



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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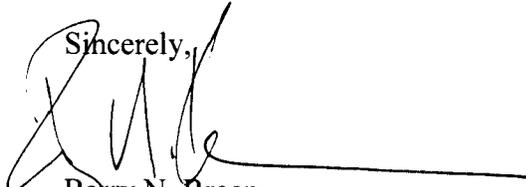
OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

The Honorable Edward J. Markey
Chairman
Committee on Energy and Commerce
Subcommittee on Energy and Environment
U.S. House of Representatives
Washington, D.C. 20515-2107

Dear Chairman Markey:

Thank you for your letter of January 13, 2009, to former U.S. Environmental Protection Agency (EPA) Administrator Stephen Johnson requesting information related to the regulation of by-products associated with coal-burning power plants. Enclosed please find EPA's responses to your questions.

Again, thank you for your letter. If you have further questions, please contact me or your staff may contact Amy Hayden in EPA's Office of Congressional and Intergovernmental Relations, at (202) 564-0555.

Sincerely,

Barry N. Breen
Acting Assistant Administrator

Enclosures

**Responses to Questions related to the Regulation of the By-products Associated with
Coal-burning Power Plants
February 2009**

1. Does EPA believe that coal ash and/or other by-products associated with coal-burning power plants should be designated a hazardous waste? If not, why not? If so, why has it not already done so? Please provide copies of all EPA studies, memos, draft proposals and other correspondence related to any deliberations associated with such designation, or alternate approaches to regulating these materials.

Section 3001(b)(3)(A)(i) of the Resource Conservation and Recovery Act (RCRA) temporarily excluded certain large-volume wastes, including by-product wastes associated with the combustion of coal and other fossil fuels from being regulated as hazardous wastes under Subtitle C of RCRA, pending completion of a Report to Congress and a Regulatory Determination by the Administrator of the U.S. Environmental Protection Agency (EPA) either to promulgate regulations under Subtitle C of RCRA or deem that such regulations are unwarranted. With this legislative mandate, EPA published its Part 1 Regulatory Determination for large-volume utility coal combustion wastes in the Federal Register in August 1993 (see 58 FR 42466). At that time, EPA determined that fly ash, bottom ash, boiler slag, and flue gas emission control dust from coal burning utilities did not warrant regulation as hazardous waste and, thus, remained excluded from regulation under Subtitle C of RCRA §261.4(b)(4). That Regulatory Determination addressed the large-volume utility coal combustion waste streams, but it did not cover co-management of all wastes generated at facilities that combust coal and other fossil fuels. Therefore, EPA conducted additional research regarding the co-management of the large-volume utility wastes with the remaining wastes generated at facilities that combust coal and other fossil fuels.

In May 2000, EPA issued its Part 2 Regulatory Determination (“Regulatory Determination on Wastes from the Combustion of Fossil Fuels” (65 FR 32214)), addressing the remaining wastes that had not been considered under its 1993 Regulatory Determination.¹ In the May 2000 Regulatory Determination, the Agency likewise concluded that these wastes did not warrant regulation as hazardous waste under Subtitle C of RCRA. However, EPA also determined that national non-hazardous waste regulations under RCRA Subtitle D were appropriate for coal combustion wastes disposed of in surface impoundments and landfills, and used as fill in surface or underground mines. For disposal in landfills and surface impoundments, EPA based its determination on the following considerations: (1) the constituents present in these wastes include toxic metals that could present a danger to human health and the environment under certain conditions; (2) the Agency identified 11 documented cases of proven dangers to human health and the environment by the improper management of these wastes in landfills and surface

¹ The wastes addressed under the May 2000 Regulatory Determination includes: (1) large-volume coal combustion wastes (i.e., fly ash, bottom ash, boiler slag and flue gas emission control dust) generated at electric utility and independent power producing facilities that are co-managed together with certain other coal combustion wastes; (2) coal combustion wastes generated at non-utilities; (3) coal combustion wastes generated at facilities with fluidized bed combustion technology; (4) petroleum coke combustion wastes; (5) wastes from the combustion of mixtures of coal and other fuels (i.e., co-burning of coal with other fuels where coal is at least 50% of the total fuel); (6) wastes from the combustion of oil; and (7) wastes from the combustion of natural gas.

impoundments; (3) lack of controls, such as liners and groundwater monitoring, at many sites; and (4) while there had been improvements in state regulatory programs, there also were some gaps identified in state oversight . Please see the enclosed 2000 Regulatory Determination.

The supporting technical documents, including the findings of the 1999 Report to Congress (RTC) “Wastes from the Combustion of Fossil Fuel,” are voluminous and are accessible at: http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/volume_2.pdf and <http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/fsltech.htm>. They address the characterization of coal combustion waste (CCW), its management practices as of the mid-1990s, State regulatory programs, damage cases associated with the management of CCW, the economic and cost impact analysis of rulemaking, and human health and ecologic risk analysis of fossil fuel combustion (since superseded by a 2006 study).

Since the May 2000 Regulatory Determination, additional information and data became available, which EPA believed should be noticed for public comment as part of the Agency’s evaluation regarding the development of regulations under Subtitle D of RCRA of CCW. Thus, this information was made available for public comment in EPA’s August 2007 Notice of Data Availability (NODA) (72 FR 49714; enclosed). The NODA included an update of waste management practices—a joint U.S. Department of Energy (DOE) and EPA report entitled, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, a further assessment of damage cases, and a draft risk assessment.² In addition, the draft risk assessment was subject to peer review, which was completed in September 2008. EPA is carefully analyzing the approximately 400 comments and recommendations we received, including those from the peer reviewers, and will consider this information as we continue to follow up on the regulatory determination on the management of CCW in surface impoundments and landfills.

The 2007 NODA, as well as its accompanying technical documents, the public comments, citizen and industry proposals for the regulation of coal combustion waste, and the results of the draft risk assessment’s peer review, are all accessible at the NODA’s docket, at http://www.regulations.gov/search/search_results.jsp?css=0&&Ntk=All&Ntx=mode+matchall&Ne=2+8+11+8053+8054+8098+8074+8066+8084+8055&N=0&Ntt=epa-hq-rcra-2006-0796&sid=11F141358782.

² The NODA also solicited comment on a February 2004 Petition for Rulemaking submitted by the Clean Air Task Force and the Hoosier Environmental Council, jointly with a number of citizens’ groups to prohibit the placement or disposal of CCW into groundwater or surface water, and two suggested approaches for managing CCW in landfills and surface impoundments. One approach is a Voluntary Action Plan that was formulated by the electric utility industry; the other approach is a proposed framework prepared by a number of citizens’ groups for federal regulation of CCW disposed of in landfills and surface impoundments under Subtitle D or RCRA

2. Does EPA believe it has sufficient legal authority under existing environmental statutes to regulate coal ash, heavy metals, and other hazardous wastes associated with coal-burning power plants? If so, why hasn't EPA used this authority? If not, what changes in the law would be needed to give EPA the authority to protect public health and the environment from these wastes?

Yes, EPA believes that it currently has sufficient legal authority to regulate such wastes and does not believe that any changes to environmental statutes are required. With respect to your second question, please see our response to Question 1.

3. If coal ash and/or other by-products associated with coal-burning power plants was designated as hazardous waste, please detail the potential regulatory steps that would follow such designation.

If the Agency were to decide to regulate CCW as hazardous under Subtitle C of RCRA, then we believe that the Agency would need to revise the Regulatory Determination. This could possibly be done at the same time that EPA could propose to remove the existing regulatory exemption. However, as part of this effort, the Agency would need to describe the facts that cause the Agency now to believe that CCW needs to be regulated under Subtitle C, as opposed to Subtitle D. In addition, while RCRA does not specifically spell out the process by which EPA would revise the Regulatory Determination, we would expect that based on recent cases in other contexts, the Agency would find it advisable to use the same process it followed to establish it—in other words, “after public hearings and an opportunity for comment.” That would require the Agency to develop a proposed regulation, including the needed supporting documentation; publish that proposal in the Federal Register for public comment and hold public hearings; analyze and respond to those comments; and then publish a final regulation. After EPA promulgated the federal rule, States authorized for the RCRA program would then have to adopt those regulations (or regulations no less stringent than the federal ones) and receive authorization from EPA.

4. Has EPA examined the manner in which these materials are stored? For example, last month's accident occurred in a storage pond. Given the dangers that these materials particularly pose to the surrounding water system, has EPA considered the wisdom of allowing them to be stored in this manner in the first place? Please provide copies of all EPA studies, memos, draft proposals and other correspondence related to any deliberations associated with the regulation of the types of facilities that can be used to store these materials.

EPA's May 2000 Regulatory Determination did not specifically address surface impoundment integrity. The discharge of fly ash and bottom ash transport water (i.e., the discharge from ash ponds) is regulated by National Pollutant Discharge Elimination System (NPDES) permits and EPA has issued national effluent limitations that apply to the discharge.

NPDES regulations issued under the authority of the Clean Water Act (CWA) require that all NPDES permits include standard conditions that include the requirement to "...properly operate and maintain all facilities and systems of treatment and control (and related appurtenances)...to achieve compliance with the conditions of this permit" (See 40 CFR part 122.41(e)). In addition, best management practices can be included in NPDES permits as necessary to achieve limitations or to carry out the purpose and intent of the CWA (See 40 CFR part 122.44(k)). Given the Tennessee Valley Authority-Kingston ash pond collapse, EPA is presently reviewing existing permits to assess if additional requirements or guidance are appropriate.

The national effluent limitations, issued by EPA in 1982 and codified at 40 CFR part 423, imposed an effluent limit of "zero discharge" for fly ash transport water from new facilities. As a result, nearly all generating units built after 1982 have avoided using storage ponds for fly ash by using ash handling systems that keep the fly ash dry. The dry fly ash is either disposed of in a landfill or sold for cement manufacturing or other uses. Some plants built before 1982 also use dry handling practices for fly ash, although placing the wet fly ash in storage ponds is commonplace at other plants. Bottom ash is typically stored in ponds at most plants; however, some plants handle the bottom ash with a dry process that avoids the need for a storage pond.

EPA is nearing the end of a multi-year study of the steam electric power generating industry to determine whether the national effluent limitations guidelines warrant revision. Upon concluding the study later this year, EPA will determine whether to initiate a rulemaking process. The study has expended substantial effort in reviewing discharges from coal-fired power plants, including ash ponds. EPA's review of operating practices and wastewater management technologies will include an assessment of technologies that enable some plants to manage their fly ash and bottom ash without the need for ash storage ponds.

EPA has compiled a substantial amount of documentation over the course of the study. Most of these documents were made available for public review as part of the docket for EPA's Final 2008 Effluent Guidelines Program Plan. As required by Section 304(m) of the Clean Water Act, EPA publishes an Effluent Guidelines Program Plan presenting a schedule for the annual review and revision of promulgated effluent guidelines and for identifying industrial categories without effluent guidelines that might need to be regulated to prevent or control pollution. The Plan also presents the results of ongoing and completed industry studies. The Final 2008 Effluent

Guidelines Program Plan was published September 15, 2008 (73 FR 53218). The most recent status report for the detailed study of the steam electric power generating point source category was published August 2008 (<http://epa.gov/waterscience/guide/304m/2008/steam-detailed-200809.pdf>). The entire docket for the 2008 Plan is available at <http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=EPA-HQ-OW-2006-0771>.

Rules and Regulations

ENVIRONMENTAL PROTECTION AGENCY (EPA)

40 CFR Part 261

[530-Z-93-009; FRL-4689-8]

Final Regulatory Determination on Four Large-Volume Wastes From the
Combustion of Coal by Electric Utility Power Plants

Part V

58 FR 42466

DATE: Monday, August 9, 1993

ACTION: Final regulatory determination.

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To view a specific page, transmit p* and the page number, e.g. p*1

SUMMARY: Today's action presents the Agency's final regulatory determination required by Section 3001(b)(3)(C) of the Resource Conservation and Recovery Act (RCRA) on four large-volume fossil-fuel combustion (FFC) waste streams-fly ash, bottom ash, boiler slag, and flue gas emission control waste-studied in the Agency's February 1988, Report to Congress: Wastes from the Combustion of Coal by Electric Utility Power Plants (RTC). EPA has concluded that regulation under Subtitle C of RCRA is inappropriate for the four waste streams that were studied because of the limited risks posed by them and the existence of generally adequate State and Federal regulatory programs. The Agency also believes that the potential for damage from these wastes is most often determined by site- or region-specific factors and that the current State approach to regulation is thus appropriate. Therefore, the Agency will continue to exempt these wastes from regulation as hazardous wastes under RCRA subtitle C. However, EPA believes that industry and the States should continue to review the appropriate management of these wastes. EPA will consider these wastes during the Agency's ongoing assessment of industrial non-hazardous wastes under RCRA subtitle D.

EPA plans to make a final regulatory determination on the remaining FFC waste streams (beyond the four listed above) subject to Section 3001(b)(3) of RCRA by April 1, 1998.

EFFECTIVE DATE: September 2, 1993.

FOR FURTHER INFORMATION CONTACT: For further information on the regulatory

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determination, contact the RCRA/Superfund hotline at (800) 424-9346 or (703) 412-9810, or Patti Whiting at (703) 308-8421.

□
58 FR 42466, *
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- I. Background
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 - A. Statutory Authority

Today's notice is issued under the authority of section 3001(b)(3)(C) of RCRA, which requires that after completion of the Report to Congress mandated by Section 8002(n) of RCRA, the Administrator must determine whether subtitle C

□ regulation of fossil fuel combustion wastes is warranted.

- B. History of the Combustion Waste Exclusion

In December 1978, EPA proposed the first regulations to implement subtitle C of RCRA. At that time, the Agency recognized that certain large-volume wastes, including wastes from the combustion of fossil fuels, might warrant special treatment. However, the Agency had very little information regarding the nature of and risks posed by these large-volume wastes. Additionally, the Agency had no data on the costs and effectiveness of technologies for managing these wastes. In light of these uncertainties, EPA proposed a limited set of regulations for the management of these wastes (43 FR 58946, 59015, December 18, 1978).

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On May 19, 1980, EPA promulgated the initial regulations implementing Subtitle C. By then, however, Congress was debating RCRA reauthorization and both Houses had passed bills restricting EPA's authority to regulate large-volume wastes under Subtitle C of RCRA. Anticipating the enactment of legislation amending RCRA Section 3001, EPA excluded fossil fuel combustion wastes from these regulations (45 FR 33084, 33089, May 19, 1980).

In October 1980, Congress passed the Solid Waste Disposal Act Amendments. Among other things, the amendments temporarily exempted from regulation as hazardous wastes certain large-volume wastes generated primarily from the combustion of coal or other fossil fuels (RCRA Section 3001(b)(3)(A)(i)). These large-volume wastes include fly ash waste, bottom ash waste, boiler slag waste, and flue gas emission control (or flue gas desulfurization) waste. In RCRA Section 8002(n), Congress directed EPA to conduct a detailed and comprehensive study based on eight study factors (discussed in detail below) and to submit a Report to Congress on "the adverse effects on human health and the environment, if any, of the disposal and utilization of fly ash waste, bottom ash waste, slag waste, flue gas emission control waste, and other byproduct materials generated primarily from the combustion of coal or other fossil fuels."

Finally, in RCRA Section 3001(b)(3)(C), Congress directed that within 6 months of submitting the report, EPA must, after public hearings and opportunity for comment, decide whether regulation of the management of the temporarily exempt FFC wastes as hazardous wastes under Subtitle C is warranted. Once the decision is made, the Administrator must publish the Agency's regulatory determination in the Federal Register.

In 1981, EPA provided an interpretation of the RCRA regulations regarding the exclusion of fossil-fuel combustion wastes from regulation under Subtitle C n1. EPA stated that, pending the results of the Report to Congress, the Agency would interpret the following to be exempt from RCRA Subtitle C pending further study: (1) Fly ash, bottom ash, boiler slag, and flue gas emission control wastes resulting from: the combustion solely of coal, oil, or natural gas, the combustion of any mixture of these fossil fuels, and the combustion of any mixture of coal and other fuels n2 where coal makes up at least 50 percent of the mixture, and (2) wastes produced in conjunction with the combustion of fossil fuels that are necessarily associated with the production of energy and

□ that have been and are mixed with and co-disposed or co-treated with fly ash, bottom ash, boiler slag, or flue gas emission control wastes from coal combustion.

□ n1 Letter from G. Dietrich, U.S. EPA, to P. Emler, Utility Solid Waste Activities Group, January 13, 1981, Report to Congress: Wastes from the Combustion of Coal by Electric Utility Power Plants, February 1988, Appendix A.

n2 See discussion below on page 10.

RCRA was amended again in 1984 by the Hazardous and Solid Waste Amendments (HSWA) (Pub. L. No. 98-616, 98 Stat. 3221). These amendments [*42467] added Section 3004(x), which gave EPA the flexibility to promulgate regulations under Subtitle C that considered the unique characteristics of some large-volume wastes, including FFC wastes. Specifically, if EPA determined that some or all

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of the wastes from fossil-fuel combustion should be regulated as hazardous waste, it could modify certain HSWA requirements to take into account the special characteristics of the wastes, the practical difficulties of implementing the standards, and site-specific characteristics, as long as the modifications still protected human health and the environment.

In February 1988, EPA submitted its Report to Congress: wastes from the Combustion of Coal by Electric Utility Power Plants, as required under RCRA Section 8002(n). Because coal-fired electric utilities generate a large majority of all fossil-fuel combustion wastes, the RTC focused on wastes generated by coal-fired electric utilities. The document does not address wastes generated by utilities burning other fossil fuels or wastes from non-utility boilers burning any type of fossil fuel (the Agency deferred study of these waste streams until a later date). The report provided the Agency's analysis of available data considering the eight study factors listed in Section 8002(n) of RCRA and presented the Agency's tentative determination regarding large-volume wastes from coal-fired electric utilities. Following the release of the RTC, the Agency provided a notice and comment period that extended through May 16, 1988, and held a public hearing in Denver, Colorado, on April 26, 1988. Appendix A summarizes the comments received on the RTC.

Because of other priorities, the Agency did not publish the regulatory determination for fossil-fuel combustion wastes within the timeframe established in Section 3001(b)(3)(C). As a result, a suit was filed on behalf of the Bull Run Coalition (an Oregon citizens group), with the Edison Electric Institute intervening as plaintiffs. n3 On June 30, 1992, the Agency entered into a Consent Decree that established a schedule for the Agency to complete the regulatory determinations for all fossil-fuel combustion wastes. The Consent Decree divides FFC wastes into two categories: (1) Fly ash, bottom ash, boiler slag, and flue gas emission control waste from the combustion of coal by electric utilities and, (2) all remaining wastes subject to RCRA Sections 3001(b) and 8002(n). Separate schedules are provided in the Consent Decree for each category of waste.

n3 Frank Gearhart, et al. v. William K. Reilly, et al., No. 91-2435 (D.D.C.)

In accordance with the requirements of the Consent Decree, the Agency notified the parties to the litigation on December 1, 1992, that a regulatory determination for fly ash, bottom ash, slag, and flue gas emission control waste

□ from the combustion of coal by electric utilities would be made by August 2, 1993. For the remaining FFC wastes, the Agency indicated that further study was required and that a regulatory determination would be completed for these wastes by April 1, 1998.

□ In preparing the regulatory determination, EPA collected and reviewed recent information on wastes from coal-fired electric utility power plants. On February 12, 1993, EPA published a Notice of Data Availability in the Federal Register, soliciting comments on these data (58 FR 8273). In the notice, EPA also requested comments on a proposed methodology to be used in making the final regulatory determination. This three-step analytical approach was recently used in making the June 13, 1991, regulatory determination for special wastes from mineral processing (56 FR 27300). Comments on the newly available data and on the proposed methodology are discussed in Appendix B of today's notice.

Today's decision is based on the RTC and the data and analyses that underlie the report, comments on the RTC, supplemental information gathered after the RTC, and comments on that newly available information.

C. Overview of the Report to Congress

1. Scope of the Report

EPA published the RTC in 1988. The RTC documents EPA's study of special wastes from coal-fired utilities temporarily excluded from regulation under RCRA Subtitle C. EPA did not include within the scope of the RTC oil- and gas-fired utility wastes, as well as industrial FFC wastes. The study presents EPA's understanding of the generation, management, disposal, and reuse of wastes from coal combustion for electricity generation.

2. Study Factors

The RTC addressed the following eight study factors required under Section 8002(n) of RCRA:

1. Sources and volumes of such materials generated per year,
 2. Present disposal and utilization practices,
 3. Potential danger, if any, to human health and the environment from the disposal and reuse of such materials,
 4. Documented cases in which danger to human health or the environment from surface runoff or leachate has been proved,
 5. Alternatives to current disposal methods,
 6. Costs of such alternatives,
 7. Impact of those alternatives on the use of coal and other natural resources, and
 8. Current and potential utilization of such materials.
- In preparing the RTC, EPA addressed these eight study factors as they apply

□
to coal-fired combustion wastes generated by electric utilities. The RTC is divided into six sections that address these factors. The first section provides an overview of the U.S. electric utility industry, including the structure, economic and environmental regulations, and describes the importance of coal to the electric utility industry. The second section examines the amounts and

□
types of wastes generated. The third section discusses current waste management and disposal practices used by the electric utility industry and possible alternatives to these practices. The fourth section reviews the potential and documented impacts of these wastes on human health and the environment, and the fifth section evaluates costs associated with current waste disposal practices and additional costs that could be incurred under a variety of alternative waste management practices. The final section summarizes the RTC's tentative findings and provides recommendations for a regulatory determination.

3. Preliminary Findings

Using the RTC findings, EPA developed three preliminary recommendations for such wastes. A summary of these recommendations is provided below.

a. Large-volume wastes. The RTC found that while the majority of the materials present in the four large volume wastes-fly ash, bottom ash, boiler slag, and flue dust-are not of major concern (e.g., more than 95 percent of the ash is composed of oxides of silicon, aluminum, iron, and calcium), trace

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constituents in the wastes, including arsenic, barium, cadmium, chromium, lead, mercury, and selenium, may present risks to human health and the environment. However, the data also indicates that these wastes generally do not exhibit the RCRA hazardous waste characteristics. In particular, a review of the extraction procedure (EP) test data indicated that metals are generally not found in leachate at levels above the hazardous waste toxicity characteristic. Only three [*42468] metals-cadmium, chromium, and arsenic-were detected in any ash or sludge samples above toxicity characteristic levels and then only infrequently. In addition, the report tentatively concluded that current waste management practices appear to be adequate for protecting human health and the environment. For example, while groundwater monitoring data showed that waste management units can cause releases of pollutants to underlying groundwater, the frequency and magnitude of exceedences of Primary Drinking Water Standards (PDWSS) were found to be relatively low-about 5 percent of all samples showed exceedences of PDWS, with exceedences less than 20 times the applicable standard in all cases. Additionally, human populations generally are not directly exposed to groundwater in the vicinity of coal-fired utility waste management sites; public drinking water intakes are usually at least several kilometers from the sites.

