

Spring 1990

Bevill Amendment: Burning Hazardous Waste in Cement Kilns

Bradley S. Hiles

Robert F. Wilkinson

Follow this and additional works at: <https://scholarship.law.missouri.edu/mlr>



Part of the [Law Commons](#)

Recommended Citation

Bradley S. Hiles and Robert F. Wilkinson, *Bevill Amendment: Burning Hazardous Waste in Cement Kilns*, 55 MO. L. REV. (1990)

Available at: <https://scholarship.law.missouri.edu/mlr/vol55/iss2/1>

This Article is brought to you for free and open access by the Law Journals at University of Missouri School of Law Scholarship Repository. It has been accepted for inclusion in Missouri Law Review by an authorized editor of University of Missouri School of Law Scholarship Repository. For more information, please contact bassettcw@missouri.edu.

MISSOURI LAW REVIEW

VOLUME 55

SPRING 1990

NUMBER 2

BEVILL AMENDMENT: BURNING HAZARDOUS WASTE IN CEMENT KILNS

Bradley S. Hiles
*Robert F. Wilkinson**

During the decade of the '80s, the Environmental Protection Agency (EPA) modified our nation's waste disposal laws to carry out what is now a national mandate to protect human health and the environment. Some of the modifications were imposed on the agency, such as the "automatic hammer" provisions established by Congress to ban the land disposal of certain hazardous wastes.¹ Some changes evolved after exhaustive rule making while others have come about through the initiative of industry seeking safer and more permanent means of waste destruction in order to limit future liability.

At the heart of our nation's waste disposal laws are the classification of waste as "hazardous" and, if necessary, the selection of treatment, storage, or disposal alternatives for such waste. EPA now has a comprehensive set of regulations designed to regulate the universe of hazardous wastes. Because of certain unique characteristics, though, not all "hazardous wastes," such as certain so-called "high volume, low toxicity" wastes, fit neatly into the program. In 1980, Congressman Thomas Bevill of Alabama successfully introduced an amendment to the

* Mr. Hiles is a partner, and Mr. Wilkinson an associate, in the St. Louis office of Peper, Martin, Jensen, Maichel and Hetlage. They are members of the firm's Environmental Law Department and represent cement companies permitted to burn hazardous waste for resource recovery. The views expressed in this Article are those of the authors, and do not necessarily reflect the views or policies of clients of Peper, Martin, Jensen, Maichel and Hetlage.

1. 42 U.S.C. § 6924(d) (1982 & Supp. 1987).

Solid Waste Disposal Act of 1980 (SWDA)² mandating that high volume, low hazard wastes be excluded temporarily from regulation and studied by EPA. One of the wastes excluded by the SWDA and to be studied by the EPA is the residue from the manufacture of cement, known as cement kiln dust or "CKD."

EPA has not undertaken the study of CKD mandated by the Bevill Amendment. In the meantime, the cement industry has assisted with our nation's hazardous waste effort in a rather ironic and most effective way. Several cement plants across the country beneficially use "regulated" hazardous waste as a supplemental source of energy in firing cement kilns. The method destroys organic hazardous constituents in the hazardous waste with an efficiency of 99.99 percent.³ Some of the cement kilns currently utilizing hazardous waste effectively recycle the waste for its material value in the production of cement.⁴ EPA regulates such resource recovery operations, in part, however, EPA exempts certain portions of the hazardous waste program when energy or other resources are genuinely recovered in the cement manufacturing process. As a result, the cement industry assists our nation's environmental efforts while conserving natural resources and industry resources.

In 1987, EPA proposed regulations for burning hazardous wastes in cement kilns, as well as other boilers and industrial furnaces. A supplement to the proposed regulations was published by EPA in October, 1989, in which the agency solicited comments on a number of issues, including the treatment of residues from the combustion of hazardous waste and cement kilns.

This article examines the historical development of the exclusion granted to cement kilns; discusses the recently proposed regulation and supplement with respect to kilns, boilers, and other industrial furnaces; and the potential impact of that regulation on the cement industry and its use of waste fuels.

2. Pub. L. No. 96-482, 94 Stat. 2334 (codified in scattered sections of 42 U.S.C. §§ 6901-6991 (1982)).

3. The 99.99% efficiency is the same as that required of permitted hazardous waste incinerators, and is imposed under proposed regulations. *See* 52 Fed. Reg. 16,982, 17,036 (1987).

4. *See* Cement Kiln Recycling Coalition, Comments to the RCRA docket section concerning Docket No. F-80-BBSP-FFFFF, at 1 (Dec. 20, 1989) [hereinafter CKRC Comments].

I. THE BEVILL AMENDMENT

The Resource Conservation and Recovery Act of 1976 (RCRA)⁵ established the framework for a comprehensive system for the regulation of solid waste.⁶ When Congress enacted RCRA, it recognized that certain wastes pose unique problems related to management and disposal, however, Congress did not have sufficient information about the hazards and potential dangers associated with such wastes to determine an appropriate regulatory approach for such wastes. Therefore, Congress "directed the [EPA] to study the sources and composition of these wastes; the existing methods of disposal; and the potential dangers to human health and the environment caused by the improper management of these wastes."⁷ EPA was then to report its findings to Congress and make recommendations for appropriate actions to take regarding such wastes.⁸ Among the wastes to be studied were mining wastes⁹ and sludge.¹⁰

EPA proposed regulations in 1978 to regulate the transportation, handling, treatment, storage and disposal of hazardous waste.¹¹ The proposed program provided regulation of all aspects related to the handling and disposal of hazardous waste (cradle to grave). As part of the comprehensive management program, EPA created a category of "special wastes" including certain high volume, low hazard wastes. These wastes were the subjects of the study mandated by Congress and were the wastes that EPA believed were not amenable to management under the proposed regulatory program.¹² Regulation of such "special wastes" was delayed until EPA completed a study to determine how such wastes should be regulated.¹³ Included among the wastes in the "special waste" category was CKD.¹⁴

5. Resource Conservation and Recovery Act of 1976 (RCRA), Pub. L. No. 94-580, 90 Stat. 2795 (1976) (to be codified in scattered sections of 42 U.S.C. §§ 6901-6991).

