

Boston College Environmental Affairs Law Review

Volume 28 | Issue 2

Article 2

1-1-2004

Control of Hazardous Air Pollution

Arnold W. Reitze

Randy Lowell

Follow this and additional works at: <https://lawdigitalcommons.bc.edu/ealr>



Part of the [Environmental Law Commons](#)

Recommended Citation

Arnold W. Reitze & Randy Lowell, *Control of Hazardous Air Pollution*, 28 B.C. Env'tl. Aff. L. Rev. 229 (2004), <https://lawdigitalcommons.bc.edu/ealr/vol28/iss2/2>

This Article is brought to you for free and open access by the Law Journals at Digital Commons @ Boston College Law School. It has been accepted for inclusion in Boston College Environmental Affairs Law Review by an authorized editor of Digital Commons @ Boston College Law School. For more information, please contact abraham.bauer@bc.edu.

CONTROL OF HAZARDOUS AIR POLLUTION

ARNOLD W. REITZE, JR.*

RANDY LOWELL, ESQ.**

Abstract: This article begins with an overview of ecosystem and human health impacts of hazardous air pollutants (HAPs) and is followed by a synopsis of the early efforts to control HAPs that were based on common law and the Clean Air Act (CAA) prior to 1990. In the CAA Amendments of 1990 Congress added a twenty-fold expansion of the statutory provisions aimed at the control of HAPs. In the decade that followed the Environmental Protection Agency (EPA) has generated thousands of pages of rules and guidance to implement the 1990 statutory changes. This article provides an analysis of these requirements and the program created to implement them. Several categories of HAPs are the subject of a more in depth analysis including asbestos, synthetic organic chemicals, and emissions from incineration. The article then examines the requirements aimed at preventing accidental catastrophic environmental releases of HAPs and the risk management plans that must be developed by about 70,000 facilities that handle regulated chemicals. The emergency planning and reporting requirements imposed in 1986 by the Emergency Planning and Community Right to Know Act (EPCRA) also are addressed.

I. INTRODUCTION

A. *The Hazardous Air Pollution Problem*

In 1984, the Union Carbide toxic chemical release in Bhopal, India that killed about two thousand people focused attention on

* © Arnold W. Reitze, Jr. 2000. J.B. and Maurice C. Shapiro Professor of Environmental Law, George Washington University Law School; J.D. 1962, Rutgers University; M.P.H. 1985, Johns Hopkins University; B.A. 1960, Fairleigh Dickinson University, Special Consulting Counsel with the law firm of LeBoeuf, Lamb, Greene & MacRae, Washington, D.C.

** Randy Lowell was the Randolph C. Shaw Fellow while earning an LL.M. in Environmental Law at George Washington University. He received his J.D. and M.P.A. degrees from the University of South Carolina and a B.A. from the College of Charleston. He is an associate with the Columbia, South Carolina office of Willoughby & Hoefler, P.A.

hazardous pollutants, particularly airborne hazardous pollutants.¹ A subsequent chemical release from a West Virginia facility drew attention to the problem here in the United States.² Congress responded by introducing a toxics reporting requirement in 1986 and increased implementation and regulation of hazardous air pollutants (HAPs) under the Clean Air Act (CAA) in the 1990 Amendments.³

In 1986, Title III of the Superfund Amendments and Reauthorization Act (SARA) created the free-standing Emergency Planning and Community Right-to-Know Act (EPCRA).⁴ Sections 11021–11023 of EPCRA mandate reporting to the Environmental Protection Agency (EPA) on the amount of toxic substances released into the air each year by industry. This toxic release inventory (TRI) must include releases of more than 320 chemicals included in the Committee Print Number 99–169 of the Senate Committee on Environment and Public Works.⁵ The statute also provides for EPA's Administrator to add chemicals to the list, and any person may petition the Administrator to add or delete chemicals.⁶ Since July 1, 1988, industries with standard industrial classification (SIC) codes of 20 to 39 that have ten or more full time employees and that handle regulated chemicals above threshold amounts have to meet the annual TRI reporting requirements.⁷ The threshold amount is 25,000 lbs/year for 1989 and subsequent years.⁸

The first year of submissions showed HAPs were released in amounts estimated at 2.18 billion lbs/year.⁹ This did not include emissions from federal facilities or from facilities exempted because of their small size or less than threshold use of chemicals.¹⁰ It also did

¹ See List of Regulated Substances and Thresholds for Accidental Release Prevention: Requirements for Petitions Under Section 112(r) of the CAA as Amended, 59 Fed. Reg. 4478, 4478 (Jan. 31, 1994) (to be codified at 40 C.F.R. pt. 68).

² See *id.*

³ Pub. L. No. 101-549, 104 Stat. 2399 (1990) (codified in various parts of 42 U.S.C. §§ 7401–7671 (q)).

⁴ *Id.* §§ 301–330, 42 U.S.C. §§ 11001–11050 (1994).

⁵ EPCRA § 313(c).

⁶ *Id.* § 313(c)-(e). See generally *Fertilizer Inst. v. Browner*, 163 F.3d 774 (3d Cir. 1998).

⁷ EPCRA § 313(a).

⁸ *Id.* § 313(f) (1) (B) (iii). See generally Arnold W. Reitze, Jr. & Steven D. Schell, *Reporting Requirements for Non-Routine Hazardous Pollutant Releases Under Federal Environmental Laws*, 5 ENVTL. LAW. 1 (1998).

⁹ COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY THE WORLD WIDE WEB 308, tbl. 8.6 (1997).

¹⁰ Federal facilities were made subject to EPCRA's TRI reporting requirements by Executive Order. See Exec. Order No. 12,856, 58 Fed. Reg. 41,981, 41,981 (Aug. 3, 1993).

not include emissions to water or land that indirectly become air pollutants (e.g., evaporation). Nor did it include the release of hazardous materials not on the EPA list.¹¹ The size of this toxic chemical emissions inventory had a significant effect on the public perception of the hazardous chemical problem and helped spur Congress to regulate these emissions.¹²

In 1997, 21,490 facilities filed 61,123 Form Rs¹³ as required by EPCRA.¹⁴ According to the TRI data, the total releases to land, air, and water were 2.58 billion pounds of the 643 chemicals subject to EPCRA reporting requirements.¹⁵ Air emissions comprised 62.9% of all on-site toxic releases.¹⁶ This reporting did not include releases from electric utilities, motor vehicles, or from emission sources with less than ten employees.¹⁷ The top states for total releases in 1997 were Texas with 261.7 million pounds, Louisiana with 186 million pounds, and Ohio with 158.7 million pounds.¹⁸ The hazardous chemical most released to the air in 1997 was methanol with air emissions of 194.4 million pounds.¹⁹ Ammonia ranked second with air releases of 156.1 million pounds.²⁰ Air emissions represented over three-fourths of the total on-site and off-site releases for twelve of the top twenty chemicals.²¹ In addition to methanol and ammonia, these were toluene, xylene, n-hexane, chlorine, hydrochloric acid, methyl ethyl ketone, carbon disulfide, dichloromethane, styrene, and glycol ethers.²² Over 50,000 chemicals are in commerce in the United States,

¹¹ See generally SUBCOMM. ON HEALTH AND THE ENV'T COMM. ON ENERGY AND COMMERCE, S. Rep. No. 101-228, THE NATIONAL TOXIC RELEASE INVENTORY, (1989); see generally REPORT OF THE COMM. ON ENV'T AND PUB. WORKS, S. Rep. No. 101-228, CAA AMENDMENTS OF 1989 TO ACCOMPANY S. 1630, 127-47 (1989).

¹² See generally ARNOLD W. REITZE, JR., AIR POLLUTION LAW (1995).

¹³ U.S. EPA, 1997 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE REPORT 2-11 (1997), available at <http://www.epa.gov/triinter/tri97/pdr/index.htm> (last visited Aug. 22, 2000) [hereinafter TRI].

¹⁴ EPCRA § 313, 42 U.S.C. § 11023(a), (g) (1994).

¹⁵ 1995 TRI Data Show Waste Increase While Total Emission Figures Decline, DAILY ENV'T REP. (BNA) A-11 (May 21, 1997).

¹⁶ TRI, *supra* note 13, at 2-11.

¹⁷ *Id.* at 1-9. Since 1997, facilities that are required to file TRI reports but that have reportable amounts of less than five hundred pounds and who do not manufacture, process, or otherwise use more than one million pounds of a chemical need only file a Form A certification that does not require reporting of releases. *Id.*

¹⁸ *Id.* at 2-18, tbl. 2-4.

¹⁹ *Id.* at 2-27, tbl. 2-9.

²⁰ *Id.*

²¹ *Id.* at 2-27.

²² TRI, *supra* note 13, at 2-27.

and approximately 14,000 of those are releases in quantities over 10,000 lbs/year.²³ Fewer than 1000 of these chemicals have been properly evaluated for toxicity because of lack of resources by the regulating government agencies.²⁴

EPA used three approaches in the early 1990s to obtain reductions in toxic releases. They were: (1) the Toxic Release Inventory required by EPCRA; (2) the voluntary 33/50 program to encourage a 33% reduction of releases of seventeen toxic chemicals by the end of 1992 and a 50% reduction by the end of 1995;²⁵ and (3) the Early Reduction Program, under CAA section 112, to reward industry with a six-year extension for meeting CAA emission standards if the industry made a 90 to 95% reduction in toxic air emissions before the maximum achievable control technology (MACT) standards are proposed.²⁶ The United States General Accounting Office made a study of the effectiveness of these efforts and concluded that there was little evidence that the 33/50 or Early Reduction programs had a meaningful benefit.²⁷

According to TRI reports, during the period from 1988 to 1992, toxic releases to air, water, and land were reduced by 35%, or about 1.7 billion pounds.²⁸ Over 50% of the reduction involved four chemicals—acetone, ammonium sulfate, chlorine, and hydrochloric acid. Also, over 40% of the reductions occurred in three states—Louisiana, Texas, and Virginia.²⁹ Reductions, however, are reported by the companies making the releases, but they are not verified by EPA or the states,³⁰ and EPA states that much of the reported TRI reduction is due to (1) changes in how chemicals are reported; (2) changes in how releases are estimated; and (3) decreases in production levels.³¹

²³ John C. Dernbach, *The Unfocused Regulation of Toxic and Hazardous Pollutants*, 21 HARV. ENVTL. L. REV. 1, 2 n.5 (1997).

²⁴ See *id.* at 28–29, 52–55; see generally U.S. Dep't of Health & Hum. Servs., Agency for Toxic Substances and Disease Control, *Minimum Risk Levels (MRLs) for Hazardous Substances*, available at <http://www.atsdr.cdc.gov/mrls.html> (last visited Aug. 22, 2000).

²⁵ ARNOLD W. REITZE, JR., AIR POLLUTION LAW 286 (1995) (citing U.S. EPA, SPECIAL PROJECTS OFFICE, OFFICE OF TOXIC SUBSTANCES, FORGING AN ALLIANCE FOR POLLUTION PREVENTION (1991) [TS-792A]).

²⁶ CAA § 112(i)(5)(A), 42 U.S.C. § 7412(i)(5)(A) (1994).

²⁷ U.S. GEN. ACCT. OFFICE: TOXIC SUBSTANCES, PUB. NO. GAO/RCED-94-207, STATUS OF EPA'S EFFORTS TO REDUCE TOXIC RELEASES 1 (1994).

²⁸ *Id.* at 3.

²⁹ See *id.*

³⁰ *Id.*

³¹ *Id.*

B. *Ecosystem Impacts of Hazardous Air Pollution*

Industrial sources in the United States subject to TRI reporting requirements emitted about 1.332 billion pounds of toxic air emissions into the atmosphere in 1997.³² Emissions from automobiles, pesticide use, municipal waste incineration, and other combustion processes not included in the TRI report were responsible for additional toxic air pollutant releases.³³ Much of this pollution is eventually deposited on land or water.³⁴

Some pollutants remain airborne and contribute to air pollution problems far from the pollution source. Other pollutants released into the air can be deposited to land and water through precipitation, or by settling directly out of the air into land or water. Eventually, a large portion of those pollutants deposited near water bodies or small tributaries will reach the water bodies via stormwater runoff or inflow from tributary streams.³⁵

After deposition, some of these chemicals bioaccumulate in living organisms and can become more concentrated at higher levels in the food chain (a phenomenon known as biomagnification).³⁶ Dichlorodiphenyltrichloroethane (DDT), for example, has bioaccumulated in the Great Lakes where it has an adverse effect on fish, birds, and other wildlife.³⁷ Another problem involves "persistent" air toxics, such as mercury or lead, that can remain for a long time (sometimes forever) in the environment and can be transported long distances.³⁸ Some toxic air pollutants are precursors that can lead to compounds such as ozone, acid aerosols, and carcinogenic hydrocarbons that form in the atmosphere over large areas of North America.³⁹ One government study says that air deposition of lead and

³² TRI, *supra* note 13, at 2-12, tbl. 2-2.

³³ See, e.g., U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA/451/K-98-001, TAKING TOXICS OUT OF AIR 1, 2 (1998) [hereinafter TAKING TOXICS OUT].

³⁴ See *id.* at 3.

³⁵ See *id.* at 4.

³⁶ See *id.*

³⁷ *Id.* at 5.

³⁸ U.S. ENVTL. PROTECTION AGENCY, PUB. NO. SAB-EC-90-021, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION 3 (1990).

³⁹ *Id.* at 13-14.

polychlorinated biphenyls (PCBs) account for 90% or more of those compounds entering Lake Superior.⁴⁰

The 1990 CAA Amendments, in section 112(m), require the Administrator, in cooperation with the Under Secretary of Commerce for Oceans and Atmosphere, to study the extent of atmospheric deposition of HAPs to the Great Lakes, the Chesapeake Bay, Lake Champlain and coastal waters.⁴¹ Monitoring of these waters is required,⁴² and a report by the Administrator is to be used to promulgate further emission standards or control measures for HAPs (and their atmospheric transformation products) as may be necessary and appropriate.⁴³ EPA has monitored some toxic compounds in the Great Lakes since the 1980s and in the 1990s began to measure deposition in the Chesapeake Bay.⁴⁴

The first report required by section 112(m) was released in May 1994; the second report, "Deposition of Air Pollutants to the Great Waters," was sent to Congress on July 1, 1997.⁴⁵ It confirmed the conclusion of the first report that toxic air pollutants deposited in the waters identified in section 112(m) were having an adverse impact on their ecosystems. The fifteen pollutants of concern that are the focus of the reports are: cadmium and cadmium compounds; chlordane; DDT/DDE; dieldrin; hexachlorobenzene (HCB); *α*-hexachlorocyclohexane (*α*-HCH); lindane; *γ*-hexachlorocyclohexane (*γ*-HCH); lead and lead compounds; mercury and mercury compounds; (PCBs); polycyclic organic matter (POM); tetrachlorodibenzo-*p*-dioxin (TCDD; dioxins); tetrachlorodibenzofuran (TCDF; furans); toxaphene; and nitrogen compounds.⁴⁶ The report, however, concluded that no additional

⁴⁰ See Robert L. Fischman, *Biological Diversity and Environmental Protection: Authorities to Reduce Risk*, 22 ENVTL. L. 435, 471 (1992); U.S. GEN. ACCT. OFFICE, PUB. NO. GAO/RCED-91-102, EPA MAY NOT FULLY ACHIEVE TOXIC AIR DEPOSITION GOALS 2-3 (1991) [hereinafter GAO].

⁴¹ CAA § 112(m) (1), 42 U.S.C. § 7412(m) (1) (1994).

⁴² *Id.* § 112(m) (2)-(4).

⁴³ *Id.* § 112(m) (6).

⁴⁴ See Fischman, *supra* note 40, at 471; U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-453/R-97-011, DEPOSITION OF AIR POLLUTANTS TO THE GREAT WATERS, SECOND REPORT TO CONGRESS 92, 148 (1997) [hereinafter SECOND REPORT TO CONGRESS].

⁴⁵ SECOND REPORT TO CONGRESS, *supra* note 44, at 1; U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-453/R-93-055, DEPOSITION OF AIR POLLUTANTS TO THE GREAT WATERS, FIRST REPORT TO CONGRESS 1 (1994).

⁴⁶ SECOND REPORT TO CONGRESS, *supra* note 44, at 8.

legislation was needed because the existing section 112 provides adequate authority to deal with the problem.⁴⁷

C. *Human Health Impacts of Air Toxics*

Stationary and mobile sources emit many different air pollutants to which large populations are exposed. Some air pollutants have toxic and/or carcinogenic effects following direct inhalation exposure (e.g., carbon monoxide and benzene).⁴⁸ Others, such as lead and arsenic, reach humans by a variety of pathways including direct inhalation, inhalation of resuspended dust, ingestion of contaminated food products, ingestion of contaminated water, and skin contact with contaminated soil, water, or dust.⁴⁹

Industrial and agricultural workers often are exposed to many toxic substances in the air in concentrations above those to which the general population is exposed. Such exposures can cause cancer or a wide range of non-cancer health effects.⁵⁰

Building occupants may be exposed to radon and its decay products as well as to many airborne combustion products, including nitrogen dioxide and environmental tobacco smoke. Indoor exposures to toxic agents in consumer products (e.g., solvents, pesticides, formaldehyde) also can cause cancer and a range of non-cancer health effects.⁵¹ Due to the large population directly exposed to a number of agents, some of which are highly toxic, this problem poses relatively high human health risks.⁵²

The known harm caused by these chemicals includes an estimated three thousand cases of fatal cancer each year as well as birth defects, lung disease, nervous system disorders, immune system disorders, endocrine system disorders, neurological problems, liver damage, and other health problems.⁵³ In 1999, a preliminary study in southern California indicated that exposure to ten HAPs may be responsible for an additional 426 cancer cases per million exposed

⁴⁷ *Id.* at 187.

⁴⁸ See TAKING TOXICS OUT, *supra* note 33, at 2-3.

⁴⁹ See *id.* at 4.

⁵⁰ See *id.*

⁵¹ See generally Arnold W. Reitze, Jr. & Sheryl-Lynn Carof, *The Legal Control of Indoor Air Pollution*, 25 B.C. ENVTL. AFF. L. REV. 247 (1998).

⁵² *Id.*

⁵³ See generally TAKING TOXICS OUT, *supra* note 33.

individuals.⁵⁴ Very little is known about health problems, other than cancer, caused by air pollutants, because most testing has been for carcinogenic properties.⁵⁵ In addition, EPA announced that it has "fair or better" data available only on twenty HAPs and that the health effects data for other HAPs is "spotty."⁵⁶

The Mickey Leland National Urban Air Toxics Research Center (Center) was created under the authority of CAA section 112(p).⁵⁷ The statute requires that it be located in Harris County, Texas.⁵⁸ One of its responsibilities is to direct a sound research program to better understand the risks posed to human health by toxic chemicals in the urban air. To do this, the Center researches the effects of the 189 materials Congress has identified in CAA section 112(b).⁵⁹ The Center issued a strategic research plan in 1997 that focuses the Center's activities on human health effects, community programs, and personal exposure.⁶⁰ The plan is reviewed annually.⁶¹

On May 23, 1996, the Agency for Toxic Substances and Disease Registry published its methodology for calculating minimal risk levels.⁶² Minimal risk levels (MRLs) are screening tools to determine whether acute (1 to 14 days), intermediate (15 to 364 days), or chronic (365 days or more) exposure to a chemical poses a threat to human health and therefore merits investigation.⁶³ Such evaluations are done for both inhalation exposure and oral exposure.⁶⁴ As of

⁵⁴ Carolyn Whetzel, *Toxic Chemicals: Greatly Elevated Cancer Risk Found in Study on Los Angeles Pollutants*, TOXICS L. DAILY (BNA) D-6 (April 8, 1999).

⁵⁵ U.S. GEN. ACCT. OFFICE, AIR POLLUTION, PUB. NO. GAO/RCED-91-143, EPA'S STRATEGY AND RESOURCES MAY BE INADEQUATE TO CONTROL AIR TOXICS 9 (1991).

⁵⁶ *Good Data Lacking on Majority of Air Toxics*, ENV'T WEEK, Mar. 16, 1995, LEXIS, News Library, CURTWS File; see generally Richard L. Williamson et al., *Gathering Danger: The Urgent Need to Regulate Toxic Substances that Can Bioaccumulate*, 20 ECOLOGY L.Q. 605 (1993).

⁵⁷ CAA § 112(p), 42 U.S.C. § 7412(p) (1994).

⁵⁸ *Id.* § 112(p)(1).

⁵⁹ THE MICKEY LELAND NATIONAL URBAN AIR TOXICS RESEARCH CENTER, ABOUT THE CENTER: MISSION, <http://www.sph.uth.tmc.edu/mleland/Pages/about.htm> (last visited Sept. 10, 2000).

⁶⁰ THE MICKEY LELAND NATIONAL URBAN AIR TOXICS RESEARCH CENTER, STRATEGIC RESEARCH PLAN UPDATE OCTOBER 1999, <http://www.sph.uth.tmc.edu/research/mleland/attachments/SRPjr.htm> (last visited Sept. 10, 2000).

⁶¹ *Id.*

⁶² Minimal Risk Levels for Priority Substances and Guidance for Derivation, 61 Fed. Reg. 25,873, 25,873 (May 23, 1996).

⁶³ U.S. DEP'T OF HEALTH AND HUMAN SERVS., AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, MINIMUM RISK LEVELS FOR HAZARDOUS SUBSTANCES, available at <http://www.atsdr.cdc.gov/mrls.html> (last visited Sept. 10, 2000).

⁶⁴ *Id.*

February 2000, the agency has calculated 286 risk levels for 136 chemicals.⁶⁵

D. Common Law Control

Despite the comprehensive regulatory regime, a business is not necessarily protected from common-law state actions for nuisance, negligence, strict liability, or trespass for harm to an individual resulting from a hazardous air release. The United States Supreme Court once stated that "air pollution is . . . one of the most notorious types of public nuisance in modern experience."⁶⁶ The CAA specifically provides that nothing "shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any emission standard or limitation or to seek any other relief"⁶⁷ While the CAA may preempt claims in federal courts, it does not stop actions brought under color of state law nor does the permit shield doctrine apply to estop assertion of a claim.⁶⁸

II. PRE-1990 CAA SECTION 112

HAPs have been subject to control since 1970 by CAA section 112,⁶⁹ which provides for National Emission Standards for HAPs, known as NESHAPs. Prior to the 1990 CAA Amendments, the Administrator of EPA was required to publish a list of pollutants deemed hazardous.⁷⁰ Within 180 days of publication, proposed regulations were to be promulgated and within the following 180 days, either an emission standard was to be set or the Administrator had to find that the listed pollutant was not a HAP.⁷¹ The Administrator was to set emission standards "at the level which in his judgment provides ample margin of safety to protect the public health from such hazardous air pollutant."⁷²

⁶⁵ *Id.*

⁶⁶ *Washington v. Gen. Motors Corp.*, 406 U.S. 109, 114 (1972).

⁶⁷ CAA § 304(e), 42 U.S.C. § 7604(e) (1994).

⁶⁸ *See id.* § 504(f). The permit shield doctrine would preclude any claim based on a emissions or conditions that were allowed under the permit. *Id.*

⁶⁹ *Id.* §112, .

⁷⁰ 1977 CAA Amendments, § 112(b)(1)(A)-(B) amended by 42 U.S.C. § 7401 (1994).

⁷¹ *See id.*

⁷² *Id.* § 112(b)(1)(B), CAA as Amended August 1977, Serial No. 95-11, 95th Congress, 1st Sess. (1977).

The statutory time frame was unrealistic. The data and testing methods were inadequate, and the risk analysis approach proved controversial at the time.⁷³ It typically took from four to seven years from the time EPA identified a chemical as a candidate until a final regulation was issued.⁷⁴ Thus EPA resisted using section 112. After twenty years, EPA had regulated only seven hazardous substances— asbestos, beryllium, mercury, radionuclides, inorganic arsenic, benzene, and vinyl chloride.⁷⁵ EPA issued notices and health effects information on twenty-five other substances but never completed the regulatory process. For example, coke oven emissions were listed,⁷⁶ but no standard under the pre-1990 CAA was ever promulgated.⁷⁷ A notice of intent to list chromium or hexavalent chromium under section 112 was as far as EPA ever moved to regulate that chemical.⁷⁸

Although a few hazardous chemicals were regulated, only a limited number of circumstances involving their use were covered by the regulations. For example, arsenic emissions were controlled at primary copper smelters, glass manufacturing plants, and arsenic plants.⁷⁹ Vinyl chloride had similar restrictions on its regulatory applicability.⁸⁰ Mercury emissions from electric power plants were exempt from the standards even though they contribute to the high mercury levels of fish in the Great Lakes.⁸¹

⁷³ See *TAKING TOXICS OUT*, *supra* note 33, at 5–6.

⁷⁴ The mechanics of the NESHAP program took about three years to complete, although lack of resources and/or political problems often extended the period.

⁷⁵ See generally 40 C.F.R. pt. 61 (1992). The annual air toxics reduction from the regulation of these seven chemicals was estimated at 125,000 tons. *TAKING TOXICS OUT*, *supra* note 33, at 5.

⁷⁶ NESHAPs: Addition of Coke Oven Emissions to List of HAPs, 49 Fed. Reg. 36,560 (Sept. 18, 1984).

⁷⁷ Benzene emissions from coke by-product recovery plants are regulated at 40 C.F.R. §§ 61.130–139 (2000).

⁷⁸ Intent to List Chromium or Hexavalent Chromium as a HAP, 50 Fed. Reg. 24,317 (June 10, 1985).

⁷⁹ NESHAPs: Standards for Inorganic Arsenic, 51 Fed. Reg. 27,956 (Aug. 4, 1986) (to be codified at 40 C.F.R. §§ 61.160–167, 61.170–177, 61.180–186).

⁸⁰ See generally NESHAPs: Vinyl Chloride; Equipment Leaks of Volatile HAPs, 51 Fed. Reg. 34,904 (Sept. 30, 1986) (to be codified at 40 C.F.R. §§ 61.60–71).

⁸¹ Mercury sources covered by 40 C.F.R. § 61.50 (2000) include stationary sources that process mercury ore, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and that incinerate or dry wastewater treatment plant sludge. Amendments to Standards for Asbestos and Mercury, 40 Fed. Reg. 48,292, 48,302 (1975).

Radionuclide regulations control radon-222 emissions from a variety of sources.⁸² National standards, however, for radon for Department of Energy facilities were not promulgated until 1989,⁸³ and radon emissions from phosphogypsum stacks were not regulated until 1992.⁸⁴ Radionuclides from elemental phosphorus plants were regulated in 1989,⁸⁵ but EPA changed the standard⁸⁶ on December 19, 1991.⁸⁷

In 1989 EPA regulated radon emissions from operating mill tailings⁸⁸ and from uranium mill tailings disposal sites.⁸⁹ Radon emissions from inactive sites are regulated under both the CAA and the Uranium Mill Tailings Radiation Control Act (UMTRCA).⁹⁰ EPA proposed to amend the UMTRCA to include monitoring and closure requirements.⁹¹ It planned to make the UMTRCA the vehicle to regulate mill tailing disposal sites and to transfer the responsibility to implement the requirements to the Nuclear Regulatory Commission (NRC).⁹² There are approximately twenty NRC-licensed waste piles that are primarily located in the western states.⁹³ The remaining waste is scattered in outdoor piles that range in size from a few acres to several hundred acres.⁹⁴ The December, 1989 EPA rules require earth covers over the piles in order to limit radon emissions to an acceptable level, but the NRC claimed these rules duplicated their authority.⁹⁵ EPA claimed that under the 1990 CAA Amendments it

⁸² See NESHAPs: Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings, 51 Fed. Reg. 34,056 (Sept. 24, 1986) (to be codified at 40 C.F.R. §§ 61.220-226); see generally Karen Hoyden Curtin, *Indoor Radon: Regulating a Blameless Cause*, 3 BUFF. ENVTL. L.J. 181 (1996).

⁸³ NESHAPs: Radionuclides, 54 Fed. Reg. 51,654, 51,701 (Sept. 15, 1989) (to be codified at 40 C.F.R. §§ 61.190-193).

⁸⁴ See NESHAPs: National Emissions Standards for Radon Emissions from Phosphogypsum Stacks, 57 Fed. Reg. 23,305 (June 3, 1992) (to be codified at 40 C.F.R. §§ 61.200-210).

⁸⁵ NESHAPs: Radionuclides, 54 Fed. Reg. at 51,699.

⁸⁶ See 40 C.F.R. §§ 61.220-61.225 (2000).

⁸⁷ NESHAPs: Polonium-210 Emissions from Elemental Phosphorus Plants, 56 Fed. Reg. 65,934, 65,943 (Dec. 19, 1991) (to be codified at 40 C.F.R. pt. 61).

⁸⁸ NESHAPs: Radionuclides, 54 Fed. Reg. at 51,703.

⁸⁹ NESHAPs: Radionuclides, 54 Fed. Reg. at 51,702.

⁹⁰ 42 U.S.C. §§ 7901-7942 (1988).

⁹¹ See *Radioactive Waste: Uranium Tailing Emission Program May Shift to Nuclear Regulatory Commission*, 22 ENVTL. REP. (BNA) 2101 (Jan. 3, 1992).

⁹² *Id.*

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

may transfer this authority to the NRC,⁹⁶ and in September, 1992 appeared ready to give the NRC this responsibility.⁹⁷ However, on September 25, 1992, the U.S. Court of Appeals for the D.C. Circuit ruled that EPA does not have authority to suspend emission standards for radionuclides from sources regulated by the NRC except with respect to the NRC-licensed medical facilities.⁹⁸ The court rejected EPA's argument that CAA section 112 permitted broad suspension of the radionuclide rules.

Although EPA regulated only a few HAPs, even the short list of regulated hazardous pollutants was the result of litigation that forced EPA to regulate. For example, the court in *Sierra Club v. Gorsuch*⁹⁹ ordered EPA to regulate radionuclides.¹⁰⁰ EPA's failure to act later led to a contempt order.¹⁰¹ A similar case, *New York v. Gorsuch*,¹⁰² led to a court order requiring organic arsenic to be regulated.

⁹⁶ CAA § 112(g)(1), (3); 42 U.S.C. § 7412(g)(1), (3) (1994).

⁹⁷ *Environmentalists, Mining Industry Reach Deal on EPA Radionuclides Rule*, INSIDE EPA, Sept. 18, 1992, at 16.

⁹⁸ *Natural Res. Def. Council, Inc. v. Reilly*, 976 F.2d 36, 41 (D.C. Cir. 1992).

⁹⁹ 551 F. Supp. 785 (N.D. Cal. 1982).

¹⁰⁰ See *id.* In the 1977 CAA Amendments, section 122 required EPA to investigate radionuclides to determine whether they pose a health risk, and if so, to list them as hazardous and issue emission standards. In November, 1979, EPA issued its determination that radionuclides were hazardous pollutants. When EPA failed to issue regulations, the Sierra Club sued and obtained a court order requiring proposed regulations to be issued. *Sierra Club v. Gorsuch*, 551 F. Supp. at 786. Proposed regulations were issued on April 6, 1983. When EPA failed to either issue final regulations or make a finding that radionuclides were not hazardous as required by section 112(b)(1)(B), the Sierra Club sued EPA again. On July 27, 1984, a federal district court ordered EPA to issue final regulations. After subsequent moves to amend the July 27, 1984 order failed, on October 23, 1984, EPA announced the withdrawal of proposed radionuclide emission standards for three of the four categories of sources for which proposed standards had been issued. The four categories were: DOE facilities, NRC-licensed facilities, elemental phosphorus plants, and underground uranium mines. EPA also announced it would not regulate five other sources of radionuclides for which no proposed regulations had been issued. EPA made this announcement while affirming the risk to health from radionuclides. This led to a contempt order against EPA in *Sierra Club v. Ruckelshaus*. See 602 F. Supp. 892, 904 (N.D. Cal. 1984).

¹⁰¹ See *Ruckelshaus*, 602 F. Supp. at 904.

¹⁰² 554 F. Supp. 1060 (S.D.N.Y. 1983). In 1977 Congress enacted section 122 as part of the CAA Amendments that directed the Administrator to determine within one year whether arsenic should be regulated. On June 5, 1980, almost two years later than required by the statute, the Administrator listed inorganic arsenic as a hazardous air pollutant. NESHAPs: Addition of Inorganic Arsenic to List of HAPs, 45 Fed. Reg. 37,886 (June 5, 1980). This listing required the Administrator to publish regulations within 180 days. When EPA failed to act, New York State sued to force the Administrator of EPA to perform her nondiscretionary duty. On January 12, 1983, a federal court ordered the Administrator to publish regulations within 180 days. *Gorsuch*, 554 F. Supp. at 1060. See

The failure of EPA to seriously regulate HAPs led Congress in the CAA Amendments of 1977 to encourage EPA to act. The definition of "hazardous air pollutant" was expanded to mean "an air pollutant to which no ambient air quality standard is applicable and which in the judgment of the Administrator causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible or incapacitating reversible illness."¹⁰³ A new section 122¹⁰⁴ was added to the CAA that required the Administrator to study the need for regulating radioactive pollutants, cadmium, arsenic, and polycyclic organic matter. If any of these substances, when released to the ambient air, would cause or contribute to air pollution that might reasonably be anticipated to endanger public health, they were required to be regulated.¹⁰⁵ These CAA changes had little effect on EPA's efforts to regulate HAPs.

The control of hazardous emissions under the 1977 CAA Amendments was not as stringent as the action being taken under the Clean Water Act (CWA). The CWA regulated only six toxic substances when the Natural Resources Defense Council (NRDC) sued EPA in 1975.¹⁰⁶ In June, 1976 a consent decree was approved requiring EPA to regulate sixty-five pollutants and classes of pollutants. In the 1977 CWA, the consent decree was codified in sections 301(b)(2)(A) and 307(a)(1) that required a readjusted list of 129 toxic water pollutants to be regulated. The consent decree, however, continued to be enforceable even if its provisions were beyond the scope of the 1977 CWA Amendments.¹⁰⁷

EPA's reticence to use CAA sections 112 and 122 was due not only to the short time period provided for promulgating regulations, but also was due to the agency's interpretation that the statute did not allow cost and technology availability to be considered in setting standards.¹⁰⁸ Section 112 appeared to require that, once a hazardous pollutant was listed, a no-risk standard must be set regardless of

generally Gregory D. Call, *Arsenic, ASARCO, and EPA: Cost-Benefit Analysis, Public Participation, and Polluter Games in the Regulation of Hazardous Air Pollutants*, 12 *ECOLOGY L.Q.* 567 (1985).

¹⁰³ CAA § 112(a)(1), 42 U.S.C. § 7412(a)(1) (Pre-1990 Amendments).

¹⁰⁴ *Id.* § 122.

¹⁰⁵ *Id.* § 122(a).

¹⁰⁶ The Federal Water Pollution Control Act (FWPCA), as amended, and the CWA since 1977 are the same statute. Since 1977, the CWA is the term usually used.

¹⁰⁷ *Citizens for a Better Env't v. Gorsuch*, 718 F.2d 1117, 1130 (D.C. Cir. 1983).

¹⁰⁸ See Renee S. Dankner, *Safety Before Feasibility: A Two-Step Approach to Regulating Hazardous Air Pollutants*, 56 *GEO. WASH. L. REV.* 799, 803 (1988).

cost.¹⁰⁹ In situations where there was scientific uncertainty as to the threshold of exposure below which there is no risk, section 112 seemed to require a zero-emissions standard.¹¹⁰ Thus, for carcinogens or substances with no known safe level, EPA believed no emissions could be allowed.¹¹¹ Therefore, the use of section 112 might result in regulations so harsh that major segments of the economy would be adversely impacted.¹¹² In addition, the time allowed for compliance after regulations were promulgated was unrealistically short because industry was required to implement section 112's requirements in two years or less.¹¹³ Thus industry could face penalties for failing to comply with requirements that were impossible to meet.¹¹⁴

In 1976 EPA set a final emission standard for vinyl chloride, a gaseous synthetic chemical used to manufacture polyvinyl chloride plastics.¹¹⁵ It is a human carcinogen known to cause liver cancer and had been implicated as a cause of cancer in other organs, such as the brain and the lungs.¹¹⁶ The Environmental Defense Fund (EDF) sued EPA claiming that cost and technology factors had been considered in deciding to require a 95% emission reduction.¹¹⁷ A settlement agreement required EPA to make its vinyl chloride standards stricter.¹¹⁸ EPA proposed new regulations in June, 1977,¹¹⁹ but took no final action during the next seven years.¹²⁰ In 1985 EPA withdrew the proposed standards¹²¹ and proposed in their place the 1976

¹⁰⁹ See *id.*

¹¹⁰ See *id.* (citing NESHAPs, 42 Fed. Reg. 28,154 (June 2, 1977)).

¹¹¹ See Dankner, *supra* note 108, at 803.

¹¹² See *id.*

¹¹³ See, e.g., *Citizens for a Better Env't*, 718 F.2d at 1121 (noting a compliance period of only three and one-half years for proposed regulation of pollutants).

¹¹⁴ See *id.*

¹¹⁵ Standard For Vinyl Chloride, 41 Fed. Reg. 46,560 (Oct. 21, 1976). EPA had listed vinyl chloride as a hazardous air pollutant at HAPs, Addition to List, 40 Fed. Reg. 59,477 (Dec. 24, 1975).

¹¹⁶ Standard For Vinyl Chloride, 41 Fed. Reg. at 46,559-60.

¹¹⁷ *Env'tl. Def. Fund v. Train*, No. 76-2405 (D.C. Cir. June 24, 1976).

¹¹⁸ See Dankner, *supra* note 108, at 803-04.

¹¹⁹ NESHAPs, 42 Fed. Reg. 28,154 (June 2, 1977).

¹²⁰ For a discussion of the effects of vinyl chloride exposure see *Society of Plastics Industry, Inc. v. Occupational Safety & Health Administration*. See 509 F.2d 1301 (2d Cir. 1975); see also David D. Doniger, *Federal Regulation of Vinyl Chloride: A Short Course in the Law and Policy of Toxic Substances Control*, 7 *ECOLOGY L.Q.* 497, 522-27 (1978); Christopher Schroeder, *A Decade of Change in Regulating the Chemical Industry*, 46 *LAW & CONTEMP. PROBS.* 1, 4-9 (1983).

¹²¹ NESHAPs: Vinyl Chloride, 50 Fed. Reg. 1182 (proposed Jan. 8, 1985) (to be codified at 40 C.F.R. pt. 61).

regulations with minor revisions.¹²² The NRDC then sued to challenge the rescission.

In *NRDC v. EPA*,¹²³ the U.S. Court of Appeals for the D.C. Circuit, *en banc*, held that EPA must set section 112 standards using a two-prong procedure.¹²⁴ EPA reasoned that, due to the scientific uncertainty surrounding safe levels of exposure to vinyl chloride, it was authorized under section 112 to consider economic and technological factors in establishing emission levels.¹²⁵ Based on this reasoning, EPA advocated emission levels set in accordance with the best available control technology.¹²⁶ EPA argued that consideration of health factors alone in this situation would require complete prohibition of the carcinogen because a safe level could not be conclusively determined.¹²⁷

The court rejected the NRDC position that section 112 demands a zero emission standard when a no-risk threshold cannot be determined.¹²⁸ "Safe" does not mean "risk-free" according to the D.C. Circuit.¹²⁹ While deferring to EPA's construction of the statute and agreeing that economic and technological factors are permissible considerations within the Administrator's discretion under section 112, the court held that the clear intentions of Congress relating to safety must be satisfied prior to any consideration of economics and technology.¹³⁰ The D.C. Circuit established a two-step process requiring the Administrator to first make a determination of safety, exclusive of other factors.¹³¹ Only after safety is assured may the Administrator consider economic and technological factors to "diminish as much of the statistically determined risk as possible by setting the standard at the lowest feasible level."¹³² This decision made the legal validity of other section 112 standards suspect because some

¹²² *Id.* at 1184.

¹²³ Natural Res. Def. Council v. U.S. EPA, 824 F.2d 1146, 1164 (D.C. Cir. 1987) [hereinafter *Vinyl II*].

¹²⁴ *Id.* at 1164-65 & n.11.

¹²⁵ *Id.* at 1148-49.

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ See *Vinyl II*, 824 F.2d at 1153-54.

¹²⁹ *Id.* at 1153 (citing *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 642 (1980)).