Furthermore, the RTC indicated that as of 1988, coal-fired electric utilities spent about \$ 800 million per year for the disposal of coal combustion wastes. If all utility large-volume wastes from coal combustion were regulated as hazardous wastes, the cost of disposal practices, excluding corrective action costs or higher recycling costs, could increase to \$ 3.7 billion per year. Costs would approach \$ 5 billion annually if all existing facilities were capped and closed and new facilities were constructed with liners, leachate collection systems, flood protection, and groundwater monitoring. Based on these findings, the RTC tentatively concluded that regulation of these wastes under Subtitle C was not warranted.

b. Low-Volume wastes. The RTC identified a number of wastes other than the
□ large-volume wastes that are typically generated in lower volumes by coal-fired electric utilities. These "low-volume wastes" include, but are not limited to, boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant and rinses, metal and boiler cleaning wastes, pyrites, and sump effluents. The report indicated that several low-volume wastes may exhibit the

□ hazardous waste characteristics of corrosivity and EP toxicity.

Data in the RTC showed that waste streams produced during equipment maintenance (e.g., boiler chemical cleaning wastes) occasionally exceeded hazardous waste toxicity characteristics for chromium and lead. Boiler chemical cleaning wastes were also, in limited instances, found to exhibit the characteristic of corrosivity. No exceedences of toxicity characteristics were observed for other low-volume wastes, but available data were limited. In addition, the Agency concluded that data on these low-volume wastes that are co-disposed with the four large-volume waste streams were insufficient to determine the potential contribution of particular wastes to environmental risk and that additional study of low-volume wastes was warranted. Because of these findings, the Agency indicated that it was considering removing the exemption for low-volume wastes.

c. Waste utilization. EPA noted in the RTC that waste utilization practices appeared to be conducted in an environmentally safe manner. The Agency encouraged the utilization of coal combustion wastes as one method for reducing the amount of these wastes requiring disposal and supported voluntary efforts by

industry to investigate new possibilities for utilizing coal combustion wastes.

4. Public Comment Process

With the publication of the RTC, EPA established a comment period that ended May 16, 1988 (See 53 FR 9976, March 28, 1988). In addition, the Agency held a public hearing on the RTC in Denver, Colorado, on April 26, 1988 (53 FR 14839). A second hearing was scheduled but subsequently cancelled. EPA received 24 sets of written comments prior to the close of the comment period. All individual comments and a transcript from the public hearing are available for public inspection in the RTC docket (Docket No. F-88-PATA-FFFFF). The docket also contains a summary of all the comments presented at the hearing or submitted in writing. EPA's responses to those comments are provided in the docket, as well as in Appendix A to this regulatory determination.

D. Supplemental Analysis and Notice of Data Availability

Supplemental data were collected and analyzed for the large-volume and some low-volume wastes addressed by the RTC. A Notice of Data Availability (Notice), which announced the availability of this information, was published in the Federal Register on February 12, 1993. In the Notice, EPA also made available for comment the proposed methodology to be used in making a final regulatory determination for fly ash, bottom ash, slag, and flue gas emission control wastes. The Agency provided a 45-day public comment period, which closed on March 29, 1993.

The supplemental data provided in the Notice were obtained by EPA from various EPA offices and other Federal agencies, State agencies, and the electric utility industry. In addition, literature searches were performed to identify recently published materials on fly ash, bottom ash, boiler slag, and flue gas emission control waste generated by coal-fired electric utilities. Information

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in the Notice included:

Published and unpublished materials obtained from State and Federal agencies, utilities and trade industry groups, and other knowledgeable parties on the volumes and characteristics of fly and bottom ash, slag, and flue gas emission

□
control waste.

Published and unpublished materials on management practices (including co-disposal and reutilization) associated with fly and bottom ash, slag, and flue gas emission control waste.

Published and unpublished materials on the potential environmental impacts associated with fly and bottom ash, slag, and flue gas emission control waste management.

Published and unpublished materials on trends in utility plant operations that may affect waste volumes and characteristics. Specific information was sought on innovations in scrubber use and the potential impacts of the 1990 Clean Air Act Amendments on waste volumes and characteristics.

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Energy Information Agency (EIA), Department of Energy, 1990 data on utility operations and waste generation obtained from EIA's Form 767 database. These data are submitted to EIA annually by electric utilities.

Site visit reports and accompanying facility submittals for five power plants visited by EPA during fall of 1992.

Materials obtained from public files maintained by State regulatory agencies in Virginia, North Dakota, Texas, Indiana, Colorado, Wisconsin, Ohio, and Pennsylvania. These materials focus on waste characterization and environmental monitoring data, along with supporting background information.

EPA received 14 written comments addressing the Notice. All of the comments are available for public inspection in Docket No. F-93-FFCA-FFFFF. EPA's response to the comments are provided in the docket and in Appendix B to this regulatory determination.

II. Scope of the Regulatory Determination

This section describes the wastes that are and are not affected by this [*42469] regulatory determination. The discussion addresses the affected generators, the status of wastes generated from those utilities that co-burn fossil fuels with non-coal fossil fuels or other materials, and the effect of co-management of the four large-volume wastes with low-volume coal combustion wastes on the regulatory status of the large-volume wastes.

The Consent Decree divided the universe of fossil-fuel combustion wastes into two categories: large-volume wastes from coal-fired electric utilities referenced in RCRA Section 3001(b)(3) (fly ash, bottom ash, boiler slag, and flue gas emission control wastes) and "remaining wastes" (these wastes must still be studied according to RCRA Section 8002(n)). Each category has separate schedules for making the regulatory determination. Today's action only affects fly ash, bottom ash, boiler slag, and flue gas emission control waste from coal-fired electric utilities. All remaining wastes are outside the scope of this determination. Because a waste stream which is categorized as a

□ large-volume waste as generated may become a remaining waste as a result of the manner in which it is managed, this section explains the universe of as-generated and as-managed large-volume wastes affected by today's action.

A. As-Generated Large-Volume Wastes

□ The universe of wastes affected by this action is limited to the large-volume wastes generated by coal-fired units at steam electric utility power plants in the United States, including independent power producers not engaged in any other industrial activity (this latter group was included because the Agency has no reason to believe that its wastes and practices are any different than those of larger power plants). These wastes are subject to the regulatory determination only when managed separately from other FFC wastes. Further, the population is limited to wastes from those facilities for which coal is almost the sole fossil-fuel feed.

Information on electric utilities collected since publication of the Report

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to Congress demonstrates that nearly all coal-fired boilers occasionally burn small amounts of natural gas and/or fossil-fuel oil for boiler startup or flame stabilization. While oil ash is a remaining waste outside the scope of today's action, the Agency believes, based on published literature and information collected during site visits, that the burning of oil for startup and flame stabilization results in a de minimis contribution to the total volume of combustion by-products generated by the boiler during normal operations. Similarly, natural gas combustion for boiler startup or flame stabilization results in de minimis ash formation relative to the volume of by-products generated from coal combustion. Accordingly, the total volume of fly ash, bottom ash, slag, and flue gas emission control waste generated by a coal-fired plant that burns oil or natural gas in small quantities for start-up or flame stabilization shall be considered a large-volume waste subject to this determination.

The information collected following publication of the RTC also indicates that some operators occasionally burn materials other than coal in utility boilers, some of which are considered hazardous wastes under RCRA (operators may do so and their residues continue to remain exempt under the Bevill exemption as long as 50 percent of the feed is coal and the residue passes the BIF two-part test if they burn hazardous waste). This practice may be conducted for the purposes of disposal or energy recovery. Wastes from the co-burning of materials were not studied in the RTC, and very limited information regarding their generation, characteristics, and management has been collected to date. The Agency recognizes that the burning of such materials, when practiced in an environmentally sound manner, can be an effective waste management or energy recovery strategy. However, EPA has insufficient data to determine the amount of material burned or the potential influence of burning such materials on the characteristics of the four large-volume wastes. The Agency intends to study the co-burning issue further at a later date, as appropriate. Thus, the large-volume wastes which result from any such burning (with the exception of co-burning with hazardous waste) are outside the scope of this determination. The following paragraph discusses the special case of co-burning hazardous waste and coal.

The residues from those facilities that burn hazardous wastes are subject to the Boiler and Industrial Furnace (BIF) rule under RCRA (40 CFR 266.112). n4 Under the BIF rule, facilities must conduct site-specific sampling and analysis of waste-derived residues to document that hazardous waste burning has not significantly increased concentrations of hazardous constituents in the

□ residues. Because this testing ensures that such wastes are similar to those studied in the RTC, thus making further study of these wastes unnecessary, residues that pass the test are within the scope of today's regulatory determination.

□ n4 The 1981 interpretation at footnote 1 above states that the residues from co-burning enjoy the temporary exemption only when the non-coal material in the feed is burned for its fuel value. This condition, however, was removed for co-burners of hazardous waste in the BIF rule (see preamble discussions at 56 FR 7196-7200, Feb. 21, 1991). For the same reasons cited during that rulemaking, and as a matter of consistency, the Agency no longer imposes such a condition when the non-coal material is not a hazardous waste.

Finally, for the purposes of this action, large-volume wastes from coal-fired electric utilities do not include wastes generated from fluidized bed combustion (FBC) boiler units. FBC is a relatively new combustion technology that allows

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for the removal of sulfur without an end-of-pipe scrubber. The wastes generated by this technology were not studied in the RTC, and only limited information regarding their characteristics and management has been collected to date. The information that is available has not provided EPA with enough evidence to conclude that waste generated from FBC units is substantially similar to conventional boiler wastes. Some sources maintain that FBC units that burn solely coal as a fossil-fuel source generate fly ash and spent bed material that is substantially different from conventional boiler wastes. n5 This is because in FBC, coal is burned in the presence of limestone. The differences in the FBC wastes are defined by a presence of sulfur compounds and high amounts of residual alkalinity. On the other hand, industry representatives believe that the wastes are very similar to the fly ash waste and flue gas emission control wastes studied in the RTC.

n5 United States Environmental Protection Agency, Office of Research and Development, Fluidized-Bed Combustion Technology Overview, EPA-600/7-81-074, April 1981.

The information does indicate that the use of FBC technology in the electric utility industry may be increasing. Because of the current lack of data, the potential of the co-firing of limestone to have a significant effect on the characteristics of the wastes produced, and the potential for increased utilization of the technology, the Agency has decided to defer a decision on these wastes until further information from the growing number of facilities can be examined. Therefore, the Agency considers these wastes "remaining wastes," which are outside the scope of today's regulatory determination.

B. As-Managed Large-Volume Wastes

As described above, large-volume wastes include fly ash, bottom ash, slag, and flue gas emission control wastes [*42470] from coal-fired electric utility boilers. However, the Consent Decree defines large-volume wastes that are "mixed with, co-disposed, co-treated, or otherwise co-managed with other wastes generated in conjunction with the combustion of coal or other fossil-fuels * * *" as remaining wastes. As a result, a waste that may be categorized as large-volume as generated may become a remaining waste by virtue of the circumstances of its management. Remaining wastes are outside the scope of this regulatory determination. (Although these wastes are not covered by today's regulatory determination, these wastes remain exempt from RCRA Subtitle

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C until April 1, 1998, at the latest.)

The RTC found that the level of "co-mixing, co-treatment, co-disposal or co-management" practiced at utility waste disposal sites varies considerably. At one extreme, many or most liquid wastes generated at the plant may be handled

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along with ash in a single impoundment system. At the other extreme, all large-volume wastes may be discharged to units receiving no other materials of any kind. In practice, most utility disposal sites operate somewhere between these extremes, with large-volume wastes discharged into units receiving certain other materials. Depending on the specific materials commingled in a particular management unit, the resulting mixture may be a remaining waste and hence fall outside of the scope of today's action.

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The Agency recognizes that many plant operators use process waters (e.g., non-contact cooling water and low-pressure service water) in ash handling or FGD systems. Because of the continuous use of these process waters, the Agency does not consider them to be wastes. In any event, the use of these process waters as feedwater for emission control systems or for ash transport generally will not increase the environmental risks associated with the wastes relative to the risks derived from utilization of fresh water for the same purposes. Discouraging such practices may lead to an increased usage of fresh water for the same purposes, thereby increasing the total volume of water exposed to the large-volume wastes as well as the total volume of waste generated. The Agency feels that this would be an undesirable outcome of today's action. For these reasons, the Agency does not consider the practice of using these non-contact process waters in ash sluicing systems or as makeup water for FGD systems to constitute co-management. The four large-volume wastes, therefore, that are transported/mixed with these process waters do not become "remaining wastes." Instead, they are within the scope of this Regulatory Determination. These waters are limited to ash hopper seal water, ash hopper cooling water, and other non-contact cooling waters.

The Agency emphasizes that co-management of low-volume wastes and large-volume wastes makes the combined waste stream a remaining waste. Given below is a list of management practices that result in combined waste streams that are remaining wastes. This list, which is not exhaustive, includes those activities observed or believed to occur at operating FFC waste disposal facilities that involve the "mixing, co-treatment, co-disposal, or co-management" of large-volume wastes with low-volume wastes. Remaining wastes as managed include:

Discharge of boiler blowdown to a large-volume waste impoundment,

Discharge of demineralizer regenerant to a large-volume waste impoundment,

Discharge of metal cleaning wastes to a large-volume waste impoundment,

Discharge of boiler chemical cleaning wastes to a large-volume waste impoundment,

Discharge of plant wastewater treatment effluent to a large-volume waste impoundment,

Discharge of coal mill rejects to a large-volume waste impoundment,

□ Disposal of oil ash in a large-volume waste landfill or impoundment,

Disposal of plant wastewater treatment sludge in a large-volume waste landfill,

□ Disposal of coal mill rejects in a large-volume waste landfill, and

Reuse of metal cleaning wastewaters in a FGD feedwater system.

EPA recognizes that it may not have provided a clear understanding of what constitutes co-management since offering the 1981 interpretation of the exemption cited above. Therefore, the Agency may propose a definition of co-management in the future. This is important because low-volume wastes are within the Bevill Exemption only if they are co-managed with large volume waste. Low-volume wastes that are independently managed are not and have never been within the scope of the Bevill Exemption. n6

n6 Industry comments on both the RTC and Notice generally agreed with this interpretation.

III. Factors Considered in Making the Regulatory Determination
RCRA, as amended, directs EPA to make a regulatory determination generally based upon the RTC and comments received from interested parties. The statute contains the eight study parameters identified in Section I.C.2., Study Factors. In addition, RCRA Section 8002(n) suggests that EPA review relevant studies and other actions of other Federal and State agencies and invite participation by other concerned parties, including industry and other Federal and State agencies, with a view toward avoiding duplication of effort.

EPA complied with the congressional mandate in developing, in 1988, the required RTC. In conducting this study, EPA relied upon the analysis of the eight study factors noted above. The Agency has expanded the data base through the collection of additional data referenced in the February 12, 1993, Notice. The Notice also made available, in the RCRA docket, the three-step methodology the Agency was considering using in making this regulatory determination. This basic analytical approach was used in making the regulatory determination for mineral processing wastes (56 FR 27300, June 13, 1991). EPA modified the methodology in this case, however, so that it best fit the available information on the nature and management of the coal-fired electric utility wastes at issue in this determination. The method involves answering a series of questions covering the potential hazards of the wastes, the existing management and regulatory controls that affect the hazards that may be presented, and the potential impacts of regulating the wastes as hazardous under RCRA Subtitle C. This approach allows EPA to make a systematic evaluation of the information presented in the RTC and other information collected pursuant to the Notice. EPA has solicited and incorporated comments on the RTC, the data described in the Notice, and the three-step methodology in making today's regulatory determination. EPA believes that this approach is consistent with congressional intent.

EPA received no comments that disagreed with any aspect of the three-step methodology. Therefore, no changes have been made in the approach. The decision process outlined below presents a series of questions and sub-questions that were addressed in the order posed. If the Agency determined the response to Step

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1 for a waste to be affirmative (e.g., "Yes, management of this waste does pose human health/environmental problems, or might cause problems in the future"), then the analysis proceeded to Step 2 for the waste and constituent(s) of concern. If, however, the answer to Step 1 was negative, then the analysis [*42471] stopped and the Agency determined that regulation of that waste

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under Subtitle C was not warranted. If the analysis proceeded to Step 2 and the response to Step 2 was affirmative (e.g., "Yes, more stringent regulation is necessary and desirable"), analysis then proceeded to Step 3. If the response to Step 2 was negative, however, the analysis stopped and the Agency determined that regulation of that waste under Subtitle C was not warranted. Finally, if the Agency proceeded to Step 3 and found that the consequences of regulating the waste under Subtitle C were substantial and not justified by the risk reduction that could be obtained by subtitle C regulation, then the Agency would determine that subtitle C regulation was not warranted. The opposite conclusion to the question posed by Step 3 would result in a determination that regulation of the waste as hazardous under subtitle C is warranted.

The rationale for the order of questions is that a FFC waste should first be considered to present risk to human health or the environment or a potential risk under plausible mismanagement scenarios before the Agency considers it for regulation under Subtitle C. Second, the Agency should determine that current management practices and existing State and Federal regulatory controls are inadequate to limit the risks posed by a waste, and that Subtitle C regulation would be effective and appropriate, before it considers regulating the waste under Subtitle C. Finally, the special status of the waste requires that the Agency consider the impacts to the industry that regulation under Subtitle C would create in making a decision to regulate the waste as hazardous. The methodology, therefore, allows EPA to systematically narrow its focus to those wastes that do or may present significant risk of harm and for which additional regulatory controls are necessary and desirable.

The discussion below addresses each of the steps and sub-steps in more detail.

Step 1. Does the management of this waste pose human health/environmental problems? Might current practices cause problems in the future?

Critical to the Agency's decision-making process is whether the special waste either has caused or may cause human health or environmental damage. To resolve those issues, EPA has posed the following key questions:

Substep 1. Has the waste, as currently managed, caused documented human health impacts or environmental damage?

Substep 2. Does EPA's analysis indicate that the waste could pose significant risk to human health or the environment at any sites that generate it (or in offsite use), under either current management practices or plausible mismanagement scenarios?

Substep 3. Does the waste exhibit any of the characteristics of hazardous waste?

As described above, the Agency first determined whether each waste may pose human health/environmental problems by examining whether the waste has caused documented human health or environmental damages in the past, whether each

□ waste, as managed, may pose significant risk to human health or the environment, and whether each waste exhibits any of the characteristics of hazardous waste.

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If each of the questions in Step 1 resulted in a negative response, no further review would be performed for that waste, and the Agency would determine that regulation under subtitle C of RCRA is not warranted. However, as with the

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Regulatory Determination for Mineral Processing Special Wastes (56 FR 27305, June 13, 1991), an affirmative response to any one of the three sub-questions above did not necessarily trigger further analysis under Step 2 of the methodology. Rather, the Agency answered each of the three questions separately and then considered the combined responses as a whole in deciding whether further evaluation was necessary. In that consideration, the certainty and weight of evidence supporting an affirmative response to one question was taken into account in the Agency's decision to proceed to Step 2. If the Agency determined that additional review was warranted for a particular waste, additional review under Step 2 was limited to those waste characteristics or waste management practices for which significant potential for risk was identified in Step 1.

The first question the Agency addressed under Step 1 was whether coal combustion waste has caused documented human health impacts or environmental damage. To determine this, the Agency first considered existing damage case information presented in the RTC. EPA examined additional damage case information to determine whether there was further evidence of negative impacts to human health or the environment. The Agency requires that each relevant case satisfy at least one of the following three conditions: scientific investigation concluding that damages occurred, administrative ruling concluding that damages occurred, or court decision or out-of-court settlement concluding that damages occurred. Ideally, damages would clearly be the result of the large-volume coal combustion wastes.

In the Agency's analysis, damage to human health or the environment was considered as follows: Threat to human health included both acute and chronic effects (e.g., exceedences of primary drinking water standards, directly observed health effects, such as elevated blood contaminant levels or loss of life) associated with management of coal-fired electric utility wastes, while danger to the environment included: (1) Impairment of natural resources (e.g., contamination of any source of drinking water reasonably expected to be used), (2) ecological effects resulting in impairment of the structure or function of natural ecosystems and habitats, and (3) effects on wildlife resulting in impairment of terrestrial or aquatic fauna (e.g., reduction in species diversity or density, impairment of reproduction).

To address the second question—"could the waste pose significant risk to human health and the environment under either current management practices or plausible mismanagement scenarios, the Agency performed a two-part assessment of the potential for risk presented by the waste.

First, the Agency conducted a risk screen of intrinsic hazard of the wastes, comparing waste characterization data with conservative screening criteria developed for four exposure pathways: groundwater, surface water, inhalation, and ingestion. The purpose of the risk screen was to identify the waste constituents and exposure pathways that have the potential to present threats to human health and the environment. Exceedences of the screening criteria indicate the need for further study, but do not in themselves demonstrate that the wastes pose a significant hazard.

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Second, for each waste constituent found to exceed the screening criteria, the Agency evaluated the potential for release, transport, and exposure of that constituent for specific pathways. The three exposure pathways evaluated for human health risk were groundwater ingestion, particulate inhalation, and soil

ingestion. The fourth pathway, surface water, was evaluated for ecological risk. The Agency solicited comment in the Notice on excluding from consideration another pathway, radiation exposure, because of insufficient information to perform the required analysis. No comments or supplemental data were received regarding the proposed exclusion. Therefore, EPA did not consider radiation exposure in the analysis. [*42472]

To address the third question of Step 1, the Agency reviewed available waste characterization data to determine whether fly and bottom ash, slag, and FGD sludge exhibit any of the hazardous characteristics. In evaluating toxicity data, the Agency considered both Extraction Procedure (EP) and Toxicity Characteristic Leaching Procedure (TCLP) data, since much of the currently available data on toxicity predates the use of the TCLP.

Several commenters on the RTC claimed that the EP toxicity test is not a valid indication of hazards associated with utility wastes since the test was designed to mimic conditions in acidic municipal landfills rather than homogeneous monofills used by electric utilities. Those commenters concluded that data from the EP test significantly overstate potential risks.

