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The Cleanup of Releases of Radioactive Materials from Commercial Low-Level Radioactive Waste Disposal Sites: Whose Jurisdiction?

ABSTRACT

There exists an overlap between the Comprehensive Environmental Response, Compensation and Recovery Act ("CERCLA") and the Atomic Energy Act ("AEA") regarding the cleanup of releases of radioactive materials from commercial low-level radioactive waste sites. The Nuclear Regulatory Commission ("NRC") and Agreement States have jurisdiction under the AEA, and the Environmental Protection Agency ("EPA") has jurisdiction pursuant to CERCLA. This overlapping jurisdiction has the effect of imposing CERCLA liability on parties who have complied with AEA regulations. However, CERCLA was not intended to preempt existing legislation. This is evidenced by the federally permitted release exemption, which explicitly exempts releases from CERCLA liability pursuant to an AEA license. With little guidance as to the applicability of this exemption, it is uncertain whether CERCLA's liability is broad enough to supersede the Atomic Energy Act. It is the purpose of this paper to discuss the overlapping jurisdiction for the cleanup of releases of radioactive materials from commercial low-level radioactive waste disposal sites with particular emphasis on the cleanup at the Maxey Flats, West Valley and Sheffield sites.

INTRODUCTION

During the 1950s and 1960s, atomic technology captivated the nation as a new energy source. Scientists, politicians, and businesses hailed this new technology as a revolutionary means to solve the nation's energy needs. However, the use of this new technology was initiated before it was perfected. The area of waste disposal was unaddressed pending swift scientific solutions and with inadequate laws to regulate

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its safe disposal.¹ This was evidenced by the widespread use of shallow land burial² in high precipitation areas for commercial low-level radioactive wastes.³ Three of the commercial low-level radioactive waste disposal sites located at Sheffield, Illinois, Maxey Flats, Kentucky and West Valley, New York have released radioactive materials into the environment.⁴

1. See 124 Cong. Rec. S29763, S29769 (daily ed. Sept. 18, 1978) (statement of Sen. Jennings Randolph (D-W.Va.)); 123 Cong. Rec. S33,070, S33,072-73 (daily ed. Oct. 19, 1977) (statement of Sen. Charles M. Mathias (D-Md.)); Atomic Energy & the Safety Controversy 83-85 (G. Ferrara ed., 1978) (quoting *Nuclear Waste Management: Hearings Before the Subcomm. on Science, Technology & Space of the Senate Comm. on Commerce, Science & Transp.*, 96th Cong., 1st Sess. (1978) (statement of Sen. Harrison H. Schmitt (R-N.M.))).

2. "Shallow land burial" and "near surface disposal" are used interchangeably. The Nuclear Regulatory Commission [hereinafter NRC] defines a "near-surface disposal facility" as a "land disposal facility in which radioactive waste is disposed of in or within the upper 30 meters of the earth's surface." 10 C.F.R. § 61.2 (1993). This type of disposal usually consists of packaged wastes being placed into excavated trenches, which are then filled with trench soil, capped, and mounded to prevent rainwater seepage. 1 Nuclear Regulatory Commission, Final Environmental Impact Statement on the 10 CFR PART 61 "Licensing Requirements For Land Disposal of Radioactive Waste," NUREG-0945, at 2-3 (Nov. 1982) [hereinafter NUREG-0945].

3. Low-level radioactive waste, as defined in the Low Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. No. 99-240, 99 Stat. 1842 (1986) (codified at 42 U.S.C. §§ 2021b - 2021j) [hereinafter LLRWPPA], is: (1) radioactive waste which is not high-level radioactive waste, spent nuclear fuel, or byproduct material; and (2) radioactive waste which the NRC classifies as such. 42 U.S.C. § 2021b(9). Spent nuclear fuel is the discarded fuel from a nuclear reactor prior to being reprocessed. 42 U.S.C. § 10101(23). High-level radioactive waste consists of those materials which the NRC determines as such, and the liquid and solid wastes derived from reprocessing spent nuclear fuel. *Id.* § 10101(12). Byproduct materials are of two types: (1) radioactive materials, excluding special nuclear material, which are irradiated in any process incident to special nuclear materials; and (2) wastes produced from the extraction of ores used for its source material content. 42 U.S.C. § 2014(e) (1988), 10 C.F.R. § 20.3(3) (1993). The latter part includes uranium and thorium mill tailings and all other wastes produced from the extraction process, such as process fluids and nonradioactive ore residues. Memorandum from Paul H. Lohaus, Chief, Operations Branch, Div. Low-Level Waste Mgmt. & Decommissioning, on Whether or Not Uranium Mill Tailings Material is a Mixed Waste, to All Uranium Recovery Licensees (Mar. 15, 1989) (on file with Nuclear Regulatory Comm'n, Doc. No. 8903170437).

The NRC has classified four levels of low-level radioactive waste based on the concentration of long or short lived radionuclides contained in the waste. 10 C.F.R. § 61.55 (1993). Class A waste contains small concentrations of radionuclides with a long half-life which do not possess unreasonable health risks. *Id.* Class B and C waste contain higher concentrations of short and long-lived radionuclides, and require more stringent disposal requirements to safeguard against its radiation hazard. *Id.* Greater than Class C waste exceeds the Class C radiation concentration threshold, and the government assumes responsibility for its disposal. *Id.*

This definition excludes wastes generated at Department of Energy [hereinafter DOE] facilities and materials not regulated under the AEA, such as naturally-occurring radioactive substances and accelerator-produced radioactive materials.

4. NUREG-0945, *supra* note 2, at 2-6 to 2-11.

Due to the leakages at these sites, burial operations were halted. Although each site was licensed under the Atomic Energy Act ("AEA")⁵ within the jurisdiction of the Nuclear Regulatory Commission or Agreement States,⁶ the closure⁷ of each of these sites was not performed under the AEA. Instead, the Sheffield and West Valley sites were closed under the jurisdiction of their respective Agreement States, and the Maxey Flats site was closed under the jurisdiction of the Environmental Protection Agency ("EPA") pursuant to the Comprehensive Environmental Response, Compensation and Recovery Act ("CERCLA").⁸

This varying approach to closure results from an overlap in the jurisdiction over the cleanup of low-level radioactive waste disposal sites. The Agreement States and the NRC derive their jurisdiction from the AEA, and EPA has jurisdiction under CERCLA. However, it is not clear that such a dual jurisdictional scheme is beneficial for the cleanup of radioactive materials. Of significance is the liability that is imposed for the cleanup. CERCLA's liability is broad and extends to all those who were affiliated with the leaking substance. Liable parties include past and present owners and operators of the disposal facility as well as generators and transporters of the substance.⁹ Thus, CERCLA liability may be imposed on parties that complied with existing AEA regulations. Liability under the AEA regulations is narrower. Under an Agreement State license, the State owns the land and assumes responsibility for long-term control and maintenance after closure.¹⁰ The Agreement State, in turn, may have leased the site to a private party which operated the disposal activities. If so, the lease agreement between the State and the site operator dictates the site operator's financial responsibilities for the cleanup of any releases. Imposing remediation liability on other parties under CERCLA amounts to a windfall to the parties originally accepting responsibility under the AEA. There is no evidence that Congress intended CERCLA to relieve them of liability.

5. Atomic Energy Act of 1954, Pub. L. No. 83-703, 68 Stat. 919 (codified as amended in scattered sections of 42 U.S.C.).

6. *Infra* notes 18-20 and accompanying text.

7. The term "closure" denotes more than the cessation of burial operations. It also denotes those actions which prepare the disposal site for stabilization and for custodial care which will not require ongoing active maintenance. 10 C.F.R. § 61.2 (1993). In order to achieve stability and to limit ongoing active maintenance, cleanup is often part of the closure process. *See id.*

8. 42 U.S.C. § 9601 (1988).

9. *Id.* § 9607(a) (1988).

10. *Infra* notes 22-25 and accompanying text.

The closure of the three commercial low-level radioactive waste disposal sites illustrates the impact of this dual jurisdictional scheme. The Sheffield site was closed under the jurisdiction of the State of Illinois, a NRC Agreement State. After ten years of litigation, the State reached an out-of-court agreement with the site operator to properly close the site and safely maintain it in the future. The site operator bore the cost of the cleanup activities and placed additional funds into an escrow account to cover management of the site once the State assumes responsibility for it.¹¹ The West Valley site will be closed by the State of New York, also a NRC Agreement State. Closure is not scheduled until the Environmental Impact Statement ("EIS") is completed. In the interim, the disposal waste trenches have been pumped and the trench caps rehabilitated at the expense of the State of New York.¹² By contrast, the Maxey Flats site was closed by EPA as a CERCLA site. The costs for the cleanup activities for the site will be incurred not only by the Commonwealth of Kentucky and its contract operator, but also by over 800 other potentially responsible parties ("PRPs").¹³ However, the site was licensed by the Commonwealth of Kentucky, a NRC Agreement State, similar to the Sheffield and the West Valley sites.¹⁴

The Maxey Flats site illustrates the detriment of an overlapping jurisdictional scheme. CERCLA liability may be imposed on parties that complied with the then-existing AEA regulations, thus lessening the financial obligations of Agreement States. However, CERCLA was not intended to supersede existing law. This is evidenced by the federally permitted release exemption which explicitly exempts CERCLA liability for releases pursuant to an AEA license.¹⁵ With little guidance as to the applicability of this exemption, however, it is uncertain whether CERCLA's liability is broad enough to supersede the Atomic Energy Act.