¹³⁰ *Id.* at 1157, 1163.

¹³¹ *Id.* at 1165.

¹³² *Id.*

standards were set after considering costs. On September 14, 1989, EPA promulgated a new standard for benzene.¹³³ This and one of the

¹³³ In 1977, EPA listed benzene as a hazardous air pollutant. For a history of how NRDC fought for EPA to issue benzene regulations from 1983 to 1988 see *NRDC v. EPA*. See 695 F. Supp. 48, 49-52 (D.D.C. 1988). That case only resulted in a court order requiring EPA to issue final determinations on whether to regulate emissions of benzene from a variety of chemical manufacturing process units. After a follow-up court action, the EPA finally issued a proposed rule. See *NRDC v. EPA*, 705 F. Supp. 698 (D.D.C. 1989); NESHAPs: Benzene Emissions from Chemical Manufacturing Process Vents, Industrial Solvent Use, Benzene Waste Operations, Benzene Transfer Operations, and Gasoline Marketing System, 54 Fed. Reg. 38,083 (Sept. 14, 1989) (to be codified at 40 C.F.R. pt. 61). The complete list of benzene regulations follows:

- (1) NESHAPs: Addition of Benzene to List of HAPs, 42 Fed. Reg. 29,332, (June 3, 1977).
- (2) Standards of Performance of New Stationary Sources: Emissions Limitation of Volatile Organic Compounds From Gasoline Tank Truck Loading Racks at Bulk Gasoline Terminals, 45 Fed. Reg. 83,126 (proposed Dec. 17, 1980) (to be codified at 40 C.F.R. pt. 60).
- (3) Standards of Performance for New Stationary Sources: Bulk Gasoline Terminals, 48 Fed. Reg. 37,578 (Aug. 18, 1983) (to be codified at 40 C.F.R. pt. 60).
- (4) NESHAPs: Regulation of Benzene, 49 Fed. Reg. 23,478 (June 6, 1984) (Response to Comments) (to be codified at 40 C.F.R. pt. 61).
- (5) Regulatory Strategies for the Gasoline Marketing Industry, 49 Fed. Reg. 31,706 (Aug. 8, 1984) (Notice of Document Availability for Public Comment) (to be codified at 40 C.F.R. ch. 1).
- (6) Standards of Performance of New Stationary Sources: Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) Constructed after July 23, 1984, 52 Fed. Reg. 11,420 (Apr. 8, 1987) (to be codified at 40 C.F.R. pt. 60).
- (7) Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines: Refueling Emission Regulations for Gasoline-Fueled Light-Duty Vehicles and Trucks and Heavy-Duty Vehicles, 52 Fed. Reg. 31,162 (proposed Aug. 19, 1987) (to be codified at 40 C.F.R. pts. 80, 86, 600).
- (8) Occupational Exposure to Benzene, 52 Fed. Reg. 34,460 (Sept. 11, 1987) (to be codified at 29 C.F.R. pt. 1910).
- (9) Standards of Performance for New Stationary Sources: Rubber Tire Manufacturing Industry, 52 Fed. Reg. 34,868 (Sept. 15, 1987) (to be codified at 40 C.F.R. pt. 60).
- (10) NESHAPs: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants, 53 Fed. Reg. 28,496 (proposed July 28, 1988) (to be codified at 40 C.F.R. pt. 61).

The benzene regulations were the subject of litigation in *Monsanto Co. v. EPA*, 19 F.3d 1201 (7th Cir. 1994).

radionuclide standards¹³⁴ were the only standards established after the NRDC case and prior to the 1990 CAA Amendments.¹³⁵

In 1989, EPA established its risk policy by deciding that the lifetime excess risk of cancer, or maximum individual risk (MIR), to any given toxic should not be greater than one in 10,000 (1×10^{-4}).¹³⁶ In the same year, EPA promulgated its final rule for radionuclides, that protects the public from a MIR risk of 1×10^{-4} but also regulates to protect 90% of the people within eighty kilometers of a source to risk levels of 1×10^{-6} ¹³⁷ using the two-step approach required by the NRDC *v. EPA* case.¹³⁸

While EPA was reluctant to regulate hazardous emissions under section 112, some regulation occurred using other sections of the CAA. Under the basic state implementation plan (SIP) program, both particulate matter and hydrocarbons, which frequently are hazardous pollutants, are regulated.¹³⁹ CAA section 111, regulating new and modified sources, imposes technology-based controls to reduce hazardous emissions.¹⁴⁰ For example, fluorides from phosphate and aluminum plants, sulfuric acid mist from acid plants, and sulfur compounds from pulp mills are controlled through the new source performance standards (NSPS) process. NSPS for wood stoves were promulgated specifically to regulate toxics.¹⁴¹ CAA subchapter II, controlling mobile sources, also results in reductions in HAPs,¹⁴² as does CAA section 211, which authorizes the regulation of fuels and fuel additives.¹⁴³

¹³⁴ NESHAPs: Radionuclides, 54 Fed. Reg. 51,654 (Dec. 15, 1989) (to be codified at 40 C.F.R. pt. 61).

¹³⁵ However, proposed Vinyl Chloride NESHAP revisions are found at: NESHAPs: Revisions to Vinyl Chloride; Equipment Leaks of Volatile HAPs, 54 Fed. Reg. 38,938 (proposed Sept. 21, 1989) (to be codified at 40 C.F.R. pt. 61).

¹³⁶ NESHAPs: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants, 54 Fed. Reg. 38,044, 38,045 (Sept. 14, 1989) (to be codified at 40 C.F.R. pt. 61).

¹³⁷ NESHAPs: Radionuclides, 54 Fed. Reg. at 51,655.

¹³⁸ *Id.*

¹³⁹ CAA § 110, 42 U.S.C. § 7410 (1994).

¹⁴⁰ *Id.* § 111.

¹⁴¹ 40 C.F.R. pt. 60, subpart AAA (2000).

¹⁴² See generally Arnold W. Reitze, Jr., *Mobile Source Air Pollution Control*, 6 ENVTL. LAW. 309, 315 (2000).

¹⁴³ See generally Arnold W. Reitze, Jr., *The Regulation of Fuels and Fuel Additives Under Section 211 of the Clean Air Act*, 29 TULSA L.J. 485 (1994).

In 1985, EPA announced a policy of shifting the control of hazardous emissions to the states.¹⁴⁴ This approach pressed for more control over small area sources, such as gasoline stations, dry cleaners, and small combustion sources. A few states, such as New Jersey and California, moved to aggressively control hazardous emissions.¹⁴⁵ These states regulated a total of 708 different HAPs. Because the CAA allowed states to regulate air toxics for which national standards did not exist, however, state programs were not consistent and differed in their degree of stringency.¹⁴⁶ Thus, public exposure to toxic air pollution could vary from state to state.¹⁴⁷

EPA's limited regulation of air toxics was especially poor when contrasted with the federal regulation promulgated to control air pollutants in the workplace. The Occupational Safety and Health Administration (OSHA) set standards for almost 428 substances harmful when released into the air.¹⁴⁸ Most of the substances on the EPCRA list are included in the regulation by OSHA. These regulations, however, were vacated and remanded by the U.S. Court of Appeals for the Eleventh Circuit because OSHA did not show that existing limits presented a significant health risk or that the new standards were economically or technologically feasible.¹⁴⁹

In 1990, a new technology-based regulatory program was created to control HAPs.¹⁵⁰ The new section, however, 112(q) adds a "savings provision" that preserves the existing NESHAP in 40 C.F.R. part 61 until they are amended.¹⁵¹ NESHAPs in part 61 must be reviewed and, if appropriate, revised to comply with the standard-setting requirements of the new section 112 within ten years of November 15, 1990.¹⁵² If standards that were promulgated and judicially challenged

¹⁴⁴ *Federal Programs Expanded, State Role Increased Under Revised Air Toxics Strategy*, 16 ENV'T REP. (BNA) 235 (June 7, 1985).

¹⁴⁵ See generally N.J. Dep't of Env'tl. Protection, *Air Toxics Overview*, available at <http://www.state.nj.us/dep/airmon/airtoxics/overview.htm> (last visited Sept. 10, 2000); California Air Resources Bd., *California Air Toxics Program Background*, available at <http://www.arb.ca.gov/toxics/background.htm> (last visited Sept. 10, 2000).

¹⁴⁶ See *Approval of State Programs and Delegation of Federal Authorities*, 58 Fed. Reg. 62,262 (Nov. 26, 1993) (to be codified at 40 C.F.R. pts. 9, 63).

¹⁴⁷ U.S. GEN. ACCT. OFFICE, PUB. NO. GAO/RCED-87-76, AIR POLLUTION, STATES ASSIGNED A MAJOR ROLE IN EPA'S AIR TOXICS STRATEGY 3 (1987).

¹⁴⁸ 29 C.F.R. p. 1910, subpart H (2000).

¹⁴⁹ *AFL/CIO v. Occupational Safety & Health Admin.*, 965 F.2d 962, 975-76, 981-82 (11th Cir. 1992).

¹⁵⁰ CAA § 112(d)(2), 42 U.S.C. § 7412(d)(2) (1994).

¹⁵¹ *Id.* § 112(q).

¹⁵² *Id.* § 112(q)(1).

before November 15, 1990 are remanded to EPA, the Agency has the discretion to apply either the requirements of the new section 112 or the former section 112.¹⁵³ The effect of section 112(q) is to continue the existing provisions of part 61 for sources affected by pre-1990 NESHAP.¹⁵⁴

III. THE 1990 CAA AMENDMENTS

The almost complete failure of section 112's NESHAPs to control HAP emissions led to a different approach in the 1990 CAA Amendments.¹⁵⁵ The old chemical-by-chemical risk-based approach could have led to a "no emissions standard" for many chemicals because any emission arguably would create some risk.¹⁵⁶ The old section 112 imposed standard setting requirements that were so strict that EPA tried not to use it, resulting in just seven regulated HAPs.¹⁵⁷ The pre-1990 CAA section 112 was one and a half pages of text,¹⁵⁸ but the 1990 amendments created a new CAA section 112 that fills twenty-eight pages.¹⁵⁹ The 1990 approach to the regulation of HAPs is similar to the program created by section 307 of the CWA that is predicated on requiring the best demonstrated technology used by sources in an industrial category.¹⁶⁰ To accomplish this, the new CAA section 112 in 1990 became much more complex, establishing a two-tiered regulatory approach in which the first component consists of developing technology-based standards (the "maximum achievable control technology" standards, or MACTs) and then a second, risk-based approach is to be used to assess the success of the MACT standards.¹⁶¹

¹⁵³ *Id.*

¹⁵⁴ *See id.*

¹⁵⁵ *See generally id.*

¹⁵⁶ *See CAA; see also Vinyl II*, 824 F.2d 1146, 1153 (D.C. Cir. 1987) (rejecting NRDC's argument for a zero emission standard when a no-risk threshold could not be determined).

¹⁵⁷ *See supra* text accompanying note 133 (outlining the HAPs regulated prior to the 1990 CAA Amendments).

¹⁵⁸ *See WEST GROUP, SELECTED ENVIRONMENTAL LAW STATUTES: 1989-90 EDUCATIONAL EDITION 663-65 (1989).*

¹⁵⁹ *See WEST GROUP, SELECTED ENVIRONMENTAL LAW STATUTES: 1991-92 EDUCATIONAL EDITION 704-32 (1991).*

¹⁶⁰ *See CWA* § 307(a)(2), 42 U.S.C. § 1317(a)(2) (1994).

¹⁶¹ *See CAA* § 112(d).

A. Definitions Section 112(a)

“Major source” is defined broadly to include groups of stationary sources in a contiguous area that are under common control.¹⁶² It is a stationary source with the potential to emit ten tons per year (tpy) of any HAP or twenty-five tpy of any combination of HAPs. For radionuclides, however, EPA can establish a different criteria.¹⁶³ Note that “stationary source” is defined at section 111(a)(3) as any building, structure, facility, or installation which emits or may emit any air pollutant.¹⁶⁴ The Administrator may establish a lesser quantity of pollutant emissions for the definition of a major source based on various characteristics of the pollutants being emitted (including potency, persistence, potential for bioaccumulation, or other relevant factors).¹⁶⁵

An “area source” is any stationary source of HAPs that is not a major source (e.g., a dry cleaner is an area source if its emissions are below the trigger amount).¹⁶⁶ Motor vehicles are not included.¹⁶⁷ A “[n]ew source” is a stationary source constructed or reconstructed after regulations are proposed.¹⁶⁸ A “hazardous air pollutant” is any air pollutant listed under section 112(b).¹⁶⁹ An “adverse environmental effect” is any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources.¹⁷⁰ It seems to expand the “effects on welfare” defined in section 302.

B. Pollutants Covered

Section 112(b)(1) originally listed 189 HAPs; the list is used to determine the chemicals to be regulated within industrial source categories. This list evolved from lists of pollutants found in: the list of substances regulated under the toxic release inventory program of

¹⁶² *Id.* § 112(a)(1). Note that the definition of major source under section 112 is more inclusive than the regulatory definition of major source used under the new source review provisions. See 40 C.F.R. § 51.165(a)(1) (2000); see also *infra* section III(C).

¹⁶³ CAA § 112(a)(1).

¹⁶⁴ *Id.* § 111(a)(3).

¹⁶⁵ *Id.* § 112(a)(1).

¹⁶⁶ *Id.* § 112(a)(2).

¹⁶⁷ *Id.*

¹⁶⁸ *Id.* CAA § 112(a)(4).

¹⁶⁹ CAA § 112(a)(6).

¹⁷⁰ *Id.* § 112(a)(7).

section 313 of the EPCRA;¹⁷¹ high-priority environmental contaminants listed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) section 104(i) by the Agency for Toxic Substances and Disease Registry (ATSDR);¹⁷² and pollutants in the National Air Toxic Information Clearinghouse (NATICH) database for July 1986 that had an ambient concentration established by at least one state.¹⁷³ While the list is based on the lists of chemicals found in other statutes, the current list of 188 hazardous pollutants under the CAA is the second smallest compared to the other major statutes, with the CWA listing 148, OSHA listing 450, RCRA listing 502, and EPCRA listing almost 600.¹⁷⁴ The list resulted largely from a preference by Congress for an EPA-prepared list rather than one derived from the legislative process.¹⁷⁵ Chemicals regulated under CAA subchapter VI dealing with stratospheric ozone are not regulated under section 112.

Section 112(b)(2) allows EPA to add pollutants that present a threat of adverse human health effects or adverse environmental effects due to ambient concentration, bioaccumulation, or deposition.¹⁷⁶ Any person can petition EPA to add to the list, and the Administrator must grant or deny the petition with a written explanation.¹⁷⁷ EPA is currently gathering exposure data and health effect information in a two-year process while it considers listing hydrogen sulfide as a hazardous air pollutant under the CAA.¹⁷⁸ There is also a procedure for deleting a substance from the list, which in 1996 resulted in the delisting of an HAP.¹⁷⁹ The Administrator has eighteen months to act on a petition for delisting, and as of this

¹⁷¹ § 313, 42 U.S.C. § 11023 (1994).

¹⁷² CERCLA § 104(i), 42 U.S.C. § 9604(i) (1994).

¹⁷³ See Dernbach, *supra* note 23, at 41.

¹⁷⁴ *Id.* at 14. "The magnitude of inconsistencies is evident from a comparison of the pollutants on any two of the lists. . . . [M]ore than two-thirds of the total pollutants regulated under any two programs are regulated under only one of those programs." *Id.* at 15.

¹⁷⁵ See *id.* at 41-42.

¹⁷⁶ See CAA § 112(b)(2), 42 U.S.C. § 7412(b)(2) (1994).

¹⁷⁷ *Id.* § 112(b)(3)(A).

¹⁷⁸ James Kennedy, *EPA Investigates Hydrogen Sulfide Exposure, "Seriously" Considers Future Listing as HAP*, DAILY ENV'T REP. (BNA) A-1 (Nov. 19, 1999).

¹⁷⁹ Caprolactam was removed on June 18, 1996. See 61 Fed. Reg. 30,816 (to be codified at 40 C.F.R. pt. 63.60). The delisting process is found at CAA § 112(b)(3)(C), (D).

writing there are two petitions pending to delist methyl ethyl ketone¹⁸⁰ and methanol.¹⁸¹ EPA periodically updates the lists.¹⁸²

Section 112(b)(4) allows the Administrator to use any authority available to obtain information on health or environmental effects of a substance.¹⁸³ Thus, for example, EPA could use provisions such as the CAA section 114, CERCLA section 104(i), or several provisions in the Toxic Substances Control Act (TSCA).

C. Source Categories

EPA was to publish, within one year of enactment of the 1990 CAA Amendments, a list of categories of major and area sources emitting one or more listed HAPs.¹⁸⁴ Categories of area sources may be listed subject to the additional requirements of section 112(c)(3), if the Agency finds a threat of adverse effects to human health or the environment (by such sources individually or in the aggregate) that warrants regulation under section 112.¹⁸⁵

The term "stationary source" has the same meaning under section 112 as it has under section 111(a), which is any building, structure, facility, or installation which emits or may emit any air pollutant.¹⁸⁶ However, EPA may aggregate emissions from a site even if they are emitted from sources with different standard industrial classifications (SIC codes).¹⁸⁷ Thus, the definition of "source" may differ under section 112 from the definition applicable under section 111.¹⁸⁸ Section 112 applies to all stationary sources emitting HAPs, thus this section covers a building, structure, facility, or installation that emits HAPs.¹⁸⁹ Whether such source is considered "major" will

¹⁸⁰ HAP List, 64 Fed. Reg. 33,453 (proposed June 23, 1999) (to be codified at 40 C.F.R. pt. 63).

¹⁸¹ Petition to Delist Methanol from the List of HAPs, 64 Fed. Reg. 38,668 (petition completed July 19, 1999). See also Pamela Najor, *EPA to Review Petition for Removal of Methanol from Section 112 List of HAPs*, TOXICS L. DAILY (BNA) D-2 (July 21, 1999).

¹⁸² See, e.g., HAP List: Modification, 61 Fed. Reg. 30,816 (June 18, 1996) (to be codified at 40 C.F.R. § 63.60).

¹⁸³ CAA § 112(b)(4), 42 U.S.C. § 7412(b)(4) (1994).

¹⁸⁴ *Id.* § 112(c)(1).

¹⁸⁵ *Id.* § 112(c)(3).

¹⁸⁶ *Id.* § 111(a)(3).

¹⁸⁷ See *Nat'l Mining Ass'n v. EPA*, 59 F.3d 1351, 1356 (D.C. Cir. 1995).

¹⁸⁸ See *id.* at 1357.

¹⁸⁹ See NESHAPS: General Provisions, 59 Fed. Reg. 12,408, 12,434 (Mar. 16, 1994) (to be codified at 40 C.F.R. pt. 63).

depend upon the size and configuration of the source itself or of the larger source of which it is a part.¹⁹⁰

A "category" of sources is a group of sources having some common features, suggesting that they should be regulated in the same way and on the same schedule.¹⁹¹ Thus, for example, industrial process cooling towers would be considered a source category.¹⁹² Each cooling tower emitting more than the amount of HAPs provided in section 112(a) that qualifies a source as a major source, or each cooling tower located within a larger source emitting that amount of HAPs, would be subject to MACT for major sources.¹⁹³

On July 16, 1992, EPA published an initial list of categories of major and area sources of HAPs, as required under section 112(c)(1) of the 1990 CAA.¹⁹⁴ The preliminary draft list was compiled from a number of databases, including the National Emissions Data System (NEDS) and the Toxic Release Inventory System (TRIS).¹⁹⁵ These were augmented by a review of the available scientific literature. For example, categories of the synthetic organic chemical manufacturing industry (SOCMI) were identified from literature describing SOCMI reactants and products.¹⁹⁶ A SOCMI category was listed if it either manufactured a chemical on the list of HAPs or if it used one or more of the listed HAPs to produce another chemical.¹⁹⁷ Published production and consumption data for organic chemicals also were used to identify organic chemical end-user processes emitting HAPs.¹⁹⁸ This list does not include the sources subject to the requirements under section 112(c)(6) that requires EPA to identify and control sources responsible for 90% of the emissions of certain chemicals,¹⁹⁹ nor does it include all categories of major and area sources meeting the listing criteria in section 112(c)(1) because of

¹⁹⁰ *See id.*

¹⁹¹ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576, 31,578 (July 16, 1992).

¹⁹² *See id.* at 31,580.

¹⁹³ *See id.*

¹⁹⁴ *See id.* at 31,576.

¹⁹⁵ *See id.* at 31,577.

¹⁹⁶ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576, 31,577 (July 16, 1992).

¹⁹⁷ *See id.*

¹⁹⁸ *See id.*

¹⁹⁹ 42 U.S.C. § 7412 (c)(6). These specifically excluded emissions include chemicals polycyclic organic matter; polychlorinated biphenyls; 2, 3, 7, 8—tetrachlorodibenzofuran; 2, 3, 7, 8—tetrachlorodibenzo-p-dioxin; hexachlorobenzene; mercury; and alkylated lead. *Id.*

uncertainties in the available databases concerning sources and emissions of HAPs.²⁰⁰ The initial list contained 174 categories—166 major and eight area sources.²⁰¹ On December 3, 1993, EPA published a schedule for promulgation of the MACT standards following the ten-year guideline found in section 112(e)(1),²⁰² and by November 15, 2000, EPA is to have completed issuing emission standards for the listed source categories.²⁰³

Under section 112(c)(5) and (9), the Agency may add or delete a category from the list.²⁰⁴ An addition may occur when the Administrator finds that a category meets the criteria, at which point the emissions standards shall be promulgated by November 15, 2000, or two years after the date the category is listed, whichever is later.²⁰⁵ A deletion may occur based on a petition of any person or on the Administrator's own motion, upon a determination that: (1) in the case of sources that emit HAPs that may result in cancer, no source in the category (or group of sources in the case of area sources) emits HAPs in quantities that may cause a lifetime cancer risk greater than one in a million to the most exposed individual; or (2) in the case of sources that emit HAPs that may result in non-cancer adverse health effects or adverse environmental effects, emissions from sources in the category (or group of sources in the case of area sources) do not exceed a level adequate to protect public health with an ample margin of safety, and no adverse environmental effects will result.²⁰⁶ The Agency is to grant or deny a petition to delete a category within one year after the petition is filed.²⁰⁷

Section 112(c)(1) requires EPA to periodically amend the list in response to public comment or new information, and no less often than every eight years.²⁰⁸ The listing of categories is therefore an ongoing process. Since the initial list and schedule, there have been

²⁰⁰ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576 (July 16, 1992).

²⁰¹ See *id.* at 31,590, tbl. 1.

²⁰² See generally NESHAPs: Schedule for the Promulgation of Emission Standards Under Section 112(c) of the CAA, 58 Fed. Reg. 63,941 (Dec. 3, 1993).

²⁰³ See *id.*

²⁰⁴ CAA §§ 112(c)(5), (9), 42 U.S.C. §§ 7412(c)(5), (9) (1994).

²⁰⁵ *Id.* § 112(c)(5).

²⁰⁶ *Id.* § 112(c)(9)(B)(i)–(ii).

²⁰⁷ *Id.* § 112(c)(9)(B).

²⁰⁸ *Id.* § 112(c)(1).

several revisions.²⁰⁹ On June 4, 1996, EPA revised the initial list of industrial categories subject to MACT.²¹⁰ Note that the list did not use the SIC code approach that is used under the PSD, NSR, NSPS, and operating permit programs. EPA's approach was approved by the D.C. Circuit Court of Appeals in *National Mining Association v. EPA*.²¹¹ The revision formally added seven major source categories, one area source category, and deleted five major source categories, and one area source category.²¹² More revisions were made on July 18, 1996²¹³ and on February 12, 1998.²¹⁴ On April 10, 1998, EPA promulgated additional source categories subject to the section 112(c)(6) requirements to reduce specified pollutants by 90%.²¹⁵ A revised emissions standards promulgation schedule was published on May 17, 1999.²¹⁶ On November 18, 1999, a revised schedule and category list was published.²¹⁷

Various other Agency actions may trigger the need to list, revise, or delete categories.

- (1) The Agency may list categories of area sources pursuant to a number of authorities in section 112.²¹⁸
- (2) The Administrator may delete categories of sources on its own motion or on petition.²¹⁹

²⁰⁹ See, e.g., NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. 28,197 (June 4, 1996).

²¹⁰ See *id.*

²¹¹ 59 F.3d 1351, 1356 (D.C. Cir. 1995).

²¹² NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. at 28,198.

²¹³ NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. 37,542 (July 18, 1996).

²¹⁴ NESHAPs: Revision of List of Categories of Sources and Schedule for Standards Under Section 112 of the CAA, 63 Fed. Reg. 7155 (Feb. 12, 1998).

²¹⁵ Source Category Listing for Section 112(d)(2) Rulemaking Pursuant to Section 112(c)(6) Requirements, 63 Fed. Reg. 17,838 (Apr. 10, 1998) (notice).

²¹⁶ NESHAPs: Revision of Schedule for Standards Under Section 112 of the CAA, 64 Fed. Reg. 26,743 (May 17, 1999).

²¹⁷ NESHAPs: Revision of Source Category List and Schedule for Standards Under Section 112 of the CAA, 64 Fed. Reg. 63,026 (Nov. 18, 1999).

²¹⁸ NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. at 28,198.

²¹⁹ *Id.*

- (3) The Agency may revise the list to delineate the applicability of "case-by-case" emission standards pursuant to section 112(j), in instances where the Agency desires to delimit the affected sources because it may not establish a Federal emission standard by the deadline in the regulatory schedule for standards.²²⁰
- (4) The Agency may revise the regulatory schedule for standards associated with a listed source category, heeding the limitations in section 112.²²¹
- (5) After investigation EPA may revise the regulation if it has been determined that the titles or descriptions of some categories of sources can be amended to clarify the applicability of the ensuing emission standard, or a category may be included under a different, more appropriate industry group.²²²

Section 112(c) (3) required that the Agency list, within five years, sufficient categories of area sources²²³ to account for 90% of the aggregate emissions of each of thirty or more HAPs determined to present the greatest threat to public health in the largest number of urban areas.²²⁴ Section 112(c) (6) required the listing within five years, of categories of sources assuring that the sources of at least 90% of the aggregate emissions of each of seven specific pollutants that are subject to emission standards under section 112(d) are controlled by November 15, 2000.²²⁵

Section 112(e) (4) states that, notwithstanding section 307 of the Act, no action of the Administrator listing a source category or subcategory under section 112(c) shall be a final Agency action subject to judicial review, except that any such action may be reviewed under section 307 when the Administrator issues emission standards for such pollutant or category.²²⁶

²²⁰ *Id.*

²²¹ NESHAPs: Schedule for the Promulgation of Emission Standards Under Section 112(e) of the CAA Amendments of 1990, 58 Fed. Reg. 63,941 (Dec. 3, 1993); *see also* NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. at 28,198.

²²² *See* NESHAPs: Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the CAA Amendments of 1990, 61 Fed. Reg. at 28,197-198.

²²³ Defined at CAA § 112(k), 42 U.S.C. § 7412(k) (1994).

²²⁴ *Id.* § 112(c) (3).

²²⁵ *See infra* section III(K).

²²⁶ CAA § 112(e) (4).

On July 21, 1995, the United States Court of Appeals for the D.C. Circuit ruled on a petition for review of an EPA order concerning three aspects of EPA's definition of "major source" as applied to the CAA section 112 hazardous air pollutant program.²²⁷ The issues were:

- (1) whether EPA may require all hazardous emissions from a plant site to be aggregated even if they are emitted from sources with different industrial classifications (SIC codes);²²⁸
- (2) whether EPA may require "fugitive emissions" to be counted in a source's aggregate emissions to determine whether it is a major source;²²⁹ and
- (3) whether EPA may limit a source's ability to reduce its "potential to emit" by allowing only "federally enforceable" emission controls and limitations to be used.²³⁰

EPA was challenged under the provisions of CAA section 307(d)(9), which states that EPA rules that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or in excess of EPA's "statutory jurisdiction, authority, or limitations," must be set aside.²³¹ Procedural errors will invalidate a rule only "if the errors were so serious and related to matters of such central relevance to the rule that there is a substantial likelihood that the rule would have been significantly changed if such errors had not been made."²³²

The court dealt with the first question by noting that section 112(a)(1) says nothing about combining emissions only from sources within the same source category or SIC code.²³³ The court went on to say: "[i]ndeed, one could infer from § 112(a)(1) a congressional intent, in the context of hazardous air pollution regulation, to override *Alabama Power*."²³⁴ The court further noted that "major source" was defined under the Title V operating permit program and the ozone nonattainment area provisions to mean a "group of sources located within a contiguous area and under common control."²³⁵ This approach has been interpreted by EPA to mean a group of sources

²²⁷ *Nat'l Mining Ass'n v. EPA*, 59 F.3d 1351, 1354-65 (D.C. Cir. 1995).

²²⁸ *Id.* at 1354.

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ CAA § 307(d)(9).

²³² *Id.*

²³³ *Nat'l Mining Ass'n*, 59 F.3d at 1354.

²³⁴ *Id.* at 1357 (referring to *Ala. Power Co. v. Costle*, 636 F.2d 323 (D.C. Cir. 1979)).

²³⁵ CAA § 182(a)(c).

with a common industrial grouping—that is, with the same two-digit SIC code.²³⁶ But the court also held that EPA was not bound to any single definition of “major source.”²³⁷ The court held the Agency’s construction was reasonable, and it upheld EPA’s interpretation of “major source.”²³⁸ Addressing the second issue, concerning fugitive emissions, the Court of Appeals for the D.C. Circuit supported EPA’s interpretation: fugitive emissions may be counted in a source’s aggregate emissions.²³⁹

On the third question concerning limiting “potential to emit” to federally enforceable measures, the court granted the petition for review and noted, “EPA has not explained why it is essential that a control be included within a SIP.”²⁴⁰ The court went on to criticize EPA, stating that the CAA Amendments do not “suggest that Congress necessarily intended for state emissions controls to be disregarded in determining whether a source is classified as ‘major’ or ‘area’ under that national standard.”²⁴¹ The court also noted, “EPA has not explained why the criteria for federal approval and the consequences of that approval are related to ensuring the practical effectiveness of state controls such that the set of controls considered under section 112 should be limited in that fashion.”²⁴² Therefore, the petition for review was granted. The National Mining Association and the American Petroleum Institute sought a writ of mandamus on November 13, 1995, to force EPA to vacate the potential to emit definition per this decision.²⁴³ The Court of Appeals for the D.C. Circuit declined, stating that “[s]ince the opinion and judgment did not vacate EPA’s rule, the motion actually seeks a modification of the judgment and, as such, is not timely.”²⁴⁴

D. MACTs: Technology Based Standards

For each category of sources, EPA must establish the MACT.²⁴⁵ It is applicable to both new and existing sources.²⁴⁶ The standards must

²³⁶ *Nat’l Mining Ass’n*, 59 F.3d at 1359.

²³⁷ *See id.*

²³⁸ *Id.* at 1364.

²³⁹ *Id.* at 1360–61.

²⁴⁰ *Id.*

²⁴¹ *Id.*

²⁴² *Nat’l Mining Ass’n*, 59 F.3d at 1365.

²⁴³ *Nat’l Mining Ass’n v. EPA*, 1996 WL 10101 at *1 (D.C. Cir. 1996).

²⁴⁴ *Id.*

²⁴⁵ CAA § 112(d)(2), 42 U.S.C. § 7412(d)(2) (1994).

²⁴⁶ *Id.* § 112(d)(2).

consider cost, non-air quality impacts on the environment and human health, and energy requirements.²⁴⁷ However, section 112 defines a minimum level of control or "floor."²⁴⁸ Costs and other impacts are only used to evaluate options more stringent than the floor defined by the statute.²⁴⁹ This is based on section 112(d)(4) which states: "[w]ith respect to pollutants for which a health threshold has been established, the Administrator may consider such threshold level, with an ample margin of safety, when establishing emission standards under this subsection."²⁵⁰

For new sources, MACT must be at least as stringent as the average emissions achieved by the best controlled sources in the same category.²⁵¹ For existing sources, MACT may not be less stringent than the average emission limitation of the best performing 12% of existing units.²⁵² Where there are few sources, the average of the best performing five sources is to be used.²⁵³ Hazardous pollutants are to be controlled by the reduction in emissions through process changes, substitution of materials or other modifications, as well as through the use of traditional pollution control devices and work practices.²⁵⁴

EPA does not develop control requirements for each of the listed substances.²⁵⁵ Instead, EPA identifies industrial categories that emit air toxics. EPA was required to publish a list of industrial categories and subcategories by November 15, 1991 for major sources and area sources.²⁵⁶ All major sources in each designated category must be regulated.²⁵⁷ In addition, CAA section 112(c)(6) requires seven specific pollutants from sources accounting for a least 90% of the aggregate emissions for each pollutant to be listed by November 15, 1995, and to be subject to standards by November 15, 2000.²⁵⁸ They are alkylated lead compounds, polycyclic organic matter, hex-chloro-

²⁴⁷ *Id.*

²⁴⁸ NESHAPs: General Provisions, 58 Fed. Reg. 42,760, 42,762 (proposed Aug. 11, 1993) (to be codified at 40 C.F.R. pts. 60, 61, 63).

²⁴⁹ *Id.*

²⁵⁰ CAA § 112(d)(4).

²⁵¹ New sources include modified or reconstructed sources. See Standards of Performance for New Stationary Sources, 40 C.F.R. §§ 60.14-.15 (2000).

²⁵² CAA § 112(d)(3)(A).

²⁵³ *Id.* § 112(d)(3)(B).

²⁵⁴ *Id.* § 112(d)(2).

²⁵⁵ *Id.* § 112(d)(1).

²⁵⁶ *Id.* § 112(c).

²⁵⁷ *Id.* § 112(d)(1).

²⁵⁸ CAA § 112(c)(6).

benzene, mercury, polychlorinated biphenyls, 2, 3, 7, 8-tetrachlorodibenzo-p furans, and 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin.²⁵⁹

The statute provides a ten-year schedule for promulgating MACT standards for 174 source categories, with not less than forty categories to be regulated by November 15, 1990; coke oven batteries were to be regulated by December 31, 1992; 25% of categories to be regulated by November 15, 1994; an additional 25% to be regulated by November 15, 1997; and all categories to be regulated by November 15, 2000.²⁶⁰ EPA regulated all of the forty-seven source categories in the two- and four-year groups by 1997.²⁶¹ After a standard is promulgated, a source that is subject to the standard has three years to comply, although a one-year extension is authorized.²⁶² Thus, the first sources subject to the new law had to comply in late 1995 or 1996.²⁶³ If EPA does not act in a timely manner to implement a hazardous air pollution control program, then "hammer" provisions apply that require an emission limitation to be imposed on a case-by-case basis.²⁶⁴ The requirements are to be equivalent to the limitations that would apply to the source if emission standards had been promulgated in a timely manner.²⁶⁵

The basic approach in the new section 112 is to use an industrial category MACT-based program.²⁶⁶ However, the law does allow for more stringent requirements to be imposed to protect public health with an ample margin of safety.²⁶⁷ EPA is to establish standards for carcinogens that present a cancer risk greater than one in a million.²⁶⁸ Eight years after promulgation of MACT-based standards for a category of sources, EPA must assess the residual risk remaining after the application of MACT and, if necessary, revise the relevant standard on a health basis in accordance with the standard-setting criteria in effect before section 112 was amended.²⁶⁹ The National

²⁵⁹ *Id.*

²⁶⁰ *Id.* § 112(e)(1)(E).

²⁶¹ U.S. ENVTL. PROT. AGENCY, PUB. NO. EPA-453/R-96-015, SECOND REPORT TO CONG. ON THE STATUS OF THE HAZARDOUS AIR POLLUTANT PROGRAM UNDER THE CLEAN AIR ACT 1 (1997) [hereinafter SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM].

²⁶² CAA § 112(i)(2).

²⁶³ *Id.* §§ 112(e), (i).

²⁶⁴ *Id.* § 112(j)(5).

²⁶⁵ *Id.*

²⁶⁶ *See id.* § 112(d)(2).

²⁶⁷ *See, e.g., Id.* § 112(c)(9)(B)(ii).

²⁶⁸ CAA § 112(f)(2)(A).

²⁶⁹ *Id.* § 112(f)(2).

Academy of Sciences is responsible for evaluating the techniques relating to this risk assessment methodology.²⁷⁰

Area sources, which include all stationary sources of HAPs that are not major sources,²⁷¹ that are responsible for 90% of the hazardous emissions of the thirty HAPs that present the greatest threat to public health in urban areas must be regulated by November 15, 2000.²⁷² These sources may be regulated by requiring generally available control technology or management practices (GACT).²⁷³ The statute also provides for the control of HAPs from urban area sources in section 112(k) (3).

As of April 28, 2000, the final MACT standard schedules are represented in Appendix 1.²⁷⁴ In promulgating standards for all forty-seven source categories in the two-Year and four-Year groups, EPA estimates a reduction in air toxics of close to 1 million tpy and a reduction in criteria pollutants of approximately 1.8 million tpy at an annualized cost of approximately \$672 million.²⁷⁵

As of June 5, 2000, there were six proposed MACT standards, represented in Appendix 2.²⁷⁶ As of June 6, 2000, twenty-six MACT standards were expected to be finalized in 2001 and another twenty-six finalized in 2002.²⁷⁷ EPA expects that by 2005, the MACT standards will reduce toxic air emissions by 1.5 million tpy.²⁷⁸

If EPA misses the deadline for promulgating the MACT standards, sources are still required to obtain an "equivalent emission limitation" by permit within eighteen months of the statutory deadline.²⁷⁹ May 15, 1999, was the statutory deadline for

²⁷⁰ *Id.* § 112(o).

²⁷¹ *Id.* § 112(a)(2).

²⁷² *Id.* § 112(a), (c)(3), (d)(5).

²⁷³ *Id.* § 112(d)(5).

²⁷⁴ Unified Air Toxics Website: Final MACT Standards, *available at* <http://www.epa.gov/ttn/uatw/mactfnl.html> (last visited Sept. 10, 2000).

²⁷⁵ SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM, *supra* note 261, at 1-2.

²⁷⁶ Unified Air Toxics Website: Proposed MACT Standards, *available at* <http://www.epa.gov/ttn/uatw/mactprop.html> (last visited Sept. 10, 2000).

²⁷⁷ Unified Air Toxics Website: Upcoming MACT Standards, *available at* <http://www.epa.gov/ttn/uatw/mactupd.html> (last visited Sept. 10, 2000).

²⁷⁸ U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-453/R-99-001, RESIDUAL RISK: REPORT TO CONGRESS 10 (1999) [hereinafter RESIDUAL RISK]. The website is located at <http://www.epa.gov/iris>.

²⁷⁹ HAPs: Regulations Governing Equivalent Emission Limitations by Permit, 59 Fed. Reg. 26,429, 26,431 (May 20, 1994) (to be codified at 40 C.F.R. pts. 9, 63).

promulgation of the seven-year MACT standards.²⁸⁰ That deadline was extended to December 15, 1999.²⁸¹ Therefore, if the applicable MACT standard is not finalized by June 15, 2001, sources must then apply for an "equivalent emission limitation" per CAA section 112(j).²⁸² While EPA has often missed the statutory deadline for rules, it has "virtually always" issued the standards within the following eighteen months.²⁸³

E. General HAP Regulations

Parts 60 and 61 of title 40 of the C.F.R. contain national standards required by sections 111 and 112 of the CAA before it was amended in 1990.²⁸⁴ Part 61 contains the NESHAP requirements imposed by the pre-1990 CAA. Because of the savings provision of section 112, these parts continued to apply but with some modifications to comply with the 1990 CAA Amendments.²⁸⁵ To deal with the new section 112, general regulatory provisions, located in subpart A of part 63 of title 40 of the C.F.R., codify procedures and criteria used to implement emission standards for stationary sources that emit (or have the potential to emit) one or more of the 188 HAPs listed in the Act.²⁸⁶ The standards applicable to specific source categories also are codified in 40 C.F.R. part 63.

On March 16, 1994, EPA promulgated a final rule covering "General Provisions" applicable to HAPs.²⁸⁷ HAPs are to be established for stationary source categories that emit one or more of the 188 regulated HAPs.²⁸⁸ A list of sources emitting listed HAPs was published on July 16, 1992.²⁸⁹ Each source category is to be regulated by specific standards codified in 40 C.F.R. part 63, and by the General

²⁸⁰ *Id.* at 26,430, tbl. 1.