As discussed further in Appendix A to this preamble, EPA has developed the methodology to take into account the eight study factors (Section 8002(n)) set forth in the Bevill Exemption to determine whether hazardous waste regulation is warranted for FFC wastes. While waste characterization data, including both the results of EP toxicity testing and those of other leaching procedures (TCLP, ASTM, etc.), are considered in the decision, they are not the sole basis for determining whether to regulate fossil-fuel combustion wastes under RCRA Subtitle C. The methodology focuses on the risks posed by fossil-fuel combustion wastes as managed (and some ash is currently managed in Subtitle D landfills). EPA therefore believes that consideration of EP toxicity data, in conjunction with the results of other leaching studies and data on the actual environmental impacts of waste management practices, is appropriate.

EPA received limited additional data from commenters to the Notice. The few EP and TCLP results provided were consistent with other samples collected for the purposes of the RTC and the Notice. None of the additional data supplied during the comment period exceeded the hazardous waste criteria.

Step 2. Is more stringent regulation necessary or desirable?

If the Agency determined in Step 1 that the management of fly or bottom ash, slag, or FGD sludge from coal-fired utilities has caused or may potentially cause human health or environmental impacts, then the Agency would proceed to Step 2. In evaluating the need for more stringent controls to address the potential risks associated with the management of these wastes, EPA asked the following questions:

1. Are current practices adequate to limit contaminant release and associated risk?

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2. Are current Federal and State regulatory controls adequate to address the management of the wastes?
 3. Will subtitle C effectively address problems associated with the waste without imposing significant unnecessary controls that are inconsistent with
-
- the special status of the waste?

In Step 2, the Agency looked at waste management practices and existing regulations to examine the potential for release and exposure under current practices. If current management practices or existing regulatory controls were found to be adequate or if Subtitle C was found to be an ineffective or inappropriate regulatory alternative, then the Agency would determine that the waste should not be regulated under Subtitle C. If, on the other hand, current practices or existing regulatory controls were found to be inadequate in controlling potential and actual risks and if subtitle C would be effective, the Agency would proceed to Step 3.

Step 3. What would be the operational and economic consequences of a decision to regulate a special waste under Subtitle C?

If, based upon the previous two steps, the Agency found that a waste presents significant risk despite current management practices and existing regulatory controls and that subtitle C regulation would be effective and appropriate in reducing those risks without imposing unnecessary controls, the Agency would then evaluate the costs and impacts associated with regulating this waste under subtitle C and, possibly, other regulatory scenarios. Costs and impacts would be evaluated in terms of the estimated affected population of generators, the ability of generators to pass on costs of compliance to customers or suppliers, the effect of regulation on domestic energy supply and capacity, and the effect of regulation on beneficial use of the affected waste.

With cases in which the subtitle C scenarios would impose widespread and significant impacts on facilities, reduce domestic capacity or supply, and/or deter safe and beneficial use of the waste, EPA might conclude that regulation under subtitle C is inappropriate. However, EPA might determine that regulation of the waste under subtitle C is warranted if, in the Agency's judgement, the reduction in risk that would result from such regulation would justify the operational and economic consequences to the industry and the economy as a whole. The Agency invited commenters to the Notice to submit information regarding cost data.

IV. Regulatory Determination for Four Large-Volume Coal-Fired Utility Wastes
The following discussion presents EPA's conclusions regarding the regulatory status of large-volume coal-fired utility wastes under RCRA. The determination as to whether regulation of such wastes under Subtitle C is warranted is based upon the February 1988 Report to Congress, comments on the Report to Congress including comments received at the public hearing held in Denver on April 26, 1988, the information collected for the February 12, 1988, Notice, and comments received on the Notice.

Based on all of the available information, EPA has concluded that regulation of the four large-volume fossil-fuel combustion wastes as hazardous waste under RCRA subtitle C is unwarranted. Below are the Agency's responses to each step of the decision methodology.

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□ Step 1. Does the management of this waste pose human health/environmental problems? Might current practices cause problems in the future? The Agency has determined that the answer to this question is yes.

□ Substep 1. Has the waste, as currently managed, caused documented human health impacts or environmental damage?

Response: The Agency has determined that the waste has caused documented impacts, but at a very limited number of sites.

In accordance with the methodology described above, EPA first addressed whether the management of this waste currently poses human health/environmental problems and whether current practices could cause problems in the future. In its examination of potential/actual cases in which danger to human health or the environment could be attributed to the management of fossil-fuel combustion wastes, the RTC included information from several studies that documented occasional exceedences of primary and secondary drinking water standards in groundwater underlying fossil-fuel waste management sites. To supplement the RTC data, EPA conducted State file reviews in States selected for their geographical representation and large coal-fired electricity generation capacity. Overall, both efforts indicate that the extent of actual damage cases/environmental harm associated with large volume FFC waste management appears limited. [*42473]

EPA used the "test of proof" developed to support the Report to Congress on Mineral Processing Wastes to evaluate the potential damage cases. As described in Chapter 2 of that report, the test of proof requires that a case satisfy at least one of three conditions: scientific investigation concluding that damages occurred, administrative ruling concluding that damages occurred, or court decision or out-of-court settlement concluding that damages occurred. For the six damage cases described below, scientific investigation was the measure of proof satisfied, since the data most supported application of this measure.

In applying the test, EPA first considered whether actual documentation exists that shows that human health or environmental harm occurred (e.g., contaminated groundwater in a water supply well, observed impacts on wildlife). Only a limited number of large-volume FFC waste management sites actually meet this criterion and can be considered proven damage cases. These cases include the two sites identified in the RTC, as well as four additional sites identified during recent data collection efforts. EPA notes that of these six cases, only one case can clearly be attributed to fly ash management alone. The remaining five cases are associated with the co-management of the large-volume wastes with other wastes. Because co-management of large and low-volume wastes is the predominant waste management practice, limited information exists on independently managed large-volume wastes.

The RTC described a site that involved a dike failure that caused an accidental release from a fly ash disposal lagoon to a river. This case resulted in substantial damage to river organisms. The other case described in the RTC involved co-management. In this case, a release occurred from a fly ash and petroleum coke waste disposal site that resulted in the contamination of drinking water wells with selenium and vanadium. This site is ranked on the CERCLA (Superfund) National Priority List Site.

EPA's more recent data collection efforts resulted in the identification of

□ four additional sites that are considered proven cases of damage (see the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste, found in Docket no. F-93-FFCA-FFFFF). Each case involves co-management of wastes at older, unlined waste management units. These incidents involved groundwater contamination and/or vegetative

□ damages due to releases from waste management units.

In summary, there is minimal documentation of impacts on drinking water sources in the vicinity of coal-fired utilities. In addition, it is important to note that the damage case sites were chosen for study because of known releases and cannot necessarily be extrapolated to the general universe. Also, most releases have been from unlined units at older sites that in many States are now subject to more stringent design and operating criteria. n7 Furthermore, actual cases of harm to human health or the environment may be limited to a few sites, often with other contributing factors, including additional pollutant sources attributed to the co-management with other FFC and non-FFC wastes. The review of such cases of co-management will be reserved for the "remaining waste" study.

n7 The percentage of units required to meet more stringent design and operating criteria will increase as older units reach capacity (assuming a typical lifetime of 15 years) and new units come on-line (and are subject to these more stringent requirements).

The FFC waste damage case/environmental data collected to date indicate, therefore, that although the extent appears limited, damage to the environment has occurred. Although the releases are often confined to the vicinity of the units and have not reached environmental/human receptors, the potential for exposure necessitates further analysis in Substep 2, which examines the potential risks posed by these wastes.

Substep 2. Does EPA's analysis indicate that the waste could pose significant risk to human health or the environment at any sites that generate coal combustion wastes, under either current management practices or plausible mismanagement scenarios?

Responses: Groundwater contamination and surface water contamination through groundwater recharge are possible under some plausible conditions (unlined units). Available information on the environmental conditions of the sites indicates ecological and natural resource damages are of most concern, because potential for human exposure is limited.

The RTC contains considerable information on the four large-volume coal combustion wastes (fly ash, bottom ash, slag, and flue gas desulfurization (FGD) sludge). Information includes waste characteristics and management practices, environmental factors affecting human exposure potential at disposal sites, and evidence of ecological damage at coal combustion sites. In addition, EPA collected supplemental information from various EPA offices and other Federal agencies, State agencies, and the electric utility industry on waste characterization, management, and potential impacts. This supplemental information included groundwater monitoring data for 43 coal combustion waste sites collected from State regulatory agencies and from EPA site visit reports.

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All data used in this supplemental analysis are available for public inspection in the docket No. F-93-FFCA-FFFFF. A bibliography of the sources used in the risk analysis is found in Appendix A of the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion

□ Waste, also found in Docket no. F-93-FFCA-FFFFF.

The first step of the methodology was to evaluate constituents of concern (identified by waste characterization data) using a risk screen. A risk screen analysis is a process which applies a conservative and simplified methodology

□ to the constituents and pathways to determine if they are of concern. The risk screen compared waste characterization data with screening-level criteria. The screening criteria were developed to identify wastes, constituents, and pathways requiring further analysis; that is, wastes captured by the screen may or may not be of concern. Criteria for 23 constituents (primarily metals) were developed for groundwater, surface water, ingestion, and inhalation exposure pathways using a methodology similar to that used in the mineral processing regulatory determination. (In the cases where the Agency regulatory levels had changed since the mineral processing RTC, the screening criteria were also updated.)

Groundwater exposure criteria were developed using the MCLs set by the Agency to protect drinking water. If no primary MCL had been established for a particular parameter, then a health-based level (HBL) was calculated using Agency cancer slope factors or non-cancer reference doses (RfDs) from IRIS. n8 In instances where the calculated HBL was less than corresponding MCL, both values were considered in the screening.

n8 U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS). (IRIS, November 1992 update).

Screening criteria based on primary MCLs were derived by multiplying the MCL by a factor of 10 to simulate scenarios where only limited dilution of waste leachate occurs prior to exposure. HBLs were derived from IRIS n9 drinking [*42474] water or oral cancer slope factors (CSFs) representing a 1x10 sup - lifetime cancer risk, or RfDs. Calculation of the HBLs relied on the following conservative assumptions: the maximally exposed 70 kg individual drinking 2 liters of water per day, 365 days per year, for a lifetime duration of 70 years. (The 70-year exposure duration was chosen to maintain comparability with the MCLs; this approach is consistent with that taken in the mineral processing regulatory determination.) These assumptions yield the following general equations:

$$\text{HBLsub CSF (mg/l)} = (1 \times 10 \text{ sup } -)(70 \text{ y})(70 \text{ kg}) / \text{open brace (CSF (mg/kg/d) sup } -)(2 \text{ l/d})(70 \text{ y) close brace}$$

$$\text{Hsub RfD (mg/l)} = (\text{RfD mg/kg/day})(70 \text{ kg}) / (2 \text{ l/day})$$

As with the MCL-based criteria, the HBLs were multiplied by a factor of 10 to simulate a scenario where only limited dilution of waste leachate occurs prior to exposure. Groundwater exposure criteria were compared with waste EP Toxicity

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and TCLP analysis results for each of the four waste streams.

n9 Ibid.

The surface water exposure criteria were selected to represent potential harm to aquatic organisms exposed to surface water releases of wastes or waste leachate. The criteria were derived by multiplying the freshwater chronic Ambient Water Quality Criteria (AWQC) for non-human effects by a factor of 100 to simulate a scenario where only limited dilution occurs. Surface water

□ exposure criteria were compared with waste EP Toxicity and TCLP analysis results for the four waste streams.

The ingestion screening criteria were derived from IRIS oral RfDs and oral CSFs, assuming incidental ingestion of solid waste materials. Exposure

□ assumptions are an ingestion rate of 200 mg/day from ages 1 to 6, and 100 mg/day from ages 7 to 31 (resulting in an average of 0.114 g soil/day), an adult receptor weight of 70 kg and an exposure of 350 days/year for 30 years. For CSF-derived values, a life-time averaging 70 years was assumed. These assumptions were then used to calculate the concentration of a constituent in a waste that would result in an exposure equivalent to the RfD or the concentration corresponding to a lifetime cancer risk of 1x10⁻⁶. The equations for RfD- and CSF-based criteria are shown below.

$$\text{Criteria}_{\text{sub RfD}} (\text{mg/g}) = \text{RfD} (\text{mg/kg/d}) \text{ open brace } (70 \text{ kg})(365 \text{ d/y})(30 \text{ y}) \text{ close brace} / \text{open brace } (350 \text{ d/y})(30 \text{ y})(0.114 \text{ g soil/d}) \text{ close brace}$$

$$\text{Criteria}_{\text{sub CSF}} (\text{mg/g}) = \text{open brace } 10^{-6} / \text{CSF} (\text{mg/kg/d}) \text{ sup - close brace} (70 \text{ kg})(365 \text{ d/y})(70 \text{ y}) \text{ close brace} / \text{open brace } (350 \text{ d/y})(30 \text{ y})(0.114 \text{ g soil/d}) \text{ close brace}$$

No dilution factor was employed in deriving the criteria for solid samples. The exposure pathway assumes exposure to particulate whole waste material. Ingestion exposure criteria were compared with waste total constituent analysis results for the four waste streams.

The exposure assumptions used in deriving inhalation exposure criteria include: 50 µg/m³ airborne dust concentration; 10 adult inhalation volume of 20 m³/d; 70 kg body weight; exposure frequency of 350 days per year; exposure duration of 30 years; and, for CSF-derived values, 70 year lifespan (or averaging time) and 1x10⁻⁶ risk of cancer. Note that 50 µg/m³ x 20 m³/d results in a soil exposure rate of 1 mg/d. The equations used to derive the criteria from both inhalation RfDs and inhalation CSFs are shown below:

$$\text{Criteria}_{\text{sub RfD}} (\text{mg/g}) = \text{RfD} (\text{mg/kg/d}) \text{ open brace } (70 \text{ kg})(365 \text{ d/y})(30 \text{ y}) \text{ close brace} / \text{open brace } (350 \text{ d/y})(30 \text{ y})(0.001 \text{ g soil/d}) \text{ close brace}$$

$$\text{Criteria}_{\text{sub CSF}} (\text{mg/g}) = \text{open brace } 10^{-6} / \text{CSF} (\text{mg/kg/d}) \text{ sup - close brace} \text{ open brace } (70 \text{ kg})(365 \text{ d/y})(70 \text{ y}) \text{ close brace} / \text{open brace } (350 \text{ d/y})(30 \text{ y})(0.001 \text{ g soil/d}) \text{ close brace}$$

g soil/d) close brace

Again; no dilution factor was employed in deriving the criteria for solid samples. The exposure pathway assumes exposure to particulate whole waste material. Inhalation exposure criteria were compared with waste total constituent analysis results for the four waste streams.

10 50 $\mu\text{g}/\text{m}^3$ is the National Ambient Air Quality Standard for annual exposure to particulates.

The screening criteria described above were then compared to EP, TCLP, and total constituent data from the RTC and subsequent data collection efforts. For all waste constituents that exceeded a screening-level criterion at more than 10 percent of the sites sampled, or exceeded the criteria by more than a factor of 10, further analysis was conducted. A summary of screening criteria exceedences, reported by waste type and by exposure pathway, can be found in Appendix C of

□ the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste.

The results of the risk screening suggest that of the large-volume wastes, fly ash and FGD sludge are of most concern. The risk screen also identified

□ groundwater, surface water, and inhalation as exposure pathways needing further analysis. The constituents needing further analysis included arsenic, cadmium, chromium, lead, mercury, nickel, Pb, selenium, and silver.

The Agency then evaluated the release, transport, and exposure potential of those constituents, wastes, and pathways for which the risk screen indicated that further analysis was necessary. When available, monitoring data were used to determine the potential for human and environmental exposure. In other cases, information on the physical setting of coal combustion waste sites and on the waste management practices was used to evaluate exposure potential. In the case of the inhalation pathway, the potential for human health risk was evaluated using an atmospheric fate and transport model. For the inhalation pathway, the potential for human health risk, when evaluated using an atmospheric fate and transport model, was found to be negligible. For more information on the air pathway analysis, please consult the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste. Further analyses of the groundwater and surface water pathway are summarized below.

Groundwater monitoring data were used in both the groundwater and surface water exposure pathway analyses. A summary table of the groundwater monitoring sites is in Appendix D of the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste found in the docket. When interpreting the groundwater monitoring data, the Agency took several factors into account.

First, many of the sites may have co-managed their coal combustion wastes with other wastes, such as boiler cleaning solution or pyrites. The extent to which these other wastes may have contributed to groundwater contamination could

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not be conclusively determined, because it was difficult to assess in many cases whether co-management had occurred and without this information, it was not possible to separate the effects of the large-volume wastes from the other wastes. However, at least two site operators asserted that they believed that co-managed wastes, and not the large-volume wastes, were the cause of groundwater contamination. The Agency took the presence of co-managed wastes into account when evaluating the risk from the large-volume coal combustion wastes.

Second, some of the sites have other possible sources of contamination nearby. To the extent that they can be determined, these sources are noted in the summary table referenced above. Finally, in the case of some contaminants (e.g., iron), naturally occurring levels may be quite high. Again, to the extent that naturally occurring constituents can be [*42475] determined to be adding to downgradient concentrations, this is noted in the summary table.

with these considerations in mind, the Agency determined that available data from coal combustion waste landfills and surface impoundments demonstrated the existence of potential for human exposure to groundwater contamination, because coal combustion waste constituents identified in the risk screen as needing further study were found to be leaching onsite in excess of the primary MCLs.

□ Subsequent analyses of coal combustion waste sites suggest, however, that potential for actual human exposure is very limited.

For example, nine sites of the forty-nine sites with groundwater monitoring data had contaminants above the MCL that appeared to stem from coal combustion

□ units. (Another ten sites had upgradient concentrations equal to downgradient concentrations, other possible sources of groundwater contamination, or (in two cases) a lack of upgradient information, preventing any conclusions about the effects of the coal combustion units on groundwater contamination.) Constituents with exceedences include arsenic, barium, cadmium, chromium, fluoride, lead, mercury, nickel, and selenium. Of the nine sites, none were completely lined, although one site had a clay-lined disposal unit with an under-drain emptying into a series of unlined ponds. All nine sites have older (pre-1975) units, four consisting of surface impoundments, four consisting of landfills, and one with both types of units. Fly ash was the principal waste disposed of in all units. Four sites of the nine also are known to have accepted co-managed wastes (pyrites, boiler cleaning wastes, demineralizer regenerant, oil ash, etc.), and the others may have as well.

Potential for human exposure to groundwater contaminants from coal combustion wastes is limited because of the location of most coal combustion sites. Based on a random study (found in the RTC) of one hundred sites, only 29 percent of the sites have any population within 1 kilometer, and only 34 percent of the sites have public drinking water systems within 5 kilometers. Although infiltration and transportation of contaminants in groundwater varies with site- or regional-specific factors (such as depth to groundwater, hydraulic conductivity, soil type, and net recharge), exposure to coal combustion waste groundwater contaminants 5 kilometers from the source of contamination is not expected to occur. Of the public drinking water systems within 5 kilometers of coal combustion waste sites, just under half (47 percent) are expected to treat the groundwater for hardness (i.e., these systems have groundwater with over 240 ppm CaCO₃), which would tend to remove co-contaminant metals as well.

Coal combustion units also tend to be near surface water bodies. The same RTC study revealed that 58 percent of the sites are within 500 meters of a surface water body. The volume and flow rate of surface water would tend to dilute and divert the contaminant plume.

In addition, groundwater contamination appears to be attributable to past management practices. As the Agency's groundwater monitoring data outlines above, all of the nine sites with a clear indication of groundwater contamination are older (pre-1975), unlined units. (In contrast, of the 13 lined sites, only one had exceedences of an MCL, and that site had equal concentrations upgradient and downgradient.)

Finally, some of the groundwater contamination may be attributable to co-management with other wastes, such as pyrites, boiler cleaning waste, and demineralizer regenerant. Because of the prevalence of co-management (several public comments on the RTC reported that the predominant industry practice is to co-dispose of low-volume wastes in ash or flue gas emission control waste ponds), the large-volume waste may not be the sole contributor to the groundwater contamination. Two of the nine sites report that co-management is the cause of the contamination.

In conclusion, hazardous constituents in coal combustion waste (particularly

□ in fly ash and flue gas emission control waste) have the potential to leach into groundwater under certain conditions. Contaminants of concern include arsenic, cadmium, chromium, lead, mercury, and selenium. Available data suggest, however, that contamination stems from older, unlined units representing past practices, and that the units are not typically located near populations and drinking

□ water systems. In addition, the sites within 5 kilometers of public drinking water systems, about half have groundwater with over 240 ppm CaCosub 3 and are therefore expected to treat the water for hardness, thus removing co-contaminant metals as well. Furthermore, at least some of the groundwater contamination is attributable to other wastes managed with the large-volume coal combustion wastes. Thus, potential for human exposure solely from the large-volume coal combustion waste from current management practices is limited.

An examination of the surface water pathway reveals that, although direct discharge of untreated coal combustion waste to surface water is not likely because of Clean Water Act controls, a few of the coal combustion waste constituents have the potential in some instances, to affect nearby vegetation and aquatic organisms by migration through shallow groundwater to nearby surface waters. This was observed at one site where migration of boron to a nearby wetland was determined by the State to be the cause of vegetative damage. In many cases, natural attenuation processes are expected to dilute the contaminants below levels of concern. For example, if contaminants reach surface waters, the volume of surface water and its high flow rate could dilute the contaminants. For those sites whose nearby water bodies may have a low flow rate (e.g., lakes, swamps, or marshes), however, coal combustion waste may cause local environmental damages, as was observed at the above site.

Even when contaminated groundwater does not affect human health and the

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environment, it may be considered to have caused impacts that limit future use of that groundwater. In particular, available data suggest that the groundwater at a number of coal combustion waste sites is contaminated above secondary MCLs (SMCLs) by such secondary parameters as iron, manganese, sulfate, and total dissolved solids, although these effects may be localized through dilution and attenuation. The SMCLs are guidelines generally set to be protective of such aesthetic considerations as taste, odor, potential to stain laundry, and human cosmetic effects such as tooth and skin staining.

In addition to being disposed of in landfills and surface impoundments, coal combustion ash is often beneficially used both onsite and offsite. EPA continues to encourage the beneficial use of coal combustion wastes. Because most offsite applications tend to immobilize the coal combustion waste (e.g., fly ash used to make concrete), adverse impacts appear to be unlikely. However, if fly ash is applied directly to agricultural soil, there is some concern with metals uptake by food crops and cattle feed. In addition, boron in the coal ash is readily mobilized and has a phytotoxic effect on plants. Although coal ash is not frequently used in agriculture, any [*42476] agricultural use of coal combustion waste should be carefully evaluated. n11

n11 Characterization of Coal Creek Station Fly Ash for Utilization Potential, Energy and Environmental Research Center, February 1993 (see Docket No. F-93-FFCA-FFFFF).

Substep 3: Does the waste exhibit any of the characteristics of hazardous waste?