6. Subtitle C of RCRA required EPA to create a comprehensive system for the regulation of hazardous waste. *Id.* §§ 4001-4009, 90 Stat. 2813-20.

7. H.R. REP. NO. 1491, 94th Cong., 2d Sess. 4, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 6238, 6241.

8. RCRA, *supra* note 5, § 8002, 90 Stat. 2831-34 (codified at § 6982).

9. *Id.* § 8002, 90 Stat. 2832 (codified at § 6982).

10. *Id.*

11. 43 Fed. Reg. 58,946 (1978).

12. *Id.* at 58,948.

13. *Id.*

14. Other "special wastes" included waste from the extraction, beneficiation and processing of ores and minerals; utility waste; phosphate rock mining, beneficiation and processing waste; oil and gas drilling muds; and oil production

In May, 1980, EPA published interim final regulations establishing the hazardous waste management program mandated by subtitle C of RCRA.¹⁵ EPA had not completed its study of mining wastes; however, certain of the defined characteristics used to identify hazardous waste were modified from the proposal and the entire "special waste" category was dropped in the interim final regulations.¹⁶ As a result, the regulations would have regulated CKD and the other former "special wastes" as any other waste.

In October, 1980, Congress enacted the Solid Waste Disposal Act of 1980 (SWDA).¹⁷ The SWDA added CKD waste to the list of wastes to be studied¹⁸ and suspended the regulation of certain wastes, including CKD waste, under Subtitle C until at least six months after the submitted date of EPA's Report to Congress on such waste.¹⁹ The reports to Congress on the results of the study of wastes from the oil and gas industry and wastes from the combustion of coal and other fossil fuels were to be published October 21, 1982, and the reports to Congress on the results of the study of CKD and the mining wastes were to be published October 21, 1983.²⁰

The amendment to the SWDA dealing with the additional wastes to be studied and the exclusion from regulation, offered by Representative Thomas Bevill of Alabama, is commonly known as the Bevill Amendment. In response to the Bevill Amendment, EPA amended the

brines. *Id.*

15. 45 Fed. Reg. 33,155 (1980).

16. *Id.* at 33,174.

17. SWDA, *supra* note 2.

18. 42 U.S.C. § 6982(o) (1982 & Supp. 1987).

19. Other wastes so excluded include "drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy," 42 U.S.C. § 6921(b)(2)(A) (1982), and:

(i) Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels.

(ii) Solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore.

Id. § 6921(b)(3)(A).

20. As of January 1, 1990, the only reports to Congress submitted by EPA are a report on extraction and beneficiation wastes, EPA, REPORT TO CONGRESS ON WASTES FROM THE EXTRACTION AND BENEFICIATION OF METALLIC ORES, PHOSPHATE ROCK, ASBESTOS, OVERBURDEN FROM URANIUM MINING, AND OIL SHALE (Dec. 31, 1985), and coal combustion wastes, EPA, WASTES FROM THE COMBUSTION OF COAL BY ELECTRIC UTILITY POWER PLANTS (1988) EPA/530-SW-88-002.

interim final regulations and excluded CKD waste, among others, from regulation.²¹ On the same date, EPA interpreted the exclusion pursuant to the Bevill Amendment to include "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals".²²

II. PROCESSING WASTES

EPA initially interpreted the applicability of the Bevill Amendment broadly. An examination of the regulation (and attempted regulation) of certain processing wastes provides an example of one effort to define and narrow the exclusion afforded by the Bevill Amendment.

On October 2, 1985, the agency proposed to narrow the availability of the exclusion by removing most processing wastes from the exclusion.²³ The agency examined the legislative history of the Bevill Amendment and concluded that the special waste concept proposed by the agency in 1978 should be used to identify Congressional intent.²⁴ When the Bevill Amendment was adopted, Congress stated that it was "suspend[ing] regulation under subtitle C of such wastes . . . in a category designated as 'special wastes' in regulations proposed by the agency under subtitle C on December 18, 1978."²⁵ In light of the legislative history of the Bevill Amendment, EPA concluded that a broad definition of the term "processing wastes" was inappropriate. EPA determined that the term "processing" must be defined in light of the original special waste category. In proposing to remove most of the wastes from the processing of ores and minerals from the exclusion, the agency decided to rely primarily on a high volume criterion.²⁶

In response to the October, 1985 proposal, commenters identified a number of wastes that were thought to be high volume and that should, therefore, be excluded from regulation. EPA proposed a high volume criterion, yet failed to define or quantify that criterion. Thus, EPA decided it could not evaluate the various proposals to exclude additional

21. 45 Fed. Reg. 76,618, 76,620 (1980) (codified at 40 C.F.R. § 261.4(b)(6)-(7)).

22. *Id.* at 76,619.

23. Congress proposed to limit the availability of the Bevill Amendment exclusion for mineral processing wastes to "muds from facilities refining bauxite, phosphogypsum from phosphoric acid plants, and slag from primary metal smelters and phosphorus reduction facilities." 50 Fed. Reg. 40,292, 40,301 (1985).

24. *Id.* at 40,293-94.

25. H.R. CONF. REP. NO. 1444, 96th Cong., 2d Sess. 32, reprinted in 1980 U.S. CODE CONG. & ADMIN. NEWS 5028, 5031-32.

26. 50 Fed. Reg. 40,294 n.2 (1985).