²⁸¹ HAPs: Amendment to Regulations Governing Equivalent Emission Limitations by Permit, 64 Fed. Reg. 26,311 (May 14, 1999) (to be codified at 63 C.F.R. pt. 63).

²⁸² *See id.*; *see also* CAA § 112(j), 42 U.S.C. § 7412(j) (1994).

²⁸³ U.S. GEN. ACCT. OFFICE, PUB. NO. GAO/RCED-00-72, AIR POLLUTION, STATUS OF IMPLEMENTATION AND ISSUES OF THE CLEAN AIR ACT AMENDMENTS OF 1990 35 (2000).

²⁸⁴ *See generally* EPA Standards of Performance for New Stationary Sources, 40 C.F.R. pt. 60 (1990); EPA NESHAPs, 40 C.F.R. pt. 61 (1990).

²⁸⁵ NESHAPs for Source Categories: General Provisions, 58 Fed. Reg. 42,760 (proposed Aug. 11, 1993) (to be codified at 40 C.F.R. pts. 60, 61, 63).

²⁸⁶ *Id.* at 42,760.

²⁸⁷ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. 12,408 (Mar. 16, 1994) (to be codified at 40 C.F.R. pts. 60, 61, 63).

²⁸⁸ CAA § 112(b).

²⁸⁹ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576 (July 16, 1992).

Provisions that apply to all regulated sources.²⁹⁰ If there is a conflict between the specific requirements and the General Provisions, the specific requirements apply.²⁹¹ The General Provisions cover applicability determinations (including new versus existing and area versus major sources), compliance extensions, and requests to use alternative compliance measures, compliance dates, operation and maintenance requirements, methods for determining compliance, and procedures for testing, monitoring, reporting, and recordkeeping.²⁹² The General Provisions do not apply to regulations developed pursuant to section 112(r), concerning accidental releases, unless specified in the section 112(r) regulations.²⁹³

Different requirements may be established for major and area sources of the same source category.²⁹⁴ The determination of whether a facility is a major source is based on the facility's "potential to emit" HAPs "considering controls."²⁹⁵ For a physical or operational limitation on HAP emissions to limit a facility's "potential to emit," it must be federally enforceable.²⁹⁶ Thus, limits on HAP emissions, including the use of air pollution control devices, should be incorporated into an applicable permit or into the SIP to be a legal limitation.²⁹⁷ The major source versus area source determination is made by considering all HAP emissions from sources within a contiguous area that are under common control.²⁹⁸ As previously discussed, EPA has interpreted section 112 to apply to entire contiguous adjacent sites without being subdivided according to industrial SIC codes; thus, the definition for "major source" in part 63 may not be the same as the definition used in other CAA

²⁹⁰ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,408, 12,411. Until a source is subject to a 40 C.F.R. part 63 standard, the General Provisions do not apply.

²⁹¹ NESHAPs for Source Categories: General Provisions, Applicability, 40 C.F.R. § 63.1(a)(3) (2000).

²⁹² NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,408.

²⁹³ 40 C.F.R. § 63.1(a)(4).

²⁹⁴ CAA § 112(d)(1).

²⁹⁵ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,410.

²⁹⁶ *Id.* Potential to emit is covered in detail in the final rule of June 28, 1989. Requirements for the Preparation, Adoption, and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans, 54 Fed. Reg. 27,274 (1989) (to be codified at 40 C.F.R. pts. 51, 52).

²⁹⁷ *But see* Nat'l Mining Ass'n v. EPA, 59 F.3d 1351 (D.C. Cir. 1995).

²⁹⁸ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,411. There is an exception for oil and gas wells at CAA § 112(n)(4).

regulations.²⁹⁹ Major sources and area sources are subject to section 112 if they are an “affected source.”³⁰⁰ EPA has defined affected source in part 63 differently from the definition used in subchapter IV of the CAA and the related regulations.³⁰¹ Under the General Provisions, “affected source” refers to a collection of process, equipment, or groups of equipment defined in standards under part 63 (including case-by-case MACT standards or equivalent emission limitations).³⁰²

Until EPA promulgates part 63 requirements for a source, section 112(g) addresses the modification, construction, and reconstruction of major sources after the effective date of the operating permit program.³⁰³ Section 112(j) provides for states to establish emission limits in operating permits if EPA fails to promulgate standards for a category of sources on a schedule set out in section 112(e).³⁰⁴ Under these provisions, states may be required to make case-by-case MACT determinations.³⁰⁵ The issue of the relationship of the General Provisions to sections 112(g) and (j) was left to future rulemaking.³⁰⁶ Once an operating permit program is established in a state, the “hammer” provisions of section 112(j) apply.³⁰⁷ If EPA fails to promulgate a standard for a source category as required by section 112(e)(1) and (3), then the permit shall contain emission limitations, on a case-by-case basis, that are “equivalent to the limitation that would apply to such source if an emission standard had been promulgated in a timely manner”³⁰⁸

The General Provisions are intended to implement the preconstruction review requirements of section 112(i)(1), but not the review requirements of section 112(g).³⁰⁹ However, EPA generally agrees that compliance with an applicable MACT standard based on section 112(d) or (h) would constitute compliance with (g).³¹⁰ A case-by-case MACT determination under section 112(j) is only necessary

²⁹⁹ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,412.

³⁰⁰ *Id.*

³⁰¹ See NESHAPs for Source Categories: General Provisions, 40 C.F.R. § 63.2 (2000).

³⁰² NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,413.

³⁰³ CAA § 112(g)(2), 42 U.S.C. § 7412(g)(2) (1994).

³⁰⁴ *Id.* § 112(j)(2).

³⁰⁵ *Id.* § 112(j)(5).

³⁰⁶ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,415.

³⁰⁷ CAA § 112(j)(5).

³⁰⁸ *Id.*

³⁰⁹ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,416.

³¹⁰ *Id.*

when no applicable emission limitation has been established by EPA.³¹¹ The rules governing the case-by-case process are found at 40 C.F.R. section 63.43.³¹² On May 10, 1996, EPA issued a direct final rule governing the establishment of equivalent emission limitations pursuant to section 112(j).³¹³

F. *New Construction, Modification, and Reconstruction*

CAA section 112 recognizes that EPA could not immediately issue MACT standards for all industries and provides for emission standards to be promulgated for the initial list of sources as late as November 15, 2000.³¹⁴ Historically, regulations concerning construction, reconstruction, and modification of sources subject to either NSPS or NESHAPs have been regulated at 40 C.F.R. parts 60 and 61, subpart A. CAA section 112(g)(2) prohibits any person from constructing or reconstructing a major source of HAPs unless they meet a MACT standard.³¹⁵ If no applicable emission limitation exists then such determinations are made on a case-by-case basis.³¹⁶ If emission standards are not feasible, then either a design, equipment, work practice, or operational standard, or combination of these approaches may be used.³¹⁷ The operating permit required by subchapter V is to contain appropriate emission limitations for HAPs.³¹⁸ EPA promulgated a proposed section 112(g) rule on April 1, 1994,³¹⁹ and on March 20, 1996, EPA released a draft final rule.³²⁰ The final section

³¹¹ *Id.*

³¹² EPA has also issued a guidance document on preparing a Notice of MACT Approval. U.S. EPA, PREPARING A NOTICE OF MACT APPROVAL UNDER § 63.43(G) OF 40 CFR 63, SUBPART B MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY EMISSION LIMITATION FOR CONSTRUCTED OR RECONSTRUCTED SOURCES (1999).

³¹³ HAPs: Amendment to Regulations Governing Equivalent Emission Limitations by Permit, 61 Fed. Reg. 21,370 (May 10, 1996) (to be codified at 40 C.F.R. pt. 63). A similar proposed rule was issued at the same time in HAPs: Amendment to Regulations Governing Equivalent Emission Limitations by Permit, 61 Fed. Reg. 21,414 (May 10, 1996) (to be codified at 40 C.F.R. pt. 63).

³¹⁴ See CAA § 112(c)(3), 42 U.S.C. § 7412(c)(3) (1994).

³¹⁵ See *id.* § 112(g)(2).

³¹⁶ *Id.* §§ 112(g)(2)(A), (j)(5).

³¹⁷ *Id.* § 112(h)(1).

³¹⁸ *Id.* § 502(b)(3)(B)(ii).

³¹⁹ HAPs: Proposed Regulations Governing Constructed, Reconstructed or Modified Major Sources, 59 Fed. Reg. 15,504 (proposed Apr. 1, 1994) (to be codified at 40 C.F.R. pts. 63, 70).

³²⁰ *Draft Final Rule Limits Applicability of Standards Under Air Act Section 112(g)*, DAILY ENV'T REP. (BNA) A-4 (Mar. 21, 1996).

112(g) rule was promulgated on December 27, 1996.³²¹ It is narrower in scope than the 1994 proposed rule and requires MACT controls only for new facilities that are major sources for toxic air pollutants and for new or reconstructed major emitting production units at existing facilities.³²² For sources for which national MACT standards have not been issued, states continue to impose MACT standards on a case-by-case basis.³²³ The Agency decided not to issue regulations at that time for modified sources because the section 112(g) program is primarily a transitional program designed to operate until all categories of major sources of HAPs are subject to MACT standards issued under section 112(d).³²⁴ Such sources would be subject to existing state air toxics programs, if applicable.³²⁵

The effective date of the program under section 112(g) (2) (B) in any state or local jurisdiction was the date on which a permitting authority places its implementing program into effect or eighteen months after December 26, 1996, whichever is earlier.³²⁶ Implementing programs were to be in effect by June 29, 1998.³²⁷ If at that time there was no working implementation program, either the permitting authority could issue a MACT determination with EPA's concurrence or EPA regional administrator would issue a 112(g) determination for up to one year.³²⁸ On June 30, 1999, EPA extended the time period allowed for the regional administrator to render case-by-case MACT determinations to thirty months because some permitting authorities did not have implementing programs by June 29, 1999, nor the authority to issue MACT determinations.³²⁹

The program excludes steam generating units from coverage.³³⁰ Since only new and reconstructed major sources will be subject to section 112(g), other sources may avoid section 112(g) requirements by using design or emission controls that keep potential emissions

³²¹ HAPs: Regulations Governing Constructed or Reconstructed Major Sources, 61 Fed. Reg. 68,384 (Dec. 27, 1996) (to be codified at 40 C.F.R. pt. 63).

³²² *Id.* at 68,386.

³²³ *Id.* at 68,385.

³²⁴ *Id.* at 68,386.

³²⁵ *Id.*

³²⁶ HAPs: Regulations Governing Constructed or Reconstructed Major Sources, 61 Fed. Reg. at 68,387.

³²⁷ *Id.* at 68,401.

³²⁸ *Id.*

³²⁹ HAPs: Regulations Governing Constructed or Reconstructed Major Sources, 64 Fed. Reg. 35,029 (June 30, 1999) (to be codified at 40 C.F.R. pt. 63).

³³⁰ HAPs: Constructed or Reconstructed Major Source Regulations, 61 Fed. Reg. at 68,384.

below the ten tpy (or other threshold).³³¹ Netting is not allowed.³³² Alternatively, sources may avoid section 112(g) by obtaining a preconstruction minor NSR permit from the state.³³³

Major affected sources, or sources that become major affected sources due to reconstruction, must undergo preconstruction review.³³⁴ Affected sources that are nonmajor or unaffected nonmajor sources that reconstruct must only submit a notification.³³⁵ To construct a new major affected source or reconstruct a major source so that the source becomes a major affected source requires approval in advance from the Administrator.³³⁶ The details concerning the requirements of the application are found at 40 C.F.R. section 63.5(d).³³⁷ Reconstruction requirements also are based on the policy expressed in the December 16, 1975 Federal Register's New Source Performance Standard requirements.³³⁸ After an affected source completes construction or reconstruction it must comply with the relevant emission standards.³³⁹ There also are requirements for startup, shutdown, and malfunction plans that can be used to avoid noncompliance penalties.³⁴⁰ Startup, shutdown, and malfunction reports are also required.³⁴¹

³³¹ *Id.* at 68,388.

³³² U.S. EPA, QUESTIONS AND ANSWERS ON 112(G) FINAL RULE, at <http://www.epa.gov/ttn/uatw/112g/qanda12g.html> (last visited Sept. 10, 2000).

³³³ HAPs: Constructed or Reconstructed Major Source Regulations, 61 Fed. Reg. at 68,388.

³³⁴ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. 12,408, 12,436 (Mar. 16, 1994) (to be codified at 40 C.F.R. §§ 63.5(b)(3) and 63.5(d)). "Affected source" is defined at 40 C.F.R. section 63.2 as the source or group of sources or portion of a source subject to a CAA section 112 standard. This definition only applies to the use of the term in the context of part 63. *See id.*

³³⁵ *Id.* at 12,420.

³³⁶ *Id.* at 12,416.

³³⁷ *Id.*; *see also* Provisions Governing Construction, Reconstruction or Modified Sources, 59 Fed. Reg. 15,504 (Apr. 1, 1994), 60 Fed. Reg. 8333, (Feb. 14, 1995) (to be codified at 40 C.F.R. pt. 63); NESHAPs for Source Categories General Provisions, 59 Fed. Reg. at 12,416; HAPs: Proposed Regulations Governing Constructed, Reconstructed or Modified Major Sources, 59 Fed. Reg. 15,504 (Apr. 1, 1994) (to be codified at 40 C.F.R. pts. 63, 70).

³³⁸ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,408, adopting the policy laid out in Modification, Notification, and Reconstruction, 40 Fed. Reg. 58, 416, 58,416 (Dec. 16, 1975) (codified at 40 C.F.R. pt. 60).

³³⁹ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,438.

³⁴⁰ *Id.* at 12,421, 12,437.

³⁴¹ *Id.* at 12,423, 12,455.

G. Operating Permits

The section 112 program is implemented through the operating permit program developed under subchapter V of the CAA.³⁴² EPA's regulations to control HAPs in 40 C.F.R. part 63 must coordinate the requirements with the operating permit program under subchapter V of the CAA.³⁴³ The operating permit program clarifies and makes a source's air pollution requirements more enforceable by consolidating its CAA obligations in one document. On July 21, 1992, EPA promulgated regulations requiring states to develop permit programs for stationary sources including HAP sources.³⁴⁴ Thus the part 70 permit regulations of July 21, 1992,³⁴⁵ and the General Provisions applicable to all HAP sources, as well as part 63, form the basis for permit conditions.³⁴⁶

The definition of a "regulated air pollutant" under 40 C.F.R. section 70.2 for operating permit purposes includes any pollutant subject to a standard promulgated under section 112.³⁴⁷ An explanatory memo by Lydia Wegman in 1993 notes that "if a pollutant is regulated for one source category by a standard or other requirement, then the pollutant is considered a regulated air pollutant for *all* source categories."³⁴⁸ The one exception to this rule is case-by-case MACT determinations based on section 112(g)(2).³⁴⁹

Sources must file periodic reports showing their compliance status.³⁵⁰ Regulations concerning a federally-implemented permit program, to be used in states that fail to obtain EPA's approval of the state permit program, are found at 40 C.F.R. part 71. EPA believes it is appropriate for all sources regulated under part 63 to undergo the permitting process, but non-major sources may be subject to deferral of the subchapter V requirements.³⁵¹ When a source is required to obtain an operating permit, the general provisions of 40 C.F.R.

³⁴² CAA § 112(g)(2),(i),(j), 42 U.S.C. § 7412(g)(2),(i),(j) (1994).

³⁴³ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,417.

³⁴⁴ State Operating Permit Programs, 40 C.F.R. pt. 70 (2000).

³⁴⁵ Operating Permit Program, 57 Fed. Reg. 32,250 (July 21, 1992) (to be codified at 40 C.F.R. pt. 70).

³⁴⁶ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,417.

³⁴⁷ 40 C.F.R. pt. 70.

³⁴⁸ Memorandum from U.S. EPA, Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, Definition of Regulated Air Pollutant for Purposes of Title V, to Air Division Directors, Regions I-X 3 (Apr. 26, 1993) (on file with autho).

³⁴⁹ *Id.*

³⁵⁰ See EPA State Operating Permit Programs, 40 C.F.R. § 70.5 (2000).

³⁵¹ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. at 12,417.

part 63 will be implemented through the permit program.³⁵² When HAPs also are regulated under a SIP provision, as for example, VOC emissions, additional coordination is needed.³⁵³

On January 19, 1996, a memorandum by John S. Seitz, director of EPA's Office of Air Quality, Planning, and Standards, was released concerning contingency plans for sources of HAPs.³⁵⁴ Sources of HAPs must prepare and implement startup, shutdown, and malfunction plans under 40 C.F.R. section 63.6(e)(3)(1).³⁵⁵ These contingency plans do not have to be included in the operating permit. Sources must state, however, that they are subject to the requirement to maintain startup, shutdown, and malfunction plans.³⁵⁶ The permitting authorities may require a source to present a copy of its plan for review and the plan must be kept at the source's location.³⁵⁷ It is not necessary, however, for the plan to be included in the permit.³⁵⁸

H. Monitoring and Performance Testing

The General Provisions include requirements applicable to all affected HAP sources, while subparts of part 63 have additional requirements applicable to specific source categories.³⁵⁹ Major sources also are subject to the enhanced monitoring program as proposed on October 22, 1993.³⁶⁰ These requirements will be incorporated into the rules being promulgated under part 63.³⁶¹ This is to include Continuous Emission Monitoring Systems (CEMS)³⁶² when required.³⁶³

³⁵² NESHAPs for Source Categories: General Provisions, 58 Fed. Reg. 42,760 (proposed Aug. 11, 1993) (to be codified at 40 C.F.R. pts. 60, 61, 63).

³⁵³ *Id.* at 42,763.

³⁵⁴ *Agency Says Startup/Shutdown Plans Not Required in Operating Permits*, DAILY ENV'T REP. (BNA) A-3 (Jan. 23, 1996).

³⁵⁵ *Id.*

³⁵⁶ *Id.*

³⁵⁷ *Id.*

³⁵⁸ *Id.*

³⁵⁹ *Id.* at A-1.

³⁶⁰ Enhanced Monitoring Program, 58 Fed. Reg. 54,648 (proposed Oct. 22, 1993) (to be codified at 40 C.F.R. pts. 51, 52, 60, 61, 64).

³⁶¹ NESHAPs for Source Categories: General Provisions, 59 Fed. Reg. 12,408, 12,417 (Mar. 16, 1994) (to be codified at 40 C.F.R. §§ 63.5(b)(3), (d)).

³⁶² Defined at NESHAPs for Source Categories: General Provisions, 40 C.F.R. § 63.2 (2000).

³⁶³ NESHAPs for Source Categories General Provisions, 59 Fed. Reg. at 12,447.

The regulations also contain both general performance³⁶⁴ testing requirements as well as testing required under the individual categories developed under part 63.³⁶⁵ Each affected source must prepare a site-specific test plan. EPA has created a guideline document, *Preparation and Review of Site-Specific Test Plans*, to assist in the preparation of test plans.³⁶⁶

The owner or operator of an affected source is required to maintain all records required by the General Provisions for at least five years following the date of occurrence, measurement, or maintenance.³⁶⁷ If an owner or operator believes the source is not subject to a relevant standard under part 63, a record must be kept of this applicability determination.³⁶⁸

In May 2000, EPA issued a proposed rule on imposing new reporting requirements for HAPs.³⁶⁹ Each major source must obtain an operating permit which necessarily requires a HAP inventory.³⁷⁰ In addition, the Urban Toxics Air Program mandates reductions by accounting for all emission control measures, and a HAPs inventory will be crucial to the development of that program.³⁷¹ For HAPs reporting, EPA estimated the consolidated reporting rule will cost each state seven hundred hours annually.³⁷² Industry will be affected by an estimated three hours annually of work and the rule will have an industry-wide cost of \$844,000.³⁷³

However, monitoring and measurement requirements for HAPs are still to be resolved.³⁷⁴ "Of 188 HAPs, 134 have applicable [measurement] methods. [Forty-three] have likely methods. [Eleven] have potential or no methods. [Thirty-one] of the 33 high-priority urban air toxics have applicable methods."³⁷⁵

³⁶⁴ *Id.* at 12,444.

³⁶⁵ *Id.* at 12,419.

³⁶⁶ *Id.* at 12,420.

³⁶⁷ *Id.* at 12,426.

³⁶⁸ *Id.* at 12,424.

³⁶⁹ Consolidated Emissions Reporting, 65 Fed. Reg. 33,268 (May 23, 2000) (to be codified at 40 C.F.R. pt. 51).

³⁷⁰ *Id.* at 33,270.

³⁷¹ *Id.*; see also National Air Toxics Program: The Integrated Urban Strategy, 64 Fed. Reg. 38,706 (July 19, 1999) (notice).

³⁷² Consolidated Emissions Reporting, 65 Fed. Reg. at 33,271.

³⁷³ *Id.*

³⁷⁴ See RENEE J. ROBINS, ET AL., MIT ENERGY LAB., SYMPOSIUM SUMMARY: EPA'S URBAN TOXICS AIR STRATEGY 1999 URBAN AIR TOXICS SUMMER SYMPOSIUM 3 (1999) [hereinafter TOXICS SYMPOSIUM] (on file with author).

³⁷⁵ *Id.*

I. Toxic Risk Assessment

The 1990 CAA Amendments added several provisions designed to encourage the use of risk assessment to control air pollutants. Under section 112(o), the National Academy of Sciences (NAS) was to review the risk assessment methodology used by EPA to determine carcinogenic risk associated with HAPs.³⁷⁶ The NAS was to recommend improvements in methodology including methods for assessing the adverse health effects of risks other than cancer.³⁷⁷ A report was to be submitted to the Risk Assessment and Management Commission and to congressional committees by May 15, 1993.³⁷⁸ Section 303 of the 1990 CAA Amendments established a Risk Assessment and Management Commission to investigate the policy implications and appropriate use of risk assessment and risk management under various Federal laws.³⁷⁹ The Commission was to be composed of ten members.³⁸⁰ The President appointed three members, the majority and minority leadership of Congress appointed six members, and the president of the NAS appointed one member.³⁸¹

Under section 112(f), the Administrator of EPA was to report to Congress by November 15, 1996 on the methods of calculating the health risks remaining from sources subject to MACT regulation under section 112, the significance of the remaining risk, and recommendations regarding such risk.³⁸² Under section 112(g), EPA must rank the hazardous risk of the regulated air pollutants if offsets by equally or more HAPs are to be allowed.³⁸³

The National Research Council fulfilled the NAS mandate in 1994 with the publication of *Science and Judgment in Risk Assessment*.³⁸⁴ The Congressional Commission on Risk Assessment and Risk Management began meeting in 1994, and in 1997 released its report, *Framework for Environmental Health Risk Management*.³⁸⁵ This report

³⁷⁶ CAA § 112(o)(1), 42 U.S.C. § 7412(o)(1) (1994).

³⁷⁷ *Id.* § 112(o)(1)(B)(3).

³⁷⁸ See Risk Assessment and Management Commission, 59 Fed. Reg. 30,931 (June 16, 1994) (notice). The report was issued on June 16, 1994. *Id.*

³⁷⁹ CAA § 112(o)(4).

³⁸⁰ See 1990 Amendments to the CAA § 303, Pub. L. No. 101-549(c) (1990).

³⁸¹ See *id.*

³⁸² CAA § 112(f)(1).

³⁸³ *Id.* § 112(g)(1)(A).

³⁸⁴ See *supra* note 378 and accompanying text.

³⁸⁵ The Presidential/Congressional Commission on Risk Assessment and Risk Management, *Framework for Environmental Health Risk Management*, Final Report Vol. 1

“introduces a unique Risk Management Framework to guide investments of valuable public-sector and private-sector resources in researching, assessing, characterizing, and reducing risk.”³⁸⁶ Volume One of the report discusses the Commission’s comprehensive Risk Management Framework.³⁸⁷ Volume Two is a large comprehensive risk management analysis that addresses many technical and policy issues related to health and environmental risk-based decisions. It includes recommendations for the management of residual risks that are to be regulated under the CAA section 112(f).³⁸⁸

In 1998, EPA issued *Guidelines for Ecological Risk Assessment*.³⁸⁹ The guidelines provide a three-phase approach to risk assessment³⁹⁰ and is the “basis of the residual risk approach to ecological risk assessment.”³⁹¹ For human health risk assessments, EPA will rely heavily on their Integrated Risk Information System (IRIS), which is an electronic database containing information on human health effects from chemical exposure.³⁹² Risk assessment guidelines for mutagenicity, carcinogenicity, chemical mixtures, developmental toxicity, exposure assessment, risk characterization, reproductive toxicity, probabilistic analysis, and neurotoxicity have been issued by EPA.³⁹³ The “EPA plans to establish data source hierarchies for each type of toxicity information to be used in residual risk assessments”³⁹⁴

EPA will model risk assessment of HAPs using the approach found in the 1989 benzene NESHAP.³⁹⁵ This is a two-tiered approach

(1997), available at <http://www.riskworld.com/Nreports/1997/risk-rpt/pdf/EPAJAN.PDF> (last visited Sept. 19, 2000).

³⁸⁶ *Id.* at Preface.

³⁸⁷ *See id.*

³⁸⁸ *See generally* THE PRESIDENTIAL/CONGRESSIONAL COMMISSION ON RISK ASSESSMENT AND RISK MANAGEMENT, RISK ASSESSMENT AND RISK MANAGEMENT IN REGULATORY DECISION-MAKING 23 (1997).

³⁸⁹ *See generally* U.S. ENVTL. PROT. AGENCY, PUB. NO. EPA-630-R95-002F, GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT (1998).

³⁹⁰ *Id.* at 2-3. The first phase is problem formulation, the second analysis, and the last is risk characterization.

³⁹¹ RESIDUAL RISK, *supra* note 278, at ES-4.

³⁹² *Id.* at ES-5.

³⁹³ *Id.* at ES-6.

³⁹⁴ *Id.* at ES-5.

³⁹⁵ *Id.* at ES-11. *See* Alec Zacaroli, *Air Pollution: Framework for Addressing Residual Risks from Air Toxics Modeled After Benzene Rule*, DAILY ENV’T REP. (BNA) A-2 (Mar. 5, 1999). The benzene NESHAP is found at NESHAPs: Benzene Emissions from Maleic Anhydride Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants, 54 Fed. Reg. 38,044 (Sept. 14, 1989).

following the 1987 *NRDC v. EPA* case decided *en banc* by the Court of Appeals for the D.C. Circuit prior to the 1990 Amendments that discussed what is "safe" under CAA section 112.³⁹⁶ This approach was endorsed by Congress in the 1990 Amendments as illustrated by the Conference Report.

In the first step of this analysis, the Administrator must determine a safe and acceptable level of risk considering only health factors. In the second step, the Administrator may consider cost, feasibility and other relevant factors in addition to health in order to set a standard to provide an "ample margin of safety." This approach is required under the decision in . . . *NRDC v. EPA* . . . and is set forth in the rulemaking on emissions standards for benzene³⁹⁷

EPA, therefore, "strives to provide maximum feasible protection against risks to health from HAPs"³⁹⁸ by limiting the maximum individual risk to 1 in 10,000 and the individual lifetime risk to 1 in 1 million.³⁹⁹ Despite IRIS and other data sources, EPA is not prepared to conduct full residual risk analysis due to a paucity of data on human health, ecological, and exposure data.⁴⁰⁰

On June 26, 1996, EPA issued a proposed chemical test rule under the Toxic Substances Control Act (TSCA) to assist in implementing CAA section 112.⁴⁰¹ The proposed rule was to be the first in a series of rules used to generate health effects data to support

³⁹⁶ 824 F.2d 1146, 1151 (D.C. Cir. 1987).

³⁹⁷ H.R. CONF. REP. NO. 101-952 (1990).

³⁹⁸NESHAPs: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants, 54 Fed. Reg. 38,044 (Sept. 14, 1989) (to be codified at 40 C.F.R. pt. 61).

³⁹⁹ *Id.* at 38,044; see RESIDUAL RISK, *supra* note 278, at ES-11, 8.

⁴⁰⁰ Pat Phibbs, *Panel Says EPA Needs Much More Data to Conduct Full Residual Risk Analysis*, DAILY ENV'T REP. (BNA) A-14 (May 4, 2000); see *Problems Estimating Exposures, Impacts Prompt Consideration of New Methodology*, DAILY ENV'T REP. (BNA) A-7 (Apr. 22, 1999).

⁴⁰¹ Proposed Test Rule for HAPs, 61 Fed. Reg. 33,178 (June 26, 1996) (to be codified at 40 C.F.R. pt. 799). The ATSDR has also published a guidance manual focusing on the lack of data in public health assessments for CERCLA sites, which includes a discussion of the analysis of air pollutants. U.S. DEP'T OF HEALTH AND HUMAN SERVS., PUB. NO. PB94-179827, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, ENVIRONMENTAL DATA NEEDED FOR PUBLIC HEALTH ASSESSMENTS: A GUIDANCE MANUAL (1994).

emissions standards for twenty-one HAPs.⁴⁰² EPA, however, repeatedly extended the comment period for the proposed chemical test rule.⁴⁰³ On April 21, 1998, the agency promulgated a notice of another extension of the comment period.⁴⁰⁴ The agency expects to issue a final rule in January 2001.⁴⁰⁵

J. *The Early Reduction Program*

The CAA Amendments create problems for those companies that reduce emissions voluntarily.⁴⁰⁶ Voluntary reductions may not count toward mandatory reductions required in the future by the CAA.⁴⁰⁷ The CAA section 112(i)(5) provides for EPA (or a state) to issue a permit under subchapter V that allows an existing source that reduces hazardous air pollution emissions by 90% to avoid the emissions reductions required by section 112(d) for six years after the compliance date that would otherwise be applicable if the 90% reduction is achieved before an applicable section 112(d) standard is proposed.⁴⁰⁸ However, states may require reductions in excess of those specified in section 112(i)(5).⁴⁰⁹

The CAA's Early Reduction Program requires HAPs to be reduced by 90% to postpone for six years the deadline for MACT compliance.⁴¹⁰ If a source emits high risk pollutants as specified in the regulations,⁴¹¹ the non-high risk pollutants can be used to offset only a fraction of the amount of required reduction of a high risk pollutant.⁴¹² Final regulations to implement section 112(i)(5) were originally promulgated on December 29, 1992⁴¹³ and have been

⁴⁰² *EPA Extends Comment Period Again for TSCA Air Pollutant Proposed Rule*, DAILY ENV'T REP. (BNA) A-11 (Dec. 1, 1997).

⁴⁰³ Amended Proposed Test Rule for HAPs: Extension of Comment Period, 63 Fed. Reg. 19,694 (Apr. 21, 1998) (to be codified at 40 C.F.R. pt. 799).

⁴⁰⁴ *Id.* at 19,695.

⁴⁰⁵ Unified Agenda: TSCA, 65 Fed. Reg. 23,531 (Apr. 24, 2000).

⁴⁰⁶ See CAA § 112(i), 42 U.S.C. § 7412(i) (1994).

⁴⁰⁷ *Id.*

⁴⁰⁸ *Id.* § 112(d).

⁴⁰⁹ *Id.* §§ 112(d), (i)(5).

⁴¹⁰ *Id.* § 112(i)(5).

⁴¹¹ Regulations Governing Compliance Extensions for Early Reductions of HAPs, 40 C.F.R. § 63.74 (2000).

⁴¹² *Id.*

⁴¹³ NESHAPs for Source Categories: Compliance Extensions for Early Reductions, 57 Fed. Reg. 34,132 (Aug. 3, 1992) (notice); 57 Fed. Reg. 43,001 (Sept. 17, 1992) (notice); 57 Fed. Reg. 61,970 (Dec. 29, 1992); 58 Fed. Reg. 26,916 (May 6, 1993) (notice); 59 Fed. Reg. 7224 (Feb. 15, 1994) (notice). There were amendments to the rule made on November

subject to numerous changes. They are codified at 40 C.F.R. part 63, subpart D.

To determine what pollutants are high risk EPA used three criteria: chlorinated dioxins and furans; all listed HAPs that are known human carcinogens; and listed pollutants that are toxic at or below threshold ambient concentrations.⁴¹⁴ The toxicity is based on an estimated maximum exposure to a pollutant that can be tolerated by a human exposed continuously for seventy years without having any adverse health effects. This is called a reference concentration (RfC) and is extrapolated from animal studies. High risk HAPs are generally those with an RfC of 0.05 ug/m^3 , based on a two-year rat study, that are included in EPA's Integrated Risk Information System.⁴¹⁵ EPA determines human exposure by assuming a release of ten tpy of HAPs. Using their air dispersion model, this release will produce an ambient concentration of 5.02 ug/m^3 . All HAPs with an RfC that is one-tenth or more of this assumed concentration ($>.502 \text{ ug/m}^3$) are deemed high-risk HAPs.

This regulation was challenged successfully for methylene diphenyl diisocyanate (MDI). In an opinion by Judge Ginsburg, the U.S. Court of Appeals for the D.C. Circuit held that designating MDI as a high-risk pollutant based on a generic air dispersion model that bore no relationship to the properties of the chemical and that was based on an unwarranted assumption that MDI would be gaseous at temperatures at which it is a solid was an arbitrary and capricious action.⁴¹⁶

Less than 10% of the 8000 to 13,000 major sources subject to MACT standards agreed to participate in the Early Reductions Program. Only forty applications for the six-year extensions had been filed by late 1994. Industry declined to participate because of the costs and difficulties in developing the needed historical base-year emissions data.⁴¹⁷ There also was uncertainty concerning how state standards would relate to federal MACT standards, which could

29, 1993 at NESHAPs: Amendments to Compliance Extensions for Early Reductions, 58 Fed. Reg. 62,539 (1993) (to be codified at 40 C.F.R. pt. 63).

⁴¹⁴ There were high risk list amendments at NESHAPs for Source Categories: Early Reductions Program High Risk List Amendment, 59 Fed. Reg. 32,165 (June 22, 1994) (to be codified at 40 C.F.R. pt. 63); 59 Fed. Reg. 53,109 (Oct. 21, 1994) (to be codified at 40 C.F.R. pt. 63).

⁴¹⁵ NESHAP Early Reduction Program Amendments, 57 Fed. Reg. at 61,981.

⁴¹⁶ Chem. Mfrs. Ass'n v. EPA, 28 F.3d 1259, 1264 (D.C. Cir. 1994).

⁴¹⁷ Alex Zacaroli, *Determination on Protecting Great Waters Troubles States, Garners Industry Support*, DAILY ENV'T REP. (BNA) AA-1 (Sept. 10, 1997).

require industries that add controls to add more or different controls, or both, at a later date. Finally, the six-year extension offered little benefit if EPA's regulations were delayed or if the standards provided adequate time to comply.⁴¹⁸ Nevertheless, EPA continued the program, but shifted its implementation to its regional offices.⁴¹⁹ In 1997 there were about twenty-five early reduction permits pending and about six permits had been issued.⁴²⁰ With the passage of time, this program has become largely irrelevant.

K. *The National Urban Air Toxics Program*

Section 112(c)(3) requires sources representing 90% of the area sources with emissions of the thirty hazardous pollutants presenting the greatest risk to public health to be regulated by November 15, 2000. Area sources also may be subject to alternative standards pursuant to section 112(d)(5).⁴²¹ Mobile sources of hazardous emissions are to be regulated pursuant to section 202(l).⁴²² Health-based standards promulgated under section 112 prior to November 15, 1990 remain in force until modified.⁴²³ Within eight years of promulgation of a standard for major or area sources the Administrator may establish additional requirements pursuant to the "residual risk" provisions in section 112(f) to protect the public health with an ample margin of safety.⁴²⁴ It is EPA's expressed intention to deal with thirty-three HAPs, including thirty HAPs that are emitted from area sources, by developing an integrated program dealing with its responsibilities under sections 112(c)(3), (k), and 202(l).⁴²⁵ This program also will deal with a substantial portion of the HAPs being considered for regulation under section 112(d).⁴²⁶

Section 112(k)(3) tasks EPA with identifying not less than thirty HAPs from urban area sources, identifying the sources that represent 90% of the emissions of these pollutants and reducing the incidence

⁴¹⁸ *Id.*

⁴¹⁹ *Regions Get Authority to Decide Whether State Toxics Rules Meet Federal Standards*, DAILY ENV'T REP. (BNA) D-6 (July 6, 1995).

⁴²⁰ SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM, *supra* note 261, at A-9.

⁴²¹ CAA § 112(d)(5), 42 U.S.C. § 7412(d)(5) (1994).

⁴²² *Id.* § 201(l).

⁴²³ *Id.* § 112(f).

⁴²⁴ *Id.*

⁴²⁵ *Id.* §§ 112(c)(3), (k), 202(l).

⁴²⁶ *Id.* § 112(d), 42 U.S.C. § 7412(d) (1994).

of cancer attributable to emissions from these sources by 75%.⁴²⁷ Urban air is of particular concern because of the higher concentration of population and pollution in a close geographic proximity and is feasible in part because many urban areas share the same toxics profile.⁴²⁸

EPA promulgated a draft urban air toxics strategy on September 14, 1998, that introduced an integrated strategy to deal with HAPs.⁴²⁹ On July 19, 1999 EPA promulgated its Integrated Urban Air Toxics Strategy (Strategy).⁴³⁰ There are three risk reduction goals within the Strategy:

1. ensure a 75% reduction in cancer incidence from HAPs;⁴³¹
2. substantially decrease non-cancer health risks from area sources in urban areas;⁴³² and
3. target and address disproportionate risk in urban areas from all sources.⁴³³

The Strategy consists of four basic components:

1. regulatory tools and programming activities for source-specific and sector-based standard-setting on federal, state, and local levels;⁴³⁴
2. local and community efforts focusing on cumulative risks within urban areas;⁴³⁵
3. modeling and monitoring for urban areas under the National Air Toxics Assessments program;⁴³⁶ and
4. communication and education of the public.⁴³⁷

Thirty-three HAPs are identified in the Strategy.⁴³⁸ These HAPs were selected based on 1990 baseline data, and emissions of some of

⁴²⁷ CAA § 112(k)(3)(B), (C).

⁴²⁸ National Air Toxics Program: The Integrated Urban Strategy, 64 Fed. Reg. 38,706, 38,711 (July 19, 1999) [hereinafter Urban Strategy].

⁴²⁹ *Id.* at 38,706.

⁴³⁰ *Id.*

⁴³¹ *Id.* at 38,708.

⁴³² *Id.* at 38,708, n.7.

⁴³³ TOXICS SYMPOSIUM, *supra* note 374, at 1.

⁴³⁴ Urban Strategy, *supra* note 428, at 38,711.

⁴³⁵ *Id.*

⁴³⁶ *Id.*

⁴³⁷ *Id.*

⁴³⁸ *Id.* at 38,715.

the selected HAPs have been dramatically decreased since that time due to technology-based standards.⁴³⁹ It is therefore imperative to develop a monitoring system and acquire comprehensive data before the implementation of any regulatory structure.⁴⁴⁰

While CAA section 112(c)(3) requires the listing of area sources representing 90% of the emissions of the thirty hazardous pollutants presenting the greatest risk to public health, the current list does not.

The current list of area source categories doesn't include categories representing 90[%] of the emissions of each of the 30 area source HAPs. The current list meets the 90[%] or greater requirement for 11 of the 30 area source HAPs. For 10 other HAPs, the list accounts for at least 80[%] of the emissions, and for ethylene dichloride the list accounts for approximately 78[%] of the emissions. . . . The remaining HAPs on the list represent less than 75[%] of the emissions⁴⁴¹

It is important to note that the Strategy does not provide a regulatory regime, but seeks to integrate and expand current regulatory schemes to deal with the air toxics in urban areas after assessing the cumulative risks of HAPs exposure from various sources.⁴⁴² It is a *strategy*, not a rule.⁴⁴³ EPA expects to pursue a three-tiered approach to implement the Strategy.⁴⁴⁴ The first tier will consist of MACT standards, the second tier of source category specific GACT standards, and the third tier will be a flexible GACT process.⁴⁴⁵

In meeting the Strategy's goals, [EPA will] consider reductions in HAPs resulting, not only from actions under [EPAs] overall air toxics program . . . and measures resulting from programs to attain the national ambient air quality standards for particulate matter and ozone . . . , but also

⁴³⁹ *Id.* at 38,716.