□

Response: The Agency has determined that these wastes exhibit the characteristics of hazardous waste infrequently, from 0 to 7 percent of the samples depending on waste type.

□

The RTC concludes that although coal combustion waste may leach contaminants (arsenic, cadmium, chromium, lead, and mercury) above toxicity characteristic regulatory levels, such exceedences are infrequent and the average concentrations of constituents are below characteristically toxic levels. A full bibliography of the sources of EP and TCLP data and a summary of the results are given in Appendices A and B of the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste.

The results of Step 1 of the analysis indicate that the wastes rarely exhibit any characteristics of hazardous waste and the waste pose very limited risk to human health or the environment under certain scenarios, such as unlined units sited over shallow groundwater with nearby drinking water wells. Furthermore, since most releases have occurred at unlined older sites, EPA recognized that a review of current waste management practices and regulatory control governing these practices was appropriate as outlined in Step 2 of the methodology, which assesses the need for more stringent regulation.

Step 2: Is more stringent regulation necessary or desirable? The Agency has determined that the answer is no. EPA regulation is not necessary or desirable.

In evaluating the need for more stringent controls to address the potential risks associated with the management of these wastes, EPA first evaluated the

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adequacy of current industry waste management practices in limiting contaminant release and associated risk. The Agency then viewed the adequacy of current State and Federal regulatory controls addressing these wastes. For the purposes of this analysis, EPA supplemented the data supplied in the RTC with site visits, a 1992 EPA study under which the Agency obtained and reviewed State regulations applicable to FFC waste management, the Department of Energy's 1991 report entitled Coal Combustion Waste Disposal: Update of State Regulations and Cost Data, dialogue with industry and State representatives, the Electric Power Research Institute's Facility Design and Installation Manual (1991), State file searches, and literature reviews.

Substep 1. Are current practices adequate to limit contaminant release and associated risk?

Response: The Agency has determined that industry practices are moving toward increased use of control measures (liners, covers, etc.) and groundwater monitoring.

The Agency's data on current practices indicate that industry is moving toward an increased use of control measures (e.g., liners, covers) and groundwater monitoring. For example, the RTC noted that before 1975, less than 20 percent of units (surface impoundments and landfills) in the United States for which data were available had installed some form of liner. More recent data (EEI's Power Statistics Database, 1989) suggest that 13 to 29 percent of surface impoundments for which data are available, have some form of liner and that 41 to 43 percent of landfills have some form of liner. As the damage case and groundwater monitoring information suggests, most of the releases have occurred at older, unlined units. EPA has observed during site visits that newer units

□ are generally lined. Furthermore, most newer utility waste management facilities have groundwater monitoring systems, and many also have leachate collection systems. Despite the positive trends in management of FFC wastes, some of these units may be sited with inadequate controls. Therefore, in addition to viewing industry management practices, EPA collected and evaluated information on the

□ extent of current State and Federal regulation of coal-fired utility waste management.

Substep 2. Are current Federal and State regulatory controls adequate to address the management of the waste?

Response: Effluent limitations in the Clean Water Act regulations for steam electric power plants under 40 CFR part 423 require no discharge from new fly ash ponds. State programs are generally adequate and are improving, with most States now requiring permits and minimum design and operating criteria that would address likely risks. Additionally, Federal authorities exist to address site-specific problems posing threats to human health and the environment under RCRA Section 7003 and CERCLA Sections 104 and 106.

The RTC included information on coal-fired electric utility waste regulation in all 50 States. In updating this information, EPA conducted a review of States that were selected according to the high levels of ash generated in those States. This approach resulted in a study universe of 17 States that generate

approximately 70 percent of all coal ash in the United States.

The data show that States have generally implemented more stringent regulations for FFC waste since 1983 (when the State regulation review was conducted for the RTC). Under developing State industrial solid waste management programs, coal-fired utilities are more frequently being required to meet waste testing standards, and waste management units often must comply with design and operating requirements (e.g., liners and groundwater monitoring standards).

Of the 17 States for which EPA updated the RTC data, 14 regulate coal-fired utility wastes as solid wastes, explicitly exempting them from hazardous waste regulation; 12 16 States require offsite FFC waste management units to have some type of operating permit, with design and operating criteria varying by State; 12 have mandatory liner requirements, while three States provide for discretionary authority to impose liner requirements on a site-specific basis; 12 impose mandatory groundwater monitoring requirements on FFC waste disposal sites; and 16 impose final cover requirements. In addition, some States have been working to reduce the threat of groundwater and surface water contamination, by discouraging the use of wet management in ponds as a disposal practice (through permitting requirements and location restrictions). On the Federal level, National Pollutant Discharge Elimination System permits under the Clean Water Act regulate all direct discharges to surface water. Effluent limitations under 40 CFR part 423 govern steam electric power generating point sources and require no (zero) discharge to surface waters from new source fly ash transport waters (40 CFR 423.15(g)).

12 Of the remaining three States, two States establish requirements based on waste characteristics and one exempts these wastes from their solid and hazardous waste management program.

Considering industry's trend toward more protective waste management practices, the fact that State regulatory programs are generally adequate, and

□ because Federal authorities exist that can address these wastes, EPA has concluded that current management practices and regulatory controls are adequate for managing the four large-volume FFC wastes. [*42477]

□ Substep 3. would subtitle C effectively address the problems associated with the waste without imposing significant unnecessary controls?

Response: The Agency has determined that it is unlikely that subtitle C would effectively address the problems associated with the four large-volume fossil-fuel combustion wastes without imposing unnecessary controls.

After reviewing industry practices and current State and Federal regulation, EPA reviewed the alternative scenario of regulating the four large-volume FFC wastes under Subtitle C. First, it was recognized that coal combustion wastes rarely exceed the RCRA characteristics for hazardous waste, and therefore, that most coal combustion wastes would not be subject to Subtitle C controls unless they were listed as hazardous wastes. Furthermore, it was noted that even if these wastes were listed as hazardous, and therefore, regulated under subtitle C, such an approach would be inappropriate for these wastes. A Subtitle C system would require coal combustion units to obtain a Subtitle C permit (which would

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unnecessarily duplicate existing State requirements) and would establish a series of waste unit design and operating requirements for these wastes, which would generally be in excess of requirements to protect human health and the environment. For example, if such wastes were placed in the Subtitle C universe, all ash disposal units would be required to meet specific liner and monitoring requirements. Since FFC sites vary widely in terms of topographical, geological, climatological, and hydrological characteristics (e.g., depth to groundwater, annual rainfall, distance to drinking water sources, soil type) and the wastes' potential to leach into the groundwater and travel to exposure points is linked to such factors, it is more appropriate for individual States to have the flexibility necessary to tailor specific controls to the site or region specific risks posed by these wastes.

EPA also reviewed the comments received in response to the 1988 RTC and the Notice. Comments received on the RTC showed unanimous support for EPA's initial recommendation that large-volume combustion wastes do not warrant regulation under RCRA Subtitle C. Specifically, the commenters felt that current Subtitle D criteria, together with existing State regulations, have proved adequate to protect human health and the environment. Furthermore, of the respondents to the Notice who addressed the recommendation that large-volume combustion wastes do not warrant regulation under Subtitle C, all agreed that the supplemental data support this recommendation.

For these reasons, EPA concludes that Subtitle C is inappropriate to address the problems associated with these wastes and that the site or region specific State approach is appropriate for addressing the limited human health and environmental risks involved with the disposal of FFC wastes. The Agency encourages States to continue to develop and implement site-specific approaches to these wastes. EPA believes that industry and the States should continue to review the appropriate management of these wastes. EPA will also consider these wastes during the Agency's ongoing assessment of industrial non-hazardous wastes under RCRA Subtitle D. Should the characteristics of the waste streams change as a result of implementation of any provisions of the Clean Air Act as amended in 1990, the Agency may choose to reexamine the exemption.

□ Step 3. What would be the operational and economic consequences of a decision to regulate a special waste under Subtitle C?

□ Although the analysis never reached this point, EPA's preliminary examination of potential costs under Subtitle C indicates that annual costs of full Subtitle C controls would range between \$ 100 and \$ 500 million per year. This assumes that these wastes would be listed as hazardous in RCRA part 261, subpart D. However, if these wastes were not listed, the wastes would often not be subject to Subtitle C, since they rarely test characteristically hazardous pursuant to part 261, subpart C. Subtitle C controls include groundwater monitoring, liners, leachate collection, closure/covers, dust control, financial assurance, location restrictions, and corrective action.

V. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980 (Pub.L. 96-354), requires Federal regulatory agencies to consider the impact of rulemaking on "small entities." If a rulemaking will have a significant impact on small entities, agencies must consider regulatory alternatives that minimize economic impact.

Today's decision does not affect any small entity. Rather, it continues to

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exempt the four large-volume wastes from coal-fired electric utilities from regulation as hazardous wastes. Accordingly, this action will not add any economic burdens to any affected entities, small or large. Therefore, a regulatory flexibility analysis is not required. Pursuant to Section 605(b) of the RFA, 5 U.S.C. 605(b), the Administrator certifies that this rule will not have a significant impact on small entities.

VI. Regulatory Determination Docket

Documents related to this regulatory determination are available for inspection at the docket.

The EPA RCRA docket is located at the following address: United States Environmental Protection Agency, EPA RCRA Docket, room M2427, 401 M Street SW., Washington, DC 20460.

The docket is open from 9 a.m. to 4 p.m., Monday through Friday, except for Federal holidays. The public must make an appointment to review docket materials. Call the docket clerk at (202) 260-9327 to make an appointment.

Dated: August 2, 1993.

Carol M. Browner,

Administrator.

Appendix A-Analysis of and Responses to Public Comments on the Report to Congress

The 1988 Report to Congress: Wastes from the Combustion of Coal by Electric Utility Power Plants concluded with three recommendations. Comments on the RTC were largely organized in response to those recommendations. The summarized

□ comments and EPA's response to those comments follow each recommendation, printed in bold below.

(1) EPA has concluded that coal combustion waste streams generally do not exhibit hazardous characteristics under current RCRA regulations. EPA does not

□ intend to regulate under subtitle C fly ash, bottom ash, boiler slag, and flue gas emission control wastes.

All respondents agreed with and supported the RTC's first recommendation that high-volume combustion wastes do not warrant regulation under Subtitle C. They concluded that current subtitle D criteria, together with existing State regulations, have proved adequate to protect human health and the environment.

Several commenters claimed that the EP toxicity test is not a valid indication of the hazards associated with utility wastes since the test was

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designed to mimic conditions in acidic municipal landfills rather than homogeneous monofills used by electric utilities. They claim, therefore, that data from the EP test significantly overstate potential risks.

As noted in the RTC and by several commenters, the Bevill Exemption requires EPA to consider eight factors (Section 8002(n)) in determining [*42478] whether hazardous waste regulation is warranted for fossil-fuel combustion wastes. To that end, EPA has developed the methodology identified in the Notice that takes into account all of these factors. While waste characterization data, including the results of EP toxicity testing as well as other leaching procedures (TCLP, ASTM, and batch/column) are considered in the decision, they are not the sole basis for determining whether to regulate FFC wastes as hazardous. The methodology specifically focuses on the risks posed by FFC wastes as they are actually managed.

EPA acknowledges that EP toxicity test results may not always represent the leaching potential of hazardous constituents from FFC wastes. However, some ash is (or could be) managed in offsite Subtitle D landfills. Furthermore, EPA has found significant variability in the leaching characteristics of FFC wastes, depending on the fossil-fuel source and boiler operating conditions. Therefore, EPA believes that consideration of EP toxicity data, in conjunction with the results of other leaching studies and data on the actual environmental impacts of waste management practices, is appropriate. Finally, EPA's data show that EP toxicity test results for the four large-volume wastes are not inconsistent with leach tests conducted using ASTM, batch/column, and TCLP methods (see February, 1988 RTC).

(2) EPA is concerned that several other wastes from coal-fired utilities may exhibit the hazardous characteristics of corrosivity or EP toxicity and merit regulation under Subtitle C. EPA intends to consider whether these waste streams should be regulated under Subtitle C of RCRA based on further study and information obtained during the public comment period.

Nineteen of the twenty-two respondents commented on the RTC's second recommendation to study low-volume wastes further and consider regulating these wastes under RCRA Subtitle C. All 19 respondents disagreed with the recommendation to regulate any low-volume wastes under Subtitle C.

Several commenters claimed that insufficient data existed to support a Regulatory Determination for low-volume wastes. EPA concurs with these comments.

□ The Agency intends to study co-managed low-volume wastes further to obtain sufficient data to make a Regulatory Determination. Low-volume wastes managed independently are outside the scope of the Bevill Exemption.

□ Many comments maintained that Subtitle C regulation is not warranted for low-volume wastes co-managed with large-volume coal combustion wastes. Some commenters claimed that the predominant industry practice is to co-dispose of low-volume wastes in ash or FGD sludge ponds (several commenters referenced the 1985 Radian study and the 1982 EnviroSphere report). Such co-management was claimed to be practical, effective, and environmentally sound. The report acknowledges that this practice may reduce the potential hazard of low-volume wastes, by neutralization or dilution. Commenters emphasized that no adverse environmental impacts from the co-disposal of high-volume and low-volume wastes

have been shown in studies by the electric utility industry and EPA and that none were cited in the RTC.

EPA acknowledges that the RTC contained very limited information on the extent and potential environmental impacts of co-management of low-volume wastes with ash, slag, and FGD wastes. In fact, although the Agency has information verifying that co-management does occur, there is limited information clarifying the amounts and types of co-management. Indeed, this was the reason EPA reached no tentative conclusions regarding these practices. Comprehensive studies were available for fewer than five of the hundreds of existing co-management sites. EPA's efforts to compile more recent data continue to show limited information on the effects of co-management. However, some information suggests that at several large-volume waste management sites where groundwater impacts have been detected (see data in the RCRA Docket), the operators have suggested that the cause of the contamination is co-management with low-volume wastes. Of specific concern are pyrites and chemical boiler cleaning wastes. Further, the Agency has observed that the general trend in the industry is to segregate certain low-volume wastes (i.e., pyrites, boiler cleaning wastes, and demineralizer regenerant) from ash, slag, and FGD sludge.

The Agency believes that additional data collection for the low-volume wastes co-managed with the large-volume wastes described in the report is required and is deferring a final Regulatory Determination for co-managed wastes, pending completion of further studies. Co-managed low-volume wastes remain exempt from hazardous waste regulation, however, until such a determination is made. As required under the Bevill Exemption, the Agency emphasizes that the decision on remaining wastes will be based on all Section 8002(n) study factors, not on waste characterization data alone.

As discussed in the scope section of this determination, the Agency does not consider process waters (e.g., non-contact cooling water and low-pressure service water) used in ash handling or FGD systems to be wastes. Also, the continuous use of these process waters as feedwater for emission control systems or for ash transport generally will not increase the environmental risks associated with the wastes relative to the risks derived from utilization of fresh water for the same purposes. Discouraging such practices may lead to an increased usage of fresh water for the same purposes, thereby increasing the total volume of water exposed to the large-volume wastes as well as the total volume of waste generated. The Agency believes that this would be an undesirable outcome of today's action. For these reasons, the Agency does not consider the practice of using these non-contact process waters in ash sluicing systems or as

□
makeup water for FGD systems to constitute co-management.

One commenter thought that the limitations applied to discharges of pollutants from ash disposal facilities under the National Pollutant Discharge Elimination System adequately protect the environment and that additional

□
regulations would be redundant.

The Agency does not concur with the commenter that meeting NPDES permit limits at surface water discharge points alone is necessarily adequate to ensure groundwater protection. For example, FFC waste management units may not have surface water discharges, and, therefore, might not be required to have NPDES

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permits. Even if NPDES-permitted, these units may generate leachate that could affect underlying groundwater. Although some States may use Federal NPDES permit requirements to protect groundwater resources, the Clean Water Act and the NPDES program generally focus on protecting surface water quality.

One commenter referred to a 1976 study conducted by an electric utility company in which both bench (laboratory) and field tests were conducted. The purpose of the study was to demonstrate to EPA, for purposes of meeting the effluent limitations of a NPDES permit, that co-disposal of two boiler cleaning wastes with ash in ash ponds provided treatment equivalent to that available from a dedicated waste treatment facility. The bench tests showed 99 percent treatment for metals. The commenter maintained that the [*42479] low-volume wastes were effectively treated without any increase in risk from the high-volume wastes (and the waste management unit) into which they were added.

EPA acknowledges that the referenced study does demonstrate that a level of Ph adjustment can be achieved over a period of time so that NPDES permit limits can be met. However, the study does not address protection of the groundwater underlying the impoundment. Further, the study provides data for only two types of boiler cleaning solution mixed with ash from a single plant. Because of the variability in types of boiler cleaning solutions and ash characteristics and the relative paucity of data on low-volume wastes and co-management in general (and the consequent uncertainty related to the environmental impacts of co-management), the Agency believes that further study is required.

Several commenters claimed that EPA appeared to have selectively included data from EP test results for boiler cleaning wastes and other low-volume waste streams in the RTC (Exhibits 5-5 and 5-6). Exhibit 5-5 (taken from the 1985 Radian study) presents test results for two treated and three untreated boiler cleaning waste streams. The commenters noted that the Radian study sets forth data for four untreated and four treated waste streams. None of the results for the streams omitted in the report exceeds the EP toxicity limits. To the extent that only the untreated waste streams for which an exceedence was shown are included in the report, the commenters maintained that observations on those results are overstated.

In addition, the commenters felt that the report was similarly selective in reporting "EP Toxicity Test Results for Liquid Low-Volume Wastes" (taken from the 1987 Radian study) shown in Exhibit 5-6. Where the original data included 17 boiler cleaning wastes and 7 waterside rinse tests, the report included only 10 boiler cleaning wastes and 3 waterside wastes in Exhibit 5-6. Additionally, by omitting the "less than" sign next to many of the values, there was concern that the report gives a false impression that a reading is a positive value, when actually the value was below the detection limit. It was also pointed out that

□ this omission factors into the calculation of the geometric mean for the samples.

EPA acknowledges the comments. The intent was not to overstate or overemphasize the frequency or magnitude of observed concentrations of

□ constituents in leachate. Rather, EPA was attempting simply to present data that illustrated the concentrations that could be observed. In its Regulatory Determination on the wastes, EPA considered all data (including non-detects),

rather than only selected observations.

One commenter noted that the boiler cleaning wastewaters from the initial acid wash stage and subsequent rinses should not be considered separately because they are typically combined and managed together as a single waste stream. The commenter noted that the report shows these fluids as separate waste streams and includes data for each stream in Exhibit 5-6. If the data were collected on these fluids as a unified stream, the commenter claimed that the resulting boiler cleaning waste would likely not, exceed any of the current limits for EP toxicity.

The commenter went on to say that even if certain boiler cleaning wastes may, in certain circumstances, test hazardous as generated, this fact should not trigger Subtitle C regulation. The commenter emphasized that co-disposed boiler cleaning waste does not present a hazard and that this critical fact is acknowledged in the RTC.

The Agency has found that some utilities do manage the wastes generated during different stages of the waterside boiler tube cleaning operations separately, at least for some period of time. Therefore, the Agency believes that it is appropriate to consider waste characterization data for the distinct streams (as well as for combined streams). As noted previously, the Agency does not believe that the RTC and other currently available information provide sufficient data to complete a Regulatory Determination for boiler chemical cleaning wastes co-managed with large-volume wastes at this time.

One commenter cited data on 17 untreated waterside boiler cleaning wastes (which include ethylene-diamine-triacetic acid (EDTA), hydroxyacetic-formic acid, and ammoniated bromate and hydrochloric acid). Only one sample (or 5.8 per cent) showed an exceedence of the EP limits, for total lead with a concentration of 6.67 mg/l. The average lead concentration for all 17 samples was 1.43 mg/l with a median value of 0.5 mg/l. None of the 17 waterside boiler cleaning waste samples was corrosive.

Another commenter cited company data for 69 samples of waterside boiler cleaning wastes (which include EDTA, hydroxyacetic-formic acid, and citric acid). Among these samples, only 15 (or 22 percent) showed exceedences of the EP limits. Thirteen of these exceedences were for total chromium and two were for total lead. The average total chromium concentration for all 69 samples was 3.41 mg/l with a median value of 2.08 mg/l. The average total lead concentration was 1.23 mg/l with a median value of 0.56 mg/l. The commenter emphasized that these values were all considerably less than those cited in the RTC.

In addition, the company tested several of the same waterside boiler cleaning wastes for hexavalent chromium under the EP toxicity test procedure. Of the 16 samples so tested, only 1 showed a concentration of hexavalent chromium above the detection limit of 0.02 mg/l. Two of the 16 tested samples, exceeded 5.0

mg/l for total chromium concentrations. All 17 of the other samples showed concentrations of hexavalent chromium below the detection limit.

EPA acknowledges these comments and would welcome the opportunity to review any additional data. The averages for lead and chromium cited by the

□ commenters are indeed lower than those cited in the RTC. However, because some boiler cleaning chemicals appear to exhibit hazardous waste characteristics and the data on the impacts of their management with large-volume wastes are limited, the Agency believes further study is necessary before a final regulatory determination is made.

Several commenters claimed that the costs of managing low-volume wastes under Subtitle C would be very high. Some commenters felt that such management would necessitate transporting these wastes offsite, thereby posing risks of environmental releases without significant environmental benefit. Other commenters observed that continuing to manage these wastes onsite would require that the disposal facilities become treatment, storage, or disposal facilities.

As noted previously, EPA is deferring a final determination on low-volume wastes co-managed with the four large-volume wastes, pending additional data collection. As necessary and in accordance with the Section 8002(n) study factors, EPA will consider the potential cost impacts in making a determination for these wastes. Low-volume wastes managed independently are not and never have been within the scope of the Bevill Exemption.

The Agency also recognizes that transporting hazardous wastes may pose risks of environmental releases. However, regulations have been developed to ensure that hazardous wastes are transported in a manner [*42480] sufficient to protect human health and the environment (see 40 CFR @ 263).

Many commenters stated that when low-volume wastes are co-managed with high-volume wastes, the Bevill Amendment forbids EPA from regulating them until the Agency addresses each of the Section 8002(n) factors in its study and bases its determination on all of those factors. These commenters maintained that EPA may not rely solely on the outcome of a waste characteristic test as the basis of its Regulatory Determination regarding these wastes and this management process. They went on to say that the record assembled in the Report to Congress presents no evidence of environmental risk associated either with this co-management practice or with the co-disposed wastes and contains no information or findings as to many of the remaining Section 8002(n) factors.