11. Nuclear News, July 1988, at 106.

12. *Infra* note 160 and accompanying text.

13. In 1986, EPA notified 832 PRPs of their potential liability regarding the site contamination at Maxey Flats. At that time, the PRPs were offered the opportunity to perform and fund a Remedial Investigation/Feasibility Study [hereinafter RI/FS]. Eighty-two of the PRPs signed an administrative consent order to perform the RI/FS. The two largest financial contributors were the Department of Defense [hereinafter DOD] and the Department of Energy. Environmental Protection Agency, Summary of Remedial Alternative Selection, Record of Decision, Maxey Flats Disposal Site, 14-15 (Sept. 30, 1991) [hereinafter Maxey Flats ROD].

14. *See infra* note 24.

15. *See infra* note 72 and accompanying text.

I. REGULATORY SCHEME

A. AEA Regulations

As atomic technology emerged, so too did the laws to regulate radioactive materials.¹⁶ The Atomic Energy Act became the main legislation aimed at regulating commercial uses of nuclear energy.¹⁷

16. After the use of the atomic bomb in World War II, Congress took steps at regulating atomic energy. The first legislation was the Atomic Energy Act of 1946, Pub. L. No. 79-585, 60 Stat. 755 (former 42 U.S.C. §§ 1801-1819). The Act established the Atomic Energy Commission [hereinafter AEC] whose functions included the control of the materials and manufacturing facilities used for the production of atomic energy for military and nonmilitary purposes. The government's monopoly on atomic energy was lessened by the enactment of the Atomic Energy Act of 1954, Pub. L. No. 83-703, 68 Stat. 919 (codified as amended in scattered sections of 42 U.S.C.) [hereinafter AEA]. The aim of the AEA was to promote the commercial development of peaceful uses of atomic energy. The enticement for further commercial development was aided by the Price-Anderson Act of 1957, Pub. L. No. 85-256, 71 Stat. 576 (codified as amended at 42 U.S.C. § 2210), which absolved utilities for liability against nuclear power accidents up to \$560 million. The regulation of the materials used in the production of nuclear energy were subsequently placed under federal control by the enactment of the Private Ownership of Special Nuclear Materials Act of 1964, Pub. L. No. 88-489, 78 Stat. 602 (codified as amended in scattered sections of 42 U.S.C.). The purpose of this Act was for the national interest and the common defense as well as the protection of the health and safety of the public. 42 U.S.C. § 2012 (1993). To further the regulation of the safety hazards associated with nuclear energy, the Energy Reorganization Act of 1974, Pub. L. No. 93-438, 88 Stat. 1233 (codified at 42 U.S.C. §§ 5801-5891), was enacted to dissolve the Atomic Energy Commission. The AEC's responsibility was split among the Nuclear Regulatory Commission [hereinafter NRC] and the Energy Research Development Council [hereinafter ERDC]. The NRC was given the authority to regulate nuclear materials and license nuclear power plants whereas the ERDC's mission was the promotion of nuclear energy. 42 U.S.C. §§ 5801(b), 5841(f) (1988).

Legislation aimed at nuclear waste disposal began with the Uranium Mill Tailings Radiation Control Act of 1978 [hereinafter UMTRCA], Pub. L. No. 95-604, 92 Stat. 3021 (codified as amended in scattered sections of 42 U.S.C.). This Act established a remedial program aimed at stabilizing the uranium mill tailings disposal sites. Due to the proliferation of low-level radioactive wastes and the lack of disposal sites, the Low Level Waste Policy Act of 1980, Pub. L. No. 96-573, 94 Stat. 3347 (codified as amended as 42 U.S.C. §§ 2014, 2021), made each state responsible for the disposal of low-level radioactive wastes subject to federal laws and regulations. In an effort to further unify all sides of the disposal dilemma, the Nuclear Waste Policy Act, Pub. L. No. 97-425, 96 Stat. 2201 (1982) (codified at 42 U.S.C. §§ 10101-10126), established a national plan for the disposal of highly radioactive nuclear waste. See, G. Mazuzan & J. Walker, *Controlling the Atom: The Beginnings of Nuclear Regulation 1946-1962*, at 3-4, 25 (1984); K. Krushke & B. Jackson, *Nuclear Energy Policy A Reference Handbook 68-71* (1990); K. Shrader-Frechette, *Nuclear Power and Public Policy: The Social and Ethical Problems of Fission Technology 10-12* (1980).

17. 42 U.S.C. § 2013 (1988). The purpose of the AEA is: to implement policies that promote the peaceful uses of atomic energy; "for Government control of the possession, use, and production of atomic energy and special nuclear material;" and to promote international cooperation regarding the use of atomic energy. *Id.*

Under the AEA, the NRC has the responsibility to regulate the use, possession and disposal of radioactive materials. This includes the licensing of commercial low-level radioactive waste disposal sites.¹⁸ In addition, the NRC is permitted by the Act to allow states to replace it as the primary regulator, hence, relinquishing its regulatory authority to the states.¹⁹ States which have assumed the NRC regulatory authority are termed Agreement States.²⁰

In order to achieve Agreement State status, a State must show that it has an adequate regulatory program compatible with that of the NRC and which protects the health and safety of the public.²¹ When the three sites were licensed, then-existing AEC regulations²² required that the disposal sites be located on State or Federal Government-owned land,²³ and that the sites be subject to long-term governmental control.²⁴ In addition, other requirements included:

1. a written agreement that the Agreement State would assume control over the site in case of default or abandonment by the site operator;
2. assurances that the site's geological and hydrological characteristics must contain the waste so that it does not endanger public health and safety;

18. 42 U.S.C. §§ 2071-2112 (1988). The Atomic Energy Act regulates source, special nuclear, and byproduct materials. *Id.* Most low-level radioactive waste is radioactive due to contamination with fission byproducts or transuranics. C. Montange, *Federal Nuclear Waste Disposal Policy*, 27 Nat. Res. J. 309, 359 (1987). Byproduct material under the Act encompasses fission byproducts. *Id.* Transuranics are included under the Act as either byproduct material or special nuclear. *Id.* Thus, low-level radioactive wastes are covered under the AEA as source, special nuclear and byproduct materials.

The licensing of commercial low-level radioactive waste disposal sites is governed by the NRC's 10 C.F.R. § 20 regulations. *Id.* Under the regulations, the NRC is authorized to license the disposal of source, special nuclear, and byproduct materials by five means. *Id.* Commercial low-level radioactive waste disposal sites comes under the "case-by-case" means. *Id.*

19. 42 U.S.C. § 2021b (1988).

20. *Id.*

21. *Id.* § 2021d.

22. The main regulatory sections were contained in §§ 20, 30, 40, and 70 of 10 C.F.R. Section 20 contained the standards for protection against radiation and, in particular, the waste disposal requirements. Sections 30, 40, and 70 regulate the licensing of source, special nuclear and byproduct materials. In addition, the NRC published a criteria guidance to assist the Agreement States in developing a regulatory program. *Criteria for Guidance of States and AEC in Discontinuance of AEC Regulatory Authority and Assumption Thereof by States Through Agreement*, 26 Fed. Reg. 2356-58 (1961). This guidance criteria required that the State program consider an overall radiation protection scheme in order to consider the accumulated occupational radiation exposure of individuals. *Id.*

23. 10 C.F.R. § 20 (1993).

24. *Low Level Radioactive Waste Disposal: Hearings Before a Subcomm. of the House Comm. on Government Operations*, 94th Cong, 2d Sess. 205 (1976) (statement of Richard E. Cunningham, Acting Director, Nuclear Material Safety & Safeguards, NRC).

3. the burial of wastes only in solid form;
4. the existence of an environmental monitoring program; and
5. packaging and transportation within NRC's and the Department of Transportation's ("DOT") standards.²⁵

In essence, the main emphasis of these regulations was for the Agreement State to own the waste-disposal sites and to assume responsibility for their long-term control. In practice, the State leased the land to independent companies which conducted the disposal activities.²⁶ The lease agreement between the site operator and the Agreement State varied. Since there was no particular NRC-mandated requirement for financial assurances for the care of the site,²⁷ the lease agreement between the Agreement State and the site operator contained varying financial arrangements for the long-term maintenance.²⁸ Finally, the Federal Government had no policy for taking corrective action at the sites.²⁹ This was left up to the site operator and the site owner, usually the Agreement State.

Each of the sites was licensed pursuant to AEA regulations. The West Valley and Maxey Flats sites were licensed by Agreement States.³⁰ The Sheffield site was licensed by the AEC, the predecessor of the NRC, and the State of Illinois subsequently obtained Agreement State status in 1987.³¹ The regulatory authority of each site was the respective Agreement State.