"high volume" wastes. Among the problems with classifying such wastes, were: grouping the wastes (namely, by industry, by waste or both); whether to limit volume data to hazardous waste; selection of a baseline; whether to consider per facility or industry-wide generation rates; and the definition of high volume and low hazard.²⁷ As a result, EPA withdrew its October, 1985 proposed rule one year later.²⁸

The Environmental Defense Fund and others challenged the withdrawal of the 1985 proposal.²⁹ Upon examination of the legislative history of the Bevill Amendment, the court concluded "Congress intended the term processing in the Bevill Amendment to include only those wastes from processing ores or minerals that meet the 'special waste' criteria, that is, 'high volume, low hazard' wastes."³⁰ Withdrawing its proposed reinterpretation of the Bevill Amendment forced EPA to return to its November, 1980 interpretation and the court held "EPA's decision to withdraw its proposed re-interpretation in its entirety was arbitrary and capricious and contrary to law because it . . . reaffirmed an impermissibly over-broad interpretation of the Bevill Amendment."³¹ The court further imposed a schedule on EPA to determine which processing wastes fit within the high volume, low hazard exclusion criteria, and to complete its study of all processing wastes remaining within the exclusion.³²

In response to the court's order, EPA subsequently proposed regulations that would have removed most processing wastes from the exclusion provided by the Bevill Amendment.³³ In the preamble to the proposed regulations, EPA defined processing wastes as:

27. 51 Fed. Reg. 36,233, 36,234-35 (1986).

28. *Id.* at 36,234.

29. *Environmental Defense Fund v. Environmental Protection Agency*, 852 F.2d 1316 (D.C. Cir. 1988).

30. *Id.* at 1329.

31. *Id.* at 1326.

32. *Id.* at 1331.

33. EPA proposed to include in the excluded processing waste category only slag from primary copper smelting, process wastewater from primary copper smelting/refining, blowdown from acid plants at primary copper smelters, bleed electrolyte from primary copper refining, slag from primary lead smelting, blowdown from acid plants at primary zinc smelters, process wastewater from primary zinc smelting/refining, red and brown muds from bauxite refining, phosphogypsum from phosphoric acid production, slag from elemental phosphorus production, iron blast furnace slag, air pollution control dust/sludge from iron blast furnaces, waste acids from titanium dioxide production, air pollution control dust from lime kilns, and slag from roasting/leaching of chromite ore. 53 Fed. Reg. 41,288 (1988).

solid wastes, including pollution control residuals, that are *uniquely* associated with mineral industry operations and that possess the following attributes:

- (1) Follow beneficiation of an ore or mineral (if applicable);
- (2) Serve to remove the desired product from an ore or mineral, or beneficiated ore or mineral;
- (3) Use feedstock that is comprised of less than 50 percent scrap materials (i.e., at least 50 percent of the feedstock is an ore or mineral, or beneficiated ore or mineral);
- (4) Produce either a final mineral product or an intermediate to the final mineral product; *and*
- (5) Do not include operations that combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying); fabrication (any sort of shaping that does not cause a change in chemical composition), except for casting or metal anodes and cathodes; or other manufacturing activities.³⁴

EPA also discussed the factors used to evaluate whether a given processing waste stream should retain exclusion pursuant to the Bevill Amendment. EPA developed explicit requirements for the high volume criterion:

- (1) For a *specific* waste stream arising from mineral processing in any given mineral commodity sector (e.g., primary copper processing), the total quantity of the specific waste generated by all facilities in the United States in any one calendar year from 1982 through 1987 equals more than 2 million metric tons; or
- (2) For a *specific* waste stream arising from mineral processing in any given mineral commodity sector, the specific waste stream is generated at an *average rate* (i.e., total quantity of the specific waste generated by all facilities in the United States in any one calendar year from 1982 through 1987 divided by the number of facilities generating the waste) of more than 50,000 metric tons per facility per year.³⁵

EPA did not develop explicit low hazard criterion; instead, it considered all "high volume" processing wastes temporarily excluded.³⁶

On April 17, 1989,³⁷ EPA added a low hazard criterion,³⁸ modi-

34. *Id.* at 41,290-91.

35. *Id.* at 41,294.

36. *Id.*

37. 54 Fed. Reg. 15,316 (1989).

38. To meet the low hazard criteria, a candidate processing waste must (i)

fied the high volume criterion,³⁹ and revised the October, 1988 notice of proposed rule making.⁴⁰ The agency promulgated final regulations on September 1, 1989⁴¹ which retained five processing waste streams within the Bevill Amendment exclusion⁴² and conditionally retained

have a pH between 1 and 13.5; and (ii) pass the synthetic precipitation leaching procedure. *Id.* at 15,339-40.

39. EPA changed the dates of eligibility to the period from 1983 through 1988, inclusive, and limited the criteria to the average facility generation rate. *Id.* at 15,341.

40. As a result of the addition of the low hazard criteria, the list of processing wastes retained within the Bevill Amendment exclusion was modified to include slag from primary copper smelting, slag from primary lead smelting, red and brown muds from bauxite refining, phosphogypsum from phosphoric acid production, slag from elemental phosphorus production, and furnace scrubber blowdown from elemental phosphorus production. The following processing wastes were conditionally retained pending the review of additional data regarding whether or not they meet the new hazard criterion: barren filtrate from primary beryllium processing, raffinate from primary beryllium processing, bertrandite thickener sludge from primary beryllium processing, process wastewater from primary cerium processing, ammonium nitrate process solution from primary lanthanide processing, roast/leach ore residue from primary chrome ore processing, gasifier ash from coal gasification, cooling tower blowdown from coal gasification, process wastewater from coal gasification, bleed electrolyte from primary copper refining, process wastewater from primary copper smelting/refining, slag tailing from primary copper smelting, calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining, furnace off-gas solids from elemental phosphorus production, process wastewater from elemental phosphorus production, fluorogypsum from hydrofluoric acid production, air pollution control dust/sludge from iron blast furnaces, iron blast furnace slag, process wastewater from primary lead smelting/refining, air pollution control scrubber wastewater from light weight aggregate production, wastewater treatment sludge/solids from light weight aggregate production, process wastewater from primary selenium processing, process wastewater from phosphoric acid production, wastes from trona ore processing, basic oxygen furnace slag from carbon steel production, leach liquor from primary titanium processing, sulfate processing waste acids from titanium dioxide production, sulfate processing waste solids from titanium dioxide production, chloride processing waste acids from titanium and titanium dioxide production, chloride processing waste solids from titanium and titanium dioxide production, blowdown from acid plants at primary zinc smelters, and process wastewater from primary zinc smelting/refining. *Id.* at 15,354.

