fact, a more recent study revealed that PCBs may not be as toxic as previously believed. See Utilities Join Other Industries in Urging EPA to Relax PCB Rules, ELECTRICAL UTILITY WEEK, Sept. 23, 1991, at 15.

203 See EPA Commends Utilities for PCB Removal Efforts, supra note 23, at 18.

204 See id.
rules,\textsuperscript{205} and thus for the pollution problems. An appropriate solution, to more evenly distribute the responsibility for keeping our nation free from PCB contamination, is regulation according to industry, instead of by product.\textsuperscript{206}

1. Assumptions for Electrical Equipment

As a potential course of action, the EPA could extend the use assumptions for PCB concentrations to cover more ground. Though the assumptions are beneficial for the period during which the transformer is in use, they could also operate for the storage and disposal of equipment as well. Allowing the use of the assumptions during disposal would alleviate the need for workers to test equipment before storage or disposal, further minimizing the risk of exposure to the hazardous internal chemicals. The assumptions adequately reflect the current composition of transformers, so the risk of a PCB transformer evading the regulations is minimal. If the assumptions provide adequate safety from the risk of exposure to PCB's for humans and the environment encountered through use of the equipment, then the assumptions should also be safe for storage and disposal.

2. Registration of Transformers

Local governments, instead of an isolated federal system, can more efficiently and effectively handle the registration of transformers. Local officials have the resources, the need for the information, and the desire to ensure greater compliance with registration requirements in their area.

Though the EPA has a valid concern about those who have not properly registered their equipment, a national registration system is not the answer to registration problems. The EPA would achieve more accurate data through methods of enforcement at a local level. Local officials are more numerous and familiar with the area, putting them in a

\textsuperscript{205} See Utilities, Manufacturers Decry EPA PCB Proposal, supra note 59. A spokesman for the electric utilities stated, "they [the EPA] were concerned that some owners of equipment were removing the nameplates in order to avoid compliance with the requirements. Certainly the utilities weren't doing that." Id.

\textsuperscript{206} See Gary A. Davis et al., supra note 185. This suggestion is a portion of the goal of extended product responsibility, which advocates regulation of a product at each stage of production. See id.
better position to monitor compliance. Because local, not federal, emergency teams generally respond to spills and other disasters, local fire departments have a greater need for the information about transformers in the area that could pose dangers to the response teams, residents, and the environment.

Other federal agencies recognize the need to shift the responsibilities of enforcement to local officials. For example, many shippers of hazardous substances fail to comply with the registration requirements for transporting these materials. The Department of Transportation, frustrated with the lack of compliance, intends to compel its local/state personnel to enforce the registration requirements. A similar scenario of non-compliance is even more likely with transformers, as equipment often remains hidden in a building and out of view.

Because the government mandate employed in the previous system failed to encourage proper registration, a voluntary incentive would assist in achieving greater compliance. Examples of such incentives include subsidies and tax breaks to those properly registered. The EPA can also request the information from individual localities to compile a national list of data regarding location, description, and other relevant information about electrical equipment that the agency might find important.

3. Regulation of Drained Transformers

The courts and the EPA addressed the dangers posed to the environment by drained transformers in 1980. In Environmental Defense Fund, the court supported the EPA’s determination that allowing

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207 See Utilities, Manufacturers Decry EPA PCB Proposal, supra note 59.
208 Some response teams are so concerned about potential exposure to PCBs that it has led to doubts about the team’s willingness to enter buildings. See EPA to Propose Listing Transformer Oil Containing PCBs as Hazardous Waste, ELECTRIC UTILITY WEEK, Nov. 11, 1985, at 1.
210 See id.
211 See Gary A. Davis, et al., supra note 185, at 13; Kenneth J. Pokalsky, Air and Water Pollution Control: Perspective of the Regulated Community, 7 ALB. L.J. SCI. & TECH. 31, 35 (1996)(“develop programs which promote and assist compliance; not just ones which relate to enforcement”).
212 See Davis, et al., supra note 185, at 12.
drained PCB-contaminated transformers to avoid regulation posed no unreasonable risk to health or the environment.\textsuperscript{214} The court stated, "[b]ecause they contain lower concentrations of PCBs, PCB-contaminated transformers present correspondingly smaller risks associated with exposure."\textsuperscript{215} In defending this position, the EPA hoped to encourage owners of equipment to convert their transformers to a lower concentration of PCBs.\textsuperscript{216} The result was a decrease in the number of electrical equipment containing PCBs.\textsuperscript{217} Now the EPA has changed its tune.