After the leakages from the three sites, it became apparent that the regulations regarding low-level radioactive waste land-disposal sites were not adequate to insure safe disposal.³² This initiated the promulgation of the 10 C.F.R. Part 61 regulations.³³ These regulations attempted to prevent the repetition of the problems which led to the leakages at the three sites, and require technical specifications for the siting, design, operation and closure activities, as well as financial assurances for site

25. *Id.* at 205-206.

26. NUREG-0945, *supra* note 2, at 2-5.

27. U.S. General Accounting Office, RED-76-54, Improvements Needed in the Land Disposal of Radioactive Wastes-A Problem of Centuries iii (Jan. 1976) [hereinafter GAO Report].

28. For example, at the Maxey Flats site, the lease agreement established a perpetual-care fund which received its funding from a tax collected from each cubic foot of waste disposed of at the site. Maxey Flats ROD, *supra* note 13, at 12.

29. *Id.*

30. Maxey Flats was licensed by the Commonwealth of Kentucky in 1963 and the West Valley site was licensed in 1963 by the State of New York. GAO Report, *supra* note 27, at 4.

31. *Id.* The Sheffield site was licensed by the AEC in 1967. *Id.* The State of Illinois received Agreement State status in 1987. 55 Fed. Reg. 14,528 (1990).

32. See NUREG-0945, *supra* note 2, at S-1.

33. 43 Fed. Reg. 49,811 (1978).

closure and stabilization.³⁴ However, the regulations did not come into effect until 1983,³⁵ and apply only to licenses obtained thereafter.³⁶

B. CERCLA

Congress did not intend for CERCLA to apply to the cleanup of radioactive materials.³⁷ CERCLA is the predominant federal environmental law geared towards the cleanup of releases of hazardous substances.³⁸ Due to the hasty and vaguely-drafted manner in which the statute was constructed,³⁹ the statutory language includes releases of radioactive materials as hazardous substances thereby making them subject to CERCLA's liability provisions.⁴⁰

Applicability to Releases of Radioactive Materials

Pursuant to section 104 of CERCLA, EPA is authorized to take remedial action to address a release or threatened release of a hazardous substance which may present a danger to the public health or welfare.⁴¹ The key provisions of the statutory section deal with "releases" of "hazardous substances" from a "facility" into the "environment."⁴² The term "release" has a broad scope. It includes spilling, leaking, pumping, emitting, and most forms of dispersal.⁴³ Excluded from the definition of "release" are: (1) releases of source, special nuclear, or byproduct materials⁴⁴ from a nuclear incident if subject to the AEA's section 170

34. 10 C.F.R. § 61 (1993).

35. 47 Fed. Reg. 57,446 (1982).

36. *Id.*

37. See H.R. Rep. No. 1016, 96th Cong., 2d Sess., pt. 1 (1980), *reprinted in* 1980 U.S.-C.C.A.N. 6119, 6119-20 (CERCLA was enacted to respond to releases of hazardous waste from inactive hazardous waste sites which possessed a danger to the environment and the public health).

38. The term "hazardous substances," as used here, has the CERCLA semantics. It does not suggest that radioactive materials are not hazardous.

39. *United States v. Northeastern Pharmaceutical and Chem. Co.*, Env't Rep. Cas. (BNA) 1401 (W.D. Mo., No. 80-506-CV, Jan. 31, 1984) ("CERCLA is . . . a hastily drawn piece of compromise legislation, marred by vague terminology and deleted provisions . . ."); *United States v. A & F Materials Co.*, 20 Env't Rep. Cas. (BNA) 1353, 1356 (S.D. Ill., No. 83-3123, Jan. 20, 1984) (CERCLA was "hastily and inadequately drafted.").

40. *Infra* notes 46-49 and accompanying text.

41. 42 U.S.C. § 9604(a) (1988).

42. *Id.*

43. *Id.* § 9601(22) (1988).

44. The AEA defines "source, special nuclear, or byproduct materials" as follows. Source material is either uranium, thorium, or any combination thereof, or an ore which contains .05 percent of these elements. 42 U.S.C. § 2014(z) (1988), 10 C.F.R. § 20.3(15) (1993). Source materials do not include special nuclear materials. *Id.* Special nuclear materials include

financial protection requirements; and (2) releases of source, special nuclear, and byproduct materials from a processing site covered under Title I of the Uranium Mill Tailings Radiation Control Act ("UMTRA").⁴⁵

"Hazardous substances" are defined to include substances classified as hazardous or toxic under five federal statutes⁴⁶ as well as those considered hazardous under section 102 of CERCLA.⁴⁷ Included as hazardous substances are hazardous air pollutants listed under section 112 of the Clean Air Act ("CAA").⁴⁸ Radionuclides listed as air pollutants under the CAA are hazardous substances under CERCLA when

plutonium, uranium-233, enriched uranium-235, and all derivative materials artificially enriched from these elements. 42 U.S.C. § 2014(aa), 10 C.F.R. § 20.3(16). Source materials are not included in this classification. *Id.* Byproduct materials are of two types: (1) radioactive materials, excluding special nuclear material, which are irradiated by any process incident to special nuclear materials; and (2) wastes produced from the extraction of ores used for its source material content. 42 U.S.C. § 2014(e), 10 C.F.R. § 20.3(3).

45. 42 U.S.C. § 9601(22) (1988). These releases are excluded from the CERCLA response provisions but not from CERCLA's reporting requirements under § 103. 40 C.F.R. § 302.6(b)(2) (1993).

46. Specifically, hazardous substances listed under 33 U.S.C. § 1321 (b)(2)(A) of the Clean Water Act; hazardous wastes listed pursuant to RCRA, 42 U.S.C. § 6921; any toxic pollutant listed under 33 U.S.C. § 1317(a) of the Clean Water Act; hazardous chemical substances of mixtures listed under 15 U.S.C. § 2606 of the Toxic Substances Control Act; hazardous air pollutants listed under 42 U.S.C. § 7412 of the Clean Air Act; and hazardous substances listed under 42 U.S.C. § 9602 of CERCLA.

47. *Id.*

48. Emissions of radionuclides are considered hazardous air pollutants under the CAA, and hence are under the jurisdiction of CERCLA. EPA's studies of the exposure of radionuclides indicated that cancer, genetic damage, and developmental effects are the result of exposure to excessive levels of radionuclides in the ambient air. 54 Fed. Reg. 51,654, 51,663 (1989). Based on these findings, the Administrator of EPA listed radionuclides as hazardous air pollutants. 44 Fed. Reg. 76,738 (1979). Subsequent to this listing, EPA promulgated a final ruling for National Emission Standards for Hazardous Air Pollutants [hereinafter NESHAPs] for several radioactivity-producing facilities including NRC-licensed facilities. 54 Fed. Reg. 51,663 (1989) (codified at 40 C.F.R. § 61.100-109 (1993)). These regulations applied to the following radioactive facilities: DOE facilities, NRC licensees and non-DOE federal facilities, uranium fuel cycle facilities, high-level nuclear waste disposal facilities, uranium mill tailing sites, and underground and surface uranium mines. *Id.*

Congress has recognized the overlapping jurisdiction of EPA and the NRC in regard to airborne releases of radionuclides. Section 112 of the CAA was amended in October 1990 to eliminate NESHAPs for the radionuclide emissions for facilities licensed by the NRC and the Agreement States. 42 U.S.C. § 7412(d)(9) (1988). However, the elimination of the standards is contingent upon a determination by the Administrator of EPA that NRC's regulatory program provides satisfactory safety standards to protect public health. *Id.* Such a determination has been made, and EPA has announced its intention to rescind its standards controlling radionuclide emissions into the ambient air from NRC licensees and from federal facilities not licensed by NRC or operated by the DOE in regard to nuclear power reactors. 57 Fed. Reg. 56,877 (1992) (to be codified at 61.100, 61.101, 61.104). When this rule takes effect, it will eliminate one of CERCLA's means of regulating the cleanup of releases of radionuclides from commercial low-level radioactive waste sites.

released anywhere into the environment, not just when they are released into the ambient air.⁴⁹ Since most radionuclides exist in more than one form, this generic CAA classification includes most radionuclides under CERCLA. "Facility" includes sites and areas where hazardous substance are located.⁵⁰ "Environment" covers all waters, land surface, or ambient air within the United States or its jurisdictions.⁵¹

Due to the construction of "releases" of "hazardous substances" into the "environment," the following radioactive releases are included under CERCLA's liability provisions:

1. active uranium milling sites regulated by NRC or the Agreement States under Title II of UMTRCA,⁵²
2. releases of other radioactive materials other than source, special nuclear, or byproduct materials;⁵³
3. mixed low-level radioactive wastes;⁵⁴

49. CERCLA applies to "releases" of "hazardous substances" into the environment." 49 U.S.C. § 9604(a) (1993). Since the term "environment" includes air, water, and soil, therefore, a release of a radioactive material that is considered to be hazardous in one medium is considered to be hazardous in all other media. *Id.* § 9601(8).