For the reasons cited above, the data are insufficient to assess fully the potential risks associated with present co-disposal practices. As discussed, EPA does not intend to rely solely on waste characterization data as the basis of its Regulatory Determination for remaining wastes. The Agency acknowledges that many of the 8002(n) study factors have not been considered for low-volume wastes co-managed with high-volume wastes. EPA plans to address these study factors before we make a final regulatory determination on these wastes.

(3) EPA encourages the utilization of coal combustion wastes as one method for reducing the amount of these wastes that need to be disposed to the extent that such utilization can be done in an environmentally safe manner.

While all respondents agreed with the RTC's third recommendation encouraging coal combustion waste utilization, several qualifying comments were received.

□ One commenter noted that, while the RTC is correct in requiring that

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utilization to be done in an environmentally safe manner, Congress needs to be equally concerned that waste utilization is done in a structurally safe manner. This commenter claimed that the RTC's assertion, "all types of coal ash are

□ appropriate for use as construction materials, as cement additives, and for several other uses," is entirely erroneous. The commenter stated that the RTC contradicts this statement further on by delineating some of the reasons why some fly ashes are not appropriate for use in construction. All materials used in engineering construction work are required to comply with appropriate ASTM standards. Regarding utilization in concrete, the commenter felt that the RTC must cite the appropriate ASTM Standard C618.

EPA acknowledges and agrees with the comment. However, it is not within EPA's authority to mandate structural requirements, except where they may affect the potential for environmental impacts.

In a recommendation on utilization, one commenter pointed out that the RTC encourages this practice "to the extent that it can be done in an environmentally safe manner." The commenter cited the report's statement that "current waste utilization practices appear to be done in an environmentally safe manner." The commenter claims that there is no delineation between practices that are environmentally safe and ones that are not environmentally safe.

To date, and using the limited data available, the Agency has not found any environmental damages associated with the utilization of large-volume coal-fired utility wastes. However, the Agency agrees with the commenter that utilization of coal combustion wastes should be done in a manner fully protective of the environment and consistent with existing Federal and State regulations.

Several commenters disagreed with the RTC where it stated that the potential for significantly increasing the amount of waste utilization may be limited. Given current utilization techniques, the report predicts that the major portion of coal combustion wastes will continue to be land disposed. Some commenters felt that reluctance toward waste utilization is largely due to the stigma of classifying the by-products as "waste" and that EPA should remove "beneficially used coal ash" from the definition of "solid waste".

Some commenters also noted that in enacting RCRA, Congress intended that EPA take a more active role in resource conservation and recovery. They thought EPA should give stronger support for additional use and market development with the emphasis placed on large-volume utilization. It was noted that some States have exempted ash for reuse from their solid waste programs and recommended that the Agency support State efforts to authorize the use of coal combustion by-products.

These commenters claimed that considerable attention was directed to limited cases of adverse impact in the RTC. They maintained that EPA should acknowledge in its Regulatory Determination that a selective ash characterization program coupled with good engineering practice would ensure environmental acceptability of large-volume ash applications. The Agency should take a leadership role by issuing procurement guidelines related to the use of coal ash in high-volume applications within the transportation and construction industries. Such high-volume applications would include the use of coal ash as structural fills,

□ road embankments, and backfills.

The Agency notes that Congress specifically mandates in RCRA Section 8002(n) that the Agency consider the cases of adverse impact. The Agency encourages utilization of coal combustion byproducts and supports State efforts to

□ promote utilization in an environmentally beneficial manner. EPA notes that the Agency has issued a procurement guideline to encourage the use of fly ash in cement and concrete in Federal projects (see 48 FR 4230, January 28, 1984). The Agency prefers to allow States the flexibility to develop their own approaches to fostering utilization. The individual states are in the best position to determine what types of utilization are appropriate for their environmental settings.

Appendix B-Analysis of and Responses to Public Comments on the Notice of Data Availability

On February 12, 1993, the Agency issued a Notice of Data Availability (Notice) requesting comment on additional data on fossil-fuel combustion (FFC) wastes. These data are intended to update and supplement the materials presented in the 1988 Report to Congress on wastes from the Combustion of Coal by Electric Utility Power Plants (RTC). In addition, the Notice solicited comment on the proposed methodology to be used in completing the August 1993 regulatory determination.

Comments were received from 14 parties. Several commenters also submitted additional published materials on FFC waste characteristics and management/treatment techniques. The Agency considered these materials in completing the regulatory determination, as appropriate.

The following discussion briefly summarizes the comments received on the additional data and the proposed methodology. The Agency's responses are also provided. The comments and responses have been grouped according to general topic areas.

Methodology: Several commenters supported the use of EPA's proposed three-step methodology for completing the FFC waste regulatory determination. No commenters disagreed with any aspect of the methodology. [*42481]

Fly Ash, Bottom Ash, Boiler Slag, and FGD Waste: Nearly all respondents indicated that the Notice documents supported the 1988 RTC's recommendation that large-volume combustion wastes do not warrant regulation under Subtitle C. No commenters disagreed with this recommendation.

The Agency concurs with the commenters that the information contained in the docket does not contradict the data presented in the RTC. The Notice documents update and supplement the RTC by providing additional data on waste characteristics, environmental monitoring, and environmental impacts.

Several commenters noted that State regulation of FFC waste management has

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become more stringent since the 1988 RTC. More stringent solid waste regulations, including waste testing requirements and design- and performance-based standards, were specifically cited.

The Department of Energy and the EPA have recently completed separate studies of the current level of State regulation of FFC wastes. Proceeding from the

□ findings of these studies, the Agency concurs with the commenters that State requirements have generally become more stringent since 1983 (when the data cited in the 1988 RTC were collected). EPA supplemented the 1983 data for all 50 States with an updated analysis of 17 States representing all geographic regions of the United States and generating approximately 70 percent of the Nation's

□ coal ash. As noted in the preamble to the regulatory determination, this study showed that States are imposing additional controls to ensure the proper management of these wastes.

One commenter felt that there is the potential for groundwater degradation from these coal combustion residues as a result of their leaching potential, although regulation of these wastes under Subtitle C is not appropriate. The inherent high permeability of materials landfilled without the benefit of stabilization or liners could allow a large volume of percolation to occur, resulting in potential groundwater contamination. The commenter urged the Agency to eliminate questionable coal combustion waste impoundments and suggested that regulations similar to 40 CFR part 258 (requirements for municipal solid waste landfills) would be appropriate for FFC waste management units.

While the Agency believes that design and operating requirements similar to part 258 may be appropriate for some FFC waste management units, the risks posed by FFC waste management are site-specific. Although groundwater contamination has occurred at certain coal combustion waste sites, contamination has been due to a limited number of constituents, which are likely to attenuate and dilute to safe levels before reaching an exposure point. This is in contrast to municipal solid waste landfills that are subject to 40 CFR part 258. The leachate at these sites often contains elevated levels of a wide range of toxic pollutants, and numerous damages have been observed. Therefore, the Agency believes that the level of protection provided by the part 258 criteria may not need to be universally applied to all FFC waste management units. It is therefore appropriate to allow the States to retain the flexibility to tailor requirements to site-specific or regional factors rather than establish broad Federal minimum requirements. It should be noted that many States have adopted regulatory requirements for FFC waste management units comparable to the part 258 criteria. EPA will consider these wastes as part of the Agency's ongoing assessment of industrial non-hazardous wastes under RCRA Subtitle D.

Low-Volume Wastes and Co-Management: Five of the fourteen respondents supported permanently retaining the exemption for low-volume coal-fired utility wastes co-managed with large-volume wastes. These commenters indicated that the 1988 RTC and Notice data show that co-management is an environmentally sound management practice. One commenter specifically cited two Electric Power Research Institute (EPRI) studies completed since 1988 as demonstrating that co-managed wastes should be excluded.

EPA's efforts to compile more recent data continue to show limited

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information on the effects of co-management. However, some information included in the Notice docket suggests that at several large-volume waste management sites where groundwater impacts have been detected, the operators have suggested that the cause of the contamination is co-management with low-volume wastes. Of specific concern to the Agency is co-management of ash, slag, and FGD waste with pyrites and/or chemical boiler cleaning wastes.

The Agency does not believe that the two recent co-management studies cited by the commenter are conclusive or sufficiently representative of the entire

□ universe of co-management sites. For example, at one site, EPRI findings indicate that a release is occurring because of pyrite co-disposal. The release is localized by site-specific conditions (i.e., alkaline soils) that may not be found at every facility. Similarly, a release is also occurring at the second site. While migration of constituents with primary drinking water standards is

□ limited, boron and sulfate have been detected in downgradient wells.

Low-volume wastes co-managed with large-volume wastes remain exempt pending additional study. Separately managed low-volume wastes are outside the scope of the exemption, as noted by one commenter representing a large part of the industry. The same commenter in responding to the RTC cited RCRA Section 3001(b)(3)(i) and a January 13, 1981, letter from G. Dietrich, U.S. EPA, to P. Emler, Utility Solid Waste Activities Group, as indicating that the Bevill Exemption applies only to low-volume wastes when they are co-managed with the four large-volume. n13

n13 Comments dated May 16, 1988, received from USWAG on the RTC and comments dated March 29, 1993, received from USWAG on the Notice (see Docket numbers F-88-PATA-FFFFF and F-93-FFCA-FFFFF).

However, the Agency cautions that the limited data available to date indicate that co-management of some large-volume wastes with pyrites and chemical boiler cleaning wastes can cause adverse environmental impacts. Pending the study of low-volume wastes co-managed with large-volume wastes, the Agency will continue to rely on its authorities pursuant to RCRA Section 7003 as well as its Superfund authorities under CERCLA Sections 104 and 106, to address any human health and environmental threats associated with the co-management of these wastes.

Several commenters emphasized that low-volume wastes are typically co-managed with ash, slag, and FGD wastes.

The Agency has observed that the general trend in the industry is to segregate certain low-volume wastes (e.g., boiler chemical cleaning wastes) from ash, slag, and FGD wastes. At some plants, low-volume wastes, such as pyrites and chemical boiler cleaning wastes, are now being disposed of separately. As indicated above, the Agency believes that additional study is required to evaluate the risks posed by co-management of the low-volume wastes with the large-volume wastes.

Reutilization: One commenter noted that in enacting RCRA, Congress intended

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that EPA take an active role in resource conservation and recovery. The commenter indicated that some States have developed overly stringent regulatory requirements that have [*42482] discouraged reuse of FFC wastes. Several commenters recommended that, in the Regulatory Determination, EPA should recognize coal combustion byproducts as beneficial resources rather than as waste materials.

Because, according to the RTC, the majority of coal combustion byproducts are currently managed as wastes rather than re-used (because, in part, of market conditions as well as regulatory status), the Agency believes it is appropriate to consider them waste materials. However, the Agency continues to encourage reutilization of coal combustion byproducts and supports State efforts to promote reutilization in an environmentally beneficial manner. In terms of exempting coal combustion wastes from the definition of solid waste, because

□ this determination is confined to the issue of whether to regulate those wastes as hazardous, this request is outside the scope of today's action. The Agency, however, is currently engaging in an effort to revise the definition of solid waste. In April 1993, EPA's Definition of Solid Waste Task Force held a public meeting in Washington, DC. The task force plans to hold a series of monthly

□ open meetings from July through November 1993, which will provide a forum for the public to provide input on the definition of solid waste.

Comments Related to Specific Documents:

Two commenters suggested that three documents in the docket addressing the Gavin Power Plant were added in error and should not be considered in the regulatory determination because they deal with the investigation of groundwater constituents (volatile organic compounds (VOCs)) that are unrelated to the management of coal combustion byproducts.

The Agency recognizes that the source of the VOC contamination at the Gavin site is unlikely to have been coal combustion wastes. These documents were included in the docket only to provide a complete understanding of groundwater conditions, including background levels, at the site.

Site Visit Reports: One commenter provided comments on EPA's site visit report for the Cayuga Power Station, PSI Energy, Incorporated. The commenter's specific remarks and the Agency's responses are summarized below:

One commenter noted that the Cayuga site visit report incorrectly assumes that all data in Table 5 are from downgradient wells. The commenter suggests that the maximum arsenic and vanadium values above background were actually detected in an ash well (PZ-14), rather than with a soil core system. Because of this, the commenter concludes that no adverse impact on groundwater has occurred.

In response, CPZ-14 is specifically identified in EPRI's Report on the Cayuga site (see Comanagement of Coal Combustion By-product and Low-Volume Wastes: Midwestern Sites, EPRI Report EN-7545) as a downgradient well, and arsenic and vanadium were found above background levels in the sediments immediately

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underlying the ash pond. The Agency acknowledges that any release of these constituents is limited because they were not found in other wells. It should further be noted that other constituents, including sulfate and boron, have consistently been found above background levels in several downgradient wells.

One commenter stated that the Cayuga site visit report overemphasizes the lack of background groundwater monitoring data, because the actual downgradient groundwater data show no adverse impacts.

The report only indicates which parameters appear to be above background levels and notes that the limited background data make any data analysis difficult. The site visit report does not comment on whether the data show any adverse impacts associated with the ash management unit.

One commenter noted that total constituent and hydroxylamine extraction coal ash data presented in the EPRI study and the Cayuga site visit report should not be used to consider the actual leaching potential.

These data were included in the site visit report because they were the only

□ waste characterization data available for the Cayuga site (no other leaching studies were performed). The Agency recognizes that the hydroxylamine extraction test provides a "worst case" estimate of the potential for constituent mobilization and would likely overestimate actual leachability. The Agency emphasizes that the proposed three-step methodology not only considers waste

□ characterization information, but also the actual risks posed by a waste in its "as managed" state.

One commenter noted that the new groundwater monitoring data included in the Notice docket show few exceedences of primary drinking water standards. Most exceedences of primary drinking water standards occurred at older sites that are atypical of current sites. Exceedences of Secondary Drinking Water Standards occur more frequently, but the percentage of sites involved is still low. The commenter noted that exceedences of SDWSS are not violations of a Federal standard requiring enforcement or of most State standards, since SDWSS are guidelines. Further, exceedences would likely not occur if the relevant point of compliance were set further from the site (e.g., 150 meters downgradient as in the municipal solid waste landfill rules). Finally, the commenter indicated that many elevated constituent levels could be attributable to natural or other non-coal ash related sources (data were cited from several sites). Another commenter suggested that the data show that the potential exists for groundwater degradation through migration of constituents with SDWSS (e.g., iron, sulfates, chlorides, and other soluble salts).

The Agency disagrees that the new docket materials show a low percentage of exceedences of both PDWSS and SDWSS. Of the 49 individual sites with groundwater monitoring information (summarized in Appendix D of the Supplemental Analysis of Potential Risks to Human Health and the Environment from Large-Volume Coal Combustion Waste, found in the docket), 19 had at least one exceedence of a PDWS, and 42 had at least one exceedence of a SDWS.

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The Agency concurs that some of these exceedences of PDWSS could be due to contamination from other sources and that dilution and attenuation would tend to reduce contaminant concentration below levels of concern at receptors. While the Agency recognizes that SDWS exceedences are not always considered violations, elevated levels of secondary parameters can cause adverse impacts. Therefore, the Agency has considered the mobility of these parameters in determining the risks posed by FFC waste management. Acknowledging the results of this analysis, the Agency concurs that many newer units have been designed to prevent releases (i.e., with liners), releases are frequently localized by site-specific conditions such that contaminants do not reach receptors, and exceedences are sometimes caused by natural or non-coal ash related sources (often for chlorides, iron, and manganese). Finally, although much of the data is from older sites, many of these sites are currently active; therefore, they cannot be regarded as categorically atypical.

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□



Federal Register

Monday,
May 22, 2000

Part III

Environmental Protection Agency

40 CFR Part 261

Regulatory Determination on Wastes from
the Combustion of Fossil Fuels; Final
Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[FRL-6588-1]

RIN 2050-AD91

Notice of Regulatory Determination on Wastes From the Combustion of Fossil Fuels

AGENCY: Environmental Protection Agency.

ACTION: Regulatory determination.

SUMMARY: This document explains EPA's determination of whether regulation of fossil fuel combustion wastes is warranted under subtitle C of the Resource Conservation and Recovery Act (RCRA). Today's action applies to all remaining fossil fuel combustion wastes other than high volume coal combustion wastes generated at electric utilities and independent power producing facilities and managed separately, which were addressed by a 1993 regulatory determination. These include: Large-volume coal combustion wastes generated at electric utility and independent power producing facilities that are co-managed together with certain other coal combustion wastes; coal combustion wastes generated by non-utilities; coal combustion wastes generated at facilities with fluidized bed combustion technology; petroleum coke combustion wastes; wastes from the combustion of mixtures of coal and other fuels (*i.e.*, co-burning); wastes from the combustion of oil; and wastes from the combustion of natural gas.

The Agency has concluded these wastes do not warrant regulation under subtitle C of RCRA and is retaining the hazardous waste exemption under RCRA section 3001(b)(3)(C). However, EPA has also determined national regulations under subtitle D of RCRA are warranted for coal combustion wastes when they are disposed in landfills or surface impoundments, and that regulations under subtitle D of RCRA (and/or possibly modifications to existing regulations established under authority of the Surface Mining Control and Reclamation Act (SMCRA)) are warranted when these wastes are used to fill surface or underground mines.

So that coal combustion wastes are consistently regulated across all waste management scenarios, the Agency also intends to make these national regulations for disposal in surface impoundments and landfills and minefilling applicable to coal combustion wastes generated at electric

utility and independent power producing facilities that are not co-managed with low volume wastes.

The Agency has concluded that no additional regulations are warranted for coal combustion wastes that are used beneficially (other than for minefilling) and for oil and gas combustion wastes. We do not wish to place any unnecessary barriers on the beneficial use of fossil fuel combustion wastes so that they can be used in applications that conserve natural resources and reduce disposal costs. Currently, about one-quarter of all coal combustion wastes are diverted to beneficial uses. We support increases in these beneficial uses, such as for additions to cement and concrete products, waste stabilization and use in construction products such as wallboard.

DATES: Comments in response to data and information requests in this document are due to EPA on September 19, 2000.

ADDRESSES: Public comments and supporting materials are available for viewing in the RCRA Information Center (RIC). In addition to the data and information that was included in the docket to support the RTC on FFC waste and the Technical Background Documents, the docket also includes the following document: Responses to Public Comments on the Report To Congress, Wastes from the Combustion of Fossil Fuels. The RIC is located at Crystal Gateway I, First Floor, 1235 Jefferson Davis Highway, Arlington, VA. The Docket Identification Number is F-2000-FF2F-FFFFF. The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding federal holidays. To review docket materials, we recommend that the public make an appointment by calling 703 603-9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost \$0.15/page. The index and some supporting materials are available electronically. See the **SUPPLEMENTARY INFORMATION** section for information on accessing them.

Commenters must send an original and two copies of their comments referencing docket number F-2000-FF2F-FFFFF to: (1) If using regular US Postal Service mail: RCRA Docket Information Center, Office of Solid Waste (5305G), U.S. Environmental Protection Agency Headquarters (EPA, HQ), Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460-0002; or (2) if using special delivery, such as overnight express service: RCRA Docket Information Center (RIC), Crystal Gateway One, 1235 Jefferson Davis

Highway, First Floor, Arlington, VA 22202. Comments may also be submitted electronically through the Internet to: rcra-docket@epa.gov. Comments in electronic format should also be identified by the docket number F-2000-FF2F-FFFFF and must be submitted as an ASCII file avoiding the use of special characters and any form of encryption.

Commenters should not submit electronically any confidential business information (CBI). An original and two copies of CBI must be submitted under separate cover to: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460-0002.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at 800 424-9346 or TDD 800 553-7672 (hearing impaired). In the Washington, DC, metropolitan area, call 703 412-9810 or TDD 703 412-3323.

For more detailed information on specific aspects of this regulatory determination, contact Dennis Ruddy, Office of Solid Waste (5306W), U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW, Washington, DC 20460-0002, telephone (703) 308-8430, e-mail address ruddy.dennis@epa.gov.

SUPPLEMENTARY INFORMATION: The index and several of the primary supporting materials are available on the Internet. You can find these materials at <http://www.epa.gov/epaoswer/other/fossil/index.htm>.

The official record for this action will be kept in paper form. Accordingly, EPA will transfer all comments received electronically into paper form and place them in the official record, which will also include all comments submitted directly in writing. The official record is the paper record maintained at the address in **ADDRESSES** at the beginning of this notice.

EPA will not immediately reply to commenters electronically other than to seek clarification of electronic comments that may be garbled in transmission or during conversion to paper form, as discussed above.

The contents of today's notice are listed in the following outline:

1. General Information

- A. What action is EPA taking today?
- B. What is the statutory authority for this action?
- C. What was the process EPA used in making today's decision?
- D. What is the significance of "uniquely associated wastes" and what wastes does EPA consider to be uniquely associated wastes?

E. Who is affected by today's action and how are they affected?

F. What additional actions will EPA take after this regulatory determination regarding coal, oil and natural gas combustion wastes?

2. What Is the Basis for EPA's Regulatory Determination for Coal Combustion Wastes?

A. What is the Agency's decision regarding the regulatory status of coal combustion wastes and why did EPA make that decision?

B. What were EPA's tentative decisions as presented in the Report to Congress?

C. How did commenters react to EPA's tentative decisions and what was EPA's analysis of their comments?

D. What is the basis for today's decisions?

E. What approach will EPA take in developing national regulations?

3. What Is the Basis for EPA's Regulatory Determination for Oil Combustion Wastes?

A. What is the Agency's decision regarding the regulatory status of oil combustion wastes and why did EPA make that decision?

B. What were EPA's tentative decisions as presented in the Report to Congress?

C. How did commenters react to EPA's tentative decisions and what was EPA's analysis of their comments?

D. What is the basis for today's decisions?

4. What Is the Basis for EPA's Regulatory Determination for Natural Gas Combustion Wastes?

A. What is the Agency's decision regarding the regulatory status of natural gas combustion wastes and why did EPA make that decision?

B. What was EPA's tentative decision as presented in the Report to Congress?

C. How did commenters react to EPA's tentative decisions?

D. What is the basis for today's decisions?

5. What Is the History of EPA's Regulatory Determinations for Fossil Fuel Combustion Wastes?

A. On what basis is EPA required to make regulatory decisions regarding the regulatory status of fossil fuel combustion wastes?

B. What was EPA's general approach in making these regulatory determinations?

C. What happened when EPA failed to issue its determination of the regulatory status of the large volume utility combustion wastes in a timely manner?

D. When was the Part 1 regulatory decision made and what were EPA's findings?

6. Executive Orders and Laws Addressed in Today's Action

A. Executive Order 12866—Determination of Significance.

B. Regulatory Flexibility Act, as amended.

C. Paperwork Reduction Act (Information Collection Requests).

D. Unfunded Mandates Reform Act.

E. Executive Order 13132: Federalism.

F. Executive Order 13084: Consultation and Coordination with Indian Tribal Governments.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks.