The new regulation of drained transformers is an example of the problems that can arise when the public's perception of risk is favored by the EPA. The EPA removed the exemption from the disposal requirements for drained PCB-contaminated transformers based on reports of improper and potentially dangerous use of drained equipment.\textsuperscript{218} However, those reports represent only isolated incidents of noncompliance.\textsuperscript{219} The EPA appears to have acted based on a risk that poses less danger than that perceived by the public. Therefore, the regulation of drained PCB-contaminated electrical equipment is unnecessary and imposes additional cost to the utility industry not justified by the actual risk to the environment.

The proper course for the PCB regulations of drained equipment is relaxation, at least back to the old rules. Tests show that 95 to 99\% of the oil in transformers is removed during the first hour of the draining process.\textsuperscript{220} Combined with the fact that reports of improper use of drained transformers depicts only a few incidents, the additional regulations impose unnecessary costs associated with only a little extra protection to the environment. A more appropriate solution is deregulation of drained PCB-transformers. On the slight chance the EPA discovers that a 95 to 99\% removal efficiency is unreasonable, the EPA could require, instead of

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\item See Environmental Defense Fund, 10 Envtl. L. Rep. at 20978-20979.
\item See Environmental Defense Fund, 10 Envtl. L. Rep. at 20978.
\item See Environmental Defense Fund, 10 Envtl. L. Rep. at 20978-20979 ("The Administrator has sought to encourage users to convert to PCB-contaminated transformers by draining their PCB transformers and refilling them with some other dielectric fluid.") \textit{Id.}
\item See EPA Commends Utilities for PCB Removal Efforts, supra note 23.
\item See id.
\item See id.
\end{enumerate}
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simply suggesting, a “second removal action,” such as pumping or vacuuming to remove any residual oils.\textsuperscript{221}

Additionally, insisting on a tracking manifest to accompany the equipment to a solid waste landfill only adds an obstacle to disposal. The risk of landfill operators rejecting the equipment increases when faced with burdensome paperwork and increased liability from the hazardous equipment. To justify the new rule, the EPA announced that the paperwork requirement aids the agency in tracking the locations of transformer carcasses.\textsuperscript{222} However, examination of the company’s records could provide an equally effective method to locate disposed transformers. In fact, the PCB rules currently require companies to keep records and maintenance histories of transformers that have been disposed for at least three years.\textsuperscript{223} Thus, without a good justification for the burden, the EPA and the industry would be best served by eliminating the paperwork requirement.

The dangers of unregulated burning of transformers justify the complete ban on open burning.\textsuperscript{224} Open burning poses threats to the environment and human health too great to ignore. The EPA already acknowledges the hazards associated with the burning of toxic chemicals.\textsuperscript{225} In the regulation of emissions from the combustion of hazardous waste, the standards require a 99.99% destruction of organic hazardous wastes during burning.\textsuperscript{226}

The EPA’s concern with uncontrolled combustion of PCBs is the release of incomplete PCBs and other chlorinated compounds that can result from burning.\textsuperscript{227} Some of these compounds are just as dangerous as the PCBs to be destroyed.\textsuperscript{228} Thus, to help ensure that the air emission standards are met, the explicit prohibition on openly burning transformers contaminated with PCBs is certainly appropriate.