41. *Id.* at 36,592.

42. Slag from primary copper smelting, slag from primary lead smelting, red and brown muds from bauxite refining, phosphogypsum from phosphoric acid production, and slag from elemental phosphorus production were retained. *Id.* at 36,642 (to be codified at 40 C.F.R. § 261.4(b)(7)(i)).

twenty additional waste streams.⁴³ EPA also clarified the definition of "processing wastes"⁴⁴ and modified the high volume and low hazard criterion. The high volume criterion was set at 45,000 metric tons per facility for non-liquid wastes and 1,000,000 metric tons per year per facility for liquid wastes, both figures representing per facility averages within a given industry.⁴⁵ The low hazard criterion retained the pH test, but modified the manner in which the results of the synthetic precipitation leaching procedure are analyzed. This approach withdraws a waste stream from the Bevill Amendment if samples from two or more facilities fail the test, unless a preponderance of evidence proves that such test results are anomalous.⁴⁶

Following the September 1, 1989 rulemaking, EPA analyzed the twenty conditionally retained processing wastes by applying the high volume and low hazard criteria to the available data for each waste. The agency proposed to remove seven of the twenty conditionally retained wastes.⁴⁷

43. The wastes conditionally retained were roast/leach ore residue from primary chromate production, gasifier ash from coal gasification, process wastewater from coal gasification, slag tailings from primary copper smelting, calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining, furnace off-gas solids from elemental phosphorus production, fluorogypsum from hydrofluoric acid production, process wastewater from hydrofluoric acid production, air pollution control dust/sludge from iron blast furnaces, iron blast furnace slag, process wastewater from primary lead production, air pollution control dust/sludge from lightweight aggregate production, process wastewater from primary magnesium processing by the anhydrous process, process wastewater from phosphoric acid production, basic oxygen furnace and open hearth furnace slag from carbon steel production, basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production, sulfate processing waste solids from titanium dioxide production, chloride processing waste solids from titanium tetrachloride production, and slag from primary zinc smelting. *Id.* at 36,642 (to be codified at 40 C.F.R. § 261.4(b)(7)(ii)).

44. *Id.* at 36,614-22.

45. *Id.* at 36,607-14.

46. *Id.* at 36,597-607.

47. The wastes proposed to be removed are roast/leach ore residue from primary chromite production, process wastewater from coal gasification, furnace off-gas solids from elemental phosphorus production, process wastewater from hydrofluoric acid production, process wastewater from primary lead processing, sulfate process waste acids from titanium dioxide production, and sulfate process waste solids from titanium dioxide production. *Id.* at 39,298, 39,300 (to be codified at 40 C.F.R. pts. 260, 261 and 262) (proposed Sept. 25, 1989).

On January 23, 1990, EPA promulgated a final regulation which removed five of the original conditionally retained processing wastes.⁴⁸ The remaining fifteen conditionally retained wastes remain excluded and will be included in the EPA study and report to Congress on mineral processing wastes.⁴⁹

III. EPA'S 1987 PROPOSED RULE FOR BOILERS AND INDUSTRIAL FURNACES

On May 6, 1987, EPA published a proposed rule that would regulate burning hazardous waste in boilers and industrial furnaces.⁵⁰ The proposed rule would limit emissions of organic compounds, metals, hydrogen chloride and carbon monoxide; requires a 99.99 percent destruction and removal efficiency of principal organic hazardous constituents in the waste feed; waives the trial burn requirement for boilers meeting certain operating requirements; and provides discretionary alternative standards that require site specific risk assessments.⁵¹

The proposed rule addressed an area of particular interest to operators of cement kilns, addressing the relationship between combustion residuals of hazardous waste in cement kilns. The cement industry burns a significant amount of waste fuels and utilizes hazardous waste as a means of recovering energy.⁵² In analyzing the co-burning of hazardous waste in cement kilns, EPA considered the application of the "derived-from" rule. This rule states "solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash, emission control dust . . . is a hazardous waste."⁵³ A strict reading of the derived-from rule subjects such residuals to the full hazardous waste regulatory program.

EPA considered this issue in the May, 1987 proposal for boilers and industrial furnaces. In its analysis of the relationship between the residues from furnaces that burn hazardous waste and the Bevill Amendment, the agency focused on the material being processed stating

48. Furnace off-gas solids from elemental phosphorus production, process wastewater from primary lead processing, air pollution control dust/sludge from lightweight aggregate production, sulfate process waste acids from titanium dioxide production, and sulfate process waste solids from titanium dioxide production were permanently removed from the Bevill Amendment exclusion. 55 Fed. Reg. 2322 (1990) (to be codified at 40 C.F.R. § 261.4(b)(7)).

49. *Id.*

50. 52 Fed. Reg. 16,982 (1987) (to be codified at 40 C.F.R. pts 260, 261, 264, 265, 266, 270 and 271) (proposed May 6, 1987).

51. *Id.*

52. CKRC Comments, *supra* note 4, at 1.

53. 40 C.F.R. § 261.3(c)(2)(i) (1988).