H. National Technology Transfer and Advancement Act of 1995.

I. Executive Order 12898: Environmental Justice.

J. Congressional Review Act.

7. How To Obtain more Information

1. General Information

A. What Action Is EPA Taking Today?

In today's action, we are determining that regulation of fossil fuel combustion (FFC) wastes under subtitle C of the Resource Conservation and Recovery Act (RCRA) is not warranted. This determination covers the following wastes:

- Large-volume coal combustion wastes generated at electric utility and independent power producing facilities that are co-managed together with certain other coal combustion wastes;
- Coal combustion wastes generated at non-utilities;
- Coal combustion wastes generated at facilities with fluidized bed combustion technology;
- Petroleum coke combustion wastes;
- Wastes from the combustion of mixtures of coal and other fuels (i.e., co-burning of coal with other fuels where coal is at least 50% of the total fuel);
- Wastes from the combustion of oil; and
- Wastes from the combustion of natural gas.

While these wastes remain exempt from subtitle C, we have further decided to establish national regulations under subtitle D of RCRA (RCRA sections 1008(a) and 4004(a)) for coal combustion wastes that are disposed in landfills or surface impoundments or used to fill surface or underground mines. For coal combustion wastes used as minefill, we will consult with the Office of Surface Mining in the Department of the Interior and thoroughly assess whether equivalent protectiveness could be achieved by using regulatory authorities available under the Surface Mining Control and Reclamation Act (SMCRA), as well as those afforded under the Resource Conservation and Recovery Act. We will consider whether RCRA subtitle D or SMCRA authorities or some combination of both are most

appropriate to regulate the disposal of coal combustion wastes when used for minefill in surface and underground mines to ensure protection of human health and the environment. These standards will be developed through notice and comment rulemaking and in consultation with states and other stakeholders. These regulations will, in EPA's view, ensure that the trend towards improved management of coal combustion wastes over recent years will accelerate and will ensure a consistent level of protection of human health and the environment is put in place across the United States.

If, as a result of comments in response to this notice; the forthcoming analyses identified in this notice; or additional information garnered in the course of developing these national regulations; we find that there is a need for regulation under the authority of RCRA subtitle C, the Agency will revise this determination accordingly.

We recognize our decision to develop regulations under RCRA subtitle D (or, for minefilling, possibly under SMCRA) for the above-listed coal combustion wastes was not specifically identified as an option in our March 31, 1999 Report to Congress. Our final determination reflects our consideration of public comments received on the Report to Congress and other analyses that we conducted.

Today's decision was, in the Agency's view, a difficult one, given the many competing considerations discussed throughout today's notice. After considering all of the factors specified in RCRA section 8002(n), we have decided as discussed further below, that the decisive factors are the trends in present disposal and utilization practices (section 8002 (n)(2)), the current and potential utilization of the wastes (Section 8002 (n)(8)), and the admonition against duplication of efforts by other federal and state agencies.

As described in the Report to Congress, the utility industry has made significant improvements in its waste management practices over recent years, and most state regulatory programs are similarly improving. For example, in the utility industry the use of liners and groundwater monitoring at landfills and surface impoundments has increased substantially over the past 15 years as indicated in the following table.

PERCENT OF UTILITY COAL COMBUSTION WASTE MANAGEMENT UNITS WITH CONTROLS IN 1995

Waste management unit	Liners		Groundwater monitoring	
	Percent of all units	Percent of new units *	Percent of all units	Percent of new units *
Landfills	57	75	85	88
Surface Impoundments	26	60	38	65

* New units constructed between 1985-1995.
Source: USWAG, EPRI 1995.

Public comments and other analyses, however, have convinced us that these wastes could pose risks to human health and the environment if not properly managed, and there is sufficient evidence that adequate controls may not be in place—for example, while most states can now require newer units to include liners and groundwater monitoring, 62% of existing utility surface impoundments do not have groundwater monitoring. This, in our view, justifies the development of national regulations. We note, however, that some waste management units may not warrant liners and/or groundwater monitoring, depending on site-specific characteristics.

New information we received in public comments includes additional documented damage cases, as well as cases indicating at least a potential for damage to human health and the environment. We did not independently investigate these damage cases; rather, we relied on information contained in state files. While the absolute number of documented damage cases is not large, we have considered the evidence of proven and potential damage in light of the proportion of facilities that lack basic environmental controls (e.g., groundwater monitoring). We acknowledge, moreover, that our inquiry into the existence of damage cases was focused primarily on a subset of states—albeit states that account for almost 20 percent of coal fired utility electricity generation capacity. Given the volume of coal combustion wastes generated nationwide (115 million tons) and the numbers of facilities that currently lack some basic environmental controls, especially groundwater monitoring, other cases of proven and potential damage are likely to exist. Because EPA did not use a statistical sampling methodology to evaluate the potential for damage, the Agency is unable to determine whether the identified cases are representative of the conditions at all facilities and, therefore, cannot quantify the extent and magnitude of damages at the national level.

Since the Report to Congress, we have conducted additional analyses of the potential for the constituents of coal combustion wastes to leach in dangerous levels into ground water. Based on a comparison of drinking water and other appropriate standards to leach test data from coal combustion waste samples, we identified a potential for risks from arsenic that we cannot dismiss at this time. This conclusion is based on possible exceedences of a range of values that EPA is currently considering for a revised arsenic MCL. Once a new arsenic MCL is established, additional groundwater modeling may be required to evaluate the likelihood of exceeding that MCL.

As discussed further below, in light of certain comments received on the Report to Congress, we are not relying on a quantitative groundwater risk assessment to assess potential risks to human health or the environment. In the absence of a more complete groundwater risk assessment, we are unable at this time to draw quantitative conclusions regarding the risks due to arsenic or other contaminants posed by improper waste management. Once we have completed a review of our groundwater model and made any necessary changes, we will reevaluate groundwater risks and take appropriate regulatory actions. We will specifically assess new modeling results as they relate to any promulgated changes in the arsenic MCL.

We acknowledge that, even without federal regulatory action, many facilities in the utility industry have either voluntarily instituted adequate environmental controls or have done so at the direction of states that regulate these facilities. In addition, we found that for the proven damage cases, the states (and in two cases, EPA under the Superfund program) have taken action to mitigate risk and require corrective action. However, in light of the evidence of actual and potential environmental releases of metals from these wastes; the large volume of wastes generated from coal combustion; the proportion of existing and even newer units that do not currently have basic controls in

place; and the presence of hazardous constituents in these wastes; we believe, on balance, that the best means of ensuring that adequate controls are imposed where needed is to develop national subtitle D regulations. As we develop and issue the national regulations, we will try to minimize disruptions to operation of existing waste management units.

In taking today's action, we carefully considered whether to develop national regulations under RCRA subtitle D or subtitle C authorities. One approach we considered was to promulgate regulations pursuant to subtitle C authority, similar to recently proposed regulations applicable to cement kiln dust. Under this approach, EPA would have established national management standards for coal combustion wastes managed in landfills and surface impoundments and used for minefilling, as well as a set of tailored subtitle C requirements, promulgated pursuant to RCRA section 3004(x). If wastes were properly managed in accordance with subtitle D-like standards, they would not be classified as a hazardous waste. If wastes were not properly managed, they would become listed hazardous wastes subject to tailored subtitle C standards. This approach would give EPA enforcement authority in states following their adoption of the contingent management listing.

We believe, however, for the reasons described below, the better approach at this time to ensuring adequate management of FFC wastes is to develop national regulations under subtitle D rather than subtitle C. EPA has reached this conclusion in large part based on consideration of "present disposal and utilization practices." RCRA § 8002(n). As noted above, present disposal practices in landfills and surface impoundments are significantly better than they have been in the past in terms of imposing basic environmental controls such as liners and groundwater monitoring. This trend is the result of increasing regulatory oversight by states of the management of these wastes as well as voluntary industry improvements. In the 1980's, only 11

states had authority to require facilities to install liners, and 28 states had the authority to require facilities to conduct groundwater monitoring at landfills. As of 1995, these rates were significantly higher, with 43 states having the authority to require liners and 46 states having the authority to require groundwater monitoring at landfills. When authority under state groundwater and drinking water regulations are considered, some commenters have suggested that nearly all states can address the management of these wastes. Thus, with the exception of relatively few states, the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes.

While the trend both in terms of state regulatory authorities and the imposition of controls at these facilities has been positive, between 40 and 70 percent of sites lacked controls such as liners and/or groundwater monitoring as of 1995. This gap is of environmental concern given the potential for risks posed by mismanagement of coal combustion wastes in certain circumstances. Nonetheless, given most of the states' current regulatory capabilities and the evidence that basic controls are increasingly being put in place by the states and facilities (see RCRA section 8002(n), which directs EPA to consider actions of state and other federal agencies with a view to avoiding duplication of effort), EPA believes that subtitle D controls will provide sufficient clarity and incentive for states to close the remaining gaps in coverage, and for facilities to ensure that their wastes are managed properly.

For minefilling, although we have considerable concern about certain current practices (e.g., placement directly into groundwater) we have not yet identified a case where placement of coal wastes can be determined to have actually caused increased damage to ground water. In addition, there is a federal regulatory program—SMCRA—expressly designed to address environmental risks associated with coal mines. Finally, given that states have been diligent in expanding and upgrading programs, as they have done for surface impoundments and landfills, we believe they will be similarly responsive in addressing environmental concerns arising from this emerging practice. In short, we arrive at the same conclusions, for substantially the same reasons, for this practice as we did for landfills and surface impoundments: that subtitle D controls, or upgraded SMCRA controls or a combination of the two, should provide sufficient clarity and incentive to ensure proper handling

of this waste. Having determined that subtitle C regulation is not warranted for all other management practices, EPA does not see a basis in the record for carving this one practice out for separate regulatory treatment.

Once these regulations are effective, facilities would be subject to citizen suits for any violation of the standards. If EPA were addressing wastes that had not been addressed by the states (or the federal government) in the past, or an industry with wide evidence of irresponsible solid waste management practices, EPA may well conclude that the additional incentives for improvement and compliance provided by the subtitle C scheme—the threat of federal enforcement and the stigma associated with improper management of RCRA subtitle C waste—were necessary. But the record before us indicates that the structure and the sanctions associated with a subtitle D approach (or a SMCRA approach if EPA determines it is equivalent) should be sufficient.

We also see a potential downside to pursuing a subtitle C approach. Section 8002(n)(8) directs us to consider, among other factors, "the current and potential utilization of such materials." Industry commenters have indicated that they believe subjecting any coal combustion wastes to a subtitle C regime would place a significant stigma on these wastes, the most important effect being that it would adversely impact beneficial reuse. As we understand it, the concern is that, even though beneficially reused waste would not be hazardous under the contemplated subtitle C approach, the link to subtitle C would nonetheless tend to discourage purchase and re-use of the waste. We do not wish to place any unnecessary barriers on the beneficial uses of these wastes, because they conserve natural resources, reduce disposal costs and reduce the total amount of waste destined for disposal. States and industry have also expressed concern that regulation under subtitle C could cause a halt in the use of coal combustion wastes to reclaim abandoned and active mine sites. We recognize that when done properly, minefilling can lead to substantial environmental benefits. EPA believes the contingent management scheme we discussed should diminish any stigma that might be associated with the subtitle C link. Nonetheless, we acknowledge the possibility that the approach could have unintended consequences. We would be particularly concerned about any adverse effect on the beneficial re-use market for these wastes because more than 23 percent

(approximately 28 million tons) of the total coal combustion waste generated each year is beneficially reused and an additional eight percent (nine million tons) is used for minefilling. EPA believes that such reuse when performed properly, is by far the environmentally preferable destination for these wastes, including when minefilled. Normally, concerns about stigma are not a deciding factor in EPA's decisions under RCRA, given the central concern under the statute for protection of human health and the environment. However, given our conclusion that the subtitle D approach here should be fully effective in protecting human health and the environment, and given the large and salutary role that beneficial reuse plays for this waste, concern over stigma is a factor supporting our decision today that subtitle C regulation is unwarranted in light of our decision to pursue a subtitle D approach.

Additionally, in a 1993 regulatory determination, EPA previously addressed large volume coal combustion wastes generated at electric utility and independent power producing facilities that manage the wastes separately from certain other low volume and uniquely associated coal combustion wastes (see 58 FR 42466; August 9, 1993). Our 1993 regulatory determination maintained the exemption of these large volume coal combustion wastes from being regulated as hazardous wastes when managed separately from other wastes (e.g., in monofills). We intend that the national subtitle D regulations we develop for the coal combustion wastes subject to today's regulatory determination will also be applicable to the wastes covered in the 1993 regulatory determination for the reasons listed below, so that all coal combustion wastes are consistently regulated for placement in landfills, surface impoundments, and minefills.

- The co-managed coal combustion wastes that we studied extensively in making today's regulatory determination derive their characteristics largely from these large-volume wastes and not from the other wastes that are co-managed with them.

- We believe that the risks posed by the co-managed coal combustion wastes result principally from the large-volume wastes.

- These large-volume coal combustion wastes, account for over 20% of coal combustion wastes.

As we proceed with regulation development, we will also take enforcement action under RCRA section 7003 when we identify cases of imminent and substantial endangerment. We will also use Superfund remedial and emergency

response authorities under the Comprehensive Environmental Response Compensation and Liabilities Act (CERCLA), as appropriate, to address damages that result in risk to human health and the environment.

However, as stated above, this decision was a difficult one and EPA believes that, absent our conclusions regarding the current trends in management of this waste, the waste might present sufficient potential threat to human health and the environment to justify subtitle C regulation. There are several factors that might cause us to rethink our current determination. First, and perhaps most importantly, if current trends toward protective management do not continue, EPA may well determine that subtitle C regulation is warranted for this waste. As we have stated, we do not believe the current gaps in the basic controls are acceptable, and our determination that subtitle C regulation is not warranted is premised to a large extent on our conclusion that subtitle D regulation will be sufficient to close these gaps. If this conclusion turns out not to be warranted, we would be inclined to re-examine our current decision.

Second, EPA will continue to examine available information and, as a result of the ongoing review, may conclude over the next several months that this decision should be revised. Our ongoing review will include consideration of: (1) The extent to which fossil fuel combustion wastes have caused actual or potential damage to human health or the environment; (2) the environmental effects of filling underground and surface coal mines with fossil fuel combustion wastes; and (3) the adequacy of existing state and/or federal regulation of these wastes. Finally, the agency will consider the results of a report of the National Academy of Sciences regarding the adverse human health effects of mercury, one of the constituents in fossil fuel combustion wastes. EPA believes that this report will enhance our understanding of the risks due to exposure to mercury. All of these efforts may result in a subsequent revision of today's regulatory determination.

Finally, relating to oil combustion wastes, we will work with relevant stakeholders so that any necessary measures are taken to ensure that oil combustion wastes currently managed in the two known remaining unlined surface impoundments are managed in a manner that protects human health and the environment.

B. What Is the Statutory Authority for This Action?

We are issuing today's notice under the authority of RCRA section 3001 (b) (3) (C), as amended. This section exempts certain wastes, including fossil fuel combustion wastes, from hazardous waste regulation until the Agency completes a Report to Congress mandated by RCRA section 8002 (n) and maintains the exemption, unless the EPA Administrator makes a determination that subtitle C (hazardous waste) regulation is warranted. RCRA section 3004 (x) provides the Agency with flexibility in developing subtitle C standards. If appropriate, these formerly exempted wastes may not be subjected to full subtitle C requirements in areas such as treatment standards, liner design requirements and corrective action.

C. What Was the Process EPA Used in Making Today's Decision?

1. What Approach Did EPA Take to Studying Fossil Fuel Combustion Wastes?

We conducted our study of wastes generated by the combustion of fossil fuels in two phases. The first phase, called the Part 1 determination, covered high volume coal combustion wastes (e.g., bottom ash and fly ash) generated at electric utility and independent power producing facilities (non-utility electric power producers that are not engaged in any other industrial activity) and managed separately from other fossil fuel combustion wastes. In 1993, EPA issued a regulatory determination that exempted Part 1 wastes from regulation as hazardous wastes (see 58 FR 42466; August 9, 1993). Today's regulatory determination is the second phase of our effort, or the Part 2 determination. It covers all other fossil fuel combustion wastes not covered in Part 1. This includes high volume, utility-generated coal combustion wastes when co-managed with certain low volume wastes that are also generated by utility coal burners; coal combustion wastes generated by industrial, non-utility, facilities; and wastes from the combustion of oil and gas. Under court order, we are required to complete the Part 2 regulatory determination by April 25, 2000.¹

¹ The consent decree entered into by EPA (*Frank Gearhart, et al. v. Browner, et al.*, No. 91-2435 (D.D.C.)) for completing the studies and regulatory determination for fossil fuel combustion wastes used the term "remaining wastes" to differentiate the wastes to be covered in today's decision from the large-volume utility coal combustion wastes that were covered in the August 1993 regulatory determination (see 58 FR 42466).

2. What Statutory Requirements Does EPA Have To Meet in Making Today's Regulatory Determinations?

RCRA section 8002(n) specifies eight study factors that we must take into account in our decision-making. These are:

1. The source and volumes of such materials generated per year.
2. Present disposal practices.
3. Potential danger, if any, to human health and the environment from the disposal of such materials.
4. Documented cases in which danger to human health or the environment has been proved.
5. Alternatives to current disposal methods.
6. The costs of such alternatives.
7. The impact of those alternatives on the use of natural resources.
8. The current and potential utilization of such materials.

Additionally, in developing the Report to Congress, we are directed to consider studies and other actions of other federal and State agencies with a view toward avoiding duplication of effort (RCRA section 8002(n)). In addition to considering the information contained in the Report, EPA is required to base its regulatory determination on information received in public hearings and comments submitted on the Report to Congress (RCRA section 3001(b)(3)(C)).

3. What Were the Agency's Sources of Information and Data That Serve as the Basis for This Decision?

We gathered publicly available information from a broad range of sources, including federal and state agencies, industry trade groups, environmental organizations, and open literature searches. We requested information from all stakeholder groups on each of the study factors Congress requires us to evaluate. For many of the study factors, very limited information existed prior to this study. We worked closely with the Edison Electric Institute (EII), Utility Solid Waste Activities Group (USWAG), the Electric Power Research Institute (EPRI), and the Council of Industrial Boiler Owners (CIBO) as those organizations developed new information. Because other ongoing EPA projects currently focus on portions of the FFC waste generator universe, we also leveraged data collection efforts conducted for air, industrial waste, and hazardous waste programs. In addition, we obtained information from environmental organizations regarding beneficial uses of some FFC wastes and methods for characterizing the risks associated with FFC wastes.

Specifically, we gathered and analyzed the following information from industry, states and environmental groups:

- Published and unpublished materials obtained from state and federal agencies, utilities and trade industry groups, and other knowledgeable parties on the volumes and characteristics of coal, oil, and natural gas combustion wastes and the corresponding low-volume and uniquely associated wastes (see the following section for a description of "uniquely associated wastes").
- Published and unpublished materials on waste management practices (including co-disposal and re-use) associated with FFC wastes and the corresponding low-volume and uniquely associated wastes.
- Published and unpublished materials on the potential environmental impacts associated with FFC wastes.
- Published and unpublished materials on trends in utility plant operations that may affect waste volumes and characteristics. We gathered specific information on innovations in scrubber use and the potential impacts of the 1990 Clean Air Act Amendments on waste volumes and characteristics.
- Energy Information Agency (EIA), Department of Energy, data on utility operations and waste generation obtained from EIA's Form 767 database. These data are submitted to EIA annually by electric utilities.
- Site visit reports and accompanying facility submittals for utility and non-utility plants we visited during the study.
- Materials obtained from public files maintained by State regulatory agencies. These materials focus on waste characterization, waste management, and environmental monitoring data, along with supporting background information.

We visited five states to gather specific information about state regulatory programs, FFC waste generators, waste management practices and candidate damage cases related to fossil fuel combustion. The five states we examined in great detail were: Indiana, Pennsylvania, North Carolina, Wisconsin, and Virginia. These five states account for almost 20 percent of coal-fired utility electrical generation capacity.

We also performed a variety of analyses, including human health and ecological risk assessments, analyses of existing federal and state regulatory programs, and economic impact analyses. We discussed and shared

these results with all of our stakeholders. We also conducted an external peer review of our risk analysis.

4. What Process Did EPA Follow To Obtain Comments on the Report to Congress?

RCRA requires that we publish a Report to Congress (RTC) evaluating the above criteria. Further, within six months of submitting the report, we must, after public hearings and opportunity for comment, decide whether to retain the exemption from hazardous waste requirements or whether regulation as hazardous waste is warranted. On March 31, 1999, we issued the required RTC on those fossil fuel combustion wastes (coal, oil and gas) not covered in the Part 1 regulatory determination, which are also known as the "remaining wastes" (see footnote 1).

We asked the public to comment on the Report and the appropriateness of regulating fossil fuel wastes under subtitle C of RCRA. To ensure that all interested parties had an opportunity to present their views, we held a public meeting with stakeholders on May 21, 1999. The April 28, 1999 **Federal Register** notice provided a 45-day public comment period, until June 14, 1999. We received over 150 requests to extend the public comment period by up to six months. However, we were obligated by a court-ordered deadline to issue our official Regulatory Determination by October 1, 1999. (See 64 FR 31170; June 10, 1999.) In response to requests for an extension, we entered into discussions with the parties to consider an extension of the comment period to ensure that all interested members of the public had sufficient time to complete their review and submit comments. Subsequently, the plaintiffs in *Gearhart v. Reilly* moved to modify the consent decree to reopen the comment period and to allow EPA until March 10, 2000 to complete the Regulatory Determination. We supported the motion, and on September 2, 1999, the Court granted the motion. In compliance with the court order, on September 20, 1999, we announced that public comments would be accepted through September 24, 1999 (64 FR 50788; Sept. 20, 1999). We have since received two extensions to the date for the final determination. Currently, EPA is directed to issue the Part 2 regulatory determination by April 25, 2000.

We received about 220 comments on the RTC from the public hearing and our **Federal Register** requests for comments. The docket for this action (Docket No. F-99-FF2P-FFFFF) contains all individual comments presented in the

public meetings and hearing, and a transcript from the public hearing, and all written comments. The docket is available for public inspection. Today's decision is based on the RTC, its underlying data and analyses, public comments, and EPA analyses of these comments.

The comments covered a wide variety of topics discussed in the Report to Congress, such as fossil fuel combustion waste generation and characteristics; current and alternative practices for managing FFC waste; documented damage cases and potential danger to human health and the environment; existing regulatory controls on FFC waste management; cost and economic impacts of alternatives to current management practices; FFC beneficial use practices; and our review of applicable state and federal regulations.