50. 42 U.S.C. § 9601(9): The term "facility" means (A) any building structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage, container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located but does not include any consumer product in consumer use or any vessel.

51. *Id.* § 9601(8):

The term "environment" means (A) the navigable waters, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Magnuson Fishery Conservation and Management Act [16 U.S.C.A. § 1801 et seq.], and (B) any other surface water, ground water, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States.

52. Uranium mill tailings emit radionuclides which are an air pollutant under the CAA. *See supra* note 48.

53. RCRA explicitly exempts source, special nuclear, and byproduct materials. 42 U.S.C. § 9601(22) (1988). By negative induction, RCRA would include other radioactive materials which would be included under CERCLA's jurisdiction. Two examples of such materials include: (1) naturally-occurring and accelerator-produced radioactive materials; and (2) radioactive materials which the NRC classifies as "below regulatory concern." Below regulatory concern radioactive materials are radioactive materials which the NRC exempts from regulatory control, since they contain small quantities of radioactivity. 55 Fed. Reg. 27,522, 27,523 (1990).

54. A mixed low-level radioactive and hazardous waste ("mixed waste") is a waste that satisfies the definition of low-level radioactive waste (LLW) in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) and contains hazardous waste that either (1) is listed as a hazardous waste in Subpart D of 40 CFR Part 261 or (2) cause the LLW to exhibit any of the hazardous waste characteristics identified in Subpart C of 40 CFR Part 261. Memorandum from the Office of Solid Waste & Emergency Response, EPA, on

4. releases of source, special nuclear, or byproduct materials, resulting from nuclear incidents at DOE facilities;⁵⁵
5. releases of source, special nuclear, or byproduct materials as a result of non-nuclear incidents.⁵⁶

The following releases are excluded from CERCLA's liability provisions:

1. releases of source, special nuclear, or byproduct materials resulting from a nuclear incident subject to NRC's financial protection requirements;⁵⁷ and
2. releases from inactive uranium mill tailings sites being cleaned up by the DOE under Title I of UMTRCA.⁵⁸

Due to the broad scope of CERCLA, EPA has issued a policy statement that includes those sites meeting its eligibility requirements that will be considered for listing on the National Priorities List ("NPL").⁵⁹ Nuclear sites excluded under EPA's listing policy are:

1. sites which are NRC-licensed facilities meeting the statutory financial requirements, and which have releases of source, special nuclear, or byproduct materials from a nuclear incident; and
2. processing sites being cleaned up under Title I of UMTRCA which have releases of source, special nuclear, or byproduct materials.⁶⁰

Sites included under EPA's listing policy are:

1. non-federal sites not subject to RCRA's subtitle C corrective action;⁶¹
2. non-federal sites at which RCRA's Subtitle C corrective action is applicable, but only where: (1) the owners have declared bankruptcy; (2) the facilities have lost authorization to operate, and where there are indications that the operator is unwilling to take corrective action; or (3)

Joint EPA/NRC Guidance of the Definition and Identification of Commercial Mixed Low-Level Radioactive and Hazardous Waste and Answers To Anticipated Questions, to All NRC Licensees (Oct. 4, 1989) (on file with Nuclear Regulatory Comm'n, EPA 530/SW-90-016). Because CERCLA's definition of "hazardous substance" includes hazardous wastes covered under RCRA, mixed wastes are included under CERCLA.

55. CERCLA specifically exempts commercial nuclear power facilities which are subject to AEA § 170 financial requirements. 42 U.S.C. § 9601(22) (1988). Thus, by negative induction, non-commercial facilities, such as DOE facilities, are included under CERCLA.

56. Since non-nuclear incidents are not explicitly exempted, then by negative induction, they would be included.

57. 42 U.S.C. § 9601(22), 40 C.F.R. § 302.6(b)(2).

58. *Id.*

59. EPA, as a matter of policy, has chosen not to respond to certain types of releases of source, byproduct, or special nuclear material from certain NRC licensed facilities. This policy statement was first announced in 1982 and has been periodically updated. 47 Fed. Reg. 58,476, 58,477 (1982).

60. 42 U.S.C. § 9601(22) (1988).

61. 51 Fed. Reg. 21,054 (1986) (to be codified at 40 C.F.R. § 300).

where the owner or operator is unwilling to undertake corrective action;⁶²

3. non-federal RCRA facilities, non-filers, late filers, converters, or protective filers, and sites with RCRA permits issued prior to the Hazardous and Solid Waste Amendments;⁶³

4. federally-owned or operated facilities including those subject to RCRA's subtitle C corrective action;⁶⁴ and

5. NRC Agreement State-licensed facilities.⁶⁵

NRC Agreement State-licensed facilities were included in EPA's listing policy, since EPA considered the possibility that the state's remedial efforts might be inadequate.⁶⁶ Once AEA authority is delegated to an Agreement State, the NRC has no authority to enforce conditions of the state license, or to ensure that an adequate response is taken, short of withdrawing the state's delegation.⁶⁷ EPA chose this policy decision to ensure that a federal agency could intervene to adequately address the problem, if necessary.⁶⁸ EPA contends that when a state's effort sufficiently address the problem, the agency will defer to the licensing state.⁶⁹

Thus far, CERCLA's coverage includes releases of radionuclides from sources included in EPA's listing policy. Of interest here is the statute's inclusion of radionuclides from NRC Agreement State facilities where there is an inadequate response. However, this coverage is subject to CERCLA's exemptions, specifically the federally permitted release.

II. FEDERALLY PERMITTED RELEASE

Liability under CERCLA is subject to defenses⁷⁰ and exemptions.⁷¹ The federally permitted release provision⁷² creates an exemp-

62. *Id.*

63. 53 Fed. Reg. 23,978 (1988) (to be codified at 40 C.F.R. § 300) (proposed June 24, 1988).

64. 54 Fed. Reg. 10,520 (1989).

65. 48 Fed. Reg. 40,658 (1983) (to be codified at 40 C.F.R. § 300).

66. *Id.*

67. *Id.*

68. *Id.*

69. *Id.*

70. 42 U.S.C. § 9607(b) (1988).

71. *E.g., id.* § 9607(j).

72. *Id.* § 9601(10):

The term "federally permitted release" means (A) discharges in compliance with a permit under section 1342 of title 33, (B) discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a permit issued or modified under section 1342 of title 33 and subject to a condition of such permit, (C) continuous or anticipated intermittent discharges from a point source, identified in a permit or

tion from the notification requirements and from liability for response costs or damages attributable to a permitted release. A permitted release results from a legally enforceable license or permit issued under certain environmental statutes. Although CERCLA may be used to respond to the release, liability for the response costs is governed by other environmental statutes. The federally permitted release provision specifically exempts responsible parties from CERCLA section 107 liability for "any release of source, special nuclear, or byproduct material, . . . in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954."⁷³

permit application under section 1342 of title 33, which are caused by events occurring within the scope of relevant operating or treatment systems, (D) discharges in compliance with a legally enforceable permit under section 1344 of title 33, (E) releases in compliance with a legally enforceable final permit issued pursuant to section 3005(a) through (d) of the Solid Waste Disposal Act [42 USC § 6925(a)-(d)] from a hazardous waste treatment, storage, or disposal facility when such permit specifically identifies the hazardous substances and makes such substances subject to a standard of practice, control procedure or bioassay limitation or condition, or other control on the hazardous substances in such releases, (F) any release in compliance with a legally enforceable permit issued under section 1412 of title 33 or section 1413 of title 33, (G) any injection of fluids authorized under Federal underground injection control programs or State programs submitted for Federal approval (and not disapproved by the Administrator of the Environmental Protection Agency) pursuant to part C of the Safe Drinking Water Act [42 USC §§ 300h et seq.], (H) any emission into the air subject to a permit or control regulation under section 111 [42 U.S.C. 7411], section 112 [42 U.S.C. 7412], title I part C [42 U.S.C. 7470 et seq.], title I part D [42 U.S.C. 7501 et seq.], or State implementation plans submitted in accordance with section 110 of the Clean Air Act [42 U.S.C. 7410] (and not disapproved by the Administrator of the Environmental Protection Agency), including any schedule or waiver granted, promulgated, or approved under these sections, (I) any injection of fluids or other materials authorized under applicable State law (i) for the purpose of stimulating or treating wells for the production of crude oil, natural gas, or water, (ii) for the purpose of secondary, tertiary, or other enhanced recovery of crude oil or natural gas, or (iii) which are brought to the surface in conjunction with the production of crude oil or natural gas and which are reinjected, (J) the introduction of any pollutant into a publicly owned treatment works when such pollutant is specified in and in compliance with applicable pretreatment standards of section 1317(b) or (c) of title 33 and enforceable requirements in a pretreatment program submitted by a State or municipality for Federal approval under section 1342 of title 33, and (K) any release of source, special nuclear, or byproduct material, as those terms are defined in the Atomic Energy Act of 1954 [42 USC §§ 2011 et seq.], in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954.