"the ultimate question is whether the industrial furnace is engaged in a process whose wastes are excluded from regulation, and the question is answered by examining the types and proportions of materials actually being processed."⁵⁴

EPA concluded that when the industrial furnace burns hazardous waste solely for energy recovery, the residue therefrom will always be excluded because it is a cement kiln dust, a waste from the processing of an ore or mineral. In such situations, the hazardous waste contributes only energy, not material; therefore, the furnace is considered to be producing cement or processing an ore or mineral, and, therefore, the waste is excluded.⁵⁵

In burning the hazardous waste for material recovery, the characterization of the residue depends on the relative amount of hazardous waste burned. If the amount of hazardous waste exceeds the normal feedstock, the industrial furnace is no longer considered by EPA as producing cement or processing an ore or mineral, and the residue in such a case would not be excluded.⁵⁶

Finally, the agency concluded that burning the hazardous waste for destruction (for example, a cement kiln burning hazardous waste in a quantity substantially greater than that needed to fire the kiln), the industrial furnace is considered to be an incinerator which subjects it to the hazardous waste incinerator regulations.⁵⁷

IV. EPA'S OCTOBER, 1989 SUPPLEMENT TO THE PROPOSED RULE

In its October, 1989 supplement to the proposed rule,⁵⁸ EPA abandoned the "purpose of destruction" principle established in the 1987 proposed rules, establishing instead a test of "no significant effects." Under this newly proposed test, the agency determines whether the co-burning of hazardous waste along with normal feedstocks "significantly affects" the composition of the residual waste. The shift in focus, from "purpose" to "effects" is significant for several reasons, reliability being the most obvious.

Under the 1987 "purpose" standard, a cement company or other covered facility had a reliable standard on which to base its compliance. The facility need only demonstrate that its burning of hazardous waste was for energy recovery or other resource recovery, not for the purpose

54. 52 Fed. Reg. 17,012 (1987).

55. *Id.*

56. *Id.* at 17,012-13.

57. *Id.* at 17,013.

58. 54 Fed. Reg. 43,718 (1989) (to be codified at 40 C.F.R. pts. 260, 261, 264, 265, 266, 270 and 271) (proposed Oct. 26, 1989).

of destruction. In addition, state environmental agencies adopted regulations consistent with EPA's "purpose" standard.⁵⁹ With the shift to "effects," the agency adopts a health-based approach to the co-burning issue. The new standard, however, diminishes certainty and reliability. Indeed, EPA's solicitation of comments in the proposed rule shows that the "no significant effects" test may take many years, if ever, to develop.

Despite Congress' mandate to study Bevill wastes, EPA (by its own admission) lacks a sufficient data base at this time to determine the composition of residues from Bevill devices.⁶⁰ Thus, the proposed rules request the assistance of private industry to develop a data base. In essence, EPA is turning over to the private sector the responsibility of undertaking the Bevill study mandated by Congress in 1980.

Specifically, EPA is asking industry to submit data on the levels of Appendix VIII toxic compounds⁶¹ from the residues of Bevill devices. The request requires industry to test its Bevill waste as the waste is generated without burning hazardous waste, and to test separately the residue when hazardous waste is added as a fuel or processing source. In requesting this study, EPA intends to focus on the character of the residues from Bevill devices to ascertain whether the Bevill material or the hazardous waste establishes that character.⁶² While such an approach has surface appeal, the authors believe it will be difficult, if not impossible, to implement.

Implementation will be especially problematic in the cement industry. There, the constituents fed into a kiln vary widely on a daily, sometimes even hourly, basis. In addition, the composition of the residue from cement manufacturing, CKD, varies. The following factors affect the metal or organic component of CKD:

1. The rate at which waste is fed into the kiln;
2. The rate at which the kiln is fired with coal or natural gas;
3. The metals content of the coal;
4. The physical form of the waste feed as liquid or solid;
5. The levels and types of toxic organics in the hazardous waste;
6. The volatility and level of metals in the waste;
7. The system utilized to feed waste into the kiln.

59. *See, e.g.*, MO. CODE REGS. tit. 10, § 25-9.010 (1988).

60. *See* 54 Fed. Reg. at 43,734.

61. Appendix VIII is a listing of approximately 400 chemicals and chemical compounds which have been identified by the EPA as "hazardous constituents." *See* 40 C.F.R. pts. 261, app. VIII (1988).

62. 54 Fed. Reg. at 43,734.

Even EPA has admitted that these factors have an impact on the residues of cement kilns, light-weight aggregate kilns and industrial boilers.⁶³ Because of the variety of constituents in residuals, the agency concedes the probable impossibility of generic determination of "effects."⁶⁴ Nevertheless, the agency hopes that private industry will provide an adequate data base through sufficient sampling and analysis. Based on a review of the public comments filed by the cement industry, the authors believe EPA's optimism is unwarranted.⁶⁵

At a minimum, EPA wants to establish a generic "baseline" level of Appendix VIII compounds for each industry covered by the Bevill Amendment. This baseline reflects the composition of residues when the hazardous waste burned or processed contains no Bevill materials. Such a generic baseline provides a running start for EPA to undertake the Bevill studies long mandated by Congress. Again, however, there is no indication that the cement industry will voluntarily assist EPA.⁶⁶

Even if EPA is able to establish a generic baseline for the cement industry, such a baseline creates problems. The baseline data provided by one cement plant may differ dramatically from the baseline data from another plant. For example, one plant may determine its baseline using coal containing unusually high levels of organics as its energy source. That plant's baseline figure might be higher—that is, "dirtier"—than another plant using coal with a lower organics content. Therefore, the plant burning "dirtier" coal is put at a significant disadvantage to its competitor. A generic baseline concentration for Appendix VIII substances could fall below the actual baseline of a particular cement plant, thereby forcing the plant to approach or exceed the "no significant effect" threshold more rapidly than plants burning lower organic content coal. Thus, the concept of generic baseline concentrations works to the competitive disadvantage for companies who routinely utilize high-organics coal. The same holds true for plants