D. What Is the Significance of "Uniquely Associated Wastes" and What Wastes Does EPA Consider To Be "Uniquely Associated Wastes"?

Facilities that burn fossil fuels generate combustion wastes and also generate other wastes from processes that are related to the main fuel combustion processes. Often, as a general practice, facilities co-dispose these wastes with the large volume wastes that are subject to the RCRA section 3001 (b) (3) (C) exemption. Examples of these related wastes are:

- Precipitation runoff from the coal storage piles at the facility.
- Waste coal or coal mill rejects that are not of sufficient quality to burn as fuel.
- Wastes from cleaning the boilers used to generate steam.

There are numerous wastes like these, collectively known as "low-volume" wastes. Further, when one of these low-volume wastes, during the course of generation or normal handling at the facility, comes into contact with either fossil fuel (e.g., coal, oil) or fossil fuel combustion waste (e.g., coal ash or oil ash) and it takes on at least some of the characteristics of the fuel or combustion waste, we call it a "uniquely associated" waste. When uniquely associated wastes are co-managed with fossil fuel combustion wastes, they fall within the coverage of today's regulatory determination. When managed separately, uniquely associated wastes are subject to regulation as hazardous waste if they are listed wastes or exhibit the characteristic of a hazardous waste (see 40 CFR 261.20 and 261.30, which specify when a solid waste is considered to be a hazardous waste).

The Agency recognizes that determining whether a particular waste

is uniquely associated with fossil fuel combustion involves an evaluation of the specific facts of each case. In the Agency's view, the following qualitative criteria should be used to make such determinations on a case-by-case basis:

(1) Wastes from ancillary operations are not "uniquely associated" because they are not properly viewed as being "from" fossil fuel combustion.

(2) In evaluating a waste from non-ancillary operations, one must consider the extent to which the waste originates or derives from the fossil fuels, the combustion process, or combustion residuals, and the extent to which these operations impart chemical characteristics to the waste.

The low-volume wastes that are not uniquely associated with fossil fuel combustion would not be subject to today's regulatory determination. That is, they would not be accorded an exemption from RCRA subtitle C, whether or not they were co-managed with any of the exempted fossil fuel combustion wastes. Instead, they would be subject to the RCRA characteristic standards and hazardous waste listings. The exemption applies to mixtures of an exempt waste with a non-hazardous waste, but when an exempt waste is mixed with a hazardous waste, the mixture is not exempt.

Based on our identification and review of low volume wastes associated with the combustion of fossil fuels, we are considering offering the following guidance concerning which low volume wastes are uniquely associated with and which are not uniquely associated with fossil fuel combustion. Unless there are some unusual site-specific circumstances, we would generally consider that the following lists of low volume wastes are uniquely and non-uniquely associated wastes:

Uniquely Associated

- Coal Pile Runoff
- Coal Mill Rejects and Waste Coal
- Air Heater and Precipitator Washes
- Floor and Yard Drains and Sumps
- Wastewater Treatment Sludges
- Boiler Fireside Chemical Cleaning Wastes

Not Uniquely Associated

- Boiler Blowdown
- Cooling Tower Blowdown and Sludges
- Intake or Makeup Water Treatment and Regeneration Wastes
- Boiler Waterside Cleaning Wastes
- Laboratory Wastes
- General Construction and Demolition Debris
- General Maintenance Wastes

Moreover, we do not generally consider spillage or leakage of materials

used in the processes that generate these non-uniquely associated wastes, such as boiler water treatment chemicals, to be uniquely associated wastes, even if they occur in close proximity to the fossil fuel wastes covered by this regulatory determination.

An understanding of whether a waste is uniquely associated can be important in one circumstance. If a waste is not uniquely associated and is a hazardous waste, co-management with a Bevill waste will result in loss of the Bevill exemption. As a general matter, the wastes identified above as potentially not uniquely associated do not tend to be hazardous. This issue may therefore not be critical. The Agency, however, must still define appropriate boundaries for the Bevill exemption, because there is no authority to grant Bevill status to wastes that are not uniquely associated—the exemption was not intended as an umbrella for wastes that other industries must treat as hazardous.

EPA solicits comment on this discussion of uniquely associated wastes in the context of fossil fuel combustion and will issue final guidance after reviewing and evaluating information we receive as a result of this request.

E. Who Is Affected by Today's Action and How Are They Affected?

As explained above, fossil fuel combustion wastes generated from the combustion of coal, oil and natural gas will continue to remain exempt from being regulated as hazardous wastes under RCRA. No party is affected by today's determination to develop regulations applicable to coal combustion wastes when they are land disposed or used to fill surface or underground mines because today's action does not impose requirements. However, if such regulations are promulgated, they would affect coal combustion wastes subject to today's regulatory determination as well as wastes covered by the Part 1 regulatory determination when they are disposed in landfills and surface impoundments, or when used to fill surface or underground mines.

While we do not intend that national subtitle D regulations would be applicable to oil combustion wastes, we intend to work with relevant stakeholders so that any necessary measures are taken to ensure that oil combustion wastes currently managed in the two known remaining unlined surface impoundments are managed in a manner that protects human health and the environment.

F. What Additional Actions Will EPA Take After this Regulatory Determination Regarding Coal, Oil and Natural Gas Combustion Wastes?

To ensure that entities who generate and/or manage fossil fuel combustion wastes provide long-term protection of human health and the environment, we plan several actions:

- We will review comments submitted in response to today's notice on uniquely associated wastes and on the adequacy of the guidance developed by the utility industry on co-management of mill rejects (pyrites) with large volume coal combustion wastes.

- We will work with the State of Massachusetts and the owners and operators of the remaining two oil combustion facilities that currently manage their wastes in unlined surface impoundments to ensure that any necessary measures are taken so these wastes are managed in a manner that protects human health and the environment (described in section 3.D. of this document).

- We are evaluating the groundwater model and modeling methods that were used in the RTC to estimate risks for these wastes. This review may result in a re-evaluation of the potential groundwater risks posed by the management of fossil fuel combustion wastes and action to revise our Part 1 and Part 2 determinations if appropriate (see section 2.C. of this document).

- There are a number of ongoing and evolving efforts underway at EPA to improve our understanding of the human health impacts of wastes used in agricultural settings. We expect to receive substantial comments and new scientific information based on a risk assessment of the use of cement kiln dust as a substitute for agricultural lime (see 64 FR 45632; August 20, 1999) and other Agency efforts. As a result, we may refine our methodology for assessing risks related to the use of wastes in agricultural settings. If these efforts lead us to a different understanding of the risks posed by fossil fuel combustion wastes when used as a substitute for agricultural lime, we will take appropriate action to reevaluate today's regulatory determination (see section 2.C. of this document).

- We will review the findings and recommendations of the National Academy of Sciences upcoming report on mercury and assess its implications on risks due to exposure to mercury. We will ensure that the regulations we develop as a result of today's regulatory determination address any additional

risks posed by these wastes if hazardous constituent levels exceed acceptable levels

- We will reevaluate risk posed by managing coal combustion solid wastes if levels of mercury or other hazardous constituents change due to any future Clean Air Act air pollution control requirements for coal burning utilities (see section 2.C. of this document).

- We will continue EPA's partnership with the states to finalize voluntary industrial solid waste management guidance that identifies baseline protective practices for industrial waste management units, including fossil fuel combustion waste management units. We will use relevant information and knowledge that we obtain as a result of this effort to assist us in developing national regulations applicable to coal combustion wastes.

2. What Is the Basis for EPA's Regulatory Determination for Coal Combustion Wastes?

A. What Is the Agency's Decision Regarding the Regulatory Status of Coal Combustion Wastes and Why Did EPA Make That Decision?

We have determined at this time that regulation of coal combustion wastes under subtitle C is not warranted. However, we have also decided that it is appropriate to establish national regulations under non-hazardous waste authorities for coal combustion wastes that are disposed in landfills and surface impoundments. We believe that subtitle D regulations are the most appropriate mechanism for ensuring that these wastes disposed in landfills and surface impoundments are managed safely.

EPA's conclusion that some form of national regulation is warranted to address these wastes is based on the following considerations: (a) The composition of these wastes could present danger to human health and the environment under certain conditions, and "potential" damage cases identified by EPA and commenters, while not definitively demonstrating damage from coal combustion wastes, may indicate that these wastes have the potential to pose such danger; (b) we have identified eleven documented cases of proven damages to human health and the environment by improper management of these wastes in landfills and surface impoundments; (c) present disposal practices are such that, in 1995, these wastes were being managed in 40 percent to 70 percent of landfills and surface impoundments without reasonable controls in place, particularly in the area of groundwater

monitoring; and (d) while there have been substantive improvements in state regulatory programs, we have also identified gaps in state oversight.

When we considered a tailored subtitle C approach, we estimated the potential costs of regulation of coal combustion wastes (including the utility coal combustion wastes addressed in the 1993 Part 1 determination) to be \$1 billion per year. While large in absolute terms, we estimate that these costs are less than 0.4 percent of industry sales. To improve our estimates we solicit public comment on the potential compliance costs to coal combustion waste generators as well as the indirect costs to users of these combustion by-products.

We have also decided that it is appropriate to establish national regulations under RCRA non-hazardous waste authorities (and/or possibly modifications to existing regulations established under authority of SMCRA) applicable to the placement of coal combustion wastes in surface or underground mines. We have reached this decision because (a) we find that these wastes when minefilled could present a danger to human health and the environment under certain circumstances, and (b) there are few states that currently operate comprehensive programs that specifically address the unique circumstances of minefilling, making it more likely that damage to human health or the environment could go unnoticed.

With the exception of minefilling as described above, we have decided that national regulation under subtitle C or subtitle D is not warranted for any of the other beneficial uses of coal combustion wastes. We have reached this decision because: (a) We have not identified any other beneficial uses that are likely to present significant risks to human health or the environment; and (b) no documented cases of damage to human health or the environment have been identified. Additionally, we do not want to place any unnecessary barriers on the beneficial uses of coal combustion wastes so they can be used in applications that conserve natural resources and reduce disposal costs.

B. What Were EPA's Tentative Decisions as Presented in the Report to Congress?

On March 31, 1999, EPA indicated a preliminary decision that disposal of coal combustion wastes should remain exempt from regulation under RCRA subtitle C. We also presented our tentative view that most beneficial uses of these wastes should remain exempt from regulation under RCRA subtitle C.

However, in the RTC we identified three situations where we had particular concerns with the disposition or uses of these wastes.

First, we indicated some concern with the co-management of mill rejects ("pyrites") with coal combustion wastes which, under certain circumstances, could cause or contribute to ground water contamination or other localized environmental damage. We indicated that the utility industry responded to our concern by implementing a voluntary education and technical guidance program for the proper management of these wastes. We expressed satisfaction with the industry program and tentatively concluded that additional regulation in this area was not necessary. We explained that we were committed to overseeing industry's progress on properly managing pyritic wastes, and would revisit our regulatory determination relative to co-management of pyrites with large volume coal combustion wastes at a later date, if industry progress was insufficient in this area.

Second, in the RTC we identified potential human health risks from arsenic when these wastes are used for agricultural purposes (e.g., as a lime substitute). To address this risk, we indicated our preliminary view that Subtitle C regulations may be appropriate for this management practice. We explained that an example of such controls could include regulation of the content of these materials such that, when used for agricultural purposes, the arsenic level could be no higher than that found in agricultural lime. As an alternative to subtitle C regulation, we indicated that EPA could engage the industry to implement a voluntary program to address the risk, for example, by limiting the level of arsenic in coal combustion wastes when using them for agricultural purposes. Moreover, we indicated that a decision to establish hazardous waste regulations applicable to agricultural uses of co-managed coal combustion wastes would likely affect the regulatory status of the Part 1 wastes (i.e., electric utility high volume coal combustion wastes managed separately from other coal combustion wastes) when used for agricultural purposes. This is because the source of the identified risk was the arsenic content of the high volume coal combustion wastes and not other materials that may be co-managed with them.

Third, we expressed concern with potential impacts from the expanding practice of minefilling coal combustion wastes (i.e., backfilling the wastes into mined areas) and described the

difficulties we had with assessing the impacts and potential risks of this practice. We explained that these difficulties include:

- Determining if elevated contaminants in ground water are due to minefill practices or pre-existing conditions resulting from mining operations,
- Trying to model situations that may be more complex than our groundwater models can accommodate,
- The lack of long-term experience with the recent practice of minefilling, which limits the amount of environmental data for analysis, and
- The site-specific nature of these operations.

Accordingly, we did not present a tentative decision in the RTC for this practice. We indicated that subtitle C regulation would remain an option for minefilling, but that we needed additional information prior to making a final decision. Rather, we solicited additional information from commenters on these and other aspects of minefilling practices and indicated we would carefully consider that information in the formulation of today's decision.

C. How Did Commenters' React to EPA's Tentative Decisions and What Was EPA's Analysis of Their Comments?

Commenter's provided substantial input and information on several aspects of our overall tentative decision to retain the exemption for these wastes from RCRA subtitle C regulation. These aspects are: modeling and risk assessment for the groundwater pathway, documented damage cases, the potential for coal combustion waste characteristics to change as a result of possible future Clean Air Act regulations, proper management of mill rejects (pyrites), agricultural use of coal combustion wastes, the practice of minefilling coal combustion wastes, and our assessment of existing State programs and industry waste management practices.

1. How Did Commenters React to the Groundwater Modeling and Risk Assessment Analyses Conducted by EPA To Support its Findings in the Report to Congress?

Comments. Industry and public interest group commenters submitted detailed critiques of the groundwater model, EPACMTP, that we used for our risk analysis. Industry commenters believe that the model will overestimate the levels of contaminants that may migrate down-gradient from disposed wastes. Environmental groups expressed the opposite belief; that is, that the

model underestimates down-gradient chemical concentrations and, therefore, underestimates the potential risk posed by coal combustion wastes.

The breadth and potential implications of the numerous technical comments on the EPACMTP model are significant. Examples of the comments include issues relating to:

- The thermodynamic data that are the basis for certain model calculations,
- The model's ability to account for the effects of oxidation-reduction potential,
- The model's ability to account for competition between multiple contaminants for adsorption sites,
- The model's algorithm for selecting adsorption isotherms,
- The impact of leachate chemistry on adsorption and aquifer chemistry, and
- The model's inherent assumptions about the chemistry of the underlying aquifer.

EPA's Analysis of the Comments. We have been carefully reviewing all of the comments on the model. We determined that the process of thoroughly investigating all of the comments will take substantially more time to complete than is available within the court deadline for issuing this regulatory determination. At this time, we are uncertain of the overall outcome of our analysis of the issues raised in the comments. Accordingly, we have decided not to use the results of our groundwater pathway risk analysis in support of today's regulatory determination on fossil fuel combustion wastes. As explained below, in making today's regulatory determination, we have relied in part on other information related to the potential danger that may result from the management of fossil fuel combustion wastes.

Meanwhile, we will continue with our analysis of comments on the groundwater model and risk analysis. This may involve changing or restructuring various aspects of the model, if appropriate. It may also include additional analyses to determine whether any changes to the model or modeling methodology would materially affect the groundwater risk analysis results that were reported in the RTC. If our investigations reveal that a re-analysis of groundwater risks is appropriate, we will conduct the analysis and re-evaluate today's decisions as warranted by the re-analysis.

In addition to our ongoing review of comments on the groundwater model, one element of the model—the metals partitioning component called "MINTEQ"—has been proposed for

additional peer review. When additional peer review is completed, we will take the findings and recommendations into account in any overall decision to re-evaluate today's regulatory determination.

While not relying on the EPACMTP groundwater modeling as presented in the RTC, we have since conducted a general comparison of the metals levels in leachate from coal combustion wastes to their corresponding hazardous waste toxicity characteristic levels. Fossil fuel wastes infrequently exceed the hazardous waste characteristic. For co-managed wastes, 2% (1 of 51 samples) exceeded the characteristic level. For individual wastes streams, 0% of the coal bottom ash, 2% of the coal fly ash, 3% of the coal flue gas desulfurization, and 7% of the coal boiler slag samples that were tested exceeded the characteristic level. Nevertheless, once we have completed a review of our groundwater model and made any necessary changes, we will reevaluate groundwater risks and take appropriate regulatory actions. We will specifically assess new modeling results as they relate to any promulgated changes in the arsenic MCL.

We also compared leach concentrations from fossil fuel wastes to the drinking water MCLs. In the case of arsenic, we examined a range of values because EPA expects to promulgate a new arsenic drinking water regulation by January 1, 2001. This range includes the existing arsenic MCL (50 ug/l), a lower health based number presented in the FFC Report to Congress (RTC) (0.29 ug/l), and two assumed values in between (10 and 5 ug/l). We examined this range of values because of our desire to bracket the likely range of values that EPA will be considering in its effort to revise the current MCL for arsenic. The National Research Council's 1999 report on Arsenic in Drinking Water indicated that the current MCL is not sufficiently protective and should be revised downward as soon as possible. For this reason, we selected the current MCL of 50 ug/L for the high end of the range because EPA is now considering lowering the current MCL and does not anticipate that the current MCL would be revised to any higher value. We selected the health-based number presented in the Report to Congress for the low end of the range because we believe this represents the lowest concentration that would be considered in revising the current MCL. Because at this time we cannot project a particular value as the eventual MCL, we also examined values in between these low-end and high-end values, a value of 5

ug/L and a value of 10 ug/L, for our analyses supporting today's regulatory determination. The choice of these mid-range values for analyses does not predetermine the final MCL for arsenic.

Those circumstances where the leach concentrations from the wastes exceed the drinking water criteria have the greatest potential to cause significant risks. This "potential" risk, however, may not occur at actual facilities. Pollutants in the leachate of the wastes undergo dilution and attenuation as they migrate through the ground. The primary purpose of models such as EPACMTP is to account for the degree of dilution and attenuation that is likely to occur, and to obtain a realistic estimate of the concentration of contaminants at a groundwater receptor. To provide a view of potential groundwater risk, we tabulated the number of occurrences where the waste leachate hazardous metals concentrations were: (a) Less than the criteria, (b) between 1 and 10 times the criteria, (c) between 10 and 100 times the criteria, and (d) greater than 100 times the criteria. Groundwater models that we currently use, when applied to large volume monofill sources of metals, frequently predict that dilution and attenuation will reduce leachate levels on the order of a factor of 10 under reasonable high end conditions. This multiple is commonly called a dilution and attenuation factor (DAF). For this reason and because lower dilution and attenuation factors (e.g., 10) are often associated with larger disposal units such as those typical at facilities where coal is burned, we assessed the frequency of occurrence of leach concentrations for various hazardous metals which were greater than 10 times the drinking water criteria. Based on current MCLs, there was only one exceedence (for cadmium). However, when we considered the arsenic health based criterion from the RTC, we found that a significant percentage (86%) of available waste samples had leach concentrations for arsenic that were greater than ten times the health-based criterion. Even considering intermediate values closer to the current MCL, a significant percentage of available waste samples had leach concentrations for arsenic that were greater than ten times the criteria (30% when the criterion was assumed to be 5 ug/l, and 14% when the criterion was assumed to be 10 ug/l). Similar concerns also occurred when comparing actual groundwater samples associated with FFC waste units and this range of criteria for arsenic. We believe this is an indication of potential risks from arsenic.

For the above analysis, we used a value equal to half the detection level to deal with those situations where analyses resulted in "less than detection" values that exceeded the MCL criteria. The actual concentration may be as low as zero or up to the detection level. To illustrate the impact of this assumption, an analysis was performed setting the "less than detection" values to zero, and an arsenic criteria at 50 ug/l. While 30% of the values exceeded 10 times the criteria when using half the detection level, exceedences dropped to 13% when "less than detection" values were set to zero.

The comparison of the leachate levels to 10 times MCL criteria is a screening level analysis that supports our concerns, which are primarily based on damage cases and the lack of installed controls (liners and groundwater monitoring). We recognize, however, that prior to issuing a regulation the Agency expects to address the issues raised on the groundwater model and complete a comprehensive groundwater modeling effort. Furthermore, we anticipate that uncertainty regarding whether the arsenic MCL will be amended and to what level, will be more settled prior to regulation of these wastes. These factors could heighten or reduce concerns with regard to the need for Federal regulation of fossil fuel combustion wastes.

2. How Did Commenters React to EPA's Assessment of Documented Damage Cases Presented in the Report to Congress?

Prior to issuing the RTC, we sought and reviewed potential damage cases related to these particular wastes. The activities included:

- A re-analysis of the potential damage cases identified during the Part 1 determination,
- A search of the CERCLA Information System for instances of these wastes being cited as causes or contributors to damages,
- Contacts and visits to regulatory agencies in five states with high rates of coal consumption to review file materials and discuss with state officials the existence of damage cases,
- A review of information provided by the Utility Solid Waste Act Group and the Electric Power Research Institute on 14 co-management sites, and
- A review of information provided by the Council of Industrial Boiler Owners on eight fluidized bed combustion (FBC) facilities.

These activities yielded three damage case sites in addition to the four cases

initially identified in the Part 1 determination.² Five of the damage cases involved surface impoundments and the two other cases involved landfills. The waste management units in these cases were all older, unlined units. The releases in these cases were confined to the vicinity of the facilities and did not affect human receptors. None of the damages impacted human health. We did not identify any damage cases that were associated with beneficial use practices.

Comments. Public interest group commenters criticized our approach to identifying damage cases associated with the management of fossil fuel combustion (FFC) wastes, stating that EPA did not use the same procedure used to identify damage cases for the cement kiln dust (CKD) Report to Congress. These commenters believed that we were too conservative in our interpretation and determination of FFC damage cases and dismissed cases that commenters believe are relevant instances of damage. For example, these commenters indicated that EPA, in the RTC, did not consider cases where the only exceedences of ground water standards were for secondary MCLs (Maximum Contaminant Levels as established by EPA for drinking water standards). They further indicated that the states often require ground water monitoring only for secondary MCL constituents and that elevated levels of the secondary MCL constituents are an indication of future potential for more serious, health-based standards to be exceeded for other constituents in the wastes, such as toxic metals.

Additionally, these commenters stated that the Agency's analysis for damage cases was incomplete and they provided information on 59 possible damage cases involving these wastes, mostly at utilities. Additionally, commenters submitted seven cases of ecological damage that allege damage to mammals, amphibians, fish, benthic layer organisms and plants from co-management of coal combustion wastes in surface impoundments.