⁴⁴⁰ This issue is being addressed in part with the promulgation of the new HAPs reporting scheme, found at Consolidated Emissions Reporting, 65 Fed. Reg. 33,268 (proposed May 23, 2000) (to be codified at 40 C.F.R. pt. 51). The Urban Strategy discusses how to address this issue. See Urban Strategy, *supra* note 430, at 38,710.

⁴⁴¹ Urban Strategy, *supra* note 428, at 38,722.

⁴⁴² *Id.* at 38,723.

⁴⁴³ TOXICS SYMPOSIUM, *supra* note 374, at i; see also Urban Strategy, *supra* note 428, at 38,706.

⁴⁴⁴ Urban Strategy, *supra* note 428, at 38,723.

⁴⁴⁵ *Id.*

from State, local and Tribal measures. Further, [EPA will] consider cumulative risks presented by exposures to emissions of HAPs from sources in the aggregate.⁴⁴⁶

L. State Programs

The resounding lack of success of regulation of air toxics prior to the 1990 CAA Amendments led many state and local governments to create their own programs to deal with the problem.⁴⁴⁷ The programs vary, but they have focused on addressing air toxics through ambient air levels, control technology standards, and risk assessment.⁴⁴⁸ In recognition of these state and local (S/L) programs, Congress created section 112(l) of the CAA to allow for the state and local programs to be implemented rather than other applicable section 112 standards.⁴⁴⁹ The difference between the "State/local residual risk assessment approach and the strategy set forth in sections 112(d) and 112(f) of the CAA is one of timing. While the CAA envisions control of HAPs from major sources as a two-step process . . . many State and local agencies consider these simultaneously."⁴⁵⁰ In a 1995 survey, 60% of state and local air toxic programs were risk-based, and half of those addressed both new and existing sources.⁴⁵¹

Each state may develop and submit to the Administrator for approval a program to implement and enforce the emission standards and other requirements for air pollutants that are subject to CAA section 112 or to implement the accidental release provisions of section 112(r).⁴⁵² A guidance document was required to be published by the Administrator by November 15, 1991 to explain how the states should develop programs for submittal.⁴⁵³ After a program is submitted by a state, the Administrator has 180 days to approve or disapprove the program based on criteria in section 112(l)(5).⁴⁵⁴ If a proposed program is rejected then a state may revise and resubmit it. If a state with an approved program does not administer or enforce it

⁴⁴⁶ *Id.*; see also CAA § 112(k), 42 U.S.C. § 7412(k) (1994).

⁴⁴⁷ RESIDUAL RISK, *supra* note 278, at 14.

⁴⁴⁸ *Id.*

⁴⁴⁹ *Id.*; see also CAA § 112(l).

⁴⁵⁰ See CAA § 112 (1).

⁴⁵¹ *Id.*

⁴⁵² *Id.* § 112(l).

⁴⁵³ *Id.* § 112(l)(2).

⁴⁵⁴ *Id.* § 112(l)(5).

in accordance with EPA's published guidance then EPA can withdraw approval of the program.⁴⁵⁵ In states with delegation authority, EPA can still enforce applicable emission standards or requirements.⁴⁵⁶

On November 26, 1993, EPA promulgated regulations to provide guidance to states seeking EPA's approval of state programs in lieu of federally promulgated HAP standards under section 112.⁴⁵⁷ This final rule contained guidance concerning rules or programs that can be implemented or enforced by states in place of certain section 112 rules.⁴⁵⁸ States may obtain partial or complete delegation; such delegation results in state programs that are substitutes for applicable federal requirements within the state, but these programs are federally enforceable.⁴⁵⁹ The November 1993 rule was subsequently amended to clarify the rule, reduce administrative burdens, and provide more flexibility to the states.⁴⁶⁰

The federal regulations governing EPA's approval of state rules or programs under section 112(1) are located at 40 C.F.R. section 63.90. Section 112(1) and the related regulations allow state and local governments to receive EPA delegation in three ways: (1) states may substitute a state rule that is no less stringent for an EPA approved industry-specific rule; (2) the state may substitute an approved state air toxics program that is no less stringent than the federal program; or (3) EPA may delegate to a state the authority to implement and enforce the federal air toxic standards.⁴⁶¹ All delegations are subject to EPA's review and it may withdraw delegation if there are state infractions. Regulations to implement this program were promulgated on November 26, 1993.⁴⁶² Under the implementing regulations, EPA must review state air toxic rules to ensure they are as stringent as the federal requirements.⁴⁶³ On July 5, 1995, EPA announced that this responsibility would be exercised by

⁴⁵⁵ *Id.*

⁴⁵⁶ *Id.* § 112(1)(6).

⁴⁵⁷ Approval of State Programs and Delegation of Federal Authorities, 58 Fed. Reg. 62,262 (Nov. 26, 1993) (to be codified at 40 C.F.R. pt. 63) [hereinafter Approval and Delegation].

⁴⁵⁸ *Id.*

⁴⁵⁹ *Id.*

⁴⁶⁰ Approval of State Programs and Delegation of Federal Authorities, 61 Fed. Reg. 36,295 (July 10, 1996) (to be codified at 40 C.F.R. pt. 63).

⁴⁶¹ Approval of State Programs and Delegation of Federal Authorities; Program Overview, 40 C.F.R. § 63.90 (2000).

⁴⁶² Approval and Delegation, *supra* note 459, at 62,262.

⁴⁶³ 40 C.F.R. § 63.90.

the regional offices.⁴⁶⁴ State programs can differ from the federal rules if they provide equivalent or better overall emission reductions. EPA detailed this position in a memorandum sent June 26, 1995, to EPA's Region IX by John S. Seitz, director of OAQPS.⁴⁶⁵

This "rule substitution" option requires EPA to "make a detailed and thorough evaluation of the state's submittal to ensure that it meets the stringency and other requirements" of 40 C.F.R. § 63.93.⁴⁶⁶ A rule will be approved if EPA finds that: (1) the state authorities are "no less stringent" than the corresponding federal MACT; (2) adequate authorities and resources exist; (3) the schedule for implementation and compliance is sufficiently expeditious; and (4) the state program is otherwise in compliance with federal guidance.⁴⁶⁷ Upon approval, the state is given the authority to implement and enforce its rule in lieu of the MACT.⁴⁶⁸

A memorandum by John S. Seitz on July 10, 1998, clarifies what discretionary authorities are delegated to state and local entities when they receive "straight" delegation to implement the General Provisions.⁴⁶⁹ The memorandum addresses source-specific decisions only, rather than category-wide decisions.⁴⁷⁰ General Provisions that may not be delegated generally include alternatives to opacity standards, test methods, monitoring, and record-keeping.⁴⁷¹

EPA issued proposed regulations on January 19, 1999, to amend the approval process of state and local programs. This rule was finalized September 14, 2000.⁴⁷² The purpose of the rule is to increase flexibility in demonstrating equivalency and offer additional alternative processes for delegation. EPA maintains that the equivalency criteria will remain the "same no matter which delegation/approval option a S/L chooses to pursue among the

⁴⁶⁴ *Regions Get Authority to Decide Whether State Toxics Rules Meet Federal Standards*, DAILY ENV'T REP. (BNA) A-2 (July 6, 1995).

⁴⁶⁵ *Id.*

⁴⁶⁶ Approval and Delegation, *supra* note 457, at 62,274.

⁴⁶⁷ Approval of State Programs and Delegation of Federal Authorities: Approval of State Requirements that Substitute for a Section 112 Rule, 40 C.F.R. § 63.93 (2000).

⁴⁶⁸ *Id.*

⁴⁶⁹ Memorandum from U.S. EPA John S. Seitz, Director, OAQPS, *Delegation of 40 CFR Part 63 General Provisions Authorities to State and Local Air Pollution Control Agencies*, to Director Regions I-X 1 (July 10, 1998) (on file with author).

⁴⁷⁰ *Id.* at 3.

⁴⁷¹ *Id.* at 7-9.

⁴⁷² Amendments to the Approval of State Programs and Delegation of Federal Authorities, 65 Fed. Reg. 55,810 (Sept. 14, 2000) (to be codified at 40 C.F.R. pts. 9, 63).

options that allow alternative requirements to be substituted for Federal requirements."⁴⁷³

IV. HAP EMISSION STANDARDS FOR CATEGORIES OF SOURCES

The General Provisions apply to all regulated sources. But in addition, each HAP source category must have a NESHAP established. If a conflict exists between the General Provisions and the specific source category requirements, the source category requirements apply.

Pursuant to CAA section 112(c), EPA developed an initial list of 166 categories of major sources and eight categories of area sources for a total of 174 source categories which was published on July 16, 1992.⁴⁷⁴ In addition, section 112(e)(5) requires EPA to promulgate emissions standards pursuant to section 112(d) for Publicly Owned Treatment Works (POTWs) by November 15, 1995.⁴⁷⁵

The timetable for standards, found in CAA section 112(e), is organized so that the 174 source categories are to have regulations promulgated in four groups.⁴⁷⁶ Section 112(e)(1) requires EPA to have promulgated regulations for forty source categories by November 15, 1992. Coke oven batteries are separately covered in section 112(d)(8) with a requirement to promulgate regulations by December 31, 1992.⁴⁷⁷ By November 15, 1994, 25% of all initially listed categories were to be regulated; 50% were to be regulated by November 15, 1997; and the remaining categories were to be regulated by November 15, 2000.⁴⁷⁸ Forty-seven source categories had

⁴⁷³ Approval of State Programs and Delegation of Federal Authorities, 64 Fed. Reg. 1880, 1883 (Jan. 12, 1999) (to be codified at 40 C.F.R. pt. 63). The changes made to section 112(l) revise the procedures and criteria for approving S/L measures by offering a range of options for demonstrating equivalence with the federal requirements and expectations of the approval process. See Amendments to the Approval of State Programs and Delegation of Federal Authorities, 65 Fed. Reg. at 55,811. The greatest difference between the proposed rule and the final rule is the variety of enforceable mechanisms available under each equivalency option. *Id.*

⁴⁷⁴ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576 (July 16, 1992).

⁴⁷⁵ CAA § 112(e)(5), 42 U.S.C. § 7412(e)(5) (1994).

⁴⁷⁶ *Id.* § 112(e)(1)-(5).

⁴⁷⁷ Coke oven batteries are regulated by emission standard. NESHAPs for Source Categories and for Coke Oven Batteries, 58 Fed. Reg. 57,898 (Oct. 27, 1993) (to be codified at 40 C.F.R. pts. 9, 63).

⁴⁷⁸ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. at 31,576.

standards by 1996.⁴⁷⁹ Sixty-five industry group source categories had final rules published by November 1999.⁴⁸⁰ A revised schedule for MACT promulgations was published in November 1999 that projected the promulgation of another ninety-two rules by the statutorily imposed November 15, 2000 deadline.⁴⁸¹ As discussed previously, this projection has not been met.⁴⁸²

Sources within the listed categories are subject to MACT standards developed under section 112(d) when promulgated.⁴⁸³ Until standards are promulgated, major sources are subject to limitations determined on a case-by-case basis.⁴⁸⁴ Section 112(j) requires the owner or operator of any major source, in a category for which emission standards are delayed by at least eighteen months from the scheduled date for the promulgation of standards, to submit a permit application in compliance with CAA subchapter V. A proposed rule establishing requirements and procedures for complying with section 112(j) was promulgated on July 13, 1993.⁴⁸⁵ On May 20, 1994, EPA promulgated the final rule.⁴⁸⁶ The rule also contains provisions governing the establishment of MACT—equivalent emission limitations by the permitting authority.⁴⁸⁷ In addition, EPA promulgated regulations under CAA section 129 to control municipal waste combustors and hospital/medical/infectious waste incinerators.⁴⁸⁸

In the material that follows, two specific hazardous air pollution problems are briefly discussed. Asbestos is discussed because it represents the pre-1990, chemical-by-chemical approach, as well as

⁴⁷⁹ SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM, *supra* note 261, at 7.

⁴⁸⁰ NESHAPs: Revision of Source Category List and Schedule for Standards Under Section 112 of the CAA, 64 Fed. Reg. 63,025, 65,030 (Nov. 18, 1999).

⁴⁸¹ *Id.*

⁴⁸² See *supra* section III D.

⁴⁸³ CAA § 112(d)(2), 42 U.S.C. § 7412(d)(2) (1994).

⁴⁸⁴ *Id.* § 112(j); HAP: Proposed Regulations Governing Equivalent Emissions Limitations for HAP by Permit, 59 Fed. Reg. 37,778 (proposed July 13, 1993) (to be codified at 40 C.F.R. pt. 63) [hereinafter HAP: Proposed Regulations].

⁴⁸⁵ *Id.*

⁴⁸⁶ HAPs: Regulations Governing Equivalent Emission Limitations by Permit, 59 Fed. Reg. 26,429 (May 20, 1994) (40 C.F.R. pts. 9, 63).

⁴⁸⁷ HAP: Proposed Regulations, *supra* note 486, at 37,778.

⁴⁸⁸ *Id.*; see generally Arnold W. Reitze, Jr. & Michael K. Stagg, *Air Emission Standards and Guidelines Under the Clean Air Act for the Incineration of Hospital, Medical, and Infectious Waste*, 28 ENVTL. L. 791 (1998); Arnold W. Reitze, Jr. & Andrew N. Davis, *Regulating Municipal Waste Incinerators Under the Clean Air Act: History, Technology and Risks*, 21 B.C. ENVTL. AFF. L. REV. 1 (1993).

being a pervasive environmental problem that is subject to regulatory programs based on numerous statutes administered by various federal and state agencies. The Hazardous Organic NESHAP rule is discussed because it is the most complex of the MACT standards and applies to industries comprising a significant portion of the industrial community.

A. Asbestos

Asbestos is a group of mineral fibers⁴⁸⁹ commonly used in past years in building products because it possesses qualities of flexibility, strength, and durability and is resistant to heat and corrosion.⁴⁹⁰ Asbestos can be found in over three thousand products.⁴⁹¹ Many commercial buildings, older homes, and schools contain asbestos products such as roofing and flooring materials,⁴⁹² textiles, papers, filters and gaskets, cement, pipes, coating materials, thermal and acoustic insulation,⁴⁹³ and textured paints.⁴⁹⁴ Older school buildings are most likely to contain asbestos in spray-applied fireproofing, pipe and boiler insulation, acoustical and decorative insulation, and floor and ceiling tile.⁴⁹⁵ EPA estimates that there are approximately 107,000 schools and 733,000 public and commercial buildings containing

⁴⁸⁹ See U.S. ENVTL. PROTECTION AGENCY, U.S. CONSUMER PROD. SAFETY COMM'N, PUB. NO. EPA-402-K93-007, *INSIDE STORY: A GUIDE TO INDOOR AIR QUALITY*, 24 (1995) available at <http://www.epa.gov/iaq/pubsinsidest.html> (last visited Sept. 10, 2000) [hereinafter *Inside Story*]. "Asbestos" includes chrysolite, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these chemicals that has been chemically treated and/or altered." 29 C.F.R. § 1915.1001 app. K (2000).

⁴⁹⁰ See U.S. EPA, REGION 4, *THE ASBESTOS INFORMER*, available at <http://www.epa.gov/region04/air/asbestos/inform.htm> (last visited Sept. 10, 2000) [hereinafter *Asbestos Informer*]; Gerald W. Boston, *Toxic Apportionment: A Causation and Risk Contribution Model*, 25 ENVTL. L. 549, 551 n.2 (1995); see also Michael M. Stahl & David J. Kling, *Asbestos in Buildings*, TRIAL, Aug. 1990, at 28.

⁴⁹¹ See *Asbestos Informer*, *supra* note 490.

⁴⁹² For example, 9" x 9" vinyl floor tiles in pre-1980 homes contain asbestos about 90% of the time and 12" x 12" vinyl tiles about 50% of the time. See ANDREW N. DAVIS & PAUL E. SCHAFFMAN, *THE HOME ENVIRONMENTAL SOURCEBOOK* 45 (1996).

⁴⁹³ See *id.*; see also John D. Spengler, *Sources and Concentrations of Indoor Air Pollution*, in *INDOOR AIR POLLUTION: A HEALTH PERSPECTIVE* 52 (Jonathan M. Samet & John D. Spengler eds., The Johns Hopkins Univ. Press 1991).

⁴⁹⁴ See *Inside Story*, *supra* note 489.

⁴⁹⁵ See Stahl & Kling, *supra* note 490, at 28.

asbestos.⁴⁹⁶ Certain building types such as those listed above are presumed to contain asbestos if constructed before 1980.⁴⁹⁷

"Unlike most minerals, which turn into dust particles when crushed, asbestos breaks up into fine fibers that are too small to be seen by the human eye. Often individual fibers are mixed with a material that binds them together, producing asbestos containing material (ACM)."⁴⁹⁸ Asbestos exposure can occur through absorption through the skin⁴⁹⁹ or through inhalation⁵⁰⁰ or ingestion⁵⁰¹ and can be transported throughout the body by blood and by the gastrointestinal tract.⁵⁰² Based on human epidemiological data, EPA listed asbestos as a Group A (known) human carcinogen.⁵⁰³ Asbestos exposure has been closely linked with asbestosis, lung cancer, and mesothelioma.⁵⁰⁴ Asbestos fibers that are ingested are associated with stomach or gastrointestinal cancer.⁵⁰⁵ The majority of people afflicted with these diseases developed them as a result of occupational exposure to asbestos; however, these diseases also have resulted from exposure to asbestos brought home from the workplace in clothing and equipment.⁵⁰⁶

⁴⁹⁶ See *Asbestos Informer*, *supra* note 490; see Spengler, *supra* note 493, at 52.

⁴⁹⁷ UNIV. OF LOUISVILLE, DEP'T OF ENVTL. HEALTH AND SAFETY, HEALTH AND SAFETY: ASBESTOS, available at <http://www.louisville.edu/admin/dehs/hsasbes.htm> (last visited Sept. 10, 2000).

⁴⁹⁸ See *Asbestos Informer*, *supra* note 490.

⁴⁹⁹ Asbestos may cause severe skin irritation. Laurence S. Kirsch, *Behind Closed Doors: Indoor Air Pollution and Government Policy*, 6 HARV. ENVTL. L. REV. 339, 357 (1982).

⁵⁰⁰ Not all fibers become lodged in the lungs; some are removed in the same manner as are other foreign particles. However, some fibers do remain in the lungs or migrate to the heart, blood, or lymphatic systems. *Id.* at 357 n.146. Asbestos may cause fibrosis of the heart cavity, which is the formation of fibrous bodies within the lungs, heart, heart cavity, or lung cavity. *Id.* at 357.

⁵⁰¹ *Id.* at 356-57.

⁵⁰² *Id.* at 357.

⁵⁰³ Andrew J. Harrison, Jr., *An Analysis of the Health Effects, Economic Consequences and Legal Implications of Human Exposure to Indoor Air Pollutants*, 37 S.D. L. REV. 289, 312 (1991/1992); see also Asbestos Worker Protection; Asbestos-Containing Materials in Schools: Proposed Amendment, 59 Fed. Reg. 54,746, 54,750 (proposed Nov. 1, 1994) (to be codified at 40 C.F.R. pt. 763).

⁵⁰⁴ See *Asbestos Informer*, *supra* note 490. Asbestosis is a condition resulting from scarring of the lungs with fibrous tissue as a result of the inhalation of asbestos fibers. See Stahl & Kling, *supra* note 490, at 28. Asbestosis is a leading cause of death for workers exposed to asbestos. However, some workers exposed to asbestos do not become impaired. See Kirsch, *supra* note 499, at 465 n.148.

⁵⁰⁵ See DAVIS & SCHAFFMAN, *supra* note 492, at 42.

⁵⁰⁶ Asbestosis and mesothelioma have been observed in people exposed in non-occupational settings. For example, they have been found in persons living in the same house as exposed workers. See Kirsch, *supra* note 499, at 357 n.143 (citing Anderson et al.,

1. Control of Asbestos

Asbestos in existing construction does not create a public health problem if it remains fixed in the materials;⁵⁰⁷ people must come in contact with the fibers to be affected.⁵⁰⁸ Nonfriable asbestos-containing materials, for example floor tiles, will not normally release fibers and thus are considered less hazardous.⁵⁰⁹ Friable asbestos products used in building materials are most likely to release fibers.⁵¹⁰ These products are easily reduced to powder, and as a result are most susceptible to disturbance or damage.⁵¹¹ Solid materials containing asbestos are more likely to release fibers if they are subjected to vibration or to grinding, cutting, or sanding.⁵¹² Once asbestos fibers are released, they may remain airborne for many hours.⁵¹³ As a result, the activities of a building's owners and occupants play a significant role in determining the concentration of asbestos fibers.⁵¹⁴

If a building has asbestos-containing materials, the potential legal liability makes it wise to consult a professional to determine whether the asbestos is aged or damaged and whether it should be removed.⁵¹⁵ Friable asbestos products should immediately be repaired or removed

Asbestosis Among Household Contacts of Asbestos Factory Workers, 330 ANNALS N.Y. ACAD. SCI. 387 (1979)).

⁵⁰⁷ See Samet & Spengler, *supra* note 493, at 54.

⁵⁰⁸ See Stahl & Kling, *supra* note 490, at 29.

⁵⁰⁹ See DAVIS & SCHAFFMAN, *supra* note 492, at 41. "Friable" asbestos is asbestos that has "deteriorated or sustained physical injury such that the cohesion of the material . . . is inadequate, or which . . . lacks fiber cohesion." Asbestos-Containing Materials in Schools, 52 Fed. Reg. 41,826, 41,830 (Oct. 30, 1987) (to be codified at 40 C.F.R. pt. 763).

⁵¹⁰ See DAVIS & SCHAFFMAN, *supra* note 492, at 41.

⁵¹¹ See *id.*

⁵¹² See Kirsch, *supra* note 499, at 356. For example, vinyl flooring will not release fibers when cleaned but may release fibers if sanded, drilled, filed, or scraped. See DAVIS & SCHAFFMAN, *supra* note 492, at 43-44.

⁵¹³ Asbestos fibers are microscopic in size and are also very light. See Stahl & Kling, *supra* note 490, at 28.

⁵¹⁴ Contact the Consumer Product Safety Commission (CPSC) (800/638-CPSC) or the EPA's Asbestos Hotline (202/534-1404) for more asbestos information.

⁵¹⁵ See *Inside Story*, *supra* note 489. A home asbestos inspection may cost \$300 to \$500, or an extra \$100 to \$300 if added onto a full home inspection. Lab analysis for asbestos costs \$20 to \$35 per sample. *Id.* Asbestos-abatement contractors typically charge \$4 per square foot to remove vinyl flooring (tiles and linoleum), \$4 to \$5 per square foot to remove ceiling tiles, \$10 to \$15 per square foot to remove textured ceiling paint or plaster, up to \$20 per linear foot to remove asbestos pipe insulation, and \$30 per square foot to remove furnace insulation. The cost to hire a licensed contractor to remove and dispose of asbestos materials around a furnace, for example, could be \$1000 to \$2000. See DAVIS & SCHAFFMAN, *supra* note 492, at 42.

to prevent a release.⁵¹⁶ Asbestos-containing materials in good condition should not be cut or otherwise disturbed.⁵¹⁷ If removal is appropriate it should be done by trained and properly equipped professionals.⁵¹⁸

The presence of asbestos in schools has received considerable attention from Congress and federal agencies. EPA first regulated asbestos in schools in 1982 through regulations issued under Toxic Substances Control Act (TSCA) section 6(a).⁵¹⁹ In 1986 Congress enacted TSCA amendments, known as the Asbestos Hazard Emergency Response Act (AHERA), which mandated the steps schools must take to protect students and school employees.⁵²⁰ Under these amendments, schools must: (1) inspect for both friable and nonfriable asbestos-containing materials; (2) prepare and submit a management plan to the governor of the state in which the school is located and make the plan available to parents of students and to school employees; and (3) determine and conduct appropriate actions to minimize the risk of exposure.⁵²¹

EPA issued regulations under AHERA on October 30, 1987.⁵²² EPA also promulgated regulations in 1986 and 1987 to protect asbestos workers involved in state or local government asbestos abatement projects that are not covered by either the OSH Act, a state

⁵¹⁶ See DAVIS & SCHAFFMAN, *supra* note 492, at 43. With multi-family homes, for example, state and federal rules require landlords and building managers to survey for and repair or remove friable asbestos containing materials that could lead to exposure. See *id.* at 44.

⁵¹⁷ *Id.* at 43; see also *Inside Story*, *supra* note 489.

⁵¹⁸ See *Inside Story*, *supra* note 489; see also DAVIS & SCHAFFMAN, *supra* note 492, at 42. Unless proper precautions are instituted, the removal process may itself result in the release of fibers. See Kirsch, *supra* note 499, at 358. In addition, asbestos removal by the owner of a building may be illegal. See DAVIS & SCHAFFMAN, *supra* note 492, at 44; see also *In re Seneca Asbestos Removal & Control, Inc.*, No. CAA-010A-1993 (EPA EAB 1997) (holding asbestos abatement consultant liable for CAA section 112 violations for improper removal); *Agency Considering Whether to Appeal ALJ Ruling on Asbestos Removal Liability*, DAILY ENV'T REP. (BNA) B-3 (Jan. 31, 1997).

⁵¹⁹ See Asbestos: Friable Asbestos-Containing Materials in Schools, Identification and Notification, 47 Fed. Reg. 23,360 (May 27, 1982) (to be codified at 40 C.F.R. pt. 763).

⁵²⁰ TSCA §§ 201-215, 15 U.S.C. §§ 2641-2656 (1994).

⁵²¹ See Stahl & Kling, *supra* note 490, at 28. AHERA does not mandate removal; rather, it mandates the development of a management plan. See *id.* at 30. Stahl and Kling have reported that the EPA estimated that 94% of schools have complied with AHERA. See *id.*

⁵²² See Asbestos-Containing Materials in Schools, 52 Fed. Reg. 41,826 (Oct. 30, 1987) (to be codified at 40 C.F.R. pt. 763).

plan approved by OSHA, or a state asbestos regulation that is comparable to or even more stringent than EPA regulations.⁵²³

Asbestos also is regulated pursuant to section 112 of the CAA.⁵²⁴ Section 112 controls emissions of HAPs through the implementation of National Emission Standards for Hazardous Air Pollutants (NESHAPs).⁵²⁵ Asbestos was one of the few substances regulated under the pre-1990 CAA section 112.⁵²⁶ Regulations issued after the 1990 CAA Amendments significantly increased the legal requirements applicable to asbestos abatement programs.⁵²⁷ For instance, asbestos is now measured by a percentage of area measurement using polarized light microscopy instead of by weight.⁵²⁸ The regulation also divided ACM into friable and nonfriable categories with new definitions.⁵²⁹ The requirements imposed more stringent demands on the demolition or renovation of asbestos containing buildings.⁵³⁰ The definition of "owner or operator" was expanded to include those controlling or supervising demolition or renovation.⁵³¹ EPA is to be notified if regulated ACM exceeds 260 linear feet on pipes, or 160 square feet on other components, or thirty-five cubic feet on off-facility components.⁵³² Many specific notification requirements and prohibitions on ACM-related activity were added.⁵³³ Detailed requirements for asbestos removal were added with the generally applicable requirement that asbestos be wet during renovation or demolition. Also, supervision and training requirements were tightened.⁵³⁴ Additional disposal requirements, similar to RCRA requirements, were added for regulated ACMs.⁵³⁵

⁵²³ See Toxic Substances: Asbestos Abatement Projects, 51 Fed. Reg. 15,722 (Apr. 25, 1986) (to be codified at 40 C.F.R. pt. 763); see also Asbestos Abatement Projects: Worker Protection, 52 Fed. Reg. 5618 (Feb. 25, 1987) (to be codified at 40 C.F.R. pt. 763). The 1986 rule extends OSHA protection to such employees. See 51 Fed. Reg. at 15,722. The 1987 rule replaces the 1986 rule and aims to ensure that public and private sector employees have similar levels of protection. See 52 Fed. Reg. at 5168.

⁵²⁴ CAA § 112(b), 42 U.S.C. § 7412(b) (1994).

⁵²⁵ The NESHAPs for asbestos are located at 40 C.F.R. §§ 61.140–61.157 (2000).

⁵²⁶ See REITZE, *supra* note 12, at 270.

⁵²⁷ See NESHAPs: Asbestos NESHAP Revision, 55 Fed. Reg. 48,406 (Nov. 20, 1990) (to be codified at 40 C.F.R. pt. 61) [hereinafter Asbestos NESHAP Revision].

⁵²⁸ *Id.*

⁵²⁹ *Id.*

⁵³⁰ *Id.*

⁵³¹ *Id.*

⁵³² *Id.* at 48,419.

⁵³³ Asbestos NESHAP Revision, *supra* note 527, at 48,406.

⁵³⁴ *Id.*

⁵³⁵ See *id.*

On July 28, 1995, EPA clarified its asbestos air toxic standard.⁵³⁶ Residential buildings with four or fewer dwelling units are exempt from the asbestos rule, even if they are safety hazards or public nuisances under local law.⁵³⁷ Multiple small buildings located on the same site and under common ownership or control are not exempt if they are demolished or renovated.⁵³⁸ Residential structures that are demolished as part of a commercial or public project also are not exempt.⁵³⁹

Under federal law, any material containing more than 1% asbestos is considered to be a regulated "asbestos-containing material," or ACM.⁵⁴⁰ EPA and OSHA have set permissible exposure levels in public buildings and for worker exposure and now require products containing asbestos to be labelled in order to reduce asbestos exposure.⁵⁴¹ Federal regulations set forth work standards. For example, the use of safety equipment is mandated for employees working in buildings where friable asbestos is present prior to demolition or major remodeling.⁵⁴²

The asbestos NESHAP regulation was interpreted when the U.S. Court of Appeals for the Sixth Circuit decided *United States v. Midwest Suspension & Brake* on March 27, 1995.⁵⁴³ The case was a civil action brought against a brake shoe rehabilitation business for violation of the NESHAP for asbestos and an administrative order issued by EPA.⁵⁴⁴ Midwest supplied brakes and other parts for heavy duty trucks.⁵⁴⁵ Its brake operation included the collection and rehabilitation of used brake shoes for resale.⁵⁴⁶ An EPA inspection found emissions of asbestos, waste disposal that released asbestos, and asbestos in the shop floor dust.⁵⁴⁷ In response to these findings, EPA

⁵³⁶ See Asbestos NESHAP Clarification of Intent, 60 Fed. Reg. 38,725 (July 28, 1995) (to be codified at 40 C.F.R. pt. 61).

⁵³⁷ *Id.* at 38,735.

⁵³⁸ *Id.*

⁵³⁹ *Id.*

⁵⁴⁰ See Occupational Exposure to Asbestos, 59 Fed. Reg. 40,964, 41,057 (Aug. 10, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926).

⁵⁴¹ *Id.* at 40,964; see also Occupational Exposure to Asbestos: Corrections, 60 Fed. Reg. 33,974, 33,974 (June 28, 1995) (codified at 29 C.F.R. pts. 1910, 1915, 1926).

⁵⁴² Occupational Health and Environmental Controls, 29 C.F.R. § 1926.58 subpart D (2000).

⁵⁴³ 49 F.3d 1197, 1199 (6th Cir. 1995).

⁵⁴⁴ *Id.*

⁵⁴⁵ *Id.* at 1200.

⁵⁴⁶ *Id.*

⁵⁴⁷ *Id.*

paper rollboard, and specialty paper are banned from manufacture, production, importation, and distribution.⁵⁷⁰

2. OSHA's Requirements

OSHA has regulated asbestos exposure since 1971.⁵⁷¹ Approximately 1.3 million workers in construction and general industry are exposed to asbestos, but initially OSHA's asbestos exposure regulations only applied to general industry.⁵⁷² The first asbestos permissible exposure limit (PEL) was 12.0 fibers per cubic centimeter (f/cc) and was based on the national consensus standard.⁵⁷³ On December 7, 1971, this level was reduced to 5 f/cc using OSHA's emergency temporary standards (ETS) authority.⁵⁷⁴ It was not challenged and became a permanent standard in June, 1972, through normal notice and comment procedures.⁵⁷⁵ In 1975, OSHA attempted to reduce the PEL to 0.5 f/cc, but its approach was rejected by the U.S. Supreme Court.⁵⁷⁶ In 1976, OSHA reduced the standard to 2 f/cc.⁵⁷⁷ On November 4, 1983, OSHA lowered the PEL for asbestos to 0.5 f/cc using its ETS authority.⁵⁷⁸ In 1984, the U.S. Court of Appeals for the Fifth Circuit held that OSHA did not invoke its ETS powers properly and struck down the regulation.⁵⁷⁹

OSHA revised the permanent asbestos standard from 2 to 0.2 f/cc in 1986.⁵⁸⁰ OSHA's standard for general industry occupational exposure to asbestos of 0.2 f/cc was extended to the construction industry on June 17, 1986.⁵⁸¹ The standard was generally upheld in *Building & Construction Trades Department v. Brock*, but the decision resulted in nine issues being remanded to OSHA.⁵⁸² OSHA removed

⁵⁷⁰ See *id.* at 33,209.

⁵⁷¹ *Asbestos Info. Ass'n N. Am. v. OSHA*, 727 F.2d 415, 418 (5th Cir. 1984).

⁵⁷² *Reitze & Carof*, *supra* note 51, at 299.

⁵⁷³ *Asbestos Info. Ass'n*, 727 F.2d at 418 n.6.

⁵⁷⁴ *Id.*

⁵⁷⁵ *Id.*

⁵⁷⁶ See *id.* at 418 (citing *Indus. Union Dep't v. Am. Petroleum Inst.*, 448 U.S. 607, 662 (1980)).

⁵⁷⁷ *Id.*

⁵⁷⁸ *Id.* at 417 (citing *Occupational Exposure to Asbestos*, 48 Fed. Reg. 51,086, 51,139 (Nov. 4, 1983) (to be codified at 29 C.F.R. pt. 1910)).

⁵⁷⁹ *Asbestos Info. Ass'n*, 727 F.2d at 418.

⁵⁸⁰ *Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite*, 51 Fed. Reg. 22,612, 22,733 (June 20, 1986) (to be codified at 29 C.F.R. pts. 1910, 1926).

⁵⁸¹ *Id.*

⁵⁸² See 838 F.2d 1238, 1262 (D.C. Cir. 1988).

some minerals from the coverage of the asbestos standards on June 8, 1992.⁵⁸³

OSHA promulgated a final rule concerning occupational exposure to asbestos on August 10, 1994.⁵⁸⁴ The final rule amends OSHA standards issued on June 17, 1986,⁵⁸⁵ for occupational exposure to asbestos in general industry and in the construction industry.⁵⁸⁶ A separate standard covers occupational exposure to asbestos in the shipyard industry.⁵⁸⁷ The effective date of these amendments was October 11, 1994.⁵⁸⁸ The standards specify various start-up dates.⁵⁸⁹ Major revisions to these standards include a reduced time-weighted average PEL of 0.1 f/cc for all asbestos work, and a new classification scheme for asbestos construction and shipyard industry work that ties mandatory work practices to work classification.⁵⁹⁰ There is now a presumptive asbestos identification requirement for building materials containing "high hazard" asbestos, limited notification requirements for employers using unlisted compliance methods in high-risk asbestos abatement work, and mandatory methods of control of asbestos during brake and clutch repair.⁵⁹¹

The asbestos rules applicable to owners of buildings built before 1981 became effective on October 1, 1995.⁵⁹² This regulation, nearly two hundred pages long, has been expanded by three sets of clarifications and corrections.⁵⁹³ The construction standard applies to almost any activity that disturbs material containing asbestos, or that is

⁵⁸³ See Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite, 57 Fed. Reg. 24,310, 24,330 (June 8, 1992) (to be codified at 29 C.F.R. pts. 1910, 1926).

⁵⁸⁴ Occupational Exposure to Asbestos, 59 Fed. Reg. 40,964, 41,037 (Aug. 10, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926; 29 C.F.R. § 1910.1001 (2000); 29 C.F.R. § 1915.1001 (2000); 29 C.F.R. § 1926.1101 (2000)).

⁵⁸⁵ Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite, 51 Fed. Reg. 22,612, 22,733 (June 20, 1986) (to be codified at 29 C.F.R. pts. 1910, 1926).

⁵⁸⁶ 29 C.F.R. § 1926.1101 (2000).

⁵⁸⁷ *Id.* § 1915.1001.

⁵⁸⁸ See Occupational Exposure to Asbestos, 59 Fed. Reg. at 40,964.

⁵⁸⁹ *Id.*

⁵⁹⁰ *Id.*

⁵⁹¹ *Id.*

⁵⁹² Occupational Exposure to Asbestos, 60 Fed. Reg. 30,411 (Sept. 29, 1995) (to be codified at 29 C.F.R. pts. 1913, 1926).

⁵⁹³ See Occupational Exposure to Asbestos; Corrections, 60 Fed. Reg. 33,974, 33,983 (June 29, 1995) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926); Occupational Exposure to Asbestos; Final Rule Amendments, 60 Fed. Reg. 50,411, 50,411 (Sept. 29, 1995) (to be codified at 29 C.F.R. pts. 1915, 1926); 29 C.F.R. § 1910.1001 (2000); 29 C.F.R. § 1915.1001 (2000); 29 C.F.R. § 1926.1101 (2000).

presumed to contain asbestos, in commercial buildings.⁵⁹⁴ The regulations require specific work practices to be followed that are designed to prevent the release to the air of asbestos fibers.⁵⁹⁵ Workers exposed to airborne asbestos levels of 0.1 f/cc must be protected through the use of personal protection gear according to OSHA's and EPA's regulations.⁵⁹⁶

Most of the 1994 revisions to the asbestos standards were in response to an order of the U.S. Court of Appeals for the D.C. Circuit, which upheld the 1986 standards but remanded certain issues for reconsideration.⁵⁹⁷ OSHA previously made changes in response to the court order on December 14, 1989,⁵⁹⁸ and February 5, 1990.⁵⁹⁹ OSHA issued a notice correcting and clarifying certain of these provisions on June 29, 1995.⁶⁰⁰ OSHA further corrected and clarified the construction and shipyard employment standards on September 29, 1995, but it did not amend the general industry standards.⁶⁰¹ The amendments became effective October 1, 1995.⁶⁰² The Building and Construction Trades Department of the AFL-CIO challenged these job-related asbestos standards in the U.S. Court of Appeals for the D.C. Circuit.⁶⁰³ The American Petroleum Institute (API) filed a motion to intervene, arguing that a victory by the union could have a direct effect on companies that are members of the API.⁶⁰⁴ In late

⁵⁹⁴ Occupational Exposure to Asbestos, 59 Fed. Reg. 40,964, 41,000 (Aug. 10, 1994) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926).

⁵⁹⁵ See James B. Witkin, *Owners Face New Asbestos Rules: Special Concern for Custodial Workers*, LEGAL TIMES, Oct. 16, 1995, at S27; 29 C.F.R. § 1910.1001 (2000).

⁵⁹⁶ 29 C.F.R. pt. 1926, subpart D.

⁵⁹⁷ See *Bldg. & Constr. Trades Dep't v. Brock*, 838 F.2d 1238, 1262 (D.C. Cir. 1988).

⁵⁹⁸ Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite, 54 Fed. Reg. 52,024, 52,025 (Dec. 20, 1989) (to be codified at 29 C.F.R. pts. 1910, 1926).

⁵⁹⁹ Occupational Exposure to Asbestos, 55 Fed. Reg. 3724, 3725 (Feb. 5, 1990) (to be codified at 29 C.F.R. pts. 1910, 1926).

⁶⁰⁰ Occupational Exposure to Asbestos: Corrections, 60 Fed. Reg. 33,974, 33,983 (June 29, 1995) (to be codified at 29 C.F.R. pts. 1910, 1915, 1926).

⁶⁰¹ See Occupational Exposure to Asbestos, 60 Fed. Reg. 50,411, 50,412 (Sept. 29, 1995) (to be codified at 29 C.F.R. pts. 1915, 1926).

⁶⁰² *Id.*

⁶⁰³ See *Bldg. & Constr. Trades Dep't v. OSHA*, No. 95-1584, 1995 WL 791559, at *1 (D.C. Cir. 1995) [hereinafter *Brock II*].

⁶⁰⁴ See *API Seeks to Intervene in BCTD's Asbestos Challenge*, ENV'T REP. (BNA) A-3 (Dec. 13, 1995).