63. See *id.* at 43,734.

64. See *id.*

65. See CKRC COMMENTS, *supra* note 4; DUNDEE CEMENT CO., COMMENTS TO THE RCRA DOCKET SECTION CONCERNING DOCKET NO. F-80-BBSP-FFFFFF (Dec. 21, 1989) [hereinafter DUNDEE COMMENTS]; MEDUSA CEMENT CO., COMMENTS TO THE RCRA DOCKET SECTION CONCERNING DOCKET NO. F-80-BBSP-FFFFFF (Dec. 18, 1989) [hereinafter MEDUSA COMMENTS]; PORTLAND CEMENT ASS'N, COMMENTS TO THE RCRA DOCKET SECTION CONCERNING DOCKET NO. F-80-BBSP-FFFFFF (Dec. 18, 1989) [hereinafter PCA COMMENTS]; ST. MARYS PEERLESS CEMENT CO., COMMENTS TO THE RCRA DOCKET SECTION CONCERNING DOCKET NO. F-80-BBSP-FFFFFF (Dec. 21, 1989) [hereinafter ST. MARYS COMMENTS].

66. See Comments listed *supra* note 65.

using coal having high levels of heavy metals. Furthermore, this disadvantage may chill the desire of companies to supply data to EPA.

Once EPA determines a generic baseline, the agency must answer the question, "What constitutes a significant increase?"⁶⁷ EPA proposes a two-part test. First is a test to determine if an increase is statistically significant, using a test of statistical significance such as the student's "t" test, "F" test or some other statistical test at a 95% confidence level.⁶⁸ If the co-generated residue "passes" the statistical test, there is "no significant effect" and the inquiry stops. If the co-generated residue fails the statistical test, the second inquiry begins—an examination of health risks.⁶⁹

Health-based significance determinations have never been enthusiastically embraced by the regulated community. As to EPA's October, 1989 proposed rules, however, the cement industry was noticeably quiet in its comments on health-based testing. The approach proposed by EPA is straightforward: For EP toxic metals, the agency proposes to find no health risk if the co-generated CKD residues pass the EP Toxicity test.⁷⁰ For other Appendix VIII compounds, EPA proposes to establish a conservative health-risk test; applying the Toxicity Characteristic Leaching Procedure (TCLP).⁷¹

EPA deems these health-based tests "conservative." The agency boasts that the two-step approach of statistical testing, followed by EP Toxicity and TCLP testing carries the virtue of "easy implementability."⁷² We believe a simpler solution exists. EPA should simply mandate that EP Toxicity testing be performed *now* on co-generated residue, while the agency conducts the Bevill study for cement kilns and other industrial boilers and furnaces mandated by Congress a decade

67. 54 Fed. Reg. at 43,735.

68. *Id.*

69. EPA has requested public comment on the statistical prong of the two-part test. In the cement industry, no substantive comments were filed on the issue. Apparently, though, EPA is satisfied that the level eventually selected for statistical significance will be *per se* a level of no concern from a conservative human health perspective. See *id.* at 43,735; cf. ENVIRONMENTAL DEFENSE FUND, COMMENTS OF THE ENVIRONMENTAL DEFENSE FUND, THE NATURAL RESOURCES DEFENSE COUNCIL, AND THE SIERRA CLUB ON EPA'S SUPPLEMENT TO PROPOSED RULE GOVERNING THE BURNING OF HAZARDOUS WASTE IN BOILERS AND INDUSTRIAL FURNACES 41 (Dec. 22, 1989) (advocating that failure of the statistical test is *per se* evidence of significant effect and should end the assessment without the need for health-based testing) [hereinafter EDF COMMENTS].

70. See 54 Fed. Reg. at 43,735. For the EP Toxicity test, see 40 C.F.R. § 261.24 (1988); 40 C.F.R. pt. 261, app. II (1988).

71. See 40 C.F.R. pt. 268, app. I (1988).

72. 54 Fed. Reg. at 43,736.

ago. The involved procedures set out in the proposed rules represent a case of regulatory overkill.

V. EPA STUDY AND RELIANCE ON EP TOXICITY TEST

Since the enactment of the Bevill Amendment in 1980, EPA has been responsible for studying certain large-volume, low-toxicity wastes (Bevill wastes). The agency must determine the risk, if any, to human health and the environment posed by the Bevill wastes, taking into account "context-specific" factors to determine if the wastes merit management different from other hazardous wastes. So far, EPA has not undertaken that task for CKD.

In a lawsuit currently pending to force EPA to study CKD, EPA has stated in discovery that it will not begin studying CKD until May, 1993; and will not report to Congress until October, 1995.⁷³ When EPA completes its study, it may find hazardous waste characteristics in CKD, although evidence suggests to the contrary.⁷⁴ Even if it finds hazardous waste characteristics, the agency may still exclude CKD from subtitle C treatment if the agency determines that the alternative disposal of the waste will not present a significant risk to human health and the environment.⁷⁵

Before even beginning its study of CKD, EPA proposes to study CKD as affected by (or "co-generated with") hazardous waste. Such an approach, quite simply, presents a classic case of putting the cart before the horse.

EPA cannot contemplate establishing a "baseline" concentration for CKD before determining its health effects. EPA may conclude that the baseline is unacceptably low once the agency undertakes its Bevill studies. In that case, millions of tons of co-generated CKD will have been disposed in a way that jeopardizes human health and the environment (although studies to date indicate otherwise).⁷⁶ Similarly, the agency may determine that the baseline was set too conservatively, forcing cement manufacturers to needlessly undertake costly disposal of

73. EDF Comments, *supra* note 69, at 28.

74. In response to EPA's proposed rules, three cement companies, one cement association and a cement kiln recycling coalition filed comments noting that CKD passes (in some cases easily) the EP Toxicity test of Appendix VIII. See CKRC Comments, *supra* note 4, at 27-30; Dundee Comments, *supra* note 65, at 2; Medusa Comments, *supra* note 65, at 4; St. Marys Comments, *supra* note 65, at 11-13; PCA Comments, *supra* note 65, at 5.