73. *Id.* § 9601(10)(K).

At first glance, it seems that the simple language of the exemption would eliminate CERCLA liability for releases of radionuclides permitted within a NRC Agreement State license. With little guidance as to the interpretation of this exemption, various arguments can be made to support or refute a given interpretation. In particular, EPA's interpretation of the exemption and congressional intent support the premise that CERCLA was not intended to encroach on the enforcement provisions of the AEA. However, as will be examined below, an ambiguity lies in the use of the term "release", thereby lending the exemption to various interpretations.

A. EPA's Interpretation

EPA's interpretation of the federally permitted release exemption is narrowly limited to a "straight forward interpretation."⁷⁴ Under a straightforward interpretation, only the amount of the release which is within the permitted level is exempted.⁷⁵ Any amount exceeding the permitted quantity is not federally permitted.⁷⁶ Likewise, only discharges covered under a legally enforceable permit are exempted.⁷⁷ Thus, a straight forward interpretation of the federally permitted release provision with regard to legally enforceable licenses issued pursuant to the Atomic Energy Act would imply that releases of radionuclides that are within a NRC or an Agreement State license would appear to be exempt from CERCLA liability. The congressional intent of this exemption also supports this premise.

B. Congressional Intent

Legislative History

The legislative history behind CERCLA's federally permitted release exemption shows Congress' intent to preserve the enforcement

74. 53 Fed. Reg. 27,268 (1988) (to be codified at 40 C.F.R. § 117, 302, and 355) (proposed July 19, 1988).

75. *Id.*

76. *Id.*

77. *Idaho v. Hanna Mining Co.*, 699 F. Supp. 827, 833 (D. Idaho 1987) (discharges from a nonpoint source are not part of a National Pollutant Discharge Elimination System [hereinafter NPDES] permit issued under the Clean Water Act since the permit does not regulate nonpoint source discharges). See also *T & E Industries, Inc. v. Safety Light Corp.*, 680 F. Supp. 696 (D.N.J. 1988) (a federally permitted release only covers the enumerated federal permits listed under the statute and cannot be expanded to cover Bureau of Land Management or U.S. Forest Service permits).

provisions of certain enumerated existing laws.⁷⁸ With regard to the Atomic Energy Act, the legislative history states:

Under either Federal or State regulatory regimes, releases of source, special nuclear, or byproduct materials that are within the terms of a license or permit issued by the Commission or by an Agreement State are covered by this portion of the definition. The definition also applies to releases of designated nuclear materials, defined in sections 11e, 11z, and 11aa of the Atomic Energy Act of 1954, when those releases are made pursuant to Commission order.⁷⁹

The legislative history makes it clear that releases of source, special nuclear, or byproduct materials within the terms of an Agreement State license are exempt from section 107 liability as a federally permitted release. "If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress."⁸⁰

Regulatory Authority of the AEC/NRC

The Atomic Energy Act of 1954 established the AEC, the predecessor of the NRC, for the purpose of promoting and regulating peaceful uses of nuclear energy.⁸¹ The AEC had exclusive jurisdiction for regulating the use, possession and distribution of source, special nuclear and byproduct materials. The AEC had authority to relinquish its authority under section 271b of the Act to Agreement States.⁸² Thus, prior to 1970, the AEC had exclusive jurisdiction over the area of nuclear energy either directly or indirectly through the Agreement States.

In 1970, the Reorganization Plan No. 3 created EPA.⁸³ Pursuant to this Reorganization Plan, EPA was vested with the authority under the AEA to promulgate radiation safety standards for areas accessible to the public.⁸⁴ This authority was limited to the promulgation of "generally applicable standards for protection of the general environment from off-

78. S. Rep. No. 848, 96th Cong., 2d Sess. 46 (1980). However, Congress left open the applicability of CERCLA response actions in emergency situations to some federally permitted releases. *Id.* In such a situation, the CERCLA fund would be used to pay response costs, and recoupments of these costs would be pursuant to common law or Federal or State law, but not CERCLA. *Id.* at 47.

79. *Id.*

80. *Chevron U.S.A., Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 843-44 (1984).

81. *Supra* notes 16-19 and accompanying text.

82. *Supra* note 16.

83. Reorganization Plan No. 3, 84 Stat. 2086 (Dec. 2, 1970); Pub. L. No. 98-80, 97 Stat. 485 (1983) (codified at 42 U.S.C. § 4321).

84. 42 U.S.C. § 10141 (1988).

site releases from radioactive materials in repositories."⁸⁵ This has been interpreted to limit EPA's jurisdiction only to the regulation of radiation standards for offsite releases.⁸⁶ Responsibility for the implementation and enforcement of the radiation standards was left with the AEC through its licensing authority.⁸⁷

In 1974, the AEC was abolished under the Energy Reorganization Act of 1974, and the responsibility for nuclear promotion and regulation was divided between the NRC and ERDA.⁸⁸ ERDA assumed AEC's responsibilities to promote and develop nuclear power.⁸⁹ The NRC received the AEC's regulatory duties.⁹⁰ In addition, the US Supreme Court has treated the AEA as a broad grant of authority to the AEC/NRC and has accorded great deference to the agency's decisions.⁹¹

In light of the comprehensive regulatory role of the NRC under the AEA and the legislative history behind the federally permitted release, it seems apparent that it was the clear and manifest intent of Congress to preserve the enforcement provisions of the AEA. Thus, CERCLA was not intended to encroach on the enforcement provision of AEA. Although Congress' intent is clear, there still lies an uncertainty as to the interpretation of the term "release" for purposes of the federally permitted release.

C. "Release"

The federally permitted release exemption applies to a release of source, special nuclear, or byproduct material in compliance with a legally enforceable license, permit, regulation or order issued pursuant to the Atomic Energy Act of 1954.⁹² The compliance element includes all relevant licensees and AEC/NRC and Agreement State regulations and orders in effect at the time of disposal.⁹³ The material element covers source, special nuclear, and byproduct materials defined under the

85. *Id.*

86. *Natural Resources Defense Council v. Environmental Protection Agency*, 824 F. 2d 1258, 1278 (1st Cir. 1987) (original jurisdictional allocation and high-level waste disposal statute show that "Congress intended that the EPA only regulate releases beyond the controlled site.").

87. 5 U.S.C. app. 1346 (1988).

88. Pub. L. No. 93-438, 88 Stat. 1233 (1974) (codified at 42 U.S.C. § 5841).

89. 42 U.S.C. 5801(b) (1988).

90. *Id.* § 5841(f).

91. *Baltimore Gas and Electric Co. v. Natural Resources Defense Council*, 462 U.S. 87 (1983); *Power Reactor Development Co. v. International Union of Electrical, Radio and Machine Workers AFL-CIO*, 367 U.S. 396 (1961).

92. 42 U.S.C. § 9601(10)(K) (1988).

93. *Id.*

AEA.⁹⁴ Materials other than source, special nuclear, and byproduct materials are not covered under the exemption. Three such materials are the hazardous portion of mixed wastes, naturally-occurring and accelerator-produced radioactive materials, and materials classified as below regulatory concern.⁹⁵ Although the exemption appears to be straightforward, an ambiguity lies in the interpretation of the term "release." The ambiguity concerns the questions: 1) whether the original act of disposal constitutes a release; and 2) whether there is a distinction between an "offsite release" and an "onsite release."

Original Disposal Act as a Release

The statutory definition of release is found in section 101(22).⁹⁶ This term has been interpreted broadly.⁹⁷ It covers, for example, "disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)."⁹⁸ "Disposal" is defined in the Solid Waste Disposal Act.⁹⁹ The mere act of disposal does not in and of itself constitute a release.¹⁰⁰ However, activities which cause materials to be released after the original disposal act took place

94. *Id.*

95. *Supra* notes 53-54.

96. 42 U.S.C. § 9601(22) (1988).

97. *See, e.g., Vermont v. Staco, Inc.*, 684 F. Supp. 822, 832-33 (D.C. Vt. 1988) (a release consists of seepage and leaching from domestic septic systems that continued from an earlier discharge); *Artesian Water Co. v. Government of New Castle County*, 659 F. Supp. 1269, 1281 (D.C. Del. 1987) (a release or threat of a release exists where a water utility offers several studies and analyses demonstrating that hazardous substances are present in their groundwater source); *U.S. v. Northern Plating Co.*, 670 F. Supp. 742, 748 (W.D. Mich. 1987) (a release and threat of a release of hazardous substances consisted of a finding of certain hazardous substances at an electroplating site where no party asserted control over the substances); *Missouri v. Independent Petrochemical Co.*, 610 F. Supp. 4 (E.D. Mo. 1985) (a release consisted of soil which was contaminated at one site which was later excavated and disposed of at another site).

98. 42 U.S.C. § 9601(22) (1988).