\textsuperscript{221} See id. The EPA acknowledged that pumping or vacuuming could be an efficient way to remove the excess oil that could be trapped in the inner workings of drained transformers. See id.
\textsuperscript{222} See Thurin Rollin, , supra note 77, at D5.
\textsuperscript{223} See 40 C.F.R. § 761.30(a)(1)(xii) (1999).
\textsuperscript{224} For the rule against open burning, see 40 C.F.R. § 761.50(a) (1996) (“No person may open burn PCBs.”) Id.
\textsuperscript{225} See 40 C.F.R. § 266.100 (1999). This provision is part of the regulatory scheme under the Clean Air Act.
\textsuperscript{226} See 40 C.F.R. § 266.104 (1999).
\textsuperscript{228} See Kostmayer, supra note 28, at 21.
4. Scrap Metal Recovery Ovens

The new regulations may result in the loss of valuable, recyclable materials. However, some businesses that deal with scrap metals abused the freedom provided under the old regime, which justifies the rules. Confusion regarding the proper requirements to follow and the desire to "cut corners" prompted many dealers to disregard the regulations. Thus, dealers mishandled hazardous wastes, creating potential dangers to humans, the environment, and the recycling business as a whole. Therefore, the hope is that the regulation of scrap metal recovery ovens would balance the unreasonable risks created by those involved in the scrapping process. The new regulations should do just that.

5. Household Waste

The added exemption for household wastes is a safe, efficient update of the disposal rules. The amendment imposes only a reasonable risk of exposure because most of the waste included would be unregulated even without the exemption. It saves costs to individual consumers because they are no longer required to arrange for collection by a special disposal facility. The exemption will also benefit the scrapping and recycling industry. By easing the burden on people to properly dispose of their appliances, such appliances are more readily available to scrappers. Household goods and appliances such as refrigerators and furnaces contain a good deal of valuable materials that could then more easily be reacquired.

However, if the EPA wants to alleviate the problem of abandoned household appliances in the environment, the agency should consider implementing a plan similar to the one established in New York. The New York Power Authority bought refrigerators from residents and commercial

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229 See Perry, supra note 176, at 1.
230 See id. The businesses that do not follow the rules threaten to put the law-abiding companies out of business because they can offer lower prices for their services. See id.
231 See Perry, supra note 176, at 1. Of course, relaxing the disposal requirements for household goods only places the appliances in the hands of the scrap dealers and removes the appliances from the ravines. The problem of assuring that scrap dealers properly recycle and discard the waste persists. See id.
businesses. The Power Authority removed the dangerous parts, including any PCB-contaminated sections of the refrigerators. The plan achieved a high efficiency rate: only 1% of the original appliance ended up in a landfill, and with a 12% participation, the city saved 1.5 million kwh a year. It also saves the scrap dealers from the chore of handling the PCBs, reducing the risk of improper disposal by dealers. The EPA could attain a similar result with a nation-wide plan, establishing a system to allow states to implement their own buy-back solution.

The EPA could take an additional step. The exemption applies only to waste generated by individuals in their residences. The new rule excludes commercially-produced waste; such waste falls into the regulatory categories for liquids or articles. This oversight makes little sense, as much of the “household wastes” now exempted originate in a commercial setting, but do not differ from the waste of a typical residence. Therefore, it is more logical to categorize wastes for the exemption by type instead of source.

6. Disposal Methods for General Bulk Solid Waste

The demonstration of disposal alternatives for the disposal of bulk solid wastes is an example of how the current regulations can “freeze technology.” Many landfills are at maximum capacity and trash piles continue to grow, threatening to expand past their bounds. Therefore,

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234 See id.
235 See id.
236 See id.
238 See id.
239 See Business & Technology NCPA: Regulators Should Not Consider Commercial Latex Paint as Hazardous, HAZARDOUS WASTE NEWS, Sept. 22, 1997, available in 1997 WL 10931579(citing a National Paint and Coatings Association (NCPA) study saying that commercial paints should be excluded from RCRA hazardous waste categorization, as household wastes).
240 See Madden, supra note 28, at B2.
the EPA should encourage alternate forms of disposal for bulk solid wastes.\textsuperscript{241}