75. This was the holding of the court in *Environmental Defense Fund v. EPA*, 852 F.2d 1316 (D.C. Cir. 1988), a case involving the beneficiation and extraction of mining wastes, a Bevill waste.

76. *Id.*

millions of tons of co-generated CKD. It strains logic when EPA claims that toxicity will be examined on co-generated residue from cement kilns while failing to conduct the toxicity studies mandated by Congress on the residue presumably affected by the waste in the first instance.

There may, of course, be an unannounced motive in EPA's strategy. By inviting data from cement plants and other industrial boilers and furnaces, the agency can begin to build its own documentation for the Bevill study. If, indeed, EPA intends to cast its Bevill study burden on private industry, that strategy is flawed. First, none of the cement companies, associations, or coalitions who filed comments indicated even the slightest interest in undertaking testing programs to establish case-by-case levels for either the baseline or "significant effects" tests.⁷⁷ Second, as commenters aptly noted, even if the cement plants would volunteer to undertake such testing programs, the results are subject to attack (perhaps even by EPA itself) since the agency would not oversee the testing.⁷⁸

EPA should not rely upon private industry to supply its data base for CKD or co-generated CKD. Congress mandated EPA to act—not the private sector. Arguably, EPA has no authority to regulate co-generated CKD until it conducts a study of the high volume, low hazard character of CKD and determines if CKD is subject to regulation under subtitle C. Unless and until EPA completes the Bevill studies, it will lack an accurate "baseline" from which to assess the hazardous and toxic effects of hazardous waste fuel sources on CKD.

In the event EPA continues its planned approach—regulating co-generated residues from cement kilns—there is strong support that CKD is not "significantly affected" by being co-generated with hazardous waste. This is true because of the unique nature of cement production.

In cement kilns, flame temperatures normally exceed 3,000° F., with material temperatures usually exceeding 2,650° F. These thermal rates, along with the long residence times of raw material within the kiln, make cement kilns incomparable to other commercial boilers and furnaces, especially commercial hazardous waste incinerators. Especially dramatic is the difference between cement kiln dust and hazardous waste incinerator ash.

In a hazardous waste incinerator, the presence of hazardous waste creates fuel ash. In a cement kiln, by contrast, dust is not a residue of fuel, but of the raw material fed into the kiln. Any fuel ash generated in a cement kiln reacts with free calcium oxide in the kiln and becomes

77. See Comments listed *supra* notes 4, 65.

78. EDF Comments, *supra* note 69, at 46-47.

part of the cement clinker. All types of fuel—natural gas, coal or hazardous waste—generate CKD.⁷⁹

Since CKD contains virtually no fuel ash, it differs from other thermal treatment residues and should be categorized differently by EPA. Co-generated CKD is a natural candidate for direct testing to determine its hazardous waste characteristics. A "baseline" for virgin CKD should not be compared with co-generated residues. For the cement industry, the agency simply should test the co-generated residue to determine if it shows the characteristics of hazardous waste.

Furthermore, government studies have been conducted already on cement kiln residue. In a 1982 publication, the Bureau of Mines reported the testing of 113 samples of CKD based on a 1979 study.⁸⁰ Of the 113 samples of CKD studied by the Bureau of Mines, only one exhibited a hazardous waste characteristic.⁸¹ In the report, the Bureau of Mines concluded that "the results of this extensive survey show that U.S. CKD is not a hazardous waste as defined by current regulations established under RCRA."⁸²

Moreover, on August 2, 1989, EPA collected data on kilns burning 100% liquid and solid hazardous waste fuel. The Louisville, Nebraska plant of Ash Grove Cement Company conducted the tests.⁸³ The solid hazardous waste utilized as the fuel source in the test contained a high metals content. Nevertheless, the test showed that the co-generated CKD did not exhibit a hazardous waste characteristic under either the EP Toxicity test or through total dust samples for metals.⁸⁴

The Bevell Amendment limits the hazardous waste component of the fuel mix or raw materials in a cement kiln to 50%. EPA's test at the Ash Grove Cement Company utilized hazardous waste as 100% of the fuel source. Given the Bevell limitation at *half* that amount, the Ash Grove experiment provides substantial assurance that co-generated CKD will not exhibit the most likely potential hazardous waste

79. See St. Marys Comments, *supra* note 65, at 11-12; PCA Comments, *supra* note 65, at 5.

80. B. HAYNES & G. KRAMER, CHARACTERIZATION OF U.S. CEMENT KILN DUST (1982) (Bureau of Mines Information Circular 8885).

81. The Bureau did not rule out sampling error to explain this existence. See *id.* at 19.

82. *Id.* RCRA hazardous waste characteristics have not changed since the Bureau of Mines Study was published, but may be changed in the future to include additional parameters.

83. U.S. EPA Contract No. 68-01-7287.

84. Letter from Eric R. Hansen, Vice President and Technical Director of Ash Grove Cement Company, to Carrie Yonley of the Cement Kiln Recycling Coalition, with attached Research Laboratory Report (Dec. 20, 1989), reprinted in CKRC Comments, *supra* note 4, at app. C.

characteristic, EP Toxicity.⁸⁵ Thus, EPA has one study, conducted under EPA contract with conservative factors, which supports a conclusion that co-generated CKD should not be defined as a "hazardous waste." To our knowledge, there are no studies contrary to the Ash Grove experiment. Accordingly, the agency should either conduct further studies—as mandated by the Bevill Amendment—or accept the evidence already conclusively established by the Ash Grove experiment and the 1979 Bureau of Mines study. Positive evidence currently exists that co-generated CKD does not show hazardous waste characteristics. It is manifestly unfair to require private industry to prove the negative.