99. *Id.* § 6903(3) (1988):

The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

100. *United States v. Wade*, Civil Action No. 79-1426, 20 Env't Rep. Cas. (BNA) 1657, 1659 (1984) ("the act of disposal without more does not necessarily constitute a release."); *cf. Fertilizer Institute v. Environmental Protection Agency*, 935 F.2d 1303, 1309 (D.C. Cir. 1991) (a release is not the placement of a substance from a facility that is exposed to the environment).

have been considered "disposal" for purposes of determining whether a "release" has occurred.¹⁰¹

Under this broad definition of "release," radioactive materials disposed of by generators and transporters in compliance with appropriate licenses and which were subsequently released into the environment as a result of actions by the site operator may be considered to be a "release." For example, in the cases discussed below, the disposed-of materials were released into the environment when they contaminated the water which, in turn, infiltrated the trenches and subsequently migrated elsewhere.¹⁰² The cause of the infiltration was partly due to the site operator's maintenance activities. Thus, the original act of disposal under these circumstances either led to or constituted a "release." Since the original disposal act took place in accordance with a proper license, the resultant releases were arguably federally permitted and, hence, no liability should be incurred by the generators and transporters of the waste.

Offsite vs. Onsite Release

It is also unclear whether there is a distinction between an offsite release and an onsite release for the purposes of a federally permitted release. Onsite releases would be considered within the scope of the federally permitted release exemption, since the AEA license regulates the disposal area.¹⁰³ Since these licenses regulate the activities within the site, according to a straight forward interpretation, onsite releases within the permitted allowance would be included within the scope of the federally permitted release. This is consistent with the congressional intent not to preempt existing legislation.

Whether the term "release" includes an offsite release as well is not clear. The statute does not distinguish between an offsite and an onsite release. A straight forward interpretation would lead to a presumption that in the absence of a more precise distinction, a "release" would encompass both offsite and onsite releases. Thus, the broad interpretation of "release" would arguably apply to a federally permitted

101. See, e.g., *Tanglewood East Homeowners v. Charles-Thomas, Inc.*, 849 F.2d 1568, 1573 (5th Cir. 1988) (disposal includes hazardous materials being released during landfill excavations and filings).

102. See, e.g., *infra* note 153.

103. For example, the 10 C.F.R. § 20 regulations distinguish between a restricted area and an unrestricted area. A "[r]estricted area means any area access to which is controlled by the licensee." 10 C.F.R. § 20.3(14) (1993). An "[u]nrestricted area means any area access to which is not controlled by the licensee . . . and any area used for residential quarters." *Id.* § 20.3(17). The regulations specify permissible levels of releases within both the restricted and unrestricted areas. E.g., *id.* §§ 20.101, 20.106.

release including offsite as well as onsite releases. Under this interpretation, all releases within the permitted allowance would be federally permitted releases. However, under a distinctional interpretation, onsite releases within the permitted allowance would be exempt, whereas all offsite releases would be subject to CERCLA liability.

D. Summary

In sum, the federally permitted release exemption pertains to releases of source, special nuclear, and byproduct materials pursuant to a license issued by the NRC or Agreement State. The legislative history behind the exemption shows Congress' intent to preserve the enforcement provision of the AEA. This intent is supported by the comprehensiveness of the regulatory authority that the AEC/NRC has in regulating source, special nuclear, and byproduct materials. However, an ambiguity lies in the interpretation of the term "release." Does this broad interpretation of "release" include the original act of disposal, in compliance with a valid license, which subsequently releases into the environment due to the site operator's maintenance of the wastes? If so, then these releases which were in compliance are federally permitted and exempt from CERCLA liability. Also, is there a distinction between onsite and offsite releases? Onsite releases, which are within the permitted allowance, are included within the exemption. If no distinction exists, then offsite releases, within the permitted allowance, also constitute federally permitted releases. Otherwise, offsite releases are not covered under the exemption, and will be subject to CERCLA liability.

III. CASE STUDY: SHEFFIELD, MAXEY FLATS, WEST VALLEY

To illustrate the impact of a dual jurisdictional scheme, this section analyzes the closure of the three closed commercial low-level radioactive waste disposal sites. First, a description of each of these sites is presented.

A. Sheffield Low-Level Radioactive Waste Disposal Site

The Sheffield Waste Management Facility is a 45-acre site consisting of three waste disposal facilities in Sheffield, Illinois.¹⁰⁴ The facility consists of a low-level radioactive waste disposal site and two

104. Environmental Protection Agency, Fact Sheet: Proposed Plan For Corrective Measures, US Ecology Site, Sheffield, Illinois 1 (May 1990).

hazardous waste disposal sites.¹⁰⁵ The low-level radioactive waste disposal site was made operational in 1967 by Nuclear Engineering Company ("NECO").¹⁰⁶ Until its closure, the site was operating under a license to dispose of low-level radioactive wastes. However, the site proved to be an illegal dumping ground for 47,000 cubic feet of high-level nuclear waste from the Elk River nuclear test reactor.¹⁰⁷ Thirty-four pounds of plutonium and seventy pounds of enriched uranium were buried there.¹⁰⁸

In 1975, Illinois health inspectors noticed water seeping into the closed trenches and that tritium had migrated from the trenches into the ground water.¹⁰⁹ From 1976 to 1988, the site underwent extensive environmental monitoring. This monitoring revealed that tritium levels in the ground water migration were below NRC and the State's standards.¹¹⁰

About the same time as these releases were noticed, NECO petitioned to enlarge the 20-acre site to 168 acres.¹¹¹ A local community group and the State's Attorney General opposed the expansion, forcing NECO to drop its plans. The State took action to close the site by suing NECO.¹¹² The suit was dismissed on May 26, 1988 when the State of Illinois and US Ecology ("USE") signed an agreement to close the site and perform post-closure maintenance and monitoring.¹¹³ The terms of the agreement mandated that US Ecology recap all of the trenches, replace some of the monitoring wells and the site boundary fence, and purchase a 170-acre buffer zone around the site.¹¹⁴ The agreement also preserved the State's right to take future actions if any of several predefined signaling events occur.¹¹⁵ In addition, USE will maintain the site for ten years.¹¹⁶ For those ten years, USE will pay \$250,000 annually into an escrow account to cover maintenance costs incurred in the management

105. *Id.*

106. Nuclear Engineering Company became US Ecology and was later bought out by Teledyne, Inc. Norm Brewer, (*Who Handles The Waste*) *Two Firms Dominate*, Gannett News Service, Nov. 1990.

107. D. Bartlett & J. Steele, *Forevermore* 357-358 (1985).

108. *Id.*

109. I. Wilks, *League of Women Voters of Ill. Educ. Fund, Rights and Responsibilities: A Community Handbook For Low-Level Radioactive Waste* 36 (C. Stetter ed., 1987).

110. Illinois Dep't of Nuclear Safety, No. 0656-100, *Environmental Monitoring Report: Sheffield Low Level Radioactive Waste Disposal Site 1967-1988*, at 13 (1991).

111. Wilks, *supra* note 109.

112. Illinois *ex rel.* Hartigan v. Teledyne, Inc., No. 78-MR-25 (Bureau County Cir. Ct. May 26, 1988).

113. *Id.*

114. *Id.*

115. *Id.*

116. *Id.*

of the site.¹¹⁷ The Illinois Department of Nuclear Safety ("IDNS") will take over the management of the site at the end of the ten-year period.¹¹⁸ These remedial actions will cost USE approximately eight million dollars.¹¹⁹

B. *The Maxey Flats Disposal Site*

The Maxey Flats Disposal Site is a 280-acre facility located in Fleming County, Kentucky.¹²⁰ Part of the facility encompassing approximately 25 acres was licensed as a low-level radioactive waste disposal site by the Commonwealth of Kentucky, an NRC Agreement State.¹²¹ The site was operational from 1963 to 1977 by NECO.¹²² Disposed there are approximately 2.4 million curies of byproduct material, 533,000 pounds of source material, 950 pounds of special nuclear material, and 140 pounds of plutonium.¹²³ The site accepted both liquid and solid wastes.¹²⁴ The solid wastes were packaged in steel, cardboard, or wood containers before they were placed in the trenches.¹²⁵ The liquid wastes were solidified before being placed in separate trenches.¹²⁶ In addition to the radioactive wastes, organic materials and chemicals were disposed there as well.¹²⁷

In 1972, during a routine radiological survey of Maxey Flats by the Kentucky Department for Human Resources, elevated levels of radioactivity were detected near the facility.¹²⁸ This detection sparked additional investigations into the radioactive releases emanating from the site.¹²⁹ When subsequent investigations revealed elevated levels of radioactive materials in the air and ground water, the Commonwealth

117. *Id.*

118. *Id.*

119. *Id.*

120. Maxey Flats Steering Committee, Maxey Flats Disposal Site, Remedial Investigation Report 1-3 (May 1989) [hereinafter Maxey Flats RI].

121. *Id.*

122. *Id.* at 1-3, 1-4.

123. *Id.* at 1-4.

124. *Id.*

125. *Id.*

126. *Id.*

127. *Id.*

128. Office of Radiation Programs, U.S. Environmental Protection Agency, EPA-520/3-75-021, Preliminary Data on the Occurrence of Transuranium Nuclides in the Environment at the Radioactive Waste Burial Site, Maxey Flats, Kentucky 1 (1976).