1995, the D.C. Circuit transferred the case and two related cases to the Fifth Circuit.⁶⁰⁵ In 1996, the case was settled.⁶⁰⁶

Asbestos was initially listed as an area source subject to MACT standard formulations,⁶⁰⁷ but was delisted in 1995.⁶⁰⁸ One of the reasons for delisting was to prevent duplicative regulation, as the removal of asbestos is governed by 40 C.F.R. part 61, subpart M.⁶⁰⁹ Asbestos may be covered in other MACT standards if the facility qualifies as a major source.⁶¹⁰

B. *The Hazardous Organic NESHAP Rule*

On April 22, 1994,⁶¹¹ and June 6, 1994,⁶¹² EPA promulgated a NESHAP for the synthetic organic chemical manufacturing industry (SOCMI) and for several other processes subject to the equipment leaks portion of the rule in 40 C.F.R. part 63, subparts F, G, H, and I.⁶¹³ This rule is commonly referred to as the Hazardous Organic NESHAP (HON or HON rule).⁶¹⁴

The HON was challenged by the Chemical Manufacturers Association and Dow Chemical Company in June, 1994 in the U.S. Court of Appeals for the D.C. Circuit.⁶¹⁵ The petitioners raised over

⁶⁰⁵ See *Brock II*, *supra* note 605, at *1.

⁶⁰⁶ See *Asbestos: BCTD Settles Lawsuit with OSHA: Agreements on Training, Information Reached*, O.S.H. Rep. (BNA) D-4 (May 6, 1996).

⁶⁰⁷ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576, 31,586 (notice July 16, 1992).

⁶⁰⁸ Delisting of Source Category and Revision of Initial List of Categories of Sources and Schedule for Standards Under Section 112(c) of the CAA, 60 Fed. Reg. 61,550, 61,551 (Nov. 30, 1995).

⁶⁰⁹ See *id.*

⁶¹⁰ See NESHAPs for Shipbuilding and Ship Repair (Surface Coating) Operations, 40 C.F.R. pt. 63 (2000).

⁶¹¹ NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks, 59 Fed. Reg. 19,402 (Apr. 22, 1994) (to be codified at 40 C.F.R. pt. 63).

⁶¹² NESHAPs for Source Category: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks: Determination of MACT "Floor," 59 Fed. Reg. 29,196, 29,196 (June 6, 1994) (to be codified at 40 C.F.R. pt. 63).

⁶¹³ NESHAPs for Source Categories, 40 C.F.R. pt. 63, subparts F, G, H, I (2000).

⁶¹⁴ See *id.*

⁶¹⁵ NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks: Rule Clarifications, 61 Fed. Reg. 64,572 (Dec. 5, 1996) (to be codified at 40 C.F.R. pt. 63) (citing *Chem. Mfrs. Ass'n v. EPA*, Nos. 94-1463 and 94-1464 (D.C. Cir. 1994); *Dow Chem. Co. v. EPA*, No. 94-1465 (D.C. Cir. 1994)).

seventy-five technical issues that were subsequently addressed in the amendments to the rule on December 5, 1996,⁶¹⁶ and January 17, 1997, thereby ending the case.⁶¹⁷

The HON regulates emissions from five kinds of emission points at SOCFI sources: (1) process vents, (2) transfer operations, (3) storage vessels, (4) air emissions from wastewater streams, wastewater collection, and treatment operations, and (5) equipment leaks.⁶¹⁸

A SOCFI facility is subject to the HON rule if it meets three tests.⁶¹⁹ First, it must be a facility that is major by having the potential to emit either ten tons of any of the 188 HAPs or twenty-five tons of any combination of HAPs.⁶²⁰ A facility includes all the emission points on a contiguous or adjacent property under common ownership or control.⁶²¹ Second, the chemical manufacturing process unit (CMPU) must either manufacture or use one of the chemicals listed in subpart F of HON rule table one.⁶²² Third, the CMPU must use as a reactant, or manufacture as a product, byproduct, or coproduct, one or more of the 112 HAPs listed in subpart F of HON rule table two.⁶²³ The HON rule identifies 385 facilities that involve an organic HAP either as a product, byproduct, coproduct, intermediate, or reactant.⁶²⁴ Further details are provided in the rule concerning the circumstances in which the HON rule is applicable.⁶²⁵ If a facility fails to meet any of the three tests it is not subject to the HON rule.⁶²⁶

⁶¹⁶ See *id.*

⁶¹⁷ NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks: Rule Clarifications, 62 Fed. Reg. 2722 (Jan. 17, 1997) (to be codified at 40 C.F.R. pt. 63); see also NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks: Rule Clarifications, 61 Fed. Reg. 64,572 (Dec. 5, 1996) (to be codified at 40 C.F.R. pt. 63) (citing Settlement Agreement, Chem. Mfrs. Ass'n v. EPA, No. 94-1463 (D.C. Cir. 1996)).

⁶¹⁸ See U.S. ENVTL. PROTECTION AGENCY, PUB. EPA-305-B-97-006, INSPECTION TOOL FOR THE HAZARDOUS ORGANIC NESHAP (HON), VOLUME I: OVERVIEW OF EMISSION POINTS, CONTROL TECHNOLOGIES, AND HON PROVISIONS I-3 (1997) [hereinafter INSPECTION TOOL].

⁶¹⁹ See *id.* at I-12.

⁶²⁰ See *id.*

⁶²¹ See *id.*

⁶²² See *id.*

⁶²³ See *id.*

⁶²⁴ See INSPECTION TOOL, *supra* note 618, at I-12.

⁶²⁵ See *id.*

⁶²⁶ See *id.*

The HON rule is divided into three subparts.⁶²⁷ Subpart F has general provisions; subpart G provides emission requirements for process vents, storage vessels, transfer operations, and air emissions from wastewater operations; and subpart H deals with emissions due to equipment leaks and relief-valve discharges.⁶²⁸

Forty C.F.R. section 63.100 contains additional details for determining applicability in situations where a process makes multiple products.⁶²⁹ If a chemical manufacturing process is subject to the HON, then the emission points associated with that process are regulated.⁶³⁰ Details on how to determine which storage vessels and transfer racks are part of a chemical manufacturing process are also contained in section 63.100.⁶³¹

Definitions of terms used in subpart F are contained in 40 C.F.R. section 63.101.⁶³² Sections 63.102 and 63.103 contain general compliance, recordkeeping, and reporting provisions and override certain portions of the NESHAP General Provisions (40 C.F.R. part 63, subpart A).⁶³³ These sections specify general performance test conditions, require records to be maintained for five years, and clarify where reports required under subparts G and H are to be sent.⁶³⁴

Subpart G contains the standard for process vents, transfer operations, storage vessels, and wastewater.⁶³⁵ It includes emissions averaging provisions.⁶³⁶ The first section of subpart G (40 C.F.R. section 63.110) contains applicability provisions that clarify potential overlaps between process vents, storage, wastewater, and equipment leaks.⁶³⁷ Section 63.111 contains definitions.⁶³⁸

Process vents are not regulated under the HON rule unless they contain HAPs in a quantity that exceeds 0.005% by weight of total HAPs.⁶³⁹ Process vents must be further classified into Group 1 or

⁶²⁷ See *id.* at I-1.

⁶²⁸ See *id.*

⁶²⁹ *Id.* at I-3.

⁶³⁰ INSPECTION TOOL, *supra* note 620, at I-3.

⁶³¹ *Id.*

⁶³² *Id.*

⁶³³ *Id.*

⁶³⁴ *Id.*

⁶³⁵ *Id.*

⁶³⁶ INSPECTION TOOL, *supra* note 618, at I-3.

⁶³⁷ *Id.*

⁶³⁸ *Id.*

⁶³⁹ NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated

Group 2 based on their flowrate, HAP concentration, and “total resource effectiveness index” (TREI).⁶⁴⁰ Wastewater streams are also subject to classification.⁶⁴¹ A proposed rule was issued on January 20, 2000 to further clarify the applicability of the HON rule to process vents.⁶⁴²

Section 63.112 provides an equation for use in determining a site-specific allowable overall emission limit for each source.⁶⁴³ The “source” is the combination of all emission points subject to the HON at a plant site (contiguous area under common ownership or control).⁶⁴⁴ The standard requires sources to meet the allowable emission limit; this equation, however, is not used to determine compliance with the standard, and source owners or operators are not required to calculate their allowable emission limit.⁶⁴⁵ As provided in 40 C.F.R. section 63.112(c), the owner or operator must demonstrate compliance using one or both of two approaches: the point-by-point compliance approach or the emissions averaging approach.⁶⁴⁶

Under the point-by-point approach, the owner or operator would apply control to each “Group 1” emission point.⁶⁴⁷ A Group 1 emission point is a point which meets the control applicability criteria, and the owner or operator must reduce emissions to specified levels; whereas a “Group 2” emission point is one that does not meet the criteria and no emission reduction is required.⁶⁴⁸ These Group 1 and Group 2 emission points are defined in section 63.111.⁶⁴⁹ Owners or operators selecting the point-by-point compliance approach must comply with the process vent provisions in sections 63.113 through 63.118; the storage vessel provisions in sections 63.119 through 63.123; the transfer operation provisions in sections 63.126 through 63.130; and the wastewater provisions in sections 63.131 through

Regulation for Equipment Leaks, 59 Fed. Reg. 19,402, 19,406 (Apr. 22, 1994) (to be codified at 40 C.F.R. pt. 63) [hereinafter Final Rule].

⁶⁴⁰ See *id.*

⁶⁴¹ *Id.* at 19,454.

⁶⁴² NESHAPs for Source Categories: Organic HAPs from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks, 65 Fed. Reg. 3169 (proposed Jan. 20, 2000) (to be codified at 40 C.F.R. pt. 63).

⁶⁴³ INSPECTION TOOL, *supra* note 618, at I-3.

⁶⁴⁴ *Id.* at I-3, I-7.

⁶⁴⁵ *Id.* at I-7.

⁶⁴⁶ *Id.*

⁶⁴⁷ *Id.*

⁶⁴⁸ *Id.*

⁶⁴⁹ INSPECTION TOOL, *supra* note 618, at I-7.

63.147.⁶⁵⁰ These sections include applicability criteria, emission limits, equipment and work practice standards, testing, monitoring recordkeeping, and reporting provisions.⁶⁵¹

Under the emissions averaging approach, an owner or operator may elect to control different groups of emission points within the source to different levels than specified in sections 63.113 through 63.147, as long as the overall emissions do not exceed the overall allowable emission level.⁶⁵² An owner or operator can choose not to control a Group 1 emission point (or to control the emission point with a less effective control technique) *if* the owner or operator over controls another emission point within the source.⁶⁵³ Emission “debits” (in mg of HAP emissions) are generated for each Group 1 emission point that is uncontrolled or under-controlled.⁶⁵⁴ Emission “credits” (also in mg) are generated for over-controlled points.⁶⁵⁵ Credits can be generated if a Group 1 or Group 2 point is controlled by a distinct technology that EPA approves as having a greater efficiency than the level of control required for Group 1 points.⁶⁵⁶ Credits have to equal or exceed debits for a source to be in compliance.⁶⁵⁷ Section 63.150 contains detailed equations for calculating debits and credits.⁶⁵⁸

Subpart H contains the standard for equipment leaks.⁶⁵⁹ Equipment regulated includes pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, product accumulator vessels, and instrumentation systems in volatile HAP (VHAP) service.⁶⁶⁰ A piece of equipment is in VHAP service if it contains or contacts a fluid that is at least 5% VHAP by weight.⁶⁶¹

The applicability of subpart H and definitions are contained in sections 63.160 and 63.161.⁶⁶² Sections 63.162 through 63.179 contain

⁶⁵⁰ *Id.*

⁶⁵¹ *Id.*

⁶⁵² *Id.*

⁶⁵³ *Id.*

⁶⁵⁴ *Id.*

⁶⁵⁵ INSPECTION TOOL, *supra* note 618, at I-7.

⁶⁵⁶ *Id.*

⁶⁵⁷ *Id.*

⁶⁵⁸ *Id.*

⁶⁵⁹ *Id.*

⁶⁶⁰ *Id.*

⁶⁶¹ INSPECTION TOOL, *supra* note 618, at I-7.

⁶⁶² *Id.*

the standards for the various kinds of equipment and alternative means of emission limitation.⁶⁶³ These include leak detection and repair provisions and other control requirements.⁶⁶⁴ Sections 63.180 through 63.182 contain test methods and procedures and reporting and recordkeeping provisions.⁶⁶⁵ Sections 63.183 and 63.184 contain lists of VHAP's and chemical production processes subject to subpart H.⁶⁶⁶

An emission rate is established for each portion of a SOCOMI source based on a "reference control technology" (RCT).⁶⁶⁷ RCTs have been established for process vents, storage vessels, transfer operations, and wastewater streams.⁶⁶⁸ For each source there is a specified control technology, and control efficiency of 95% or more is required.⁶⁶⁹ Emissions averaging can be applied to the various release points, but the equations that must be used are difficult to apply, and new and existing sources are treated differently.⁶⁷⁰ In general, when emissions averaging is used, the HON rule requires HAP emissions to be reduced 98% over a one-year averaging period.⁶⁷¹ Averaging cannot be used, however, if the failure to control an emissions point presents too much localized risk to the public, workers, or the environment.⁶⁷² Pollution prevention measures, if adopted, can receive emission control credits.⁶⁷³ Thus, controls are not limited to end-of-the-stack measures.⁶⁷⁴

The HON rule requires detailed records be maintained for all emission points subject to the rule.⁶⁷⁵ Recordkeeping requirements vary depending on the source and the compliance method selected, but records on operating parameters, emission rates, and other variables can be expected to be required.⁶⁷⁶ In addition to the recordkeeping requirements, five types of reports must usually be

⁶⁶³ *Id.*

⁶⁶⁴ *Id.*

⁶⁶⁵ *Id.*

⁶⁶⁶ *See id.*

⁶⁶⁷ *See* Final Rule, *supra* note 639, at 19,407-08.

⁶⁶⁸ *See* NESHAPs for Service Categories, 40 C.F.R. § 63.111 (2000).

⁶⁶⁹ *See* Final Rule, *supra* note 639, at 19,419.

⁶⁷⁰ *See* NESHAPs for Source Categories, 40 C.F.R. § 63.111.

⁶⁷¹ *See* Final Rule, *supra* note 639, at 19,419.

⁶⁷² *See id.* at 19,427.

⁶⁷³ *See id.* at 19,419.

⁶⁷⁴ *See id.*

⁶⁷⁵ *See* INSPECTION TOOL, *supra* note 618, at I-8.

⁶⁷⁶ *See id.*

submitted to EPA under subpart G of the HON rule.⁶⁷⁷ First, an initial notification is required for existing sources and at the preconstruction stage for new sources.⁶⁷⁸ Second, an implementation plan concerning compliance with subpart G must be filed with the application for an operating permit.⁶⁷⁹ For existing sources that are under an emissions averaging plan, the plan had to be submitted by October 22, 1995.⁶⁸⁰ For existing sources that are not included in an averaging plan, the plan had to be submitted by April 22, 1996.⁶⁸¹ New sources must submit the plan at the time of their initial notification.⁶⁸² Third, the compliance status of a source must be reported 150 days after the source's compliance date. It is to include emissions data and all information necessary to demonstrate compliance.⁶⁸³ Fourth, periodic reports are required semiannually, and quarterly reports are required for those using emissions averaging.⁶⁸⁴ These reports must include the data that is beyond acceptable ranges and the results of periodic inspections.⁶⁸⁵ Finally, other reports are required concerning startups, shutdowns, malfunctions, and repairs.⁶⁸⁶ Monitored variables that temporarily exceed legal limits ("excursions") are allowed. Six excursions are allowed in the first semiannual reporting period.⁶⁸⁷ They are reduced by one per reporting period.⁶⁸⁸ After three years only one excursion per semiannual reporting period is allowed.⁶⁸⁹

Because most MACT sources subject to the HON rule also are subject to the CAA subchapter V operating permit program, they have to meet additional requirements that are imposed by the permitting process.⁶⁹⁰ Many operating permit requirements are found in the HON rule⁶⁹¹, and others are found in the general provisions at 40 C.F.R. part 63.⁶⁹² For most sources, compliance with the HON rule

⁶⁷⁷ *See id.*

⁶⁷⁸ *See id.*

⁶⁷⁹ *See id.* at I-9.

⁶⁸⁰ *See id.*

⁶⁸¹ *See INSPECTION TOOL, supra* note 618, at I-9.

⁶⁸² *See id.*

⁶⁸³ *See id.*

⁶⁸⁴ *See id.* at I-9, I-10.

⁶⁸⁵ *See id.*

⁶⁸⁶ *See id.* at I-10.

⁶⁸⁷ *See INSPECTION TOOL, supra* note 618, at I-10.

⁶⁸⁸ *See* NESHAPs for Source Categories, 40 C.F.R. § 63.152(c) (2000).

⁶⁸⁹ *See id.*

⁶⁹⁰ *See INSPECTION TOOL, supra* note 618, at I-9.

⁶⁹¹ *See* Final Rule, *supra* note 641, at 19,402.

⁶⁹² NESHAPs for Source Categories, 40 C.F.R. pt. 63 (2000).

was to be achieved by April 22, 1997⁶⁹³, but a one-year delay to attain compliance was provided.⁶⁹⁴

Organic hazardous wastes that are not subject to air toxics or new source performance standards may be subject to air pollution controls under RCRA.⁶⁹⁵ On November 25, 1996, EPA published a second "subpart CC" rule.⁶⁹⁶ The rule requires control of air emissions from hazardous waste units, including all tanks, containers, surface impoundments, and miscellaneous "subpart X" units that: (1) receive hazardous waste with an average volatile organics content that is 500 parts per million by weight or more at the point of waste organization; (2) are subject to a RCRA permit, interim status, or less than ninety-day standards; and (3) are not covered by a subpart CC exemption.⁶⁹⁷ The container requirements extend applicability to all portable units such as drums, bags, totes, roll-offs, tank trucks, and rail cars.⁶⁹⁸ The regulation also changes the rules applicable to less than ninety-day generators under 40 C.F.R. parts 264 and 265, subparts AA and BB.⁶⁹⁹ The changes in the subpart AA regulations were primarily to make them consistent with the NESHAP rules under the CAA.⁷⁰⁰

EPA estimated that about 308 chemical manufacturing facilities are subject to the recordkeeping and reporting requirements imposed by the HON rule.⁷⁰¹ The average time spent meeting the requirements by an existing source is 4760 hours per year.⁷⁰² The

⁶⁹³ See INSPECTION TOOL, *supra* note 618, at I-17.

⁶⁹⁴ NESHAPs for Source Categories: Organic Hazardous Air Pollutants from Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Regulation for Equipment Leaks, 62 Fed. Reg. 2722, 2929 (Jan. 17, 1997) (to be codified at 40 C.F.R. pt. 63).

⁶⁹⁵ See Hazardous Waste Treatment, Storage, and Disposal Facilities and Hazardous Wastes Generators: Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers, 61 Fed. Reg. 59,932, 59,933 (Nov. 25, 1996) (to be codified at 40 C.F.R. pts. 261, 262, 264, 265, 270, 271).

⁶⁹⁶ *Id.* at 59,932.

⁶⁹⁷ See Kenneth M. Kastner & Sara E. McCoy, *RCRA Subpart CC: New Air Emission Controls for Organic Hazardous Wastes*, 27 ENV'T REP. (BNA) 1595 (Nov. 29, 1996); Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers, 61 Fed. Reg. 59,932, 59,934-35 (Nov. 25, 1996) (to be codified at 40 C.F.R. pts. 261, 262, 264, 265, 270, 271); NESHAPs for Source Categories, 40 C.F.R. pts. 264, 265, subpart CC (2000).

⁶⁹⁸ *Id.*

⁶⁹⁹ *Id.*

⁷⁰⁰ *Id.*

⁷⁰¹ *HON Rule's Reporting, Record Provisions Cost \$98 Million Per Year, EPA Estimates*, DAILY ENV'T REP. (BNA) A-1 (Mar. 26, 1997).

⁷⁰² *Id.*

chemical manufacturers spend an estimated 1.727 million hours and \$98.46 million each year according to EPA.⁷⁰³

The synthetic organic chemical industry, the target of the HON rule, has been selected to be the subject of an EPA attempt to develop a consolidated air rule.⁷⁰⁴ The Consolidated Federal Air Rule was proposed on October 28, 1998.⁷⁰⁵

The proposed rule is intended to pull together applicable Federal SOCOMI rules into one integrated set of rules in order to simplify, clarify, and improve implementation of the existing rules with which source owners or operators must comply. The consolidated rule is an optional compliance alternative for SOCOMI sources; sources may simply continue to comply with existing applicable rules or choose to comply with the proposed consolidated rule. The effect of this consolidation will be to improve understandability, reduce burden, clarify requirements, and improve implementation and compliance.⁷⁰⁶

Final action was expected in June 2000.⁷⁰⁷

V. STANDARDS FOR INCINERATION

"Incineration is the controlled burning of substances in an enclosed area."⁷⁰⁸ An incinerator's major advantage is that it reduces solid waste 70 to 85% by weight and 85 to 95% by volume.⁷⁰⁹ Effective incineration requires complete combustion. Complete combustion rests on three critical factors known as the three "T"s of combustion: temperature, time, and turbulence. More specifically, the important factors are the:

⁷⁰³ *Id.*

⁷⁰⁴ Consolidated Federal Air Rule (CAR): Synthetic Organic Chemical Manufacturing Industry, 63 Fed. Reg. 57,748, 57,748 (proposed Oct. 28, 1998) (to be codified at 40 C.F.R. pts. 60, 61, 63, 65).

⁷⁰⁵ *Id.*

⁷⁰⁶ *Id.*

⁷⁰⁷ Unified Agenda: CAA, 65 Fed. Reg. 23,487, 23,489 (Apr. 24, 2000).

⁷⁰⁸ U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-530-R-99-052, INTRODUCTION TO HAZARDOUS WASTE INCINERATORS 2 (2000) [hereinafter HWI INTRODUCTION].

⁷⁰⁹ U.S. CONG. OFFICE OF TECH. ASSESSMENT, PUB. NO. OTA-O-424, FACING AMERICA'S TRASH: WHAT NEXT FOR MUNICIPAL SOLID WASTE 219 (1989), available at http://www.wws.princeton.edu/~ota/ns20/alpha_f.html (last visited Oct. 22, 2000) [hereinafter OTA REPORT].

- 1) combustion chamber temperature;
- 2) duration of burn at high temperature; and
- 3) degree of mixing of wastes and air.⁷¹⁰

Incineration destroys pathogens and some toxic chemicals, but, as a trade-off, produces harmful air emissions.⁷¹¹ Compared with many of the alternatives, however, the risks from incineration appear modest.⁷¹²

The primary result of incineration is that combustibles are changed to carbon dioxide and water vapor.⁷¹³ If combustion is not complete, however, then compounds known as products of incomplete combustion (PICs) may be released.⁷¹⁴ Another byproduct is ash, which may take the form of fly ash or bottom ash.⁷¹⁵ The residual ash left at the bottom of the chamber (bottom ash) may be treated as hazardous waste under RCRA.⁷¹⁶ Fly ash, however, is emitted as particulate matter unless it is captured by air pollution control devices.⁷¹⁷ If captured, fly ash also may be a RCRA waste.⁷¹⁸ While the toxicity of the ash depends upon the kinds of waste incinerated, fly ash is generally more toxic than bottom ash because the metals and dioxins "are attracted to and condense on the small fly ash particles."⁷¹⁹ The most controversial air pollutants are the seventy-five organic chemical compounds known as chlorinated dioxins and the 135 organic compounds known as chlorinated furans.⁷²⁰ Because dioxins and furans condense onto fly ash, they are removed by air

⁷¹⁰ HWI INTRODUCTION, *supra* note 708, at 2.

⁷¹¹ *Id.*

⁷¹² *Id.*

⁷¹³ *Id.*

⁷¹⁴ *Id.*

⁷¹⁵ *Id.*

⁷¹⁶ HWI Introduction, *supra* note 710, at 2. The U.S. Supreme Court held that ash from waste-to-energy (WTE) facilities that fails a RCRA characteristics test is subject to RCRA subtitle C requirements. *See City of Chicago v. Env'tl. Def. Fund*, 511 U.S. 328, 339 (1994); *see also* Markus G. Puder, *Trash, Ash, and the Phoenix: A Fifth Anniversary Review of the Supreme Court's City of Chicago Waste-to-Energy Combustion Ash Decision*, 26 B.C. ENVTL. AFF. L. REV. 473, 473-74 (1999). Fly ash represents about 13 to 15% by weight of the ash from U.S. solid waste incinerators is fly ash, and this is about 5% to 15% of the ash volume. *See* OTA REPORT, *supra* note 709, at 247.

⁷¹⁷ HWI INTRODUCTION, *supra* note 708, at 2.

⁷¹⁸ *Id.*

⁷¹⁹ HANS TAMMEMAGI, *THE WASTE CRISIS: LANDFILLS, INCINERATORS, AND THE SEARCH FOR A SUSTAINABLE FUTURE* 159 (1999).

⁷²⁰ *Id.* at 156.

pollution controls that remove particulate matter.⁷²¹ Heavy metals are toxics of particular concern, with arsenic, beryllium, cadmium, and chromium being the most important.⁷²²

CAA section 129, added to the statute in 1990, requires EPA to establish NSPS under CAA section 111 for new solid waste combustion units and to establish emission guidelines under section 111(d) for existing units.⁷²³ Section 129 directs EPA to regulate four categories of solid waste incineration units: municipal waste combustors (MWCs),⁷²⁴ hospital/medical/infectious waste incinerators (HMIWIs),⁷²⁵ industrial and commercial waste incinerators (ICWIs),⁷²⁶ and other categories of solid waste incinerators (OSWIs).⁷²⁷ It does not regulate the incineration of hazardous waste.

The NSPS may require pollutants to be removed or destroyed "before, during, or after combustion," and new units must meet site-specific requirements that, to the maximum extent practicable, minimize potential risks to public health or the environment.⁷²⁸ Section 129 also requires that "[t]he degree of reductions in emissions that is deemed achievable for new units in a category shall not be less stringent than the emissions control that is achieved in practice by the best controlled similar unit, as determined by the

⁷²¹ *Id.*

⁷²² Assessment of Municipal Waste Combustor Emissions Under the CAA, 52 Fed. Reg. 25,399, 25,404 (proposed July 7, 1987) (to be codified at 40 C.F.R. pt. 60).

⁷²³ CAA § 129(a)(1), 42 U.S.C. § 7429(a)(1) (1994).

⁷²⁴ *Id.* §§ 7429(a)(1)(B), (C).

⁷²⁵ *Id.* § 7429(a)(1)(C).

⁷²⁶ *Id.* § 129(a)(1)(D) requires EPA to regulate solid waste incinerators that combust industrial or commercial waste. Incinerators potentially covered in this definition include any incinerator that does not burn hazardous waste or is not regulated as a medical waste incinerator or as a municipal waste combustor. Regulations were required to be promulgated by November 15, 1994. EPA was sued by the Sierra Club for its failure to promulgate these regulations. On June 6, 1997, a settlement was proposed that would give the agency until November 15, 2000, to promulgate the regulations. EPA plans to regulate these incinerators as part of a larger rulemaking to regulate five categories of nonhazardous combustion sources not regulated by other rules. This Industrial Combustion Coordinated Rulemaking (ICCR) involves industrial boilers, process heaters, industrial/commercial waste incinerators, stationary gas turbines, and stationary internal combustion engines. See *Settlement Allows EPA Additional Time to Develop Rule for Some Waste Burners*, 28 ENV'T REP. (BNA) 366 (June 20, 1997). The proposed standards were issued on November 30, 1999. Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units, 64 Fed. Reg. 67,092 (proposed Nov. 30, 1999) (to be codified at 40 C.F.R. pt. 60).

⁷²⁷ CAA § 129(a)(1)(E).

⁷²⁸ *Id.* § 7429(a)(3).

Administrator.”⁷²⁹ Because this language establishes a threshold limit below which EPA may not set emissions limitations, this latter standard of minimum performance is known as the MACT floor.⁷³⁰ Although the MACT floor represents a statutory minimum, EPA is required by the CAA to evaluate standards more stringent than the MACT floor, and it may set performance levels to be adopted as MACT that are higher than the MACT floor. In making this determination, EPA also must consider the factors set forth in section 129(a)(2): costs, non-air quality health and environmental impacts, and energy requirements.⁷³¹

If the incinerators emit any of the HAPs listed under section 112(b), they also must comply with those regulations promulgated for their source categories.

A. Waste Incineration

Hazardous waste incinerators (HWIs) are designed to destroy combustible hazardous constituents.⁷³² HWIs have been regulated since 1981 under RCRA.⁷³³ Hazardous waste burning cement kilns (CKs) and lightweight aggregate kilns (LWAKs) have been regulated since 1991, when EPA promulgated an updated RCRA rule governing emissions from the incineration of hazardous waste.⁷³⁴ The rule was challenged by numerous groups, and under a settlement agreement EPA agreed both to propose a rulemaking by November 1995 and to finalize the rule by December 1996.⁷³⁵ Pursuant to RCRA, EPA promulgated regulations governing HWIs.⁷³⁶

Under the CAA Amendments of 1990, an expanded section 112 resulted in regulations that included hazardous waste incinerators on

⁷²⁹ *Id.* § 7429(a)(2).

⁷³⁰ Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators, 62 Fed. Reg. 48,348, 48,351 (Sept. 15, 1997) (to be codified at 40 C.F.R. pt. 60).

⁷³¹ *See* 42 U.S.C. § 7429(a)(2).

⁷³² HWI INTRODUCTION, *supra* note 708, at 2.

⁷³³ Burning of Hazardous Waste in Boilers and Industrial Furnaces, 56 Fed. Reg. 7134 (Feb. 21, 1991) (to be codified at 40 C.F.R. pts. 260, 261, 264, 265, 266, 270, 271).

⁷³⁴ *Id.*

⁷³⁵ Revised Standard for Hazardous Waste Combustors, 61 Fed. Reg. 17,358, 17,360 (proposed Apr. 19, 1996) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271).

⁷³⁶ Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, 40 C.F.R. pt. 264 (2000); Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, 40 C.F.R. pt. 265, subpart O (2000).

the list of categories to be subject to hazardous air pollutant controls.⁷³⁷ In November 1994, 162 HWIs were operating in the United States.⁷³⁸ In 1995, 141 HWIs had final RCRA permits while the other twenty-one were in interim status.⁷³⁹ In 2000, there were only a handful of HWIs operating in interim status.⁷⁴⁰

Under existing law, hazardous wastes may be burned in HWIs, in boilers, or in industrial furnaces.⁷⁴¹ Industrial furnaces include CKs and LWAKs.⁷⁴² HWIs reduce the volume or toxicity of hazardous waste, but usually do not utilize the heat value of the waste or recover usable material to be recycled.⁷⁴³ HWIs can be placed on ships operating in the ocean,⁷⁴⁴ but EPA essentially has banned ocean incineration as a means of waste disposal in the United States.⁷⁴⁵

In 1990, hazardous waste combustors (HWCs) were included as a source category pursuant to CAA section 112.⁷⁴⁶ To meet the MACT requirements and satisfy the settlement agreement (albeit after the deadline), EPA issued a proposed rule on April 19, 1996,⁷⁴⁷ to cover the three main categories of hazardous waste burners—HWIs,⁷⁴⁸

⁷³⁷ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576, 31,591 (notice July 16, 1992).

⁷³⁸ U.S. GEN. ACCOUNTING OFFICE, PUB. NO. GAO/RCED-95-17, HAZARDOUS WASTE INCINERATORS: EPA'S AND OSHA'S ACTIONS TO BETTER PROTECT HEALTH AND SAFETY NOT COMPLETE 3 (1995), available at <http://www.gao.gov> (last visited Oct. 22, 2000).

⁷³⁹ *Id.*

⁷⁴⁰ HWI INTRODUCTION, *supra* note 708, at 2.

⁷⁴¹ RCRA §§ 3004(o)(1), (q), 42 U.S.C. §§ 6924(o)(1), (q) (1994); see David B. Kopel, *Burning Mad: The Controversy Over Treatment of Hazardous Waste in Incinerators, Boilers, and Industrial Furnaces*, 23 ENVTL. L. REP. (Envtl. L. Inst.) 10,126, 10,217 (1993).

⁷⁴² Revised Technical Standards for Hazardous Waste Combustion Facilities, 62 Fed. Reg. 24,212 (proposed May 2, 1997) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271). EPA lists twelve types of industrial furnaces. *Id.*

⁷⁴³ U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-530-R-99-032, HAZARDOUS WASTE INCINERATORS, available at <http://www.epa.gov/epaoswer/hotline/training/incin.txt> (last modified Mar. 28, 1997).

⁷⁴⁴ Ocean incineration is governed by the Marine Protection, Research, and Sanctuaries Act. Pub. L. No. 92-532, 86 Stat. 1052 (1972). No regulations exist and therefore such incineration is not allowed by U.S. law. See *id.*

⁷⁴⁵ See Arnold W. Reitze, Jr. & Andrew N. Davis, *Reconsidering Ocean Incineration as Part of a U.S. Hazardous Waste Program: Separating the Rhetoric from the Reality*, 17 B.C. ENVTL. AFF. L. REV. 687, 737-38 (1990).

⁷⁴⁶ Initial List of Categories of Sources Under Section 112(c)(1) of the CAA Amendments of 1990, 57 Fed. Reg. 31,576, 31,591 (July 16, 1992).

⁷⁴⁷ Revised Standard for Hazardous Waste Combustors, 61 Fed. Reg. 17,358 (proposed Apr. 19, 1996) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271).

⁷⁴⁸ NESHAPs: Final Standards for HAPs for Hazardous Waste Combustors, 64 Fed. Reg. 52,828, 52,835 (Sept. 30, 1999) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264,

CKs,⁷⁴⁹ and LWAKs⁷⁵⁰—collectively regulated as hazardous waste combustors (HWCs). HWCs burn approximately 80% of all hazardous waste combusted annually.⁷⁵¹ In 1997, there were 149 hazardous waste facilities with 189 individual operating units, eighteen Portland cement plants operating thirty-eight hazardous waste burning kilns, and five LWAKs facilities with ten hazardous waste-fired kilns.⁷⁵²

EPA subsequently published five notices of data availability for review and comment.⁷⁵³ The final rule establishing the MACT standard was published on September 30, 1999.⁷⁵⁴ While satisfying the requirements under the CAA, the final rule also satisfied EPA's obligation under RCRA "to ensure that hazardous waste combustion is conducted in a manner adequately protective of human health and the environment."⁷⁵⁵ This derives from RCRA section 3005(c)(3),

265, 266, 270, 271) [hereinafter HWC Final Rule]. "Hazardous waste incinerators are enclosed, controlled flame combustion devices, as defined in 40 C.F.R. § 260.10." *Id.*

⁷⁴⁹ *Id.* at 52,835. "Cement kilns are horizontally inclined rotating cylinders, lined with refractory-brick, and internally fired. Cement kilns are designed to calcine, or drive carbon dioxide out of, a blend of raw materials such as limestone, shale, clay, or sand to produce Portland cement." *Id.*

⁷⁵⁰ *Id.* at 52,835. "The term 'lightweight aggregate' refers to a wide variety of raw materials (such as clay, shale, or slate) that, after thermal processing, can be combined with cement to form concrete products." HWC Final Rule, *supra* note 748, at 52,835.

⁷⁵¹ *Id.* at 52,832.

⁷⁵² *Id.* at 52,835.

⁷⁵³ The first notice was published on August 23, 1996, and involved review of several aspects that were later published as the Comparable Fuels Rule. Hazardous Waste Combustors: Revised Standards; Proposed Rule—Notice of Data Availability and Request for Comments, 61 Fed. Reg. 43,501, 43,502 (Aug. 23, 1996) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271). The second notice appeared on January 7, 1997, and concerned the database. Hazardous Waste Combustors: Revised Standards; Proposed Rule—Notice of Data Availability and Request for Comments, 62 Fed. Reg. 960, 962 (Jan. 7, 1997) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271). The third notice involved the technical feasibility of monitoring. Hazardous Waste Combustors: Continuous Emissions Monitoring Systems; Proposed Rule—Notice of Data Availability and Request for Comments, 62 Fed. Reg. 13,776, 13,777 (Mar. 21, 1997) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271). On May 2, 1997, a notice was published about a revised emissions database and compliance issues. Revised Technical Standards for Hazardous Waste Combustion Facilities, 62 Fed. Reg. 24,212, 24,213 (May 2, 1997) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271). The final notice for comment appeared on December 30, 1997, and dealt with continuous emissions monitoring. Total Mercury and Particulate Continuous Emissions Monitoring Systems; Measurement of Low Level Particulate Emissions; Implementation at Hazardous Waste Combustors; Proposed Rule—Notice of Data Availability and Request for Comments, 62 Fed. Reg. 67,788, 67,789 (Dec. 30, 1997) (to be codified at 40 C.F.R. pts. 60, 63, 260, 261, 264, 265, 266, 270, 271).

⁷⁵⁴ HWC Final Rule, *supra* note 748, at 52,828.

⁷⁵⁵ *Id.* at 52,832.

dubbed the “omnibus provision,” which requires that each permit for a facility “contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment.”⁷⁵⁶ To that end, a risk analysis also was undertaken:

These MACT standards are technology-based; they are not risk-based. These facilities, however, are also covered by RCRA in [sections] 3004(a) and 3004(q), which require EPA to develop standards that are protective of human health and the environment. The risk analysis . . . was conducted to satisfy RCRA’s requirement in support of the MACT standard rulemaking for HWCs.⁷⁵⁷

MACT emission standards are established for: chlorinated dioxins and furans; mercury; semivolatile metals lead and cadmium; low volatility metals arsenic, beryllium, and chromium; and hydrochloric acid/chlorine gas.⁷⁵⁸ Other HAPs identified in the 112(b) list are regulated through the use of surrogates.⁷⁵⁹ A particulate matter standard is used to control five metals: antimony, cobalt, manganese, nickel, and selenium.⁷⁶⁰ Carbon monoxide, hydrocarbons, and organic HAPs are also subject to regulation.⁷⁶¹

A HWC facility must have a RCRA permit for stack air emissions or be classified as “interim status” until it demonstrates MACT compliance.⁷⁶² The compliance deadline is September 30, 2002.⁷⁶³ A one-year extension may be granted if system retrofits cannot be completed despite a good faith effort.⁷⁶⁴ “Continuous emissions monitoring systems and other continuous monitoring systems for the specified operating parameters must be fully operational by the compliance date.”⁷⁶⁵ A compliance test must be conducted no later than March 30, 2003.⁷⁶⁶ A “Notification of Compliance” must be

⁷⁵⁶ RCRA § 3005(c)(3), 42 U.S.C. § 6925(c)(3) (1994).

⁷⁵⁷ U.S. EPA, RESEARCH TRIANGLE INST., EPA CONTRACT NO. 68-W6-0053, HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT SUPPORT TO THE DEV. OF TECHNICAL STANDARDS FOR EMISSIONS FROM COMBUSTION UNITS BURNING HAZARDOUS WASTES 1-I (1999).

⁷⁵⁸ HWC Final Rule, *supra* note 748, at 52,834.

⁷⁵⁹ *Id.*

⁷⁶⁰ *Id.*

⁷⁶¹ *Id.*

⁷⁶² *Id.* at 52,833.

⁷⁶³ *Id.*

⁷⁶⁴ HWC Final Rule, *supra* note 748, at 52,833.