Various companies and research facilities are currently in assorted stages of development for promising new methods of disposal that pose little risk to the environment and could provide a cheaper means of cleaning up pollution. For example, NASA created a system called plasma arch.\textsuperscript{242} The system breaks down hazardous chemicals into their harmless, basic components by exposure to intense heat.\textsuperscript{243} Additionally, scientists in Spain created a cheaper alternative to the incinerator, called catalytic combustion.\textsuperscript{244} For dredging, thermal stripping is a possible alternative that alleviates the need to landfill contaminated sediments.\textsuperscript{245} After the sediment is dredged from the river, thermal heating removes chemicals from the sediment.\textsuperscript{246} The clean sediment is then returned to the river.\textsuperscript{247}

Though these forms of disposal provide more efficient, safer alternatives than currently used methods, the rules do not necessarily encourage their use. For instance, to choose a plan of disposal for dredged materials other than the techniques specified in the rules, the owner must submit a written application to the EPA containing an explanation why the stated methods are not adequate.\textsuperscript{248} This hardly encourages development, improvement, and use of new alternatives to dispose of dredged materials. A showing that incineration or chemical landfills are inappropriate and unreasonable is not always possible. If the new method is simply more convenient and cheaper to the owner, would this qualify as establishing that the other plans are unreasonable and inappropriate? A simple description of the new technology and its benefits and risks adequately

\textsuperscript{241} Two Congressmen sent a letter to the EPA, encouraging the Agency to consider implementing the recent advances in disposal technology as an alternative to current disposal methods. See Congressmen Question Burning of PCBs, supra note 159.


\textsuperscript{243} See id.

\textsuperscript{244} See Incineration: Catalytic Combustion of Biphenyls, supra note 150.


\textsuperscript{246} See id.

\textsuperscript{247} See id.

\textsuperscript{248} See 40 C.F.R. § 761.60(a)(5)(iii) (1999).
provides the EPA with information to protect the environment from unreasonable exposure during disposal.\textsuperscript{249}

The four options for disposal of bulk solid wastes present a similar situation to the option to apply for approval for an alternative mode of disposal.\textsuperscript{250} This subsection does not establish definite criteria or information for obtaining approval, leaving applicants unclear on the information they need to provide.\textsuperscript{251} Though flexibility in allowing the EPA to make its decisions on applications for such disposal is important, general guidelines would assist applicants in composing an application, thus expediting the process.

V. CONCLUSION

The “Mega Rule” could impose harsh consequences on several regulated industries. New regulations of drained electrical equipment and scrap metal recovery ovens will probably result in a loss of recycled materials and an increase in costs to scrap dealers and the utility industry. On the other hand, businesses that handle bulk solid wastes receive a break in the regulations from the household exemption, and the increased options for disposal methods.

These regulatory consequences do not follow the current trend in waste disposal needs. When the EPA imposed huge costs and disposal burdens on the utility industry, companies turned to safer modes of operation and began eliminating their PCB equipment. However, the amount of trash our nation produces continues to surge. With little space in landfills remaining, other options need to be explored. Without alternatives to disposal, landfills will soon refuse to accept waste, encouraging improper and haphazard disposal, and threatening our already damaged environment.

The current command and control methodologies are no longer feasible to correct the problems with PCB disposal. Trash needs to be stopped before reaching the landfills. The Netherlands made great headway in dealing with its growing waste by implementing regulation that controlled the production process at each step of development. This method encouraged recycling and more efficient manufacturing processes,

\textsuperscript{249} See \textit{id.} This section already requires information about the “protection to health and the environment” in the application. \textit{Id.}

\textsuperscript{250} See 40 C.F.R. § 761.62(c).

\textsuperscript{251} See \textit{id.}
keeping many of the byproducts from ever entering a landfill. The United States could encourage a similar program and achieve similar results. By encouraging recycling and alternative modes of disposal, the rules could diminish the amount of PCBs that find their way into the environment.