129. The Kentucky Department for Human Resources [hereinafter KDHR] initiated additional studies at the Maxey Flats site. Environmental monitoring in 1972 indicated elevated levels of radioactivity. This prompted the KDHR to pursue a six-month study as to the source of the radiation leakage. *Id.*

began negotiating with NECO to cease operations and to close the site.¹³⁰ This was eventually accomplished in May, 1978, when the Commonwealth of Kentucky bought NECO's contractual and license rights to the site for an estimated \$1.3 million.¹³¹ As part of the purchase agreement, the Commonwealth assumed any and all obligations and liabilities of NECO stemming from NECO's operation of the site.¹³²

Subsequently, the Commonwealth of Kentucky submitted the site to the EPA as a nominee for cleanup under CERCLA. The site was listed as a National Priorities Site in October, 1984.¹³³ The Hazardous Ranking System ("HRS") score sheet for the site lists ground water releases of predominantly plutonium-238 and plutonium-239, as well as tritium, cobalt-60, strontium-90 and cesium-137.¹³⁴ Airborne releases of tritium were also prevalent.¹³⁵ Tritium is a radionuclide included as a hazardous air pollutant under section 112 of the Clean Air Act, and hence is included under CERCLA. It is the airborne releases of tritium which made the site eligible for CERCLA cleanup.¹³⁶

In 1986, EPA notified approximately 800 potentially responsible parties ("PRPs") as to their potential liability under CERCLA for the cleanup of the Maxey Flats site.¹³⁷ Approximately 80 of these PRPs formed the Maxey Flats Steering Committee, and signed an administrative consent order agreeing to conduct a Remedial Investigation and Feasibility Study.¹³⁸ These studies were completed in 1989. The Record of Decision was completed in 1991.¹³⁹ The selected remedy chosen was that of natural stabilization.¹⁴⁰ This remedy will allow the materials to subside naturally to a stable condition before the final cap is installed.¹⁴¹ This stabilization process may take 100 years or more.¹⁴² In the interim,

130. In 1974, the State modified the site operator's license to preclude the disposal of plutonium and other transuranic-contaminated wastes at the site. *Id.* See also, *Nuclear Waste Site Shut*, Chemical Week, June 7, 1978, at 20 (Kentucky's agreement to purchase NECO's lease of Maxey Flats followed several months of negotiations between the Commonwealth and NECO to end disposal at the site.)

131. Chemical Week, June 7, 1978, at 20.

132. See Nuclear News, Aug. 15, 1988, at 12A.

133. Remedial Response Program, U.S. Environmental Protection Agency, NPL-U2-2-80, National Priorities List, Site Listing Document (1986).

134. *Id.*

135. *Id.*

136. See *id.*

137. Maxey Flats Steering Committee, Maxey Flats Disposal Site Remedial Investigation/Feasibility Study Reports, Executive Summary 2-3 (rev. Apr. 1991).

138. *Supra* note 132.

139. Maxey Flats ROD, *supra* note 13, at 15.

140. *Id.* at 122.

141. *Id.*

142. *Id.*

an initial cap with a synthetic liner will be installed, and other remedial measures will be implemented to contain the site.¹⁴³

C. West Valley

The West Valley New York Nuclear Service Center ("Center") is a 3,345-acre facility located in Cattaragus County, New York. The facility consists of a nuclear reprocessing plant, high-level nuclear waste storage facility, NRC-licensed radioactive waste burial area, low-level liquid waste treatment facility, and a State-licensed low-level radioactive waste disposal site ("SDA").¹⁴⁴

The Center commenced as a commercial nuclear fuel reprocessing facility from 1966 to 1972, and was owned by the State of New York and operated by Nuclear Fuel Services. The facility ceased operations in 1972 due to plant modifications necessary to conform to upgraded NRC regulations. The site never reopened and Nuclear Fuel Service surrendered the facility to the State of New York in 1976.¹⁴⁵

The legacy that the site left to the State was its radioactive waste. High-level transuranic and low-level radioactive wastes were stored and buried there. Of major concern was a high-level waste tank 8D2, which contains 600,000 gallons of waste and 39 million curies of radioactivity. In addition, there is approximately 2.4 million feet of radioactive waste buried in the NRC-licensed disposal area.¹⁴⁶

In an effort to alleviate its financial burden in managing the waste at the site, the State of New York persuaded Congress to have DOE clean up the site as a federal responsibility.¹⁴⁷ This was accomplished by the passage of the West Valley Demonstration Project Act.¹⁴⁸ The

143. *Id.* at 125.

144. J. Spath & T. DeBoer, *West Valley Low-Level Radioactive Disposal Area 1* (1984) (on file with N.Y. State Energy Res. & Dev. Authority).

145. See H.R. Rep. No. 1100, 96th Cong., 2d Sess., pt. 1 (1980), *reprinted in* 1980 U.S.C.C.A.N. 3103 ("Although the major benefit from this project will accrue to the Federal Government and the national nuclear waste management program through advancement of research and development of handling, processing, solidification, and decommissioning techniques for high level nuclear waste, the committee recognizes that the State of New York and commercial operator of the facility, Nuclear Fuel Services, Inc., will also benefit from the conduct of this project. For this reason, the committee requires that the costs of the project shall be shared among the Federal Government, State of New York, and other appropriate persons.").

146. New York State Energy Research and Development Authority, Rep. No. 87-14-e, *Executive Summary of Site Stabilization Study for Low Level Radioactive Waste Disposal at West Valley, New York 2-2* (1986).

147. See H.R. Rep. No. 1100, 96th Cong., 2d Sess., pt. 1, at 7-8 (1980), *reprinted in* 1980 U.S.C.C.A.N. 3099, 3102-103.

148. Pub. L. No. 96-368, 94 Stat. 1347 (1980) (codified as 42 U.S.C. § 2021a).

purpose of the Act was to use the West New York Nuclear Service Center to demonstrate the solidification techniques for preparing high-level radioactive waste for disposal by using the wastes stored at the site.¹⁴⁹

The low-level radioactive waste disposal site is located adjacent to the West New York Nuclear Service Center facility, but was licensed by the State of New York, a NRC Agreement State.¹⁵⁰ The site accepted radioactive wastes from Nuclear Fuel Services, commercial power reactors, hospitals, and other commercial and institutional sources. An estimated 67,000 cubic meters of radioactive wastes with a radioactivity level of 200,000 curies has been disposed there.¹⁵¹ The site was operational from November, 1963 to March, 1975 by Nuclear Fuel Services, and possession of the facility was turned over to the New York State Energy, Research, and Development Authority ("NYSERDA") on March 30, 1983.¹⁵²

The low-level radioactive waste disposal site employed shallow land burial and experienced similar problems with this burial method as did the Sheffield and Maxey Flats sites. The settling of the wastes caused the trench caps to crack, allowing precipitation to enter into the trenches. The water accumulated in the trenches and bubbled out into a neighboring stream.¹⁵³ Soon thereafter, disposal operations were ceased and measures were taken to alleviate the water infiltration into the trenches. The leachate from the trenches was pumped and treated at the low-level liquid waste treatment facility, and discharged into surface streams.¹⁵⁴

A subsequent study by the United States Geological Survey ("USGS") analyzed the radioactive releases from the site as a result of water infiltration into the trenches. The results of this study indicated that there is no future threat of ground water contamination,¹⁵⁵ the surface

149. *Id.* The Centers objectives include:

1. solidifying the high-level radioactive waste to a suitable form for transport to a government disposal facility;
2. disposal of the low-level radioactive and transuranic wastes produced by solidification; and
3. decontaminating and decommissioning the tanks and facilities used to store or solidify high level radioactive waste.

150. 53 Fed. Reg. 53,053 (1988).

151. *Id.*

152. Spath & DeBoer, *supra* note 144.

153. J. Matuszek, New York State Energy Research and Development Authority, *Hearing Testimony In Regard To Low-Level Radioactive Waste Management 2* (1985) (on file with author).

154. *Supra* note 144, at 5.