⁷⁶⁵ *Id.*

⁷⁶⁶ *Id.*

placed in the operating record by the compliance date.⁷⁶⁷ The Notification must show:

- (1) compliance with the emission standards during the performance test;
- (2) the revised operating parameter limits calculated from the performance test; and
- (3) conformance of the carbon monoxide and hydrocarbon continuous emissions monitoring systems and the other continuous monitoring systems with performance specifications.⁷⁶⁸

The RCRA stack air emission provisions in the permit remain viable until the permit is modified to delete those conditions.⁷⁶⁹ The MACT standards under the CAA are to be incorporated in the facility's operating permit under CAA subchapter V.⁷⁷⁰ There are specific provisions in the regulation to ease the transition from the RCRA operating permit to the CAA operating permit.⁷⁷¹ This includes a "fast-track process" to modify the RCRA permit as needed.⁷⁷²

A site-specific risk assessment (SSRA) is suggested as the primary mechanism "by which the permitting authority may develop the information necessary to make the determination regarding what, if any, additional permit conditions are needed for a particular hazardous waste combustor."⁷⁷³ EPA issued a guidance document in 1994, updated in 1998, entitled *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* to aid in an SSRA.⁷⁷⁴ The SSRA

⁷⁶⁷ *Id.*

⁷⁶⁸ *Id.*

⁷⁶⁹ *Id.* "Only those provisions of the RCRA permit that are less stringent than the MACT requirements specified in the Notice of Compliance will be approved for deletion." *Id.*

⁷⁷⁰ HWC Final Rule, *supra* note 748, at 52,973–81. "Although these requirements are self-implementing, in that you must comply in accordance with the time frames set forth in today's rule, the requirements are ultimately implemented through title V operating permits (see 40 C.F.R. pts. 70 and 71)." *Id.* at 52,977.

⁷⁷¹ *Id.* at 52,981–90.

⁷⁷² *Id.* at 52,981–82; see Hazardous Waste Combustors; Revised Standards; Final Rule—Part 1: RCRA Comparable Fuel Exclusion: Permit Modifications for Hazardous Waste Combustion Units: Notification of Intent to Comply: Waste Minimization and Pollution Prevention Criteria for Compliance Extensions, 63 Fed. Reg. 33,782, 33,816 (proposed June 19, 1998) (to be codified at 40 C.F.R. pts. 63, 261, 270).

⁷⁷³ HWC Final Rule, *supra* note 748, at 52,842.

⁷⁷⁴ U.S. ENVTL. PROTECTION AGENCY, PUB. NOS. EPA-530-D-98-001A, EPA-530-D-98-001B, & EPA-530-D-98-001C, HUMAN HEALTH RISK ASSESSMENT PROTOCOL FOR

is used to address the RCRA omnibus provision requirements.⁷⁷⁵ While the SSRA is site-specific, the residual risk analysis required under the section 112(f) of the CAA is to be determined on a source category basis.⁷⁷⁶ In addition, the SSRA is made during the permitting process and the residual risk analysis is made years after MACT compliance.⁷⁷⁷ Therefore, "nothing in the RCRA national risk evaluation for this rule should be taken as establishing a precedent for the nature or scope of any residual risk procedure under the CAA."⁷⁷⁸ Different approaches, represented in Appendix 3, were used to establish the MACT floor standards for each regulated pollutant.⁷⁷⁹

EPA estimates that the "total social costs" of the HWC rule will be between \$65 and \$73 million.⁷⁸⁰ While the compliance costs will be higher on average for cement kilns than incinerators,⁷⁸¹ "between one and two cement kilns and between seven and sixteen on-site incinerators will stop burning waste entirely . . ."⁷⁸² However, "many of the marginal facilities are likely to exit the market even in the absence of the combustion MACT."⁷⁸³ This market activity will result in between 23,000 and 54,000 tons of waste being reallocated from combustion systems that shutdown.⁷⁸⁴ The combustion price is expected to increase an estimated \$15 per ton for kilns and \$12 per ton for incinerators, representing 6% and 2% increases, respectively.⁷⁸⁵ Thirty-eight square kilometers of water and between 115 and 147 square kilometers of land will experience decreases in risk.⁷⁸⁶ EPA also estimates that 70% of the annual dioxin and furan

HAZARDOUS WASTE COMBUSTION FACILITIES (1998), available at <http://www.epa.gov/epaoswer/hazwaste/combust/risk.htm> (last visited Oct. 22, 2000).

⁷⁷⁵ See HWC Final Rule, *supra* note 748, at 52,843.

⁷⁷⁶ See *id.*

⁷⁷⁷ See *id.*

⁷⁷⁸ *Id.*

⁷⁷⁹ See *id.* at 52,853-56.

⁷⁸⁰ U.S. EPA, ASSESSMENT OF THE POTENTIAL COSTS, BENEFITS, & OTHER IMPACTS OF THE HAZARDOUS WASTE COMBUSTION MACT STANDARDS: FINAL RULE ES-3 (1999), available at <http://www.epa.gov/epaoswer/hazwaste/combust/combust.pdf> (last visited Oct. 22, 2000) [hereinafter ASSESSMENT].

⁷⁸¹ *Id.* at ES-8. The average annual compliance costs are: cement kilns, \$800,000; commercial incinerators, \$290,000; LWAKs, \$640,000; private on-site incinerators, \$270,000; and government on-site incinerators, \$190,000. *Id.*

⁷⁸² *Id.* at ES-4.

⁷⁸³ *Id.* at ES-3.

⁷⁸⁴ *Id.* at ES-4.

⁷⁸⁵ ASSESSMENT, *supra* note 780, at ES-5.

⁷⁸⁶ *Id.*

emissions will be eliminated and that mercury emissions will be cut by 55%.⁷⁸⁷

The MACT standards are expected to result in reduction of the following adverse health effects on an annual basis: approximately two premature deaths, six hospital admissions associated with respiratory ailments and heart conditions, 25 cases of chronic bronchitis, over 250,000 asthma attacks, and nearly 20,000 days of work loss or restricted activity. These human health benefits are valued at \$30 million per year.⁷⁸⁸

Some aspects of the HWC rule dealing with closing down HWCs were held to be arbitrary and capricious and were vacated by the U.S. Court of Appeals for the D.C. Circuit on July 25, 2000.⁷⁸⁹

B. *Municipal Waste Incineration*

The problems associated with managing municipal solid waste (MSW)⁷⁹⁰ in the United States are both environmental and economic. Where to put the ever-increasing garbage has become an important issue at all governmental levels.⁷⁹¹ Municipal solid waste includes those wastes generated at residences and commercial establishments and contains a wide variety of waste products.⁷⁹² EPA predicted waste production would increase from over 195 million tons in 1990 to 222 million tons in 2000.⁷⁹³ However, most statistics concerning solid waste seem to be crude guesses, and actual amounts may be much higher

⁷⁸⁷ HWC Final Rule, *supra* note 748, at 52,832.

⁷⁸⁸ ASSESSMENT, *supra* note 780, at ES-5.

⁷⁸⁹ Chem. Mfr. Ass'n v. EPA, 217 F.3d 861, 865 (D.C. Cir. 2000).

⁷⁹⁰ MSW is defined as "solid waste generated at residences, commercial establishments (e.g., offices, retail shops, and restaurants), and institutions (e.g., hospitals and schools)." OTA REPORT, *supra* note 709, at 4. "[The] waste may be categorized as materials (e.g., glass and paper) or products (e.g., appliances, containers and tires)." *Id.*

Under RCRA, solid waste is more broadly defined as: "any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities . . ." RCRA § 1004(27), 42 U.S.C. § 6903 (27) (1994).

⁷⁹¹ See OTA Report, *supra*, note 709, at iii.

⁷⁹² See U.S. GEN. ACCOUNTING OFFICE, PUB. NO. GAO/RCED-94-200, ENERGY SUPPLY: ENERGY POTENTIAL OF MUNICIPAL SOLID WASTE IS LIMITED 2 (1994), available at http://www.access.gpo.gov/su_docs/aces/aces160.html (last visited Oct. 22, 2000).

⁷⁹³ *Id.*

because EPA's numbers are often based on dry waste.⁷⁹⁴ Although most of the MSW increase is due to population growth, the increase in per capita consumption also is important.⁷⁹⁵

As a result of ever-increasing amounts of solid waste, declining landfill capacity, stricter legal regulations, and rising costs, there is an interest in MSW incineration.⁷⁹⁶ The RCRA subtitle D regulations for MSW landfills require landfills receiving wastes after October 9, 1993 to comply with strict provisions that are both technically and economically onerous.⁷⁹⁷ The costs of compliance help make incineration an attractive option, but the air pollution control costs and the problems of obtaining site approval make land disposal an attractive option. About 16% of all MSW is incinerated.⁷⁹⁸

The first municipal incinerator was constructed in Allegheny, Pennsylvania in 1885, and other cities soon followed by building "crematories" for their MSW.⁷⁹⁹ During the late 1930s, the number of MSW incinerators in the United States declined substantially with most MSW ending up in landfills.⁸⁰⁰ When the CAA of 1970 was enacted, it essentially banned uncontrolled burning, thereby leading to a renewed interest by local governments in the construction of incinerators.⁸⁰¹

The regulation of MSW incinerators (or municipal waste combustors (MWCs)) began with the promulgation in 1987⁸⁰² of new source performance standards NSPS for particulate matter (PM)

⁷⁹⁴ See William F. Pedersen, Jr., *The Future of Federal Solid Waste Regulation*, 16 COLUM. J. ENVTL. L. 109, 113 n.12 (1991).

⁷⁹⁵ OTA Report, *supra* note 709, at 4.

⁷⁹⁶ See *id.* at 3.

⁷⁹⁷ See Solid Waste Disposal Facility Criteria, 56 Fed. Reg. 50,978, 51,016 (Oct. 9, 1991) (to be codified at 40 C.F.R. pts. 257, 258). On July 28, 1993, the EPA proposed regulations that delayed the effective date of the Subtitle D regulations for six months (to April 9, 1994) for certain small landfills and delayed for one year (to October 9, 1994) the effective date of the financial assurance requirements for all landfills. Solid Waste Disposal Facility Criteria; Delay of Effective Date, 58 Fed. Reg. 40,568, 40,578 (proposed July 28, 1993) (to be codified at 40 C.F.R. pt. 258). To qualify for the extension, a landfill must: (1) receive 100 tons per day or less; (2) be located in a state that has submitted an application for program approval to EPA before October 9, 1993 or is located on tribal lands; and (3) not be currently on the Superfund National Priorities List (NPL). *Id.*

⁷⁹⁸ TAMMEMAGI, *supra* note 719, at 146.

⁷⁹⁹ AMERICAN PUBLIC WORKS ASS'N, HISTORY OF PUBLIC WORKS IN THE UNITED STATES 435 (Ellis L. Armstrong ed., 1976).

⁸⁰⁰ *Id.* at 449-50.

⁸⁰¹ OTA REPORT, *supra* note 709, at 217.

⁸⁰² Assessment of Municipal Waste Combustor Emissions Under the CAA, 52 Fed. Reg. 25,399 (proposed July 7, 1987) (to be codified at 40 C.F.R. pt. 60).

emissions from MWCs with more than fifty tons per day capacity under Section 111(b) of the CAA.⁸⁰³ On August 5, 1986, the Natural Resources Defense Council (NRDC) and the states of New York, Rhode Island, and Connecticut petitioned the Administrator of EPA to regulate air emissions from new and existing MWCs using the CAA sections 111 and 112.⁸⁰⁴ On July 7, 1987, EPA announced an advance notice of proposed rulemaking (ANPRM) to regulate emissions from new or modified MWCs as well as from existing sources.⁸⁰⁵ Proposed rules for both existing and new MWCs were promulgated December 20, 1989.⁸⁰⁶ Existing facilities could also be regulated by the states as part of the SIP development⁸⁰⁷ and might be subject to the nonattainment area provisions.⁸⁰⁸ EPA issued guidance documents regarding the appropriate technology—usually referred to as “best demonstrated technology” (BDT).⁸⁰⁹ New sources were required to incorporate gas scrubbers, combustion controls, and particulate controls.⁸¹⁰

The CAA Amendments of 1990 created a new CAA section 129 dealing with solid waste combustion.⁸¹¹ Subsection (a) (1) requires the Administrator to establish performance standards for categories of solid waste incineration units under Sections 111 and 129.⁸¹² The standards are to include emission limitations for new units and guidelines under Section 111(d) applicable to existing units.⁸¹³ Under this provision and under the new source performance standards of

⁸⁰³ 40 C.F.R. § 60.50 (1977).

⁸⁰⁴ Assessment of Municipal Waste Combustor Emissions Under the CAA, 52 Fed. Reg. at 25,399.

⁸⁰⁵ *Id.*

⁸⁰⁶ Emission Guidelines: Municipal Waste Combustors, 54 Fed. Reg. 52,209 (proposed Dec. 20, 1989) (to be codified at 40 C.F.R. pt. 60).

⁸⁰⁷ CAA § 110, 42 U.S.C. § 7410 (1995).

⁸⁰⁸ *Id.* §§ 171–93.

⁸⁰⁹ Assessment of Municipal Waste Combustor Emissions Under the CAA, 52 Fed. Reg. 25,399, 25,406–07 (proposed July 7, 1987) (to be codified at 40 C.F.R. pt. 60).

⁸¹⁰ *Id.*

⁸¹¹ CAA § 129.

⁸¹² *Id.* § 129(a) (1).

⁸¹³ CAA Amendments, Pub. L. No. 101-549, § 305, 104 Stat. 2399, 2577-84 (1990). Until finally enacted, it was not clear that the new law would have specific incinerator provisions. The House bill contained no incinerator related measures, the Senate bill did. It was opposed by House members who believed the subject should be dealt with in the RCRA reauthorization. *Members Urge Incinerator Measures with Exemptions Be Stripped from CAA*, INSIDE EPA, Aug. 17, 1990, at 14. Environmentalists also opposed the incinerator provisions of the CAA Amendments. *States Say Senate Incinerator Plan Is Needed to Head Off Solid Waste Crisis*, INSIDE EPA, Aug. 31, 1990, at 14.

CAA Section 111, EPA was to regulate MSW incinerators with greater than 250 tons per day input by November 15, 1991.⁸¹⁴

Pursuant to section 111 of the CAA Amendment of 1990, EPA promulgated emissions guidelines for existing MWC units in 1991.⁸¹⁵ On September 20, 1994, EPA revised the MWC emissions guidelines and issued proposed NSPSs under CAA sections 111 and 129.⁸¹⁶

On December 19, 1995, EPA issued a direct final NSPS for both small and large MWC facilities.⁸¹⁷ At the same time, a proposed rule to revise the "Standards of Performance for Municipal Waste Combustors" (subpart Ea) was issued.⁸¹⁸ Regulations promulgated as 40 C.F.R. part 60, subpart Ea apply to MWCs for which construction or modification commenced after December 20, 1989, but on or before September 20, 1994.⁸¹⁹ The new regulation did not significantly change the prior regulation, but aimed at improving clarity and making subpart Ea of the regulation more consistent with subparts Eb and Cb.⁸²⁰ Subpart Eb applies to MWCs for which construction commenced after September 20, 1994 or modification or reconstruction commenced after June 19, 1996;⁸²¹ subpart Cb applies to existing MWCs whose construction commenced on or before September 20, 1994.⁸²² In the regulations of December 19, 1995, some of the applicable dates and definitions were changed.⁸²³ The 1991 standards⁸²⁴ applied to MWCs with capacities above 225

⁸¹⁴ CAA § 129(a)(1).

⁸¹⁵ Standards of Performance for New Stationary Sources; Municipal Waste Combustors, 56 Fed. Reg. 5488, 5506 (Feb. 11, 1991) (to be codified at 40 C.F.R. pt. 60, subpart Ca).

⁸¹⁶ Standards of Performance for New Stationary Sources; Municipal Waste Combustors, 59 Fed. Reg. 48,198, 48,202 (proposed Sept. 20, 1994) (to be codified at 40 C.F.R. pt. 60).

⁸¹⁷ Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources Municipal Waste Combustors, 60 Fed. Reg. 65,387, 65,414 (Dec. 19, 1995) (to be codified at 40 C.F.R. pt. 60).

⁸¹⁸ Standards of Performance for Municipal Waste Combustors, 60 Fed. Reg. 65,437, 65,437 (proposed Dec. 19, 1995) (to be codified at 40 C.F.R. pt. 60).

⁸¹⁹ 40 C.F.R. § 60.50a(a)(1).

⁸²⁰ Standards of Performance for Municipal Waste Combustors, 60 Fed. Reg. at 65,437.

⁸²¹ 40 C.F.R. § 60.50b(a).

⁸²² *Id.* § 60.30b(a).

⁸²³ Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources Municipal Waste Combustors, 60 Fed. Reg. at 65,414.

⁸²⁴ Standards of Performance for New Stationary Sources; Municipal Waste Combustors, 56 Fed. Reg. 5488, 5506 (Feb. 11, 1991) (to be codified at 40 C.F.R. pt. 60, subpart Ca).

megagrams per day (Mg/day).⁸²⁵ The 1995 standards apply to MWCs over 35 Mg/day and are usually more stringent.⁸²⁶

Almost half of the estimated 307 operating MWC units at 128 plants have been built since 1990 and are equipped with high efficiency air pollution control equipment.⁸²⁷ The older half of the MWC population had to meet lower standards, and the 1995 regulations are designed to bring all MWC units up to the same high performance level.⁸²⁸ A summary of the Subpart Cb guidelines for existing MWCs is found in Table 3 at 60 Federal Register 65,399 (1995).⁸²⁹

The December 19, 1995 regulations made the distinction between large and small MWC facilities based on the aggregate capacity of all the MWC units at each MWC facility.⁸³⁰ In *Davis County Solid Waste Management and Recovery District v. EPA*, the U.S. Court of Appeals for the D.C. Circuit vacated the rule for both categories.⁸³¹ Upon a rehearing, however, the court reconsidered the remedy and remanded the rule to EPA regarding the large MWC units, but the rule remained vacated as to the smaller MWC units.⁸³² The regulations for large MWC facilities that incorporated the court decision were promulgated on August 25, 1997.⁸³³ On August 30, 1999, EPA issued a proposed rule for NSPS that would apply to small MWC units that are "functionally equivalent" to the 1995 regulations.⁸³⁴

Incinerator facilities are not evenly distributed geographically.⁸³⁵ Currently, the greatest incineration capacity exists, in descending

⁸²⁵ A megagram is 1.1 tons.

⁸²⁶ Standards of Performance for Municipal Waste Combustors, 60 Fed. Reg. at 65,414.

⁸²⁷ *See id.* at 65,390.

⁸²⁸ *See id.*

⁸²⁹ *Id.*

⁸³⁰ Standards of Performance for New Stationary Sources: Municipal Waste Combustors, 56 Fed. Reg. 5488, 5488 (Feb. 11, 1991) (to be codified at 40 C.F.R. pt. 60, subpart Ca).

⁸³¹ 101 F.3d 1395, 1411 (D.C. Cir. 1996).

⁸³² *Davis County Solid Waste Mgmt. & Recovery Dist. v. EPA*, 108 F.3d 1454, 1460 (D.C. Cir. 1997).

⁸³³ Emission Guidelines for Existing Sources and Standards of Performance for New Stationary Sources: Large Municipal Waste Combustion Units, 62 Fed. Reg. 45,116, 45,119 (Aug. 25, 1997) (to be codified at 40 C.F.R. pt. 60).

⁸³⁴ New Source Performance Standards for New Small Municipal Waste Combustion Units, 64 Fed. Reg. 47,276, 47,284 (proposed Aug. 30, 1999) (to be codified at 40 C.F.R. pt. 60).

⁸³⁵ *See* OTA REPORT, *supra* note 709, at 221.

order, in Florida, New York, Massachusetts, Ohio, and Virginia.⁸³⁶ More than 40% of the MWCs are located in New England and the mid-Atlantic regions combined; few are located in the Rocky Mountains or further west.⁸³⁷ Seventeen states have received delegated authority to implement plans for large MWC units.⁸³⁸ Approximately thirty-one states and territories have sent negative declarations to EPA stating that no MWC units subject to the regulation existed in their state or territory.⁸³⁹ A large MWC unit is subject to regulation if it has the capacity to combust more than 250 tons per day of municipal solid waste.⁸⁴⁰ Large MWC units in states that do not have a state plan are subject to the Federal Plan Guidelines and Emission Limits promulgated on November 12, 1998.⁸⁴¹ The state plans and the federal plan all contain nine common elements:⁸⁴²

- (1) identification of legal authority;
- (2) identification of mechanisms for implementation;
- (3) inventory of affected facilities;
- (4) emissions inventory;
- (5) emissions limits;
- (6) compliance schedules;

⁸³⁶ *Id.*

⁸³⁷ *Id.*

⁸³⁸ The states that have Approval and Promulgation of State Plans for Designated Facilities and Pollutants are: Florida, 64 Fed. Reg. 29,964 (June 4, 1999) (to be codified at 40 C.F.R. pt. 62); Georgia, 63 Fed. Reg. 27,496 (May 19, 1998) (to be codified at 40 C.F.R. pt. 62); South Carolina, 63 Fed. Reg. 40,048 (July 27, 1998) (to be codified at 40 C.F.R. pt. 62); Tennessee, 63 Fed. Reg. 70,026 (Dec. 18, 1998) (to be codified at 40 C.F.R. pt. 62); Alabama, 63 Fed. Reg. 63,990 (Nov. 18, 1998) (to be codified at 40 C.F.R. pt. 62); Maryland, 64 Fed. Reg. 48,717 (Sept. 8, 1999) (to be codified at 40 C.F.R. pt. 62); Pennsylvania, 64 Fed. Reg. 45,884 (Aug. 23, 1999) (to be codified at 40 C.F.R. pt. 62); New York, 63 Fed. Reg. 41,428 (Aug. 4, 1998) (to be codified at 40 C.F.R. pt. 62); Connecticut, 65 Fed. Reg. 21,358 (Apr. 21, 2000) (to be codified at 40 C.F.R. pt. 62); Massachusetts, 64 Fed. Reg. 37,855 (July 14, 1999) (to be codified at 40 C.F.R. pt. 62); Maine, 63 Fed. Reg. 68,396 (Dec. 11, 1998) (to be codified at 40 C.F.R. pt. 62); Illinois, 62 Fed. Reg. 67,572 (Dec. 29, 1997) (to be codified at 40 C.F.R. pt. 62); Indiana, 64 Fed. Reg. 62,982 (Nov. 18, 1999) (to be codified at 40 C.F.R. pt. 62); Minnesota, 63 Fed. Reg. 43,082 (Aug. 12, 1998) (to be codified at 40 C.F.R. pt. 62); Oklahoma, 63 Fed. Reg. 59,890 (Nov. 6, 1998) (to be codified at 40 C.F.R. pt. 62); Washington, 64 Fed. Reg. 41,294 (July 30, 1999) (to be codified at 40 C.F.R. pt. 62); and Oregon, 62 Fed. Reg. 36,997 (July 10, 1997) (to be codified at 40 C.F.R. pt. 62).

⁸³⁹ Federal Plan Requirements for Large MWC Constructed on or Before September 20, 1994, 63 Fed. Reg. 63,191, 63,193 (Nov. 12, 1998) (to be codified at 40 C.F.R. pt. 62).

⁸⁴⁰ *Id.* at 63,202.

⁸⁴¹ *Id.*

⁸⁴² *Id.* at 63,194.

- (7) public hearing requirements;
- (8) reporting and recordkeeping requirements; and
- (9) public progress reports.

C. Medical Waste Incineration

Approximately 2400 hospital/medical/infectious waste incinerators (HMIWIs) operate in the United States, and they combust about 846,000 tons of hospital/medical/infectious waste (HMIW) each year.⁸⁴³ The EPA estimated that there are approximately 1139 small, 682 medium, and 463 large HMIWIs, and 79 commercial HMIWIs.⁸⁴⁴

Medical waste accounts for less than 2% of all municipal solid waste produced in the United States,⁸⁴⁵ but its potential public health

⁸⁴³ Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators, 62 Fed. Reg. 48,348, 48,350 (Sept. 15, 1997) (to be codified at 40 C.F.R. pt. 60, subparts Ce & Ec) [hereinafter HMIWI Final Rule]. In the proposed standards, guidelines, reproposal, the EPA called these incinerators medical waste incinerators, or MWI. In the final rule, however, the EPA changed the terminology to hospital/medical/infectious waste incinerators, or HMIWI. Compare Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Medical Waste Incinerators, 60 Fed. Reg. 10,654 (proposed Feb. 27, 1995) (to be codified at 40 C.F.R. pt. 60), and Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Medical Waste Incinerators, 61 Fed. Reg. 31,736 (proposed June 20, 1996) (to be at codified 40 C.F.R. pt. 60) (reproposal), with Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators; 62 Fed. Reg. 48,348, 48,379. EPA stated that MWI and HMIWI "are essentially the same" and that the acronyms are interchangeable. OFFICE OF AIR QUALITY PLANNING AND STANDARDS, U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-453/R-97-006B, HOSPITAL/MEDICAL/INFECTIOUS WASTE INCINERATORS: BACKGROUND INFORMATION FOR PROMULGATED STANDARDS AND GUIDELINES—SUMMARY OF PUBLIC COMMENTS AND RESPONSES 1-2 (1997), available at <http://www.epa.gov/clariton/clhtml/pubtitle.html> (last visited Oct. 22, 2000).

⁸⁴⁴ Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators; Final Rule, 62 Fed. Reg. 48,348, 48,372 (Sept. 15, 1997) (to be codified at 40 C.F.R. pt. 60, subparts Ce & Ec); see generally Arnold W. Reitze, Jr. & Michael K. Stagg, *Air Emission Standards and Guidelines Under the Clean Air Act for the Incineration of Hospital, Medical and Infectious Waste*, 28 ENVTL. L. 791 (1998).

⁸⁴⁵ A total of 208 million tons of MSW and 279 million tons of RCRA hazardous waste was generated in 1995 in the U.S. An average of 4.3 pounds of solid waste per person was generated each day in 1995. OFFICE OF SOLID WASTE, U.S. ENVTL. PROTECTION AGENCY, PUB. NO. 530-R-97-015, CHARACTERIZATION OF MUNICIPAL SOLID WASTE IN THE UNITED STATES: 1996 UPDATE 2 (1997), available at <http://www.epa.gov/epaoswer/non-hw/muncpl/msw96.html> (last visited Oct. 22, 2000). Eighty-five to ninety percent of the waste generated at hospitals is municipal type waste that may be handled without special

impact has made it a subject of concern.⁸⁴⁶ In 1990, EPA estimated that about 375,000 medical waste generators produce approximately 500,000 tons of medical waste in the United States each year.⁸⁴⁷ Of the 500,000 tons of medical waste, infectious waste makes up approximately 465,600 tons, 359,000 tons of which is generated by hospitals.⁸⁴⁸ About 7100 hospitals in the United States produce over three-fourths of the total volume of infectious waste,⁸⁴⁹ but they make up slightly less than 2% of the total number of HMIW generators.⁸⁵⁰ EPA attributed generation of the remaining 23% of infectious waste, by volume, to eight other types of infectious waste generators.⁸⁵¹

The rule was expected to cause 50 to 80% of all HMIWI units to cease operations.⁸⁵² The "EPA estimated the rule will carry capital costs in 2002 of between \$12 million and \$26 million, and annual operating costs that range from \$60 million to \$120 million."⁸⁵³

On November 14, 1997, the Sierra Club and the Natural Resource Defense Council filed suit against EPA in the U.S. Court of Appeals for the D.C. Circuit, alleging primarily that EPA failed to comply with CAA section 129(a)(2) regarding the MACT "floors."⁸⁵⁴ While the D.C. Circuit upheld EPA's statutory construction of the MACT floor requirement, it nonetheless remanded the rule back to EPA. When examining the data EPA used to set limits, the court stated

treatment. Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators; 62 Fed. Reg. at 48,356.

⁸⁴⁶ OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, PUB. NO. OTA-O-459, FINDING THE RX FOR MANAGING MEDICAL WASTES 2 (1990), available at http://www.wws.princeton.edu/~ota/ns20/alpha_f.html (last visited Oct. 22, 2000).

⁸⁴⁷ U.S. ENV'T. PROTECTION AGENCY, OFFICE OF SOLID WASTE, PUB. NO. EPA/530/SW-90/051A, FIRST INTERIM REPORT TO CONGRESS: MEDICAL WASTE MANAGEMENT IN THE UNITED STATES 1-3 (1990).

⁸⁴⁸ *Id.* at 1-5.

⁸⁴⁹ *See id.*

⁸⁵⁰ *See id.*

⁸⁵¹ *Id.* Twelve thousand and seven hundred nursing homes produce the second largest volume of infectious waste, 29,600 tons per year (tpy) (6.36%); 180,000 physicians' offices produce 26,400 tpy (5.67%); 16,700 clinics produce 16,700 tpy (3.59%); 4,300 laboratories produce 15,400 tpy (3.31%); 98,400 dentists' offices produce 7,600 tpy (1.63%); 38,000 veterinarians produce 4,600 tpy (.99%); 20,400 funeral homes produce 3,900 tpy (.84%); and 900 blood banks produce 2,400 tpy (.52%). *Id.*

⁸⁵² *Final EPA Rule Sets Emission Limits on New, Existing Medical Waste Units*, DAILY ENV'T REP. (BNA) A-9 (Sept. 18, 1997).

⁸⁵³ *Id.*

⁸⁵⁴ *Sierra Club v. EPA*, 167 F.3d 658, 662 (D.C. Cir. 1997).

that with the data collected, "EPA's method looks hopelessly irrational."⁸⁵⁵

VI. PREVENTION OF ACCIDENTAL RELEASES OF HAPs

A. CAA Section 112(r)

Section 112(r) of the 1990 CAA created the first significant federal program to focus on the prevention of accidental catastrophic environmental releases of hazardous pollutants. There are three major elements to the program: (1) identify hazards which may result from releases of extremely hazardous substances; (2) design and maintain a safe facility, taking the steps necessary to prevent releases; and (3) minimize the consequences of accidental releases that nevertheless occur.⁸⁵⁶ A general duty clause, similar to OSHA's,⁸⁵⁷ imposes on owners and operators a requirement "to design and maintain a safe facility . . . to prevent releases, and to minimize the consequences of accidental releases which do occur."⁸⁵⁸ The requirements are performance-based; they do not specify how something must be done, only that the manner in which the requirements are met minimizes the risk of release.⁸⁵⁹ The subsection also creates an independent Chemical Safety and Hazard Investigation Board (CSB) modeled after the National Transportation Safety Board.⁸⁶⁰ The Board is to investigate accidental releases and make reports, including recommending the adoption of regulations for the preparation of risk management plans to prevent accidental releases and to mitigate the adverse effects of accidents.⁸⁶¹

The section 112(r) program applies to accidental releases of substances listed pursuant to section 112(r)(3) or "any other extremely hazardous substance."⁸⁶² Congress included a list of sixteen chemicals in the statute and gave EPA until November 15, 1992 to

⁸⁵⁵ *Id.* at 664.

⁸⁵⁶ CAA § 112 (r) (1), 42 U.S.C. § 7412(r) (1) (1994).

⁸⁵⁷ § 5, 29 U.S.C. § 654 (1994).

⁸⁵⁸ CAA § 112(r) (1).

⁸⁵⁹ U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-550-B-00-008, GEN. GUIDANCE FOR RISK MANAGEMENT PROGRAM (40 C.F.R. PART 68) (2000), *available at* <http://www.epa.gov/swercepp/p-tech.htm> (last visited Oct. 22, 2000) [hereinafter RMP GUIDANCE].

⁸⁶⁰ CAA § 112(r) (6).

⁸⁶¹ *Id.* § 112(r) (6) (K).

⁸⁶² *Id.* § 112(r) (1).

create an initial list of 100 substances.⁸⁶³ EPA may revise the list on its own motion or by petition and is required to review the list at least every five years.⁸⁶⁴ The basis for listing is the severity of acute health effects, the likelihood of accidental release, and the potential magnitude of human exposure.⁸⁶⁵ At the time a substance is listed, the Administrator must establish a threshold quantity for the substance "taking into account the toxicity, reactivity, volatility, dispersibility, combustibility, or flammability of the substance."⁸⁶⁶ The statutory language "or any other extremely hazardous substance" is not defined in the statute.⁸⁶⁷

By November 15, 1993, EPA was required to promulgate regulations applicable to stationary sources with regulated substances present in more than threshold quantities.⁸⁶⁸ Owners or operators of such sources must prepare a risk management plan to detect and prevent or minimize accidental releases and to provide a prompt emergency response.⁸⁶⁹ While this program is focused on the prevention of accidental releases, it is to be coordinated with similar efforts under CERCLA, EPCRA, and the CWA.⁸⁷⁰

The section 112(r) program applies to stationary sources, defined at section 112(r)(2)(C).⁸⁷¹ A stationary source can include many emission points from which an accidental release may occur if they belong to the same industrial group, are located on contiguous properties, and are under common control.⁸⁷² Section 112(r) is intended to prevent or to minimize the consequences of an accidental release.⁸⁷³ The term "accidental release" is not defined and has only a limited legislative history.⁸⁷⁴

⁸⁶³ *Id.* § 112(r)(3).

⁸⁶⁴ *Id.*

⁸⁶⁵ *Id.*

⁸⁶⁶ CAA § 112(r)(5).

⁸⁶⁷ *Id.* § 112(r)(2).

⁸⁶⁸ *Id.* § 112(r)(3).

⁸⁶⁹ *Id.* § 112(r)(7)(B)(ii).

⁸⁷⁰ Spill planning is required by CWA § 311(j), 33 U.S.C. § 1321(j) (1994). See also Adam H. Steinman, *Drafting One Integrated Emergency Response Plan for All Applicable Plan Requirements: Regulatory Guidance Has Finally Arrived*, 27 ENV'T REP. (BNA) 515, 516-17 (June 28, 1996).

⁸⁷¹ CAA § 112(r)(2)(c).

⁸⁷² *Id.*

⁸⁷³ *Id.* § 112(r)(1).

⁸⁷⁴ Van R. Delhotal, *The General Duty to Prevent Accidental Releases of Extremely Hazardous Substances: The General Duty Clause of Section 112(r) of the Clean Air Act*, 13 J. ENERGY NAT. RESOURCES & ENVTL. L. 61, 87 (1993).

States may run the section 112(r) program based on EPA's authority to delegate, but some states are not seeking to take either full or partial delegation for implementing the program.⁸⁷⁵ They are concerned with their potential liability if an accident occurs after they have audited a facility and have approved it, or if the state has not audited the facility and an accident occurs. Florida, Puerto Rico, the Virgin Islands, Georgia, and Ohio had delegated authority as of July 2000.⁸⁷⁶ Other states, including California, Louisiana, Mississippi, Nevada, New Jersey, Delaware, and South Carolina have expressed an interest in running the 112(r) program. California, Delaware, Nevada, and New Jersey have state programs that mirror the section 112(r) program.⁸⁷⁷

B. *The CSB*

The CSB had significant problems becoming operational.⁸⁷⁸ Congress provided funding in 1991 and 1993, but rescinded the funding when President Clinton did not nominate members for the CSB.⁸⁷⁹ The President nominated three people in late 1994 for CSB membership.⁸⁸⁰ Congress then approved \$500,000 for the CSB during fiscal year (FY) 1995, but President Clinton reversed his position and asked Congress to rescind the CSB's funding, which Congress did on July 27, 1995.⁸⁸¹ For FY 1996, OSHA and EPA received approximately \$4 million each to carry out the tasks assigned to the CSB.⁸⁸² In FY 1997 the Clinton administration and Congress agreed to a \$4 million start-up appropriation for the CSB.⁸⁸³ It began operations in January

⁸⁷⁵ See James Kennedy, *At Least Nine States Requesting Authority to Implement Risk Management Programs*, DAILY ENV'T REP. (BNA) A-1 (Mar. 26, 1998).

⁸⁷⁶ Approval of Delegation of the Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r)(7): State of Ohio, 64 Fed. Reg. 59,650 (Nov. 3, 1999) (to be codified at 40 C.F.R. pts. 63, 68).

⁸⁷⁷ See *id.*

⁸⁷⁸ Mark L. Farley, *Investigating Chemical Incidents—Role of the Chemical Safety and Health Identification Board*, 30 ENV'T REP. (BNA) 534, 537-39 (July 16, 1999).

⁸⁷⁹ *Id.* at 537.

⁸⁸⁰ *Id.* at 538.

⁸⁸¹ *Id.* at 539; see also SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM, *supra* note 261, at 25.

⁸⁸² Farley, *supra* note 878, at 538 (citing Pub. L. No. 104-19, 109 Stat. 194, 237 (1995)).

⁸⁸³ *Additional Funding for Safety Board Tied to Provision for Annual GAO Review*, 29 ENV'T REP. (BNA) 787, 787 (Aug. 14, 1998).

1998.⁸⁸⁴ The Board operated with just two board members for the first eleven months, and at the beginning of 1999 two others joined the Board.⁸⁸⁵ One of the board members also serves as Chairperson and Chief Executive Officer.⁸⁸⁶ All substantive board decisions are made by the Chairperson.⁸⁸⁷ In August, 1999, the Board's general counsel issued a legal opinion that the Board as a whole should make most of the substantive decisions and the Chairperson should handle day-to-day management.⁸⁸⁸ The Department of Justice (DOJ) concurred with the opinion, and a dispute arose between the Chairperson and the other board members.⁸⁸⁹ The Chairperson resigned in January, 2000 as Chair, but remains a board member.⁸⁹⁰ The Board has allocated the Chairperson's responsibilities among themselves and acts collectively when making decisions while awaiting the appointment of another Chairperson.⁸⁹¹

In FY 1999, the CSB had a \$6.5 million budget, but its Chairman told Congress the money needed to be doubled as chemical accidents kill 250 people annually and result in 60,000 chemical releases that need to be investigated.⁸⁹² In 1998, the Board undertook five investigations, and as of mid-1999 had issued reports in two.⁸⁹³ The investigations took nine and eleven months, respectively, from start to finish.⁸⁹⁴ Six investigations commenced in 1999, and in April, 1999

⁸⁸⁴ EPA, *Safety Board Sign Agreement Defining Rules on Accident Investigations*, DAILY ENV'T REP. (BNA) A-10 (Mar. 29, 1999). The CSB website is located at <http://www.chemsafety.gov>.

⁸⁸⁵ U.S. GEN. ACCOUNTING OFFICE, U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD: ANNUAL PERFORMANCE PLAN 2 (2000).

⁸⁸⁶ *Id.*

⁸⁸⁷ *Id.*

⁸⁸⁸ *Id.*

⁸⁸⁹ *Id.*

⁸⁹⁰ *Id.*

⁸⁹¹ U.S. GEN. ACCOUNTING OFFICE, U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD: ANNUAL PERFORMANCE PLAN 2 (2000); see *Investigation Board Chair Is Subordinate When Setting Direction, Justice Memo Says*, DAILY ENV'T REP. (BNA) A-8 (July 7, 2000).

⁸⁹² Dean Scott, *Chemical Board Chairman Asks Congress to Double Appropriations for Fiscal 2000*, DAILY ENV'T REP. (BNA) A-8 (Feb. 26, 1999).

⁸⁹³ U.S. GEN. ACCOUNTING OFFICE, PUB. NO. GAO/T-RCED-99-167, CHEMICAL SAFETY BOARD: STATUS OF IMPLEMENTATION EFFORTS 3 (1999), available at http://www.access.gpo.gov/su_docs/aces/aces160.shtml (last visited Oct. 22, 2000).

⁸⁹⁴ *Id.* In its 1997 Business Plan, the Board had predicted it would be able to finish investigations within six months, and would conduct between five and ten investigations in 1998 and between thirteen and nineteen investigations in 1999. *Id.* at 9.

the CSB's Chairman announced it would not begin any new probes because it lacked funds.⁸⁹⁵

The CSB functions overlap those of EPA, OSHA, and the National Transportation Safety Board (NTSB). EPA has authority under the CAA section 112(r), as well as responsibilities for chemical accidents pursuant to numerous statutes that it administers, especially CERCLA section 104.⁸⁹⁶ OSHA has its Process Safety Management (PSM) Standard⁸⁹⁷ that covers any process⁸⁹⁸ that involves a highly hazardous chemical. The PSM Standard imposes responsibilities on employers to prevent accidents and to have operating procedures to deal with covered processes.⁸⁹⁹ The NTSB is responsible for investigating every civil aviation accident and other significant railroad, ship, highway, and pipeline accident in the United States.⁹⁰⁰ The organizations have created a memorandum of understanding (MOU) to resolve their jurisdictional conflicts.⁹⁰¹

On September 25, 1998, the CSB signed an MOU with OSHA that established policy and procedures for cooperation among the two organizations.⁹⁰² Under the agreement, OSHA has primary responsibility for investigating employer compliance with job safety and health regulations.⁹⁰³ The CSB will have the responsibility to determine the cause or probable cause of chemical incidents.