This is not to say that EPA should forego study on CKD and other Bevill wastes. In the meantime the agency should conserve its resources by simply requiring the cement industry to prove that its co-generated residue does not exhibit hazardous waste characteristics under 40 C.F.R. section 261.24. That is, the agency should require firms with cement kilns that burn hazardous waste for energy or material recovery to test their waste CKD under the EP Toxicity test just like any other potentially hazardous waste likely to contain heavy metals.

There is support in prior agency policy for allowing the cement industry to screen its waste under the characteristics test, while EPA undertakes its study of CKD. Last year, EPA published a final rule on processing waste from mining operations.⁸⁶ EPA determined, while preparing its study for Congress, that large-volume wastes from processing will continue to be excluded under a *less* stringent version of the hazardous waste characteristics tests.⁸⁷ CKD, like mining processing wastes, is a large-volume, unstudied Bevill waste. If EPA subjects processing wastes to a *relaxed* version of the characteristics tests while awaiting its report to Congress, EPA should be able to subject CKD to the tougher standard of full imposition of the characteristics tests with little harm.

85. Three other "characteristic" tests exist under the RCRA regulations at 40 C.F.R. §§ 261.21-23 (1988): ignitability, corrosivity and reactivity. Based upon comments filed by the cement industry, *see supra* notes 5, 66, there is no concern within that industry that CKD will show the hazardous waste characteristics of ignitability, corrosivity or reactivity. Only EP Toxicity testing is discussed as a possible concern to determine if CKD contains metals leachable enough to reach and endanger groundwater.

86. 54 Fed. Reg. 36,592 (1989) (to be codified at 40 C.F.R. pt. 261) (published Sept. 1, 1989).

87. *Id.* For the text of the less stringent version of the characteristics test, see EPA's Notice of Proposed Rulemaking on the Mining Waste Exclusion Under Subtitle C of RCRA, 54 Fed. Reg. 15,316, 15,339 (1989) (to be codified at 40 C.F.R. Part 261) (published April 17, 1989).

Finally, public policy considerations favor an approach to CKD regulation that requires EP Toxicity testing pending EPA's further study of CKD. The cement manufacturing facilities which currently burn hazardous waste for energy or resource recovery provide a valuable means of waste elimination to the community of hazardous waste generators. As required by the 1987 proposed regulations,⁸⁸ cement kilns currently are achieving a remarkable destruction and removal efficiency for principal organic hazardous constituents of at least 99.99%. Substantial safeguards exist under federal and state law to insure the safe storage, handling, and processing of hazardous waste by cement companies.⁸⁹

In our experience, the cement firms burning hazardous waste for resource recovery do so at a fraction of the cost charged by waste incineration firms, and in some instances charge nothing for destruction of the waste. Thus, American industry benefits by reducing the costs of waste elimination by utilizing cement kilns.

The imposition of land bans on the disposal of certain hazardous wastes forces the thermal destruction of hazardous waste for some generators. Others, including corporate decision-makers, use incineration as a more reliable—albeit more expensive—means of eliminating waste. According to a major coalition involved in the recycling of hazardous waste by cement companies, there are enough cement kilns in the United States to handle *all* the combustible hazardous waste produced in the nation.⁹⁰ Furthermore, cement plants are easily accessible to generators of hazardous waste, with a cement plant located within 300 miles of virtually every waste generator in the country.⁹¹

Naturally, cement companies achieve a cost-savings by replacing coal and natural gas with hazardous waste as an energy source. These cost-efficiencies are passed on to the generators of hazardous waste through reduced disposal expense. The change also preserves some of our nation's dwindling fossil fuel reserves.

88. 52 Fed. Reg. 16,982 (1987) (to be codified at 40 C.F.R. pts. 260, 261, 264, 265, 266, 270 and 271) (proposed May 6, 1987).

89. Cement kilns that co-burn hazardous waste in Missouri are currently subject to a number of regulations and restrictions that are designed to protect human health and the environment. Such plants must obtain a Resource Recovery Certificate from the Missouri Department of Natural Resources ("MoDNR"). MO. CODE REGS. tit. 10, § 25-9.010 (1988). In addition, the MoDNR requires that such kilns meet the 99.99% destruction and removal efficiency proposed by EPA in the May 6, 1987, proposed rule for burning hazardous waste in boilers and industrial furnaces.

90. CKRC Comments, *supra* note 4, at 2.

91. *Id.*

Simply stated, the burning or recycling of hazardous waste for resource recovery is good for the generator, the cement industry and the environment.

VI. CONCLUSION

In response to Congressional mandate, EPA has developed a comprehensive regulatory program for the management and disposal of hazardous waste. Recognizing that certain wastes present special problems, Congress, in 1980, excluded from regulation certain "high volume, low hazard" wastes. EPA has spent considerable effort and resources defining which wastes are included in the Bevill Amendment. The development of the definition of "processing wastes" provides a striking example of the difficulty EPA has had dealing with the exclusion.

Among the wastes excluded from regulation by the Bevill Amendment is cement kiln dust. Cement kilns currently utilize otherwise regulated hazardous waste as a supplemental supply of fuel, thereby reducing energy demand and providing needed hazardous waste disposal capacity. In connection with such beneficial reuse of hazardous waste, EPA is trying to determine whether, and if so, under what circumstances, CKD generated in connection with such activities is excluded from regulation.

EPA abandoned the "purpose of destruction" test for an "effects" test in its proposals for regulating boilers and industrial furnaces. In addition to increasing uncertainty for the regulated community, the shift in focus appears to be an attempt by the agency to shift the burden of responsibility for its Congressionally mandated study of CKD to the regulated community.

Energy recovery from hazardous waste by the cement industry should be encouraged as a viable means of eliminating hazardous waste coupled with energy conservation. In order to assure a reasonable and efficient regulatory approach, EPA should proceed with its study of CKD and, at the same time, utilize the existing toxicity tests to screen co-generated CKD.