155. The ground water has escaped contamination due to the 90-foot layer of clay under the trenches. The USGS estimated that the subsurface flow is downwards at a rate of one inch per year. Matuszek, *supra* note 153, at 3. Thus, it would take the contaminated water 1,000 years to reach the lateral movement of Buttermilk Creek and 1,000 to 4,000 years to infiltrate Buttermilk Creek. *Id.* The only radionuclide which might escape the water flowing

water contamination is within EPA standards, and that there are airborne releases of radionuclides.¹⁵⁶ Tritium, carbon-14, and radon-22, in gaseous form, are released from the trenches as a result of the biodegradation of buried organic wastes.¹⁵⁷ The amount of radiation emitted from these gases is not known because gas effluents studies ceased prior 1981.¹⁵⁸ However, it is presumed that since no one lives or lived near the fence line of the site, no member of the public has been harmed by these emissions.¹⁵⁹

From 1975 to the present, the low-level radioactive waste trenches have been periodically pumped and the trench caps rehabilitated to control the water flow into the trenches. The leachate is treated at the low-level liquid waste treatment facility prior to being discharged into an on-site drainage stream under a State Pollution Discharge Elimination System discharge permit.¹⁶⁰ To alleviate this problem, the NYSERDA is currently pursuing remedial measures to more effectively reduce the water infiltration.¹⁶¹ The NYSERDA also plans on installing an on-site treatment facility to treat hazardous and radioactive components of the leachate.¹⁶²

In 1983, under the settlement agreement with Nuclear Fuel Services and the State of New York, the NYSERDA assumed possession of the waste-disposal area.¹⁶³ Since then, it has had the responsibility for monitoring and maintaining the trenches. Currently, DOE controls the low-level radioactive area as part of the West Valley Demonstration Project.¹⁶⁴ It continues to pump the water from the trenches and treat the leachate at the low level liquid waste treatment facility.¹⁶⁵ The costs incurred for this service are reimbursed to the DOE from the NYSERDA.¹⁶⁶

Plans are under way for the closure of the entire facility. Each agency will be responsible for closure of its portion of the facility.¹⁶⁷ DOE

through the clay would be carbon-14 ("C-14"). *Id.* However, the study anticipates that the concentration of the C-14 would be reduced before it reaches the ground water level and thus not present any public health hazard. *Id.*

156. *Id.* at 2-5.

157. *Id.* at 5.

158. J. Matuszek, N.Y. State Energy Res. & Dev. Authority, *Safer Than Sleeping With Your Spouse--The West Valley Experience* 6 (Apr. 9, 1986) (on file with author).

159. *Id.*

160. Letter from T.K. DeBoer, Director of Radiation Programs NYSERDA, to Clare Hartnett (Feb. 13, 1991) (on file with author).

161. *Id.*

162. *Id.*

163. Spath & DeBoer, *supra* note 144.

164. *Id.* at 9.

165. *Id.*

166. *Id.*

167. NuclearFuel, Jan. 9, 1989, at 10.

will be responsible for closure of the nuclear reprocessing plant and related facilities. The NYSERDA will be responsible for closure of the low-level radioactive waste disposal site. However, both agencies have agreed to jointly prepare an environmental impact statement as required by the National Environmental Policy Act¹⁶⁸ and section 8-0109 of the New York State Environmental Quality Review Act.¹⁶⁹ The EIS will serve to provide information relating to the completion of the West Valley Demonstration Project and to the closure of the West New York Nuclear Service Center. The record of decision for the joint NYSERDA/DOE EIS is not scheduled to be completed until 1995.¹⁷⁰

IV. ANALYSIS OF THE THREE SITES

Each of the sites described above employed shallow land burial and were licensed to dispose low-level radioactive wastes. Yet their closures are under different governmental jurisdictions. This is attributable in part to the type of contamination which was incurred.

A. Contamination

The contamination by the radioactive materials from the disposal sites was due, in part, to the types of wastes which were accepted and the location of the sites in high precipitation areas. Once the trenches were filled with wastes, they were covered with a layer of soil. Before long, the soil trench caps began to crack as a result of the settling and decomposition of the wastes, and the rainfall. This caused water to enter the trenches producing leachate. Leachate can contaminate the environment when it migrates into the soil and ground water, when it overflows the trenches, and when the leachate is pumped from the trenches. Leachate is characterized by the substances which are contained in the soil and from those substances produced by the microbial degradation of the wastes. It is therefore important to the assessment of the contamination to determine the types of radioactive materials contained in the trenches.

168. 42 U.S.C. § 4332(2)(C) (1988).

169. 53 Fed. Reg. 53,052 (1988).

170. Letter from T.K. DeBoer, Director, Radioactive Waste Management Program, N.Y. State Energy Res. & Dev. Authority, to Clare Hartnett (Mar. 29, 1991) (on file with author).

Tritium¹⁷¹ was the most common radioactive contaminant found at each site. This is due to the fact tritium is chemically equivalent to hydrogen and it combines with the hydrogen molecules in the water.¹⁷² The water in the trenches acts as a medium for the migration of the tritium. Currently, there are no known treatment technologies for remediating releases of tritium in contaminated soil and water.¹⁷³

B. Sheffield site

At the Sheffield site, tritium was found in the ground water which subsequently migrated offsite into a neighboring lake.¹⁷⁴ However, the concentrations of tritium in both the ground water and the lake are within regulatory limits.¹⁷⁵ Under the original release theory, CERCLA liability could not be imposed if the disposal was in accordance with the proper licenses, since the original act of disposal constituted a release. Since the releases are within regulatory limits, these releases would be federally permitted. However, if the interpretation of "release" differentiates between onsite and offsite releases, then the offsite releases could be subject to CERCLA liability.

C. West Valley site

West Valley is unique among the sites, as it did not experience any contamination into the ground water. Its contamination problems involve airborne effluents, and the potential contamination to the surface streams in the event that the leachate from the trenches overflows. The trenches are continually monitored and periodically pumped in order to prevent this from occurring. CERCLA would not apply here because there are no known releases into the environment.

171. Tritium, also known as hydrogen-3, takes on both liquid and gaseous forms. It is found naturally in cosmic radiation and also results from man-made activities associated with the production and use of nuclear energy. Lightwater nuclear reactors produce tritium as a fission byproduct which is found in the spent fuel, and about 1 percent of the tritium is released as a gas. Tritium has a half-life of 12.26 years and emits beta radiation of 0.018MeV when it decays. American Public Health Ass'n, *Standard Methods For The Examination of Water and Wastewater* 603 (1981).

172. See *Maxey Flats RI*, *supra* note 120, at 10-3.

173. Office of Technology Assessment, *Complex Cleanup* 177 n.4 (1991).

174. See *Maxey Flats RI*, *supra* note 120, at 10-3.

175. *Id.*

D. Maxey Flats site

The environmental media contaminated at the Maxey Flats site includes the leachate,¹⁷⁶ air, soil, ground water, surface water, and stream sediments. The common contaminant in these media is tritium.

The airborne releases resulted predominantly from the use of an evaporator between 1973 to 1987.¹⁷⁷ The Commonwealth employed the evaporator to mitigate the liquid wastes which had accumulated at the site. However, the airborne releases of tritium were within Kentucky's regulatory limits. The atmospheric monitoring data taken between 1983 to 1987 showed that the average tritium concentration ranged from 240 to 3,000 picocuries per cubic meter (pCi/m³).¹⁷⁸ The maximum permissible concentration of tritium under the Commonwealth's regulations was 200,000 pCi/m³ for areas outside the Restricted Area.¹⁷⁹ Thus, these airborne releases may be within the permitted allowance.

There were additional onsite releases found in the soil, ground water, and surface water. Tritium was found outside the restricted area at levels up to 560,000 pCi/ml.¹⁸⁰ Tritium concentrations were found in the ground water at levels up to 2,000,000 pCi/ml¹⁸¹ and in the surface water up to 60 pCi/ml.¹⁸² These releases need to be compared with the maximum containment levels of the then-existing federal and Kentucky regulations in order to determine if they are within the permitted levels.

The Maxey Flats site illustrates a situation where the federally permitted release exemption may be applicable in either of two ways. Under the original disposal act theory, if the disposed-of wastes were in compliance with the then-existing licenses and permits of the generators, transporters, and operators of the site, the act of disposal would be considered a "release." Consequently, these releases would come within the federally permitted release exemption. Alternatively, if the onsite releases are within the maximum permitted levels, then they too would be federally permitted.

176. The leachate has not been classified as a mixed waste. Although there are non-radiological chemical concentrations in the leachate, they have produced low and negative results when analyzed for RCRA characteristic parameters. *Id.* at A-22 to 23.

177. *Id.* at 6-3.

178. *Id.*

179. *Id.*

180. *Id.* at B-17 to B-18. The background level is 10 pCi/ml.

181. *Id.* at 4-18, 4-19. The background level is 10 pCi/ml.

182. Maxey Flats ROD, *supra* note 13, at 48. The background level is 10 pCi/ml.

V. Conclusion

There exists an overlap in the jurisdictional authority for the cleanup of releases of radioactive materials under CERCLA and the AEA. This overlapping jurisdiction has the effect of imposing CERCLA liability on parties who have complied with the AEA regulations. However, CERCLA was not intended to preempt existing legislation. This is evidenced by the federally permitted release exemption, which explicitly exempts releases pursuant to an AEA license from CERCLA liability. However, the ramification of this overlap goes beyond the liability issue. For example, does such an overlap aid or deter the cleanup of the site? There exists the potential for varying technical and legal requirements to be imposed, causing similar waste sites to be cleaned up under different standards. The AEA regulations are geared toward radioactivity, whereas CERCLA's standards include disparate state and federal regulations. The key to the resolution of these issues lies in the interpretation of the federally permitted release exemption, which will be examined when EPA attempts to recoup expenses for the cleanup of the Maxey Flats site.