On March 16, 1999, EPA and the CSB signed an MOU addressing their respective responsibilities.⁹⁰⁴ EPA as the On-Scene-Coordinator has the responsibility for dealing with an accidental release. Once a release is contained, EPA will determine whether a facility was in compliance with relevant safety and environmental statutes; CSB will determine the cause of the accident.⁹⁰⁵ The CSB will investigate chemical incidents resulting in death, serious injury, substantial

⁸⁹⁵ Dean Scott, *Board Halts New Investigations as Ongoing Accident Probes Deplete Funds*, TOXICS L. DAILY (BNA) D-2 (Apr. 6, 1999).

⁸⁹⁶ § 104, 42 U.S.C. § 9604 (1994).

⁸⁹⁷ 29 C.F.R. § 1910.119 (1992).

⁸⁹⁸ Process is defined at 29 C.F.R. § 1910.119(b).

⁸⁹⁹ See Process Safety Management of Highly Hazardous Chemicals: Explosives and Blasting Agents, 57 Fed. Reg. 6356 (Feb. 24, 1992) (to be codified at 29 C.F.R. pt. 1910).

⁹⁰⁰ Farley, *supra* note 878, at 538, 540.

⁹⁰¹ *Id.* at 540.

⁹⁰² *Id.*

⁹⁰³ *Id.* at 540 n.35 (citing to Senate Report No. 101-228, 101st Cong., 2nd Sess. 228 (1989)).

⁹⁰⁴ EPA, *Safety Board Sign Agreement Defining Roles on Accident Investigations*, 29 ENV'T REP. (BNA) 2363, 2363 (Apr. 2, 1999).

⁹⁰⁵ *Id.*

property damage, or evacuation; it is not limited to incidents involving extremely hazardous chemicals.⁹⁰⁶ Information submitted under the requirements of the risk management plans (RMPs) will be disclosed to the CSB by EPA pursuant to the MOU.⁹⁰⁷

The extent to which the CSB will grow in importance will depend on how well the board's leadership plays the political game.⁹⁰⁸ The CSB's limited success to date is the result of Congressional dissatisfaction with OSHA and support by labor unions and environmental groups (particularly the Environmental Defense Fund).⁹⁰⁹ Industry also has supported the CSB as being the organization to perform investigations because the CSB is prohibited from having its findings used as evidence in a civil suit for damages.⁹¹⁰

C. OSHA and CAA Section 112(r)

When the 1990 CAA section 112(r) was enacted, the newly created CSB was given some of OSHA's responsibilities as well as responsibility for releases to the ambient air.⁹¹¹ In addition, section 304 of the CAA Amendments of 1990 requires OSHA to promulgate a chemical process standard to protect employees from accidental releases of highly hazardous chemicals. On February 24, 1992, OSHA promulgated its standard.⁹¹² EPA and OSHA, as previously discussed, have attempted to coordinate their rules to minimize conflicting requirements.⁹¹³ OSHA and EPA use a similar list of pollutants for each of their chemical safety programs, which required OSHA to adopt EPA's larger list and lower thresholds.⁹¹⁴ This is expected to

⁹⁰⁶ *Id.*

⁹⁰⁷ Accidental Release Prevention Requirements: Risk Management Programs Under Section 112(r)(7) of the CAA as Amended; Confidential Business Information, 64 Fed. Reg. 41,111, 41,112 (July 29, 1999).

⁹⁰⁸ See, e.g., *Investigation Board Chair Is Subordinate When Setting Direction*, Justice Memo Says, 31 ENV'T REP. (BNA) A-8 (July 7, 2000).

⁹⁰⁹ Farley, *supra* note 878, at 536, 537.

⁹¹⁰ CAA § 112(r)(6)(G), 42 U.S.C. § 7412(r)(6)(G) (1994).

⁹¹¹ *Id.* §§ 112(r)(6)(C),(E),(K).

⁹¹² Process Safety Management of Highly Hazardous Chemicals: Explosives and Blasting Agents, 57 Fed. Reg. 6356, 6403 (Feb. 24, 1992) (to be codified at 29 C.F.R. pt. 1910).

⁹¹³ See *supra* note 896 and accompanying text.

⁹¹⁴ *Industry Pushes for Harmonized Risk Management Program Under Clean Air Act*, DAILY ENV'T REP. (BNA) A-4 (Oct. 25, 1995).

streamline efforts to produce risk management plans under CAA section 112(r).⁹¹⁵

EPA's proposed section 112(r) regulations were nearly identical to OSHA's process safety management standard.⁹¹⁶ The main differences are those mandated by the CAA, such as the hazard assessment with its required offsite consequences analysis and five-year accident history.⁹¹⁷ Other CAA requirements include emergency response requirements; registration; and a risk management program that must be submitted to the CSB, the implementing agency, the state emergency response commission (SERC), the local emergency planning commission (LEPC), and must be made available to the public.⁹¹⁸ The OSHA standard includes provisions applicable to workers that are not part of EPA's proposal. But, if a facility meets OSHA requirements, it will probably be in compliance with EPA's accident prevention program.⁹¹⁹ EPA's coverage of chemicals and thresholds, however, is not the same as OSHA's.⁹²⁰ EPA covers more substances with acute toxic effects, but covers fewer flammables and explosives, and no reactive substances.⁹²¹ OSHA does not cover state and local government employees.⁹²² In addition, the "OSHA exemptions do not apply or extend to EPA's Risk Management Program Rule."⁹²³

D. Regulations Under CAA Section 112(r)

EPA issued final rules concerning the list of regulated substances and thresholds covered under section 112(r) of the CAA on January 31, 1994.⁹²⁴ These regulations cover seventy-seven toxic substances,

⁹¹⁵ *Id.*

⁹¹⁶ Risk Management Programs for Chemical Accidental Release Prevention, 58 Fed. Reg. 54,190, 54,192 (proposed Oct. 20, 1993) (to be codified at 40 C.F.R. pt. 68) [hereinafter Risk Management]. The SERC and LEPC are established under EPCRA. 42 U.S.C. §§ 11001-11050 (1994).

⁹¹⁷ Risk Management, *supra* note 916, at 54,192.

⁹¹⁸ *Id.*

⁹¹⁹ *Id.*

⁹²⁰ *Id.* at 54,193.

⁹²¹ *Id.*

⁹²² *Id.* The differences between OSHA and the EPA's proposed rule are discussed in more detail in Risk Management, *supra* note 916, at 54,203-05. The universe of facilities covered by the proposed rule is discussed in Risk Management. *Id.* at 54,208-10.

⁹²³ RMP GUIDANCE, *supra* note 859, at 1-5.

⁹²⁴ List of Regulated Substances and Thresholds for Accidental Release Prevention, Requirements for Petitions Under Section 112(r) of the CAA as Amended, 59 Fed. Reg.

sixty-three flammable substances, and the explosive substances listed by the Department of Transportation (DOT).⁹²⁵ These substances are explained and listed in 40 C.F.R. part 68, subparts A and C.⁹²⁶ The list includes the name of the substance, its chemical abstract number, and the threshold amount for each substance.⁹²⁷ The threshold amount plays a key role in these regulations. If the total quantity of a regulated substance contained in a process at a stationary source exceeds the threshold amount listed in 40 C.F.R. section 68.130, then the facility is subject to the accidental release prevention requirements described in section 112(r) of the CAA.⁹²⁸ The chemicals most likely to require a section 112(r) response include chlorine, because of its low threshold and its common use in water and wastewater treatment, and flammables. The list was amended on August 25, 1997⁹²⁹ to change the concentration of hydrochloric acid, and on January 6, 1998 to delist Division 1.1 explosives as classified by the DOT.⁹³⁰ Another August 25, 1997 amendment clarified the method for calculating the quantity of a listed solution and stated that certain reports required under section 112(r) did not need to be reported under section 8(e) of the Toxic Substances Control Act.⁹³¹

EPA promulgated proposed regulations for implementing CAA section 112(r)(7) on October 20, 1993.⁹³² A supplemental notice was

4478, 4493 (Jan. 31, 1994) (to be codified at 40 C.F.R. pts. 9, 68) (referred to as the List Rule).

⁹²⁵ *Id.* at 4478.

⁹²⁶ 40 C.F.R. §§ 68.1-.15, 68.48-.60 (1993).

⁹²⁷ *Id.* § 68.130. EPA's CAA section 112(r)'s list of chemicals for developing risk management plans was challenged in 1994 by the American Petroleum Institute and the Institute of Makers of Explosives. The proposed settlement was published in Proposed Settlements: Accidental Release Prevention List of Substances Litigation, 61 Fed. Reg. 13,858 (Mar. 28, 1996).

⁹²⁸ 40 C.F.R. § 68.115; *see also* List of Regulated Substances and Thresholds for Accidental Release Prevention: Requirements for Petitions Under Section 112(r) of the CAA as Amended, 59 Fed. Reg. at 4493.

⁹²⁹ List of Regulated Substances and Thresholds for Accidental Release Prevention, 62 Fed. Reg. 45,130, 45,132 (Aug. 25, 1997) (to be codified at 40 C.F.R. pt. 68).

⁹³⁰ List of Regulated Substances and Thresholds for Accidental Release Prevention: Amendments, 63 Fed. Reg. 640, 644 (Jan. 6, 1998) (to be codified at 40 C.F.R. pt. 68).

⁹³¹ Accidental Release Prevention Requirements; Interpretations, 62 Fed. Reg. 45,134, 45,134 (Aug. 25, 1987) (to be codified at 40 C.F.R. pt. 68).

⁹³² Requirements: Risk Management Programs for Chemical Accidental Release Prevention, Under CAA Section 112(r)(7), 58 Fed. Reg. 54,190, 54,212 (proposed Oct. 20, 1993) (to be codified at 40 C.F.R. pt. 68).

issued on March 13, 1995.⁹³³ The supplemental notice stated that section 112(r) is also subject to the operating permit program in 40 C.F.R. part 70⁹³⁴ because section 112(r)'s listed substances are "regulated air pollutants," and because the accident prevention regulations implementing section 112(r)(7) are "applicable requirements" under the operating permit program.⁹³⁵ On June 20, 1996, EPA promulgated a final rule for risk management programs under section 112(r)(7).⁹³⁶ The rule is codified at 40 C.F.R. sections 68.3 to 68.22.⁹³⁷ EPA also published a stay of implementation of certain provisions on June 20, 1996.⁹³⁸

EPA's final rule requires nearly 70,000 facilities that handle regulated chemicals to develop risk management plans under CAA section 112(r).⁹³⁹ Manufacturers of listed chemicals are subject to the new rule, as are cold-storage facilities that utilize ammonia, public drinking water treatment plants, wastewater treatment plants, chemical wholesalers, propane retailers, and oil refineries.⁹⁴⁰ Much of the propane industry was later exempted from these requirements pursuant to the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act passed in 1999.⁹⁴¹

To determine whether a specific stationary source is subject to CAA section 112(r)(7) requires an examination of the list of substances and thresholds under 40 C.F.R. section 68.130; the proposed modifications of April 15, 1996;⁹⁴² the stay of

⁹³³ Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r)(7), 60 Fed. Reg. 13,526, 13,543 (Mar. 13, 1995) (to be codified at 40 C.F.R. pt. 68).

⁹³⁴ Operating Permit Program, 57 Fed. Reg. 32,250, 32,295 (July 21, 1992) (to be codified at 40 C.F.R. pt. 70).

⁹³⁵ Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r)(7), 60 Fed. Reg. at 13,526.

⁹³⁶ Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r)(7), 61 Fed. Reg. 31,668, 31,717 (June 20, 1996) (to be codified at 40 C.F.R. pt. 68) [hereinafter RMP Rule].

⁹³⁷ 40 C.F.R. §§ 68.3–22.

⁹³⁸ Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r)(7), 61 Fed. Reg. at 31,668.

⁹³⁹ *Nearly 70,000 Facilities Must Develop Air Act Risk Management Plans by 1999*, DAILY ENV'T REP. (BNA) A-1 (May 30, 1996).

⁹⁴⁰ *Id.*

⁹⁴¹ *Changes to Flammable Fuel Provisions of CAA Safety Rules Signed by Browner*, DAILY ENV'T REP. (BNA) A-3 (Mar. 9, 2000).

⁹⁴² List of Regulated Substances and Thresholds for Accidental Release Prevention: Proposed Amendments, 61 Fed. Reg. 16,598, 16,602 (proposed Apr. 25, 1996) (to be codified at 40 C.F.R. pt. 68).

implementation promulgated on June 20, 1996;⁹⁴³ and the applicability criteria in 40 C.F.R. section 68.10 of the final rule.⁹⁴⁴ The regulatory amendments made on January 6, 1998 clarify that the "Chemical Accident Prevention Provisions [part 68] do not apply to sources located on the Outer Continental Shelf," and that the "definition of stationary source is modified to clarify the exemption of transportation and storage incident to transportation and to clarify that naturally occurring hydrocarbon reservoirs are not stationary sources or parts of stationary sources."⁹⁴⁵

Stationary sources covered by these regulations must develop and implement a risk management program that includes a hazard assessment, a management program, a prevention program, and an emergency response program. The risk management program must be described in a risk management plan (RMP) that must be registered with the EPA, submitted to state and local authority, and made available to the public.⁹⁴⁶

An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process is required to comply by either June 21, 1999, three years after the substance is listed, or the date on which a regulated substance is first present, whichever date is latest.⁹⁴⁷

E. Section 112(r) Program Levels

Processes are divided into three tiers, labeled programs "1," "2," and "3," shown in Appendix 4. Each program level and the requirements reflect the appropriate level of risk.⁹⁴⁸ A source can be subject to one or more programs for its various processes.⁹⁴⁹ Each process is assigned a program level, and only one program level is assigned to each process.⁹⁵⁰ Processes cannot be subdivided for the

⁹⁴³ RMP Rule, *supra* note 936, at 31,717.

⁹⁴⁴ *Id.*

⁹⁴⁵ List of Regulated Substances and Thresholds for Accidental Release Prevention: Amendments, 63 Fed. Reg. 640, 644 (Jan. 6, 1998) (to be codified at 40 C.F.R. pt. 68).

⁹⁴⁶ RMP Rule, *supra* note 936, at 31,669.

⁹⁴⁷ *Id.* at 31,670, 31,717. Threshold quantities are determined under 40 C.F.R. section 68.115.

⁹⁴⁸ RMP GUIDANCE, *supra* note 859.

⁹⁴⁹ RMP Rule, *supra* note 936, at 31,670.

⁹⁵⁰ RMP GUIDANCE, *supra* note 859.

purpose of assigning program levels.⁹⁵¹ Program level 1 applies to any process with no accidental release “with offsite consequences in the five years prior to the submission date of the RMP and has no public receptors within the distance to a specified toxic or flammable endpoint associated with a worst-case release scenario.”⁹⁵² Program level 2 is the default program and applies to all those processes not subject to program levels 1 or 3.⁹⁵³ Program level 3 applies to processes in ten specified North American Industry Classification System codes.⁹⁵⁴ It also applies to all processes subject to OSHA PSM standard.⁹⁵⁵ It is in a facility’s best interest to qualify for program level 1, if possible.⁹⁵⁶

If a facility has multiple processes subject to different program levels, the facility must comply with the requirements of the applicable level for each process and submit a single RMP for all covered processes.⁹⁵⁷

1. Hazard Assessment

The hazard assessment includes the five-year accident history and the offsite consequence analysis.⁹⁵⁸ While the five-year history must be completed for each process, only certain releases are covered.⁹⁵⁹ The release must: (1) be from a covered process involving a regulated substance above the threshold amount; and (2) result in an on-site death, injury, or significant property damage or known offsite deaths, injuries, property damage, environmental damage, evacuations, or sheltering.⁹⁶⁰ Every reported release must include the date, time, chemical involved, release duration, release event, quantity released, release source, weather condition, onsite impacts, offsite impacts,

⁹⁵¹ *Id.*

⁹⁵² RMP Rule, *supra* note 936, at 31,670; *see generally* RMP GUIDANCE, *supra* note 859.

⁹⁵³ RMP Rule, *supra* note 936, at 31,670; *see generally* RMP GUIDANCE, *supra* note 859.

⁹⁵⁴ RMP Rule, *supra* note 936, at 31,670. Pursuant to a 1997 agreement with Canada and Mexico, the United States has adopted the North American Industry Classification System (NAICS) to replace the Standard Industrial Classification (SIC) codes and all of part 68 is being revised to reflect those changes. Accidental Release Prevention Requirements: Risk Management Programs Under CAA Section 112(r) (7), Amendments, 64 Fed. Reg. 964, 965 (Jan. 6, 1999) (codified at 40 C.F.R. part 68).

⁹⁵⁵ 29 C.F.R. § 1910.119 (2000).

⁹⁵⁶ *See* RMP GUIDANCE, *supra* note 859.

⁹⁵⁷ *Id.*

⁹⁵⁸ *Id.*

⁹⁵⁹ *Id.*

⁹⁶⁰ *See* 40 C.F.R. § 68.42(a) (2000).

initiating event, contributing factors, whether offsite responders were notified, and what changes were introduced as a result of the accident.⁹⁶¹

The offsite consequence analysis has two parts: the worst-case release scenario and the alternative release scenario.⁹⁶² A “worst-case release scenario” is defined as:

the release of the largest quantity of a regulated substance from a vessel or process line failure, including administrative controls and passive mitigation that limit the total quantity involved or the release rate. For most gases, the worst-case release scenario assumes that the quantity is released in ten minutes. For liquids, the scenario assumes an instantaneous spill; the release rate to the air is the volatilization rate from a pool one centimeter deep unless passive mitigation systems contain the substance in a smaller area. For flammables, the worst case scenario assumes an instantaneous release and a vapor cloud explosion.⁹⁶³

There are five basic components of a worst-case scenario. These are:⁹⁶⁴

- (1) define worst case;
- (2) select scenario;
- (3) determine release rate;
- (4) determine endpoints; and
- (5) determine reference table and distance.

EPA has adopted the term “alternative release scenarios” to mean an accidental release scenario that is “more realistic” and “more probable” than the worst-case scenario and will reach an endpoint offsite.⁹⁶⁵ “EPA believes sources should have flexibility to select non-worst-case scenarios that are the most useful for communication with

⁹⁶¹ RMP GUIDANCE, *supra* note 859.

⁹⁶² See RMP GUIDANCE, *supra* note 859, at 4-1 to 4-26. EPA has also issued a guidance document to assist in meeting these requirements. See generally U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA-550-B-99-009, RISK MANAGEMENT PROGRAM GUIDANCE FOR OFFSITE CONSEQUENCE ANALYSIS (1999), available at <http://www.epa.gov/swercepp/ap-ocgu.htm> (last visited Oct. 22, 2000) [hereinafter OCA GUIDANCE].

⁹⁶³ RMP Rule, *supra* note 936, at 31,670; see 40 C.F.R. § 68.3.

⁹⁶⁴ See RMP GUIDANCE, *supra* note 859.

⁹⁶⁵ OCA GUIDANCE, *supra* note 962; see RMP Rule, *supra* note 936, at 31,670.

the public and first responders and for emergency response preparedness and planning.⁹⁶⁶

An endpoint is needed for the offsite consequence analysis. Appendix A of the final rule lists the endpoints for toxic substances that must be used in worst-case and alternative scenario assessment.⁹⁶⁷ The endpoint is its Emergency Response Planning Guideline level 2 (ERPG-2) value, or if no ERPG-2 applies, then the endpoint is the level of concern (LOC) from the Technical Guidance for Hazards Analysis.⁹⁶⁸ The endpoints may also be found and/or calculated in EPA's 1999 guidance entitled *Risk Management Program Guidance for Offsite Consequence Analysis*.⁹⁶⁹ Populations potentially affected are those within a circle that have as its center the point of release and its radius the distance to the toxic or flammable endpoint.⁹⁷⁰

2. Management Programs

A management system is required under program levels 2 and 3.⁹⁷¹ The facility must delegate the responsibility of the implementation of the risk management program to a person or persons.⁹⁷² The only required element in the RMP is the name of the individual with overall responsibility.⁹⁷³

3. Prevention Programs

For program level 2 sources, there are seven elements of the prevention program requirements.⁹⁷⁴ These include: compiling safety information,⁹⁷⁵ hazard review,⁹⁷⁶ operating procedures,⁹⁷⁷ training,⁹⁷⁸ maintenance,⁹⁷⁹ compliance audits,⁹⁸⁰ and accident investigation.⁹⁸¹

⁹⁶⁶ RMP Rule, *supra* note 936, at 31,670.

⁹⁶⁷ 40 C.F.R. pt. 68 app. A (2000).

⁹⁶⁸ *Id.*

⁹⁶⁹ OCA GUIDANCE, *supra* note 962.

⁹⁷⁰ RMP Rule, *supra* note 936, at 31,670; *see* OCA GUIDANCE, *supra* note 962.

⁹⁷¹ *See* 40 C.F.R. § 15 (2000).

⁹⁷² RMP GUIDANCE, *supra* note 859.

⁹⁷³ *Id.*

⁹⁷⁴ *Id.*

⁹⁷⁵ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.48 (2000).

⁹⁷⁶ *Id.* § 68.50.

⁹⁷⁷ *Id.* § 68.52.

⁹⁷⁸ *Id.* § 68.54.

⁹⁷⁹ *Id.* § 68.56.

⁹⁸⁰ *Id.* § 68.58.

⁹⁸¹ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.60.

For program level 3 sources there are more detailed requirements.⁹⁸² They include the requirements of OSHA PSM Standard,⁹⁸³ with minor wording changes.⁹⁸⁴ However, because EPA and OSHA have differing legal authority for offsite consequences and onsite consequences, respectively, a facility may need to expand on the process hazard analysis to meet EPA's RMP requirements.⁹⁸⁵ "There are twelve elements in the program level 3 prevention program. Each element corresponds with a section of subpart D of part 68 [of 40 C.F.R.], as listed in Table 2."⁹⁸⁶

Table 2

Summary of Program Level 3 Prevention Program⁹⁸⁷
(40 C.F.R. § 68 subpart D)

40 C.F.R.	Title	OSHA PSM Reference
§ 68.65	Process Safety Information	PSM standard § 1910.119(d)
§ 68.67	Process Hazard Analysis	PSM standard § 1910.119(e)
§ 68.69	Operating Procedures	PSM standard § 1910.119(f)
§ 68.71	Training	PSM standard § 1910.119(g)
§ 68.73	Mechanical Integrity	PSM standard § 1910.119(j)
§ 68.75	Management of Change	PSM standard § 1910.119(l)
§ 68.77	Pre-Startup Review	PSM standard § 1910.119(I)
§ 68.79	Compliance Audits	PSM standard § 1910.119(o)
§ 68.81	Incident Investigation	PSM standard § 1910.119(m)
§ 68.83	Employee Participation	PSM standard § 1910.119(c)
§ 68.85	Hot Work Permit	PSM standard § 1910.119(k)
§ 68.87	Contractors	PSM standard § 1910.119(h)

4. Emergency Response

Facilities with program levels 2 or 3 may be required to submit emergency response plans.⁹⁸⁸ Plans developed to comply with other EPA contingency planning requirements and OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) rule,⁹⁸⁹ however, are expected to meet most of the requirements of the emergency

⁹⁸² *Id.* §§ 68.65 –.87.

⁹⁸³ Occupational Safety and Health Standards, 29 C.F.R. §§ 1910.119(c)-(m) & (o) (2000); see RMP GUIDANCE, *supra* note 859.

⁹⁸⁴ RMP Rule, *supra* note 936, at 31,672; see RMP GUIDANCE, *supra* note 859.

⁹⁸⁵ RMP GUIDANCE, *supra* note 859.

⁹⁸⁶ *Id.*

⁹⁸⁷ *Id.*

⁹⁸⁸ *Id.*

⁹⁸⁹ Occupational Safety and Health Standards, 29 C.F.R § 1910.120.

response program for non-responding facilities.⁹⁹⁰ Facilities that have their own employees respond to an emergency may have to implement an emergency response program “consisting of an emergency response plan, emergency response equipment procedures, employee training, and procedures to ensure the program is up-to-date.”⁹⁹¹ This requirement may be consolidated with other required emergency plans following the National Response Team Integrated Contingency Plan Guidance to prevent a duplication of efforts.⁹⁹²

5. RMP

A risk management program is what you do, an RMP is what you submit. An RMP that meets CAA section 112(r) requirements has three major components: a hazard assessment that includes a release history for the past five years, a program to prevent accidental releases, and a response program that provides for the actions to be taken in an emergency.⁹⁹³ Each stationary source that has a regulated substance in more than a threshold quantity must prepare an RMP to detect and prevent or minimize accidental releases and to provide a prompt emergency response to any release.⁹⁹⁴ The RMP is a summary of the risk management program that is registered with the Administrator of EPA, and is also submitted to the Chemical Safety and Hazard Investigation Board, to the state in which the site is located, and to any local agency with planning or response responsibility for responding to accidental releases.⁹⁹⁵ It must contain all information required by 40 C.F.R. sections 68.155 through 68.185.

An RMP must include:⁹⁹⁶

- (1) an executive summary;⁹⁹⁷
- (2) the facility’s registration;⁹⁹⁸

⁹⁹⁰ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.90(b) (2000).

⁹⁹¹ RMP GUIDANCE, *supra* note 859; *see* 40 C.F.R. § 68.95.

⁹⁹² *See* The National Response Team’s Integrated Contingency Plan Guidance, 61 Fed. Reg. 28,642 (June 5, 1996).

⁹⁹³ CAA § 112(r) (7) (B) (ii), 42 U.S.C. § 7412(r) (7) (B) (ii) (1994).

⁹⁹⁴ *Id.*

⁹⁹⁵ §112 (r) (7) (B) (iii).

⁹⁹⁶ *See* RMP GUIDANCE, *supra* note 859; Accidental Release Prevention Requirements: Risk Management Programs Under CAA § 112(r) (7), 61 Fed. Reg. 31,668, 31,670 (June 20, 1996) (to be codified at 70 C.F.R. pt. 68); 40 C.F.R. pt. 68, subpart G (2000).

⁹⁹⁷ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.155 (2000).

⁹⁹⁸ *See id.* § 68.160.

- (3) the certification statement;⁹⁹⁹
- (4) a worst-case scenario for each program 1 process;¹⁰⁰⁰
- (5) a five-year accident history for each process;¹⁰⁰¹ and
- (6) a summary of the emergency response program.¹⁰⁰²

If the facility has processes covered by program levels 2 or 3, the RMP must also include:¹⁰⁰³

- (1) at least one alternative release scenario for each regulated toxic substance in program 2 or 3 processes and at least one alternative release scenario to cover all regulated flammables in program 2 or 3 processes;¹⁰⁰⁴
- (2) a summary of the prevention program for each program 2 process;¹⁰⁰⁵ and
- (3) a summary of the prevention program for each program 3 process.¹⁰⁰⁶

Measures taken by sources to comply with OSHA PSM for any process that meets OSHA's PSM standard are sufficient to comply with the prevention program requirements of all three programs. EPA will retain its authority to enforce the prevention program requirements and the general duty requirements of CAA Section 112(r)(1). EPA and OSHA are working closely to coordinate interpretation and enforcement of PSM and accident prevention programs.¹⁰⁰⁷

Owners or operators had to submit their first RMP by June 21, 1999.¹⁰⁰⁸ After an RMP is submitted, changes in operation may require updates to the RMP (other than the standard update) every five years.¹⁰⁰⁹ If a new substance or new process is added, the RMP must be revised and submitted by the date the substance is first used above the

⁹⁹⁹ See *id.* § 68.185.

¹⁰⁰⁰ See *id.* § 68.25.

¹⁰⁰¹ See *id.* § 68.168.

¹⁰⁰² Chemical Accident Prevention Provisions, 40 C.F.R. § 68.180.

¹⁰⁰³ RMP GUIDANCE, *supra* note 859.

¹⁰⁰⁴ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.165(a)(2).

¹⁰⁰⁵ See *id.* § 68.170.

¹⁰⁰⁶ See *id.* § 68.175.

¹⁰⁰⁷ Accidental Release Prevention Requirements: Risk Management Programs Under CAA § 112(r)(7), 61 Fed. Reg. 31668, 31670 (June 20, 1996) (to be codified at 40 C.F.R. pt. 68).

¹⁰⁰⁸ Chemical Accident Prevention Provisions, 40 C.F.R. § 68.10.

¹⁰⁰⁹ See *id.* § 68.36.

threshold quantity.¹⁰¹⁰ If changes to processes require revised hazard assessments, or if a process changes the program level, the source must submit a revised RMP within six months.¹⁰¹¹ States, local emergency planning commissions (LEPCs), and the public should be able to access all RMPs electronically.¹⁰¹² See Appendix 5 for a list of RMP update requirements.

The complexity of the risk management plan will depend on whether the "covered process" is subject to a program level 1, 2, or 3. A "covered process" is a process that has greater than threshold quantities of a regulated substance onsite.¹⁰¹³ The RMP is the totality of plans for all covered processes.

The covered process (not the facility) is a program level 3 if it meets chemical threshold requirements and is in NAICS code: 32211 (pulp mills), 325181 (chlor-alkali), 325188 (industrial inorganics), 325211 (plastic and resins), 325192 (cyclic crudes), 325199 (industrial organics), 325311 (nitrogen fertilizers), 32532 (agriculture chemicals), 32411 (petroleum refineries), 32511 (petrochemical manufacturers), or the process is subject to OSHA PSM standard.¹⁰¹⁴ Most section 112(r) regulated chemicals also are on OSHA's process safety management list.¹⁰¹⁵ EPA's threshold values,¹⁰¹⁶ for each chemical listed on OSHA's PSM list, except r methylchloride is lower than OSHA's threshold; therefore, EPA's requirements usually will control.

A process that was originally classified as one program level may move up or down in classification, as shown in Appendix 6, depending on the circumstances.¹⁰¹⁷ For example, if a residential development appears within the public receptor distance for a worst-case scenario endpoint in a program level 1 covered process, that process no longer qualifies for program level 1 and must be re-evaluated for either program level 2 or 3 requirements.¹⁰¹⁸ A facility

¹⁰¹⁰ See *id.* § 68.150.

¹⁰¹¹ See *id.* § 68.190.

¹⁰¹² RMP Rule, *supra* note 936, at 31,673.

¹⁰¹³ See Chemical Accident Prevention Provisions, 40 C.F.R. § 68.3.

¹⁰¹⁴ Occupational Safety and Health Standards, 29 C.F.R. § 1910.119 (2000); see Accidental Release Prevention Requirements; Risk Management Programs Under CAA § 112(r)(7): Amendments, 64 Fed. Reg. 964, 964-65 (Jan. 6, 1999) (to be codified at 40 C.F.R. pt. 68).

¹⁰¹⁵ See Occupational Safety and Health Standards, 29 C.F.R. § 1910.119 app. A.

¹⁰¹⁶ These values can be found 40 C.F.R. § 68.115.

¹⁰¹⁷ RMP GUIDANCE, *supra* note 859.

¹⁰¹⁸ *Id.*

with a process originally not covered, but due to changes now uses a regulated substance in quantities exceeding the threshold amount, must comply at the time the threshold quantity is exceeded.¹⁰¹⁹ Conversely, if a program level 2 or 3 process experiences changes that would qualify it for program level 1 status, the facility may submit a revised RMP to that effect. For example, if an accidental release now falls outside the five-year accident report requirement and that criterion kept the program outside level 1, the facility could elect to switch down to a program level 1.¹⁰²⁰ If a process no longer involves regulated substances beyond the threshold quantity, then the process is no longer a "covered process" and the facility may submit a revised RMP indicating such.¹⁰²¹

The RMPs were first due on June 21, 1999.¹⁰²² EPA expected between 33,000 and 36,000 RMPs.¹⁰²³ Many facilities changed their operations to avoid CAA section 112(r) requirements by changing the chemicals used or by lowering the inventory below threshold amounts.¹⁰²⁴ One of the fears, however, is that avoiding RMPs by lowering inventories means increased transportation and deliveries of those same hazardous chemicals.¹⁰²⁵

On August 5, 1999, the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act was signed into law.¹⁰²⁶ To alleviate concerns about terrorists using publicly available off-site consequence analysis (OCA) information, the law limits public access until at least August 5, 2000.¹⁰²⁷ By this date, EPA is expected to issue a rule addressing the public availability of OCA materials.¹⁰²⁸ If a facility is required to submit a program level 2 or 3 plan, then the facility is required to hold a public meeting, discuss the RMP, and include a

¹⁰¹⁹ *Id.*

¹⁰²⁰ *Id.*

¹⁰²¹ *Id.*

¹⁰²² RMP Guidance, *supra* note 865.

¹⁰²³ See *Facilities Change Operations to Avoid RMP Requirements, EPA Official Says*, DAILY ENV'T REP. (BNA) A-4 (Nov. 10, 1999) [hereinafter *Facilities Change Operations*]; Judith Jacobs, *Fewer Plants Filing RMPs with Agency than Expected Under Clean Air Act Provision*, DAILY ENV'T REP. (BNA) A-8 (Aug. 13, 1999).

¹⁰²⁴ *Facilities Change Operations, supra* note 1023, at A-4.

¹⁰²⁵ *Id.*

¹⁰²⁶ Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act, Pub. L. No. 106-40, 113 Stat. 207 (1999).

¹⁰²⁷ U.S. EPA & U.S. FED. BUREAU OF INVESTIGATION, CHEMICAL SAFETY INFORMATION, SITE SECURITY AND FUELS REGULATORY RELIEF ACT: PUBLIC MEETINGS AND OTHER NOTIFICATIONS, at <http://www.epa.gov/swercepp/pubs/fbi5.htm> (Oct. 1999).

¹⁰²⁸ *Id.*

summary of the OCA.¹⁰²⁹ The law does not preclude the facility from discussing the OCA sections of the RMP; it prohibits the government dissemination of such information.¹⁰³⁰ The law also “immediately removed EPA’s authority to list flammable substances when used as a fuel, or held for sale as a fuel at a retail facility.”¹⁰³¹ EPA therefore amended the regulations in 2000 to conform to the law.¹⁰³² On August 8, 2000, EPA issued a rule placing restrictions on the dissemination of worst case scenario data. The data will not be placed on the internet, reproduction of the documents will be prohibited, and there will be a limited number of facility reports that may be viewed by an individual.¹⁰³³

F. *The General Duty Clause*

CAA section 112(r)(1) includes a general duty clause that imposes on owners and operators of stationary sources handling extremely hazardous substances:

a general duty in the same manner and to the same extent at section 654 of Title 29 [OSH Act] to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences, of accidental releases which do occur.¹⁰³⁴

The section goes on to state that it does not create liability, a basis for a suit for compensation for bodily injury, or property damages.¹⁰³⁵

¹⁰²⁹ *Id.* The facility must certify to the FBI by June 5, 2000, that the meeting has been held. *Id.*

¹⁰³⁰ See *Changes to Flammable Fuel Provisions of CAA Safety Rules Signed by Browner*, DAILY ENV’T REP. (BNA) A-3 (Mar. 9, 2000).

¹⁰³¹ Amendments to the List of Regulated Substances and Thresholds for Accidental Release Prevention: Flammable Substances Used as Fuel or Held for Sale as Fuel at Retail Facilities, 65 Fed. Reg. 13,243, 13,247 (Mar. 13, 2000) (to be codified at 40 C.F.R. pt. 68); see 40 C.F.R. pt. 68 (2000).

¹⁰³² Amendments to the List of Regulated Substances and Thresholds for Accidental Release Prevention; Flammable Substances Used as Fuel or Held for Sale as Fuel at Retail Facilities, 65 Fed. Reg. at 13,243.

¹⁰³³ *EPA Restricts Public Access to Facility Accident Risk Data*, CLEAN AIR REP., Aug. 17, 2000, at 23.

¹⁰³⁴ CAA § 112(r)(1), 42 U.S.C. § 7412(r)(1) (1994).

¹⁰³⁵ *Id.*

The legislative history of the general duty clause shows that it has two purposes.¹⁰³⁶ It places a burden of prevention and minimization on owners or operators without regulatory action by EPA, and it prevents shifting of liability to the government because of EPA's approval of risk management plans.¹⁰³⁷

The general duty clause applies to owners and operators of stationary sources that handle extremely hazardous substances regardless of whether the federal or state government has an applicable regulatory program.¹⁰³⁸ The clause imposes three obligations:

- (1) identify hazards from potential accidental release;
- (2) design and maintain a safe facility in taking the necessary steps to prevent release; and
- (3) minimize damage from actual accidental releases.¹⁰³⁹

The general duty clause itself does not prescribe how these measures will be achieved.¹⁰⁴⁰ The clause is performance-based; it places the burden on those using these substances to demonstrate safe practices regarding accidental releases.¹⁰⁴¹ EPA has issued a guidance document, however, to assist in complying with the section 112(r)(1) requirements.¹⁰⁴²

The general duty clause applies more broadly and may cover more substances and activities than the rest of section 112(r).¹⁰⁴³ It does not, however, apply to transportation or to storage incidental to transportation.¹⁰⁴⁴ Because the general duty clause is based on OSHA,¹⁰⁴⁵ the case law construing OSHA, including the decisions of the Occupational Safety and Health Review Commission, are applicable.¹⁰⁴⁶ It should be noted, however, that only EPA and the

¹⁰³⁶ See Delhotal, *supra* note 874, at 95.

¹⁰³⁷ *Id.*

¹⁰³⁸ See *id.*

¹⁰³⁹ U.S. ENV'T. PROTECTION AGENCY, Pub. No. EPA-550-B00-002, GUIDANCE FOR IMPLEMENTATION OF THE GENERAL DUTY CLAUSE CLEAN AIR ACT § 112(r)(1), *a* <http://www.epa.gov/ceppo/pubs/gdcregionalguidance.pdf> (May 2000).

¹⁰⁴⁰ *Id.* at 12.

¹⁰⁴¹ Delhotal, *supra* note 874, at 96.

¹⁰⁴² U.S. ENV'T. PROTECTION AGENCY, Pub. No. EPA-550-B00-002, GUIDANCE FOR IMPLEMENTATION OF THE GENERAL DUTY CLAUSE CLEAN AIR ACT § 112(r)(1), *a* <http://www.epa.gov/ceppo/pubs/gdcregionalguidance.pdf> (May 2000).

¹⁰⁴³ See Delhotal, *supra* note 874, at 92.

¹⁰⁴⁴ *Id.* at 98.

¹⁰⁴⁵ OSHA § 5(a)(1), 29 U.S.C. § 654(a)(1) (1994).

¹⁰⁴⁶ Delhotal, *supra* note 874, at 99.

DOJ can enforce the general duty clause.¹⁰⁴⁷ States, even those with delegation of risk management programs, cannot enforce the clause.¹⁰⁴⁸

G. Air Permitting

Air permitting authorities must ensure that sources are in compliance with applicable requirements. Because section 112(r) is an applicable requirement, EPA has identified in the section 112(r) final rule the permit conditions and the actions necessary to ensure compliance.¹⁰⁴⁹ An operating permit must identify 40 C.F.R. part 68 as an applicable requirement and establish conditions that require the owner or operator of the source to submit either a compliance schedule for meeting the requirements of part 68 by the date specified in 40 C.F.R. section 68.10(a), or as part of the compliance certification submitted under 40 C.F.R. section 70.6(c) (5), certify that to the best of the owner or operator's knowledge the source is in compliance with all requirements of part 68, including the registration and submission of the RMP.¹⁰⁵⁰ The owner or operator also must submit additional relevant information requested by the air permitting authority to ensure compliance with part 68.¹⁰⁵¹

An April, 20, 1999 EPA memorandum lists the four responsibilities that Title V air permitting agencies have under 40 C.F.R. section 68.215(e).¹⁰⁵² These include verifying that the source owner or operator has submitted the required RMP or RMP revision, verifying the source certification or its equivalent, conducting a completeness check if necessary, and instituting enforcement actions when appropriate.¹⁰⁵³ The memorandum continues with guidance as to how states and implementing agencies can best meet these obligations.¹⁰⁵⁴

¹⁰⁴⁷ *Chemical Accident Prevention Guidance Presents Compliance Opportunity From EPA*, DAILY ENV'T REP. (BNA) A-7 (June 9, 2000).

¹⁰⁴⁸ *Id.*

¹⁰⁴⁹ CAA § 112(r), 42 U.S.C. § 7412(r) (2000).

¹⁰⁵⁰ *Id.*

¹⁰⁵¹ *Id.*

¹⁰⁵² Memorandum from Steven J. Hitte & Kathleen M. Jones, U.S. EPA, *Title V Program Responsibilities Concerning the Accidental Release Prevention Program*, to Air Program Manager Regions I-X 1-2 (Apr. 20, 1999) (on file with author).

¹⁰⁵³ *Id.*

¹⁰⁵⁴ *Id.*

H. Integrated Planning

CAA section 112(r)(10) requires the President to review federal agency policies for release prevention, mitigation, and response authorities, and to clarify and coordinate federal agency responsibilities.¹⁰⁵⁵ The implementation of this subsection was delegated to EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) in coordination with the fourteen agencies that make up the National Response Team (NRT).¹⁰⁵⁶ EPA, the Coast Guard, OSHA, DOT, and the Department of Interior's Minerals Management Service have created an Integrated Contingency Plan (ICP) to deal with hazardous releases.¹⁰⁵⁷

On June 5, 1996, the NRT's ICP guidance was published.¹⁰⁵⁸ The guidance

is intended to be used by facilities to prepare emergency response plans. . . . The intent of NRT is to provide a mechanism for consolidating multiple plans that facilities may have prepared to comply with various regulations into one functional emergency response plan or integrated contingency plan (ICP).¹⁰⁵⁹

The guidance does not alter requirements, but rather provides an organizing format for required material under current regulations.¹⁰⁶⁰ There are three main sections: an introduction, a core plan, and supporting annexes.¹⁰⁶¹

The introduction contains information on the facility, response personnel, and other key contact information.¹⁰⁶² The structure of the core plan and annexes is based on the National Interagency Incident Management System (NIIMS) Incident Command System (ICS),

¹⁰⁵⁵ CAA § 112(r)(10).

¹⁰⁵⁶ Delegation of Authority to Review Emergency Release Authorities and Prepare and Transmit to the Congress a Message Concerning Such Authorities, 58 Fed. Reg. 52,397 (Aug. 19, 1993).

¹⁰⁵⁷ See SECOND REPORT TO CONGRESS ON THE STATUS OF THE HAP PROGRAM, *supra* note 261, at A-21.

¹⁰⁵⁸ The National Response Team's Integrated Contingency Plan Guidance, 61 Fed. Reg. 28,642 (June 5, 1996) [hereinafter NRT Guidance].

¹⁰⁵⁹ *Id.* at 28,642.

¹⁰⁶⁰ *Id.* at 28,642-43.

¹⁰⁶¹ *Id.*

¹⁰⁶² *Id.* at 28,644.

which is a response management system used for a multitude of emergency situations.¹⁰⁶³

"The core plan is intended to reflect the essential steps necessary to initiate, conduct, and terminate an emergency response action: recognition, notification, and initial response, including assessment, mobilization, and implementation."¹⁰⁶⁴ The core plan should be concise and simple, with checklists and flowcharts used whenever possible.¹⁰⁶⁵ The core plan also should follow a system of response levels based on the potential consequences to health and the environment and the need to communicate information to off-site authorities.¹⁰⁶⁶ The response levels should be as consistent as possible with those in place by local emergency planning organizations.¹⁰⁶⁷

The annexes are "designed to provide key supporting information for conducting an emergency response under the core plan as well as document compliance with regulatory requirements not addressed elsewhere in the ICP."¹⁰⁶⁸ The annexes are meant to be supplementary rather than duplicative.¹⁰⁶⁹

VII. EMERGENCY PLANNING UNDER EPCRA

Releases of toxic chemicals during the five years prior to 1985 caused 135 deaths and nearly 1500 injuries in 6900 incidents in the United States.¹⁰⁷⁰ This led to a successful grassroots effort to create emergency planning programs at the state and local levels. When a Union Carbide facility in Bhopal, India released a toxic pesticide, methyl isocyanate, on December 4, 1984, that killed 2500 people and injured 200,000 others, it influenced the United States Congress to enact new legislation.¹⁰⁷¹ Congress included a freestanding Title III in

¹⁰⁶³ *Id.*

¹⁰⁶⁴ NRT Guidance, *supra* note 1060, at 28,644.

¹⁰⁶⁵ *Id.* "A rule of thumb is that the core plan should fit in the glovebox of a response vehicle." *Id.*

¹⁰⁶⁶ *Id.*

¹⁰⁶⁷ *Id.*

¹⁰⁶⁸ *Id.*

¹⁰⁶⁹ *Id.*

¹⁰⁷⁰ Sidney M. Wolf, *Fear and Loathing About the Public Right to Know: The Surprising Success of the Emergency Planning and Community Right-to-Know Act*, 11 J. LAND USE & ENVTL. L. 217, 218 (1996).

¹⁰⁷¹ *Id.*

SARA¹⁰⁷² that created the Emergency Planning and Community Right-to-Know Act (EPCRA).¹⁰⁷³

A. Planning Requirements Under EPCRA

EPCRA¹⁰⁷⁴ contains four major provisions: emergency planning (sections 301–303), emergency release notification (section 304), hazardous chemical storage reporting requirements (sections 311–312), and the toxic chemical release reporting requirements (section 313), summarized at Appendix 7.¹⁰⁷⁵

EPCRA requires EPA to publish a list of extremely hazardous substances and to establish a “threshold planning quantity” for each listed substance.¹⁰⁷⁶ Under section 302, EPA initially created chemical profiles for 402 “acutely toxic chemicals” in 1986.¹⁰⁷⁷ The list now contains 356 substances subject to section 302 requirements.¹⁰⁷⁸

Under EPCRA the states must establish a state emergency response commission (SERC), which creates local emergency planning committees (LEPCs).¹⁰⁷⁹ EPCRA requirements deal primarily with notification requirements and post-accident response.¹⁰⁸⁰ There is little focus on accident prevention. EPCRA¹⁰⁸¹ is a chemical “freedom of information act” that applies to the private

¹⁰⁷² Pub. L. No. 99-499, §§ 300–330, 100 Stat. 1613, 1728–58 (1986) (codified in scattered sections of the I.R.C. and titles 10, 29, 33, and 42 of the U.S.C.).

¹⁰⁷³ EPCRA, §§ 301–330, 42 U.S.C. §§ 11001–11050 (1994).

¹⁰⁷⁴ *Id.*

¹⁰⁷⁵ U.S. ENVTL. PROTECTION AGENCY, Pub. No. EPA-550-F-00-004, THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT 1, at <http://www.epa.gov/swercepp/factsheets/epcra.pdf> (Mar. 2000) [hereinafter EPCRA FACTSHEET]; see generally Arnold W. Reitze, Jr. & Steven D. Schell, *Reporting Requirements for Non-Routine Hazardous Pollutant Releases Under Federal Environmental Laws*, 5 ENVTL. LAW. 1 (1998); Arnold W. Reitze, Jr. & Steven D. Schell, *Self-Monitoring and Self-Reporting of Routine Air Pollution Releases*, 24 COLUM. J. ENVTL. L. 63 (1999) [hereinafter *Self-Monitoring*].

¹⁰⁷⁶ EPCRA, § 302(a)(3).

¹⁰⁷⁷ Emergency Planning and Community Right to Know Programs, 51 Fed. Reg. 41,570 (Nov. 17, 1986) (to be codified at 40 C.F.R. pt. 300).

¹⁰⁷⁸ The list is found at 40 C.F.R. pt. 355 app. A (2000). EPA has published a Title III List of Lists that contains the substance lists for EPCRA, CERCLA, and the CAA. U.S. ENVTL. PROTECTION AGENCY, PUB. NO. EPA 550-B-98-017, TITLE III LIST OF LISTS: CONSOLIDATED LIST OF CHEMICALS SUBJECT TO THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA) AND § 112(R) OF THE CLEAN AIR ACT, AS AMENDED 1-36, at <http://www.epa.gov/ceppo/pubs/title3.pdf> (Nov. 1998).

¹⁰⁷⁹ EPCRA, § 301(a).

¹⁰⁸⁰ *Id.* § 301.

¹⁰⁸¹ *Id.* §§ 301–30.

sector.¹⁰⁸² It evolved from EPA's Chemical Emergency Preparedness Program (CEPP), begun in 1985; numerous state programs,¹⁰⁸³ especially New Jersey's 1985 Toxic Catastrophe Prevention Act;¹⁰⁸⁴ and in programs developed under the OSH Act.¹⁰⁸⁵

Emergency planning proceeds under several statutes administered by five agencies (EPA, the Coast Guard, OSHA, DOT, and the Minerals Management Service in the Department of Interior). EPA's approach is to use a "one-plan guidance" to meet the requirements imposed by EPCRA, the Oil Pollution Act, CAA section 112(r), and the OSHA process safety standard.¹⁰⁸⁶ In addition, EPA encourages facilities to coordinate the development of a plan with state and local agencies in order to meet any additional requirements that may be imposed.¹⁰⁸⁷

1. State and Local Committees

EPCRA requires the governor of each state to designate a state emergency response commission (SERC).¹⁰⁸⁸ State commissions must designate local emergency planning districts and appoint local emergency planning committees (LEPC) for each district.¹⁰⁸⁹ There are approximately 3500 LEPCs.¹⁰⁹⁰ Thirty-five states designated counties as the planning district, with some states having separate districts for municipalities; ten states use substate planning districts; and five states use the entire state as a district. The state commission

¹⁰⁸² EPCRA is also known as Title III of the SARA. SARA amended CERCLA, although Title III of SARA created the freestanding EPCRA.

¹⁰⁸³ See Mary Beth Arnett, *Risky Business: OSHA's Hazard Communication Standard, EPA's Toxics Release Inventory, and Environmental Safety*, 22 ENVTL. L. REP. 10,440, 10,467 (July 1992).

¹⁰⁸⁴ N.J. STAT. ANN. §§ 13:1-19 to 32 (West 1991). California, Delaware, and Nevada also have regulations requiring facilities to prepare and implement risk management plans. Risk Management Programs for Chemical Accidental Release Prevention, 58 Fed. Reg. 54,190, 54,191 (proposed Oct. 20, 1993) (to be codified at 40 C.F.R. pt. 68).

¹⁰⁸⁵ See James T. O'Reilly, *Driving a Soft Bargain: Unions, Toxic Materials, and Right to Know Legislation*, 9 HARV. ENVTL. L. REV. 307, 318-19 (1985). Background on the developments prior to CAA section 112(r) is found in Delhotal, *supra* note 874, at 63-76.

¹⁰⁸⁶ See NRT GUIDANCE, *supra* note 1058, at 28,642.

¹⁰⁸⁷ *Single Response Plan Would Replace Multiple Filings Under EPA Guidance*, DAILY ENV'T REP. (BNA) A-2 (June 4, 1996).

¹⁰⁸⁸ EPCRA § 301, 42 U.S.C. § 11001 (1994).

¹⁰⁸⁹ *Id.*

¹⁰⁹⁰ See EPCRA FACTSHEET, *supra* note 1075, at 2.

supervises and coordinates the local emergency planning committees.¹⁰⁹¹

The LEPC must include members with a variety of relevant skills, as specified in EPCRA section 301(c).¹⁰⁹² Its primary responsibility is to develop an emergency response plan and review it at least annually.¹⁰⁹³ The plan must include provisions specified in EPCRA section 303(c).¹⁰⁹⁴ These are:

1. identify facilities using extremely hazardous substances, and the expected transportation routes of those substances and other facilities at risk from such substances;
2. methods and procedures to be used by owners, operators, emergency and medical personnel;
3. designation of community and facility emergency coordinators;
4. public notification procedures;
5. methods to detect and predict impact of a release;
6. a description of the emergency equipment in the community and at each facility;
7. evacuation plans;
8. training programs; and
9. methods and schedules for exercising the emergency plan.¹⁰⁹⁵

Guidance in developing safety programs is available from the private sector as well as the government.¹⁰⁹⁶ The American Institute of Chemical Engineers, through its Center for Chemical Process Safety, has published documents concerning chemical process safety.¹⁰⁹⁷ The Chemical Manufacturers Association has developed a Responsible Care™ program that is required for its members.¹⁰⁹⁸ The American

¹⁰⁹¹ U.S. ENVTL. PROTECTION AGENCY, TITLE III FACT SHEET, EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT 1 (1988).

¹⁰⁹² EPCRA § 301(c).

¹⁰⁹³ EPCRA FACTSHEET, *supra* note 1075, at 2.

¹⁰⁹⁴ *Id.* at 1.

¹⁰⁹⁵ *Id.* at 1-2.

¹⁰⁹⁶ See American Institute of Chemical Engineers, *Center for Chemical Process Safety*, at <http://www.aiche.org/ccps/index.htm> (last visited Feb. 10, 2001); Special Committee on the Year 2000 Technology Problem of the United States Senate, *Overview of Responsible Care*, at <http://y2k.senate.gov/~y2k/hearings/990510/james.htm> (1999) [hereinafter *Overview*].

¹⁰⁹⁷ See American Institute of Chemical Engineers, *Center for Chemical Process Safety*, at <http://www.aiche.org/ccps/index.htm> (last visited Feb. 10, 2001).

¹⁰⁹⁸ See *Overview*, *supra* note 1106.

Petroleum Institute has developed a similar program.¹⁰⁹⁹ In 1982, the European Community adopted the Seveso Directive (82/501/EEC, as amended), which has risk management requirements.¹¹⁰⁰ In 1990, the NRT published *Developing a Hazardous Materials Exercise Program*.¹¹⁰¹

The local committees are to focus on, but are not limited to, the over 350 extremely hazardous substances listed at 40 C.F.R. part 355, appendix A.¹¹⁰² For each of these substances, EPA has developed threshold planning quantities, based largely on the physical characteristics of the chemical, that are also found in 40 C.F.R. part 355, appendix A.¹¹⁰³ Whether chemicals at the facility exceed the threshold planning quantity is determined using the procedures found in 40 C.F.R. section 355.30(c). Any facility that has a listed chemical in greater than threshold planning quantities must notify the SERC and the LEPC within three months after the chemical is first present at the facility.¹¹⁰⁴

A 1994 survey of the LEPCs found that 55% were either highly or mostly compliant with EPCRA requirements.¹¹⁰⁵ However, 21% are inactive or defunct.¹¹⁰⁶ Approximately two-thirds of the inactive LEPCs base their problem on local community indifference, and 38% on inadequate financing.¹¹⁰⁷ Most of the inadequacies in compliance involve the public communication requirements.¹¹⁰⁸

2. Sections 311 and 312 of the EPCRA

The requirements of EPCRA sections 311 and 312 build on the hazard communication standard (HCS) that was promulgated under OSHA.¹¹⁰⁹ The aim of the HCS is to have chemicals that are produced

¹⁰⁹⁹ See American Petroleum Institute, *Strategies for Today's Environmental Partnership*, at <http://www.api.org/step/principl.htm> (last updated June 30, 1999).

¹¹⁰⁰ Risk Management Programs for Chemical Accidental Release Prevention, 58 Fed. Reg. 54,190, 54,190-91 (proposed Oct. 20, 1993) (to be codified at 40 C.F.R. pt. 68).

¹¹⁰¹ NAT'L RESPONSE TEAM, *DEVELOPING A HAZARDOUS MATERIALS EXERCISE PROGRAM: A HANDBOOK FOR STATE AND LOCAL OFFICIALS* (1990), available at <http://www.bts.gov/NTL/DOCS/254.html> (Sept. 1990).

¹¹⁰² Emergency Planning and Notification, 40 C.F.R. pt. 355 app. A (2000).

¹¹⁰³ *Id.*

¹¹⁰⁴ EPCRA FACTSHEET, *supra* note 1075, at 2-3.

¹¹⁰⁵ WILLIAM C. ADAMS ET AL., *NATIONWIDE LEPC SURVEY: SUMMARY REPORT 1* (1994) (on file with author).

¹¹⁰⁶ *Id.*

¹¹⁰⁷ *Id.* at 3.

¹¹⁰⁸ *Id.*

¹¹⁰⁹ Occupational Safety and Health Standards, 29 C.F.R. § 1910.1200 (2000).

or imported evaluated for potential hazards and to have the information concerning those hazards communicated to employers and employees.¹¹¹⁰ Required information includes container labeling and other warnings, and the contents of material safety data sheets (MSDSs).¹¹¹¹ Employee training is required.¹¹¹² The workplace must have a list of the hazardous chemicals present, containers must be properly labeled, and MSDSs must be available.¹¹¹³ The HCS has no list of hazardous chemicals; rather, OSHA defines hazards.¹¹¹⁴ This means that the number of chemicals covered is larger than under CERCLA or the other sections of EPCRA—approximately 500,000.¹¹¹⁵ Some chemicals, however, such as hazardous waste, are excluded from the HCS.¹¹¹⁶

An employer must have an MSDS for each hazardous chemical that is produced or imported.¹¹¹⁷ Such MSDSs must accompany chemicals that are shipped and be readily accessible to employees.¹¹¹⁸ Among many requirements, the MSDS must include OSHA permissible exposure limits (PEL), the American Congress of Governmental Industrial Hygienists (ACGIH), Threshold Limit Value (TLV), if any, as well as other exposure limits.¹¹¹⁹ If the chemical is on the National Toxicology Program Annual Report on Carcinogens, or other official lists of carcinogens, it must be appropriately indicated.¹¹²⁰

Under EPCRA section 311, if a facility is required to prepare an MSDS for a hazardous chemical¹¹²¹ as mandated by OSHA,¹¹²² then the facility must also submit an MSDS to the appropriate local

¹¹¹⁰ See *Self-Monitoring*, *supra*, note 1084, at 1085.

¹¹¹¹ A material safety data sheet's content is described in 29 C.F.R. § 1910.1200(g) (2000).

¹¹¹² 29 C.F.R. § 1910.119.

¹¹¹³ See EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹¹⁴ 29 C.F.R. § 1910.119 app. A.

¹¹¹⁵ See EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹¹⁶ *Id.*

¹¹¹⁷ 29 C.F.R. § 1910.1200(g).

¹¹¹⁸ *Id.* § 1910.1200.

¹¹¹⁹ *Id.*

¹¹²⁰ *Id.*

¹¹²¹ "Hazardous chemical," for the purposes of preparing an MSDS, is defined under OSHA as "any chemical which is a physical hazard or a health hazard." 29 C.F.R. § 1910.1200(c). Thus, the definition of a hazardous chemical is much broader than the definitions in either CERCLA or in the rest of EPCRA. See EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹²² 29 U.S.C. §§ 651-770 (1994).

emergency planning committee, the state emergency response commission, and the facility's local fire department.¹¹²³ Both manufacturing and nonmanufacturing sectors of industries where workers are exposed to hazardous chemicals are subject to these requirements.¹¹²⁴ In the case of chemical mixtures, an MSDS can be filed for each hazardous component of a given mixture, or an MSDS can be filed for the mixture itself.¹¹²⁵ In lieu of submitting an MSDS for every hazardous chemical at the facility, the facility may send the relevant agencies a list of chemicals at the facility.¹¹²⁶ Such a list shall include the following as specified in EPCRA's section 311(a)(2)(A):

1. a list of the hazardous chemicals for which a material safety data sheet is required under the OSHA, grouped in categories of health and physical hazards as set forth in the OSHA;
2. the chemical name or common name of each chemical as provided on the MSDS; and
3. any hazardous component of each chemical as provided on the MSDS.¹¹²⁷

The material safety data sheets must be made available to the public in accordance with the procedure described in section 324 of EPCRA.¹¹²⁸ The LEPC must make the MSDSs they receive available to any person upon request.¹¹²⁹ If the local committee does not have the MSDS in question because the facility submitted a list of hazardous chemicals rather than copies of the MSDSs, the local planning committee can require the facility to submit the MSDS in question.¹¹³⁰ Often, local committees request that they receive only lists from a facility, not all of the MSDSs, in order to avoid a deluge of paperwork that would be useless during an emergency.¹¹³¹ However, if the facility submits a chemical list, the list must include common names of the

¹¹²³ EPCRA § 311(a)(1), 42 U.S.C. § 11021(a)(1) (1994).

¹¹²⁴ Hazard Communication, 52 Fed. Reg. 31,852, 31,860 (Aug. 24, 1987) (to be codified at 29 C.F.R. pts. 1910, 1915, 1917, 1918, 1926, 1928).

¹¹²⁵ EPCRA § 311(a)(3).

¹¹²⁶ *Id.* § 311.

¹¹²⁷ *Id.* § 311(a)(2)(A).

¹¹²⁸ *Id.* § 311(c)(2).

¹¹²⁹ *Id.*

¹¹³⁰ *Id.*

¹¹³¹ Kevin J. Finto, *Regulation by Information Through EPCRA*, 4 NAT. RESOURCES & ENV'T 13, 15 (1990).

substances and identify the appropriate hazard category.¹¹³² The five hazard categories include: immediate or acute health hazard, delayed or chronic health hazard, fire hazard, sudden release of pressure hazard, and reactive hazard.¹¹³³

If a facility is required to prepare an MSDS, the owner or operator of that facility also must prepare and submit an emergency and hazardous chemical inventory form (inventory form) on an annual basis.¹¹³⁴ The form must be submitted to the LEPC, SERC, and the local fire department.¹¹³⁵ There are two types of inventory forms: Tier I and Tier II.¹¹³⁶ Rules and forms for such reporting can be found at 40 C.F.R. part 370. A facility subject to the requirements of EPCRA section 312 must submit a Tier I form.¹¹³⁷ According to section 312(d)(1)(B), the following information must appear on a Tier I form:

1. an estimate (in ranges) of the maximum amount of hazardous chemicals in each category present at the facility at any time during the preceding calendar year;
2. an estimate (in ranges) of the average daily amount of hazardous chemicals in each category present at the facility during the preceding calendar year; and
3. the general location of hazardous chemicals in each category.¹¹³⁸

If a state emergency planning commission, local emergency planning committee, or the local fire department requests further information from a facility, the facility must then fill out a Tier II inventory form.¹¹³⁹ The Tier II form deals with specific chemicals rather than the chemical categories covered in the Tier I form.¹¹⁴⁰ EPCRA section 312(d)(2) states that the Tier II form must include the following information:

1. the chemical name or the common name of the chemical as provided on the material safety data sheet;

¹¹³² See EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹³³ *Id.*

¹¹³⁴ *Id.*

¹¹³⁵ EPCRA, § 312(a)(1), 42 U.S.C. § 11022(a)(1) (1994).

¹¹³⁶ See EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹³⁷ EPCRA, § 312.

¹¹³⁸ *Id.* § 312(d)(1)(B).

¹¹³⁹ *Id.* § 311(e)(1).

¹¹⁴⁰ *Id.* § 311(d)(2).

2. an estimate (in ranges) of the maximum amount of the hazardous chemical present at the facility at any time during the preceding calendar year;
3. an estimate (in ranges) of the average daily amount of the hazardous chemical present at the facility during the preceding calendar year;
4. a brief description of the manner of storage of the hazardous chemical;
5. the location at the facility of the hazardous chemical;
6. an indication of whether the owner elects to withhold location information of a specific hazardous chemical from disclosure to the public under section 324 of EPCRA.¹¹⁴¹

State and local officials acting in their official capacities have access to Tier II information by requesting such information from either the SERC or the LEPC.¹¹⁴² If the facility has not prepared a Tier II inventory form and a state or local official has requested Tier II information, the SERC or LEPC shall request the facility to prepare a Tier II form.¹¹⁴³

Any person may request Tier II information from either the SERC or LEPC.¹¹⁴⁴ All such requests must pertain to a specific facility and must be made in writing.¹¹⁴⁵ If the SERC or LEPC has the Tier II information in their possession at the time of the request, such information must be made available to the person making the request.¹¹⁴⁶ If the SERC or LEPC is not in possession of the Tier II information when the request is made, the state commission or local committee must request a facility to prepare a Tier II form if the facility has stored over 10,000 pounds of a hazardous chemical during the previous calendar year.¹¹⁴⁷ If the SERC or the LEPC does not possess the Tier II information for the facility and the facility did not store over 10,000 pounds of a hazardous chemical during the previous calendar year, the person requesting the information must include his reason for needing the information in his request.¹¹⁴⁸ The SERC or

¹¹⁴¹ *Id.*

¹¹⁴² *Id.*

¹¹⁴³ EPCRA § 312(e)(2).

¹¹⁴⁴ *Id.* § 312(e)(3).

¹¹⁴⁵ *Id.* § 312(e)(3)(A).

¹¹⁴⁶ *Id.* § 312(e)(3)(B).

¹¹⁴⁷ *Id.* § 312(e)(3)(B).

¹¹⁴⁸ *Id.* § 312(e)(3)(c).

LEPC has the discretion to decide whether or not to require the facility to prepare a Tier II form.¹¹⁴⁹

In 1999, retail gas stations were excluded from EPCRA sections 311 and 312 reporting.¹¹⁵⁰ There are approximately 550,000 facilities subject to the EPCRA sections 311/312 requirements.¹¹⁵¹

¹¹⁴⁹ EPCRA § 312(e)(3)(C).

¹¹⁵⁰ EPCRA FACTSHEET, *supra* note 1075, at 3.

¹¹⁵¹ *Id.*

APPENDICES

Appendix 1 Final MACT Standards

Source Category Affected	40 CFR Part 63 Subpart(s)	Final Federal Register Date	Compliance Date
2 Year Schedule			
Dry Cleaning	M	September 22, 1993 58 Fed. Reg. 49,354	September 23, 1996
Hazardous Organic NESHAP	F, G, H, I	April 22, 1994 59 Fed. Reg. 19,402	New Sources—May 12, 1998 H—May 12, 1999 F/G—May 14, 2001
4 Year Schedule			
Aerospace Industry	GG	September 1, 1995 60 Fed. Reg. 45,948	September 1, 1998
Asbestos	delisted	November 30, 1995 60 Fed. Reg. 61,550	
Chromium Electroplating	N	January 25, 1995 60 Fed. Reg. 4948	January 25, 1996 (deco) January 25, 1997 (others)
Coke Ovens	L	October 27, 1993 58 Fed. Reg. 57,898	
Commercial Sterilizers	O	December 6, 1994 59 Fed. Reg. 62,585	December 6, 1998
Halogenated Solvent Cleaners	T	December 2, 1994 59 Fed. Reg. 61,801	December 2, 1997
Gasoline Distribution	R	December 14, 1994 59 Fed. Reg. 64,303	December 15, 1997
Hazardous Waste Combustion	Parts 60, 63, 260, 261, 264-6, 270, 271	September 30, 1999 64 Fed. Reg. 52,828	September 30, 2002
Industrial Cooling Towers	Q	September 8, 1994 59 Fed. Reg. 46,339	March 8, 1995
Magnetic Tape	EE	December 15, 1994 59 Fed. Reg. 64,580	December 15, 1997 (w/new control devices)

Marine Vessel Loading Operation	Y	September 19, 1995 60 Fed. Reg. 48,388	September 19, 1998 (RACT) September 19, 1999 (MACT)
Off-Site Waste Recovery Operations	DD	July 1, 1996 61 Fed. Reg. 34,140	July 1, 2000
Petroleum Refineries	CC	August 18, 1995 60 Fed. Reg. 43,244	August 18, 1998
Polymers & Resins I ^a	U	September 5, 1996 61 Fed. Reg. 46,906	July 31, 1997
Polymers & Resins II	W	March 8, 1995 60 Fed. Reg. 12,670	March 3, 1998
Polymers & Resins IV ^b	JJJ	September 12, 1996 61 Fed. Reg. 48,208	July 31, 1997
Printing/Publishing	KK	May 30, 1996 61 Fed. Reg. 27,132	May 30, 1999
Secondary Lead Smelters	X	June 23, 1995 60 Fed. Reg. 32,587	June 23, 1997
Shipbuilding & Ship Repair	II	December 15, 1995 60 Fed. Reg. 64,330	December 16, 1996
Wood Furniture	JJ	December 7, 1995 60 Fed. Reg. 62,930	November 21, 1997

7 Year Schedule

Chromium Chemical Manufacturing	delisted	June 4, 1996 61 Fed. Reg. 28,197	
Electric Arc Furnace	delisted	June 4, 1996 61 Fed. Reg. 28,197	
Ferroalloys Production	XXX	May 20, 1999 64 Fed. Reg. 27,450	May 20, 2001
Flexible Polyurethane Foam Production	III	October 7, 1998 63 Fed. Reg. 53,980	October 8, 2001
Generic MACT	YY	June 29, 1999 64 Fed. Reg. 34,854	June 29, 2002
Mineral Wool Production	DDD	June 1, 1999 64 Fed. Reg. 29,490	June 1, 2002

^a The Group I and Group IV Polymer rules were subject to legal challenge and have since been amended by the Hazardous Organic NESHAP (HON). The new final rule regarding these two source categories was published on June 19, 2000 and is found at 65 Fed. Reg. 38,030, 38,030 (June 19, 2000) (to be codified at 40 C.F.R. pt. 63) [hereinafter Polymer NESHAP].

^b *Id.*

Nylon 6 Production	delisted	February 12, 1998 63 Fed. Reg. 7155	
Oil & Natural Gas Production	HH	June 17, 1999 64 Fed. Reg. 32,610	June 17, 2002
Pesticide Active Ingredient Production	MMM	June 23, 1999 64 Fed. Reg. 33,550	June 30, 2002
Phosphoric Acid Plants	AA	June 10, 1999 64 Fed. Reg. 31,376	June 10, 2002
Phosphate Fertilizers Production Plants	BB	June 10, 1999 64 Fed. Reg. 31,382	June 10, 2002
Polyether Polyols Production	PPP	June 1, 1999 64 Fed. Reg. 29,420	June 1, 2002
Polymers & Resins III	OOO	January 20, 2000 64 Fed. Reg. 3275	January 20, 2003
Portland Cement Manufacturing	LLL	June 14, 1999 64 Fed. Reg. 31,898	June 10, 2002
Primary Aluminum Production	LL	October 7, 1997 62 Fed. Reg. 52,384	October 7, 1999
Primary Lead Smelters	TTT	June 4, 1999 64 Fed. Reg. 30,194	June 4, 2002
POTWs	VVV	October 26, 1999 64 Fed. Reg. 57,572	October 26, 2002
Pulp & Paper (non- combust)	S	April 15, 1998 63 Fed. Reg. 18,504	April 15, 2001
Pulp & Paper (non- chem)	S	March 8, 1996 61 Fed. Reg. 9383	April 16, 2001
Secondary Aluminum	RRR	March 23, 2000 65 Fed. Reg. 15,689	March 23, 2003
Steel-Picking-HCL Process	CCC	June 22, 1999 64 Fed. Reg. 33,202	June 22, 2001
Tetrahydrobenzaldehyde Manufacture (THBA)	F	May 12, 1998 63 Fed. Reg. 26,078	May 12, 2001
Wood Treatment MACT	delisted	June 4, 1996 61 Fed. Reg. 28,197	
Wool Fiberglass Manufacturing	NNN	June 14, 1999 64 Fed. Reg. 31,695	June 14, 2001

10 Year Schedule

Aerosol Can-Filling Facilities	delisted	November 18, 1999 64 Fed. Reg. 63,025	
Antimony Oxides Manufacturing	delisted	November 18, 1999 64 Fed. Reg. 63,025	

Cyanuric Chloride Production	delisted	February 12, 1998 63 Fed. Reg. 7155	
Lead Acid Battery Manufacturing	delisted	June 4, 1996 61 Fed. Reg. 28,197	
Natural Gas Transmission & Storage	HHH	June 17, 1999 64 Fed. Reg. 32,610	June 17, 2002

Appendix 2

Proposed MACT Standards

Source Category Affected	40 CFR Part 63 Subpart(s)	Proposed Publication Date and Citation	Tentative Final Date
Selected Combustion Sources	MM	April 15, 1998 63 Fed. Reg. 18,754	December 15, 2000
Manufacturing Nutritional Yeast	CCCC	October 19, 1998 63 Fed. Reg. 55,812	December, 2000
Petroleum Refineries	UUU	September 11, 1998 63 Fed. Reg. 48,890	September, 2000
Primary Copper	QQQ	April 20, 1998 63 Fed. Reg. 19,582	November, 2000
Solvent Extraction for Vegetable Oil	GGGG	May 26, 2000 65 Fed. Reg. 34,252	April, 2001
Wet Formed Fiberglass Mat Production	HHHH	May 26, 2000 65 Fed. Reg. 34,278	April, 2001

Appendix 3

Approaches to Establishing MACT Floor Standards

HAP or HAP Surrogate	Existing Sources Emissions Standard	New Sources Emissions Standard
Standards for Existing and New Hazardous Waste Incinerators ^c		
Dioxin/Furan	0.20 ng TEQ/dscm; or 0.40 ng TEQ/dscm and temperature at inlet to the initial particulate matter control device < 400 degrees F	0.20 ng TEQ/dscm
Mercury	130 ug/dscm	45ug/dscm
Particulate Matter	34 mg/dscm (0.015 gr/dscf)	34 mg/dscm (0.015 gr/dscf)
Semivolatile Metals	240 ug/dscm	24 ug/dscm
Low Volatile Metals	97 ug/dscm	97 ug/dscm
Hydrochloric Acid/ Chlorine Gas	77 ppmv	21 ppmv
Hydrocarbons	10 ppmv (or 100 ppmv carbon monoxide)	10 ppmv (or 100 ppmv carbon monoxide)
Destruction and Removal Efficiency	99.99% for each specific principal organic hazardous constituent, except 99.9999% for specified dioxin-listed wastes	99.99% for each specific principal organic hazardous constituent, except 99.9999% for specified dioxin-listed wastes
Standards for Existing and New Cement Kilns^d		
Dioxin/Furan	0.20 ng TEQ/dscm; or 0.40 ng TEQ/dscm and control of flue gas temperature not to exceed 400 degrees F at the inlet to the particulate matter control device	0.20 ng TEQ/dscm; or 0.40 ng TEQ/dscm and control of flue gas temperature not to exceed 400 degrees F at the inlet to the particulate matter control device
Mercury ⁷	120 ug/dscm	56 ug/dscm
Particulate Matter	0.15 kg/mg dry feed and 20% opacity	0.15 kg/mg dry feed and 20% opacity
Semivolatile Metals	240 ug/dscm	180 ug/dscm
Low Volatile Metals	56 ug/dscm	54 ug/dscm

^c HWC Final Rule, *supra* note 748, at 52,860.^d *Id.* at 52,875.

HAP or HAP Surrogate	Existing Sources Emissions Standard	New Sources Emissions Standard
Hydrochloric Acid/ Chlorine Gas	130 ppmv	86 ppmv
Hydrocarbons: Kilns w/o bypass	20 ppmv (or 100 ppmv carbon monoxide)	Greenfield kilns: 20 ppmv (or 100 ppmv carbon monoxide and 50 ppmv hydrocarbons); All others: 20 ppmv (or 100 ppmv carbon monoxide)
Hydrocarbons: Kilns w/by-pass—main stack	No main stack standard	50 ppmv
Hydrocarbons: Kilns w/by-pass—bypass duct and stack	10 ppmv (or 100 ppmv carbon monoxide)	10 ppmv (or 100 ppmv carbon monoxide)
Destruction and Removal Efficiency	99.99% for each principal organic hazardous constituent (POHC) designated; if burning hazardous wastes F020, F021, F022, F023, F026, or F027, 99.9999% for each POHC designated	99.99% for each principal organic hazardous constituent (POHC) designated; if burning hazardous wastes F020, F021, F022, F023, F026, or F027, 99.9999% for each POHC designated

Standards for Existing and New Lightweight Aggregate Kilns^e

Dioxin/Furan	0.20 ng TEQ/dscm; or 0.40 ng TEQ/dscm and rapid quench of the flue gas at the exit of the kiln to less than 400 degrees	0.20 ng TEQ/dscm; or 0.40 ng TEQ/dscm and rapid quench of the flue gas at the exit of the kiln to less than 400 degrees
Mercury	47 ug/dscm	43 ug/dscm
Particulate Matter	57 mg/dscm (0.025 gr/dscf)	57 mg/dscm (0.025 gr/dscf)
Semivolatile Metals	250 ug/dscm	43 ug/dscm
Low Volatile Metals	110 ug/dscm	110 ug/dscm
Hydrochloric Acid/ Chlorine Gas	230 ppmv	41 ppmv
Hydrocarbons	20 ppmv (or 100 ppmv carbon monoxide)	20 ppmv (or 100 ppmv carbon monoxide)

^e *Id.* at 52,890.

Destruction and Removal Efficiency	99.99% for each principal organic hazardous constituent (POHC) designated; if burning hazardous wastes F020, F021, F022, F023, F026, or F027, 99.9999% for each POHC designated	99.99% for each principal organic hazardous constituent (POHC) designated; if burning hazardous wastes F020, F021, F022, F023, F026, or F027, 99.9999% for each POHC designated
------------------------------------	---	---

Note, however, that other HAPs from Portland cement kilns may also be regulated through the MACT standards promulgated for the Portland cement manufacturing source category.^f

^f NESHAPs for Source Categories; Portland Cement Manufacturing Industry, 64 Fed. Reg. 31,898, 31,900 (June 14, 1999) (to be codified at 40 C.F.R. pt. 63).

Appendix 4

Program Level Criteria[§]

Program Level 1	Program Level 2	Program Level 3
No accidents in the previous five years that resulted in any offsite: death, injury, response, or restoration activities at an environmental receptor	The process is not eligible for Program Level 1 nor subject to Program Level 3	Process is not eligible for Program Level 1
AND		AND
No public receptors in worst-case circle		Process is subject to OSHA PSM
AND		OR
Emergency response coordinated with local responders		Process is classified in NAICS code:
		32211 Pulp mills
		32411 Petroleum refineries
		32511 Petrochemical manufacturers
		325181 Alkalies and chlorine
		325188 Industrial inorganic chemicals
		325192 Cyclic crudes
		325199 Industrial organic chemicals
		325211 Plastics and resins
		325311 Nitrogenous fertilizers
		32532 Agricultural chemicals

[§] See RMP GUIDANCE, *supra* note 859.

Appendix 5

RMP Update Requirements^h

Change That Occurs at Facility	Date by Which RMP Update Must Be Submitted
No changes occur	Within 5 years of initial submission
A newly regulated substance is first listed by EPA	Within 3 years of date EPA listed new substance
A regulated substance is first present above its threshold quantity in: – a process already covered or – a new process	On or before date the quantity of the regulated substance exceeds threshold in the process
A change occurs that results in a revised PHA or hazard review	Within 6 months of the change
A change occurs that requires a revised offsite consequence analysis	Within 6 months of the change
A change occurs that alters the Program level that previously applied to any covered process	Within 6 months of the change
A change occurs that makes the facility no longer subject to the requirement to submit an RMP	Submit a revised registration (indicating that an RMP is no longer required) to EPA within 6 months of the change

^h RMP GUIDANCE, *supra* note 859.

Appendix 6
Comparison of Program Requirements¹

Program Level 1	Program Level 2	Program Level 3
Record of Releases		
Worst-case release analysis	Worst-case release analysis	Worst-case release analysis
5year accident history	Alternative release analysis 5year accident history	Alternative release analysis 5year accident history
	Document management system	Document management system
Prevention Program		
Certify no additional prevention steps necessary	Safety Information Hazard Review Operating Procedures Training Maintenance Incident Investigation Compliance Audit	Process Safety Information Process Hazard Analysis Operating Procedures Training Mechanical Integrity Incident Investigation Compliance Audit Management of Change Pre-Startup Review Contractors Employee Participation Hot Work Permits
Emergency Response Program		
Coordinate with local responders	Develop plan and program (if applicable) and coordinate with local responders	Develop plan and program (if applicable) and coordinate with local responders

¹ RMP GUIDANCE, *supra* note 859.

Appendix 7

EPCRA Program Summaries^j

	Section 302	Section 304	Sections 311/312	Section 313
Chemicals Covered	356 extremely hazardous chemicals	>1000 substances	500,000 products	650 toxic chemicals and categories
Thresholds	Threshold Planning Quantities (TPQ) 1-10,000 pounds on site at one time	Reportable quantity, 1-5000 pounds released in 24-hour period	TPQ or 500 pounds for section 302 chemicals; 10,000 pounds on site at any one time for other chemicals	25,000 pounds per year manufactured or processed; 10,000 pounds a year used; certain bioaccumulative toxics have lower thresholds
Reporting Schedule	One time notification to SERC	Each time a release above TPQ occurs, notify LEPC and SERC	311—One time submission to SERC, LEPC, fire department 312—Annually by March 1 to SERC, LEPC, fire department	Annually by July 1 to EPA and state

^j EPCRA FACTSHEET, *supra* note 1075, at 2-3.