Industry commenters cited EPA's finding of so few damage cases as important support for our tentative conclusion to exempt these wastes from hazardous waste regulation. Further, some of the industry commenters indicated that the few damage cases that EPA identified do not represent current

² The Part 1 determination identified six cases of documented damages. Upon further review, we determined that two of these cases involve utility coal ash monofills which are covered by the Part 1 determination. However, the other four cases involved remaining wastes that are covered by today's determination.

utility industry management practices, but rather reflect less environmentally protective management practices at older facilities that pre-date the numerous state and federal requirements that are now in effect for managing these wastes.

EPA's Analysis of the Comments. Regarding ecological damage, while we did not identify any ecological damage cases in the RTC associated with management of coal combustion wastes, we reviewed the information on ecological damage submitted by commenters and agree that four of the seven submitted are documented damage cases that involve FFC wastes. All of these involve some form of discharge from waste management units to nearby lakes or creeks. These confirm our risk modeling conclusions as presented in the RTC that there could be adverse impacts on amphibians, birds, or mammals if they were subject to the elevated concentrations of selected chemicals that had been measured in some impoundments. However, no information was submitted in comments that would lead us to alter our conclusion that these threats are not substantial enough to cause large scale, system level ecological disruptions. These damage cases, attributable to runoff or overflow that is already subject to Clean Water Act discharge or stormwater regulations, are more appropriately addressed under the existing Clean Water Act requirements.

Regarding our assessment of damage to ground water, we believe our approach to FFC damage cases in the RTC was consistent with the approach we used for identifying CKD damage cases. For CKD, we established two categories of damage cases—"proven" damage cases and "potential" damage cases. Proven damage cases were those with documented MCL exceedences that were measured in ground water at a sufficient distance from the waste management unit to indicate that hazardous constituents had migrated to the extent that they could cause human health concerns. Potential damage cases were those with documented MCL exceedences that were measured in ground water beneath or close to the waste source. In these cases, the documented exceedences had not been demonstrated at a sufficient distance from the waste management unit to indicate that waste constituents had migrated to the extent that they could cause human health concerns. We do not believe that it would be appropriate to consider an exceedence directly beneath a waste management unit or very close to the waste boundary to be a documented, proven damage case.

State regulations typically use a compliance procedure that relies on measurement at a receptor site or in ground water at a point beyond the waste boundary (e.g., 150 meters). While our CKD analysis did not distinguish between primary and secondary MCL exceedences, most CKD damage cases involved a primary MCL constituent. Our principal basis for determining that CKD when managed in land-based units would no longer remain exempt from being regulated as a hazardous waste was our concern about generally poor management practices characteristic of that industry. Our conclusion was further supported by the extremely high percentage of proven damage cases occurring at active CKD sites for which groundwater monitoring data were available.

For FFC, we used the same test of proof to identify possible damage cases. Our FFC analysis drew a distinction between primary and secondary MCL exceedences because we believe this factor is appropriate in weighing the seriousness of FFC damage in terms of indicating risk to human health and the environment. For FFC, in the RTC, we reported only the "proven" damage (i.e., exceedence of a health-based standard such as a primary MCL and measurement in ground water or surface water). As was done in the CKD analysis, we also identified a number of potential FFC damage cases (eleven) which were included in the background documents that support the RTC.

Unlike the primary MCLs, secondary MCLs are not based on human health considerations. (Examples are dissolved solids, sulfate, iron, and chloride for which groundwater standards have been established because of their effect on taste, odor, and color.) While some commenters believe that elevated levels of some secondary MCL parameters such as soluble salts are likely precursors or indicators of future hazardous constituent exceedences that could occur at coal combustion facilities, we are not yet able and will not be able to test their hypothesis until we complete our analysis of all comments received on our groundwater model and risk analysis, which will not be concluded until next year.

Of the 59 damage cases reported by commenters, 11 cases appear to involve exceedences of primary MCLs or other health-based standards as measured either in off-site ground water or in nearby surface waters, the criteria we used in the RTC to identify proven damage cases. Of these eleven cases, two are coal ash monofills which were included in the set of damage cases described by EPA in its record

supporting the Part 1 regulatory determination. The remaining nine cases involve the co-management of large volume coal combustion wastes with other low volume and uniquely associated coal combustion wastes. We had already identified five of these nine cases in the RTC. Thus, only four of these eleven damage cases are newly identified to us. Briefly, the four new cases involve:

- Exceedence of a state standard for lead in downgradient ground water at a coal fly ash landfill in New York. There were also secondary MCL exceedences for sulfate, dissolved solids, and iron.
- Primary MCL exceedences for arsenic and selenium in downgradient monitoring wells for a coal ash impoundment at a power plant in North Dakota. There were also secondary MCL exceedences for sulfate and chloride.
- Primary MCL exceedences for fluoride and exceedence of a state standard for boron in downgradient monitoring wells at a utility coal combustion waste impoundment in Wisconsin. There was also a secondary MCL exceedence for sulfate.
- Exceedence of a state standard for boron and the secondary MCL for sulfate and manganese in downgradient monitoring wells at a utility coal combustion landfill in Wisconsin.

We found that in nine of the 11 proven damage cases (including one Superfund site), states took appropriate action to require or conduct remedial activities to reduce or eliminate the cause of contamination. EPA took action in the remaining two cases under the Superfund program

Nineteen of the candidate damage cases submitted by commenters involve either on-site or off-site exceedences of secondary MCLs, but not primary MCLs or other health-based standards. Consistent with our CKD analysis, we consider these cases to be indicative of a potential for damage to occur at these sites because they demonstrate that there has been a release to ground water from the waste management unit.

Regarding the remaining 29 cases submitted by commenters:

- Six involve primary MCL exceedences, but measurements were in ground water either directly beneath the waste or very close to the waste boundary, i.e., no off-site ground water or receptor measurements indicated that ground water standards had been exceeded. Consistent with our analysis of damage cases for cement kiln dust, we consider these six cases to be indicative of a potential for damage to occur at these sites because they demonstrate that there has been a

release to ground water from the waste management unit.

- Eighteen case summary submissions contained insufficient documentation and data for us to verify and draw a conclusion about whether we should consider these to be potential or proven damage cases. Of these 18 cases, commenters claimed that 11 cases involve primary MCL exceedences, and another two involve secondary MCLs, but not primary MCLs. The other five cases lacked sufficient information and documentation to determine whether primary or secondary MCLs are involved. Examples of information critical to assessing and verifying candidate damage cases that was not available for these particular cases include: Identification of the pollutants causing the contamination; identification of where or how the damage case information was obtained (e.g., facility monitoring data, state monitoring or investigation, third party study or analysis); monitoring data used to identify levels of contaminants; and/or sufficient information to determine whether the damages were actually attributable to fossil fuel combustion wastes; and/or location of the identified contamination (i.e., directly beneath the unit or very close to the waste boundary or at a point some distant (e.g., 150 meters) from the unit boundary).

- Three case submissions are cases we identified in the Part 1 determination and involve monofilled utility coal ash wastes. However, as explained in the Report to Congress for the Part 1 determination, EPA determined that there was insufficient evidence to consider them to be documented damage cases.

- One case did not involve fossil fuel combustion wastes.

- One case involved coal combustion wastes and other unrelated wastes in an illegal, unpermitted dump site. This site was handled by the state as a hazardous waste cleanup site.

Our detailed analysis of the damage cases submitted by commenters is available in the public docket for this regulatory determination.

In summary, based on damage case information presented in the RTC and our review of comments, we conclude that there are 11 proven damage cases associated with wastes covered by today's regulatory determination. We identified seven of these damage cases in the RTC, so there are four new proven damage cases that were identified by commenters. All of the sites were at older, unlined units, with disposal occurring prior to 1993. For all 11 of the proven damage cases, either the state or EPA provided adequate follow-up to

require or else undertake corrective action. Although these damage cases indicate that coal combustion wastes can present risks to human health and the environment, they also show the effectiveness of states' responses when damages were identified. None of these cases involved actual human exposure.

Additionally, we determined that another 25 of the commenter submitted cases are potential damage cases for the reasons described above. Thus, including the 11 potential damage cases that we identified in the background documents that support the RTC, we are aware of 36 potential damage cases. While we do not believe the latter 36 cases satisfy the statutory criteria of documented, proven damage cases because damage to human health or the environment has not been proven, we believe that these cases may indicate that these wastes pose a "potential" danger to human health and the environment in some circumstances.

In conclusion, while the absolute number of documented, proven damage cases is not large, we believe that the evidence of proven and potential damage should be considered in light of the proportion of new and existing facilities, particularly surface impoundments, that today lack basic environmental controls such as liners and groundwater monitoring. Approximately one-third of coal combustion wastes are managed in surface impoundments. We note that controls such as liners may not be warranted at some facilities, due to site-specific conditions. We acknowledge, however, that our inquiry into the existence of damage cases was focused primarily on a subset of states. Given the volume of coal combustion wastes generated nationwide and the number of facilities that lacked groundwater monitoring as of 1995, there is at least a substantial likelihood other cases of actual and potential damage likely exist. Because we did not use a statistical sampling methodology to evaluate the potential for damage, we are unable to determine whether the identified cases are representative of the conditions at all facilities and, therefore, cannot quantify the extent and magnitude of damages at the national level.

3. What Concerns Did Commenters Express About the Impact of Potential Future Regulation of Hazardous Air Pollutants Under the Clean Air Act on Today's Regulatory Determination?

Comments. In both public hearing testimony and written comments, public interest groups expressed concern about potential changes in the characteristics of these wastes when new air pollution

controls are established under the Clean Air Act. The commenters referred to the possible future requirement for hazardous air pollutant controls at coal burning electric utility power plants, which could result in an increased level of metals and possibly other hazardous constituents in coal combustion wastes. The commenters indicated that these increased levels, in turn, could have serious implications for cross-media environmental impacts such as leaching to groundwater and volatilization to the air. The commenters argued that the Agency should include these factors in its current decision making on the regulatory status of coal combustion under the Resource Conservation and Recovery Act.

EPA's Analysis of the Comments. We have carefully considered the issue of cross-media impacts and the commenters' specific concerns that future air regulations could have an adverse impact on the characteristics of coal combustion wastes. We have concluded that it is premature to consider the possible future impact of such new air pollution controls on the wastes that are subject to today's regulatory determination. The Agency plans to issue a regulatory determination in the latter part of 2000 regarding hazardous air pollutant (HAP) controls at coal-burning, power generating facilities. If EPA decides to initiate a rulemaking process, final rulemaking under the Clean Air Act is projected to occur in 2004. Thus, no final decision has been made on what, if any, constituents will be regulated by future air pollution control requirements. Additionally, the regulatory levels of the those specific pollutants that might be controlled and the control technologies needed to attain any regulatory requirements have not yet been identified. Therefore, we believe there is insufficient information at this time for evaluating the characteristics and potential environmental impacts of solid wastes that would be generated as a result of new Clean Air Act requirements.

When any rulemaking under the Clean Air Act proceeds to a point where we can complete an assessment of the likely changes to the character of coal combustion wastes, we will evaluate the implications of these changes relative to today's regulatory determination and take appropriate action.

4. How Did Commenters React to the Findings Presented in the Report to Congress Related to Proper Management of Mill Rejects (Pyrites)?

The RTC explained that we identified situations where pyrite-bearing

materials such as mill rejects (a low volume and uniquely associated waste) that are co-managed with coal combustion wastes may cause or contribute to risks or environmental damage if not managed properly. These materials when managed improperly with exposure to air and water can generate acid. The acid, in turn, can mobilize metals contained in the co-managed combustion wastes. The RTC also explained that the Agency engaged the utility industry in a voluntary program to ensure appropriate management of these wastes. The industry responded by developing technical guidance and a voluntary industry education program on proper management of these wastes.

Comments. Utility industry commenters supported our tentative decision to continue the exemption for coal combustion wastes co-managed with mill rejects from regulation as a hazardous waste. Their position is based primarily on the industry's voluntary implementation of an education program and technical guidance on the proper management of these wastes, as described in the RTC.

Public interest groups and other commenters disagreed with our tentative decision, explaining their belief that such voluntary controls or programs are inadequate. They indicated that coal combustion wastes should be subject to hazardous waste regulations.

EPA's Analysis of the Comments. We remain encouraged by the utility industry program to educate and inform its members by implementing guidance on the proper management of coal mill rejects. However, as pointed out by commenters, there is no assurance that facilities where coal combustion wastes co-managed with pyritic wastes will follow the guidance developed by industry. In light of the number of demonstrated and potential damage cases identified to date, we are concerned that simply relying on voluntary institution of necessary controls would not adequately ensure the protection of human health and the environment. At this time, to ensure that we are aware of all stakeholders views on the adequacy of the control approaches described in the guidance to protect human health and the environment, we are soliciting public comment on the final version of the industry coal mill rejects guidance. This guidance is available in the docket supporting today's decisions.

5. How Did Commenters React to the Findings Presented in the Report to Congress Related to Agricultural Use of Coal Combustion Wastes?

In the RTC, we presented findings on the human health risks associated with agricultural use of coal wastes as an agricultural lime substitute. The pathway examined embodies risks from ingestion of soil and inhalation, and from ingestion of contaminated dairy, beef, fruit and vegetable products. The resultant "high end" cancer risk reported in the RTC was 1×10^{-5} (one in one hundred thousand exposed population), for the child of a farmer. The variables held at high end for this calculation were contaminant concentration and children's soil ingestion. With all variables set to central tendency values, the risk was calculated to be 1×10^{-7} (one in ten million exposed population). We did not identify the presence of any non-cancer hazard of concern. Based on the high end risk, the Agency raised the possibility in the RTC of developing Subtitle C controls or seeking commitments from industry to a voluntary program.

Comments. A number of industry, academic, and federal agency commenters disagreed with our tentative conclusion that some level of regulation may be appropriate for coal combustion wastes when used as an agricultural soil supplement. They indicated that EPA used unrealistically conservative levels for four key inputs used in our risk analysis and that use of a realistic level for any one of these inputs would result in a risk level less than 1×10^{-6} . The four inputs identified by the commenters are: application rate of the wastes to the land, the rate of soil ingestion by children, the bioavailability of arsenic and the phytoavailability of arsenic.

These commenters further recommended that EPA not regulate, but rather encourage voluntary restrictions because:

- Agricultural use of coal combustion wastes creates no adverse environmental impacts and EPA identified no damage cases associated with this practice;
- Agricultural use of these wastes has significant technical and economic benefits;
- Federal controls would be unnecessarily costly and would create a barrier for research and development on the practice;
- Existing regulatory programs are sufficient to control any risks from this practice; and
- The limits suggested in the RTC for arsenic levels in coal combustion wastes

are inconsistent with limits applied to other materials used in agriculture.

Public interest groups stated their belief that a voluntary approach would not be sufficiently protective of human health and the environment. They believe the Agency should apply restrictions on the use of these wastes in agriculture because the Agency's analyses of the risks and benefits of this practice were inadequate. They further recommended that EPA should prohibit the land application of coal combustion wastes generated by conventional boilers, and make the arsenic limitation of EPA's sewage sludge land application regulations applicable to the land application of coal combustion wastes generated by fluidized bed combustors, which add lime as part of the combustion process.

EPA's Analysis of Comments. After reviewing these comments and supporting information provided by the commenters, we concluded that a revised input into the model for children's soil ingestion rate is appropriate. Based on further review of the Agency's Exposure Factors Handbook (EFH), we decided to model a children's soil ingestion rate of 0.4 grams per day instead of the 1.4 grams per day that underlay the results given in the RTC.

Many studies have been conducted to estimate soil ingestion by children. Early studies focused on dirt present on children's hands. More recently, studies have focused on measuring trace elements in soil and then in feces as a function of internal absorption. These measurements are used to estimate amounts of soil ingested over a specified time period. The EFH findings for children's soil ingestion are based on seven key studies and nine other relevant studies that the Agency reviewed on this subject. These studies showed that mean values for soil ingestion ranged from 39 mg/day to 271 mg/day with an average of 146 mg/day. These results are characterized for studies that were for short periods with little information reported for pica behavior. To account for longer periods of time, the EFH reviewed the upper percentile ranges of the data studied and found ingestion rates that ranged from 106 mg/day to 1,432 mg/day with an average of 383 mg/day for soil ingestion. Rounding to one significant figure, the EFH recommended an upper percentile children's soil ingestion rate of 400 mg/day. The Agency believes that this recommendation is the best available information to address children's exposure through the soil ingestion route. Reducing the ingestion rate to the EFH handbook recommended level of

400 mg/day reduced the calculated risk to 3.4×10^{-6} for this one child risk situation and suggests that agricultural use of FFC wastes does not cause a risk of concern.

EPA believes its inputs for phytoavailability are accurate, although there are studies that suggest phytoavailability will decrease over time. Arsenic bioavailability is a function of all sources of arsenic and EPA believes it has characterized this accurately. However, as noted elsewhere, arsenic toxicity is now being studied by the Agency in conjunction with a proposed new arsenic MCL and may necessitate re-visiting today's judgement on agricultural use.

Our technical analysis that resulted in revised risk is explained in a document titled Reevaluation of Non-groundwater Pathway Risks from Agricultural Use of Coal Combustion Wastes, which is available in the docket for this action.

The comment on inappropriateness of application frequency was caused by a misunderstanding of the language in the RTC. The rate used was actually every two or three years, not two or three times per year.

Two ongoing studies of wastes of potential use as agricultural soil supplements relate to the use of FFC wastes for this purpose. Although these did not play a direct role in EPA's decision regarding FFC wastes, they are summarized below and may play a role in any future review of today's decision.

(1) On August 20, 1999, the agency proposed risk-based standards for cement kiln dust when used as a liming agent (see 64 FR 45632; August 20, 1999). This analysis was completed in 1998 just prior to our completion of the analysis of FFC wastes when used as agricultural supplements. The CKD analysis underwent a special peer review by a standing committee that is used by the Department of Agriculture. We were not able to respond to the peer review comments in either the CKD proposal or in our assessment for fossil fuel combustion wastes prior to publication of today's regulatory determination. The comment period for the CKD proposal closed on February 17, 2000, and we will soon begin our review and analyses of the public and peer review comments.

(2) In December 1999, EPA proposed new risk based standards for the use of municipal sewage sludge under section 503 of the Clean Water Act (the "503 standards"). It is important to note that municipal sludge has unique properties, application rates, and uses. This makes it inappropriate to transfer the 503 standards directly. Even though the standards cannot be used directly, there

may be interest in the risk assessment methodologies used to support the development of these standards. We disagree that it is appropriate to establish an arsenic limitation for coal combustion ash when used for agricultural purposes equivalent to that contained in the EPA sewage sludge land application regulations. The organic nature of sewage sludge makes it behave very differently from inorganic wastes such as coal combustion wastes.

We conclude at this time that arsenic levels in coal combustion wastes do not pose a significant risk to human health when used for agricultural purposes. We expect to continue to review and refine the related risk assessments noted above, and will consider comments on the Agency's CKD and municipal sludge proposals, as well as new scientific developments related to this issue such as additional peer review of the EPA MINTEQ model that was used as a component of our risk analysis. If these efforts lead us to a different understanding of the risks posed by coal combustion wastes when used as a substitute for agricultural lime, we will take appropriate action to reevaluate today's regulatory determination.

6. How Did Commenters React to the Findings Presented in the Report to Congress Related to Minefilling of Coal Combustion Wastes?

In the RTC, we explained that we had insufficient information to adequately assess the risks associated with the use of coal combustion wastes to fill surface and underground mines, whether the mines are active or abandoned. Accordingly, we did not present a tentative conclusion in the RTC with respect to the use of coal combustion wastes for disposal in active mines or for reclamation of mines. However, we did indicate that regulation of minefilling under hazardous waste rulemaking authority would remain an option for minefilling, but that we needed additional information prior to making a final decision. Thus, we solicited additional information on specific minefilling techniques, problems that may be inherent in this management practice, risks posed by this practice, existing state regulatory requirements, and environmental monitoring data. We indicated that we would consider any comments and new information on minefilling received in comments and would address this management practice in today's regulatory determination.

Comments. A number of commenters responded to our request by providing reports on individual case studies, including minefilling in underground as

well as in surface mines, descriptions of current state regulatory requirements that address this practice, monitoring data, and information about risk analysis techniques.

Industry commenters and one federal agency supported our decision to study the issue further and not attempt to estimate the risks posed by this practice using existing methods. Further, numerous industry, academic, state agency, and federal agency commenters encouraged EPA not to adopt national regulations or voluntary restrictions on minefilling because: (a) Nationwide standards would not be conducive to the site-specific evaluations needed to appropriately control these operations; (b) minefilling creates no adverse environmental impacts and EPA identified no damage cases associated with this practice; (c) existing state and federal regulatory programs and industry practices are sufficient to control any risks from this practice, and (d) federal standards would be an unreasonable interference with states' authorities.

Additionally, several industry representatives, legislators, and state mining and environmental agencies mentioned that this practice, when used to remediate abandoned mine lands, will produce considerably greater environmental benefits than risks. Further, they maintained that minefilling is a relatively inexpensive means to stop or even reverse the environmental damage caused by old mining practices. They indicated that through remediation by minefilling, these lands frequently can be returned to productive use. These commenters recommended no additional regulation of this practice.

Public interest groups and others believe we should regulate minefilling under RCRA subtitle C or prohibit it for several reasons including weaknesses in existing state and federal regulatory programs, the poor practices and performance at existing minefilling operations, and potential impacts on potable water sources. Commenters stated that state programs effectively allow open dumps without any design or construction standards. For minefilling, one commenter urged EPA to defer to state regulations only if the Agency specifically found existing state regulations to be adequate.

EPA's Analysis of Comments. We agree with commenters that it is inappropriate to estimate the risks posed by minefilling using the existing methods that we employed to conduct risk analyses for disposal of coal combustion wastes in landfills and impoundments. We found that the

groundwater models available to us are unsuitable for estimating risks from minefills because, for example, they are not able to account for conditions such as fractured flow that are typical of the hydrogeology associated with mining operations. In addition, as explained above, EPA's primary groundwater model, EPACMTP, is now undergoing careful review on the basis of comments received on the Report to Congress.

We are aware that the use of coal combustion wastes to conduct remediation of mine lands can improve conditions caused by mining activities. We also recognize that this often is the lowest cost option for conducting these remediation activities. We generally encourage the practice of remediating mine lands with coal combustion wastes when minefilling is conducted properly and when there is adequate oversight of the remediation activities. We are also aware that relatively few states currently operate regulatory or other programs that specifically address minefilling, and that many states where this practice is occurring do not have programs in place. Based on our review of information on existing state minefill programs, we find serious gaps such as a lack of adequate controls and restrictions on unsound practices, e.g., no requirement for groundwater monitoring and no control or prohibitions on waste placement in the aquifer.

At this time, we cannot reach definitive conclusions about the adequacy of minefilling practices employed currently in the United States and the ability of government oversight agencies to ensure that human health and the environment are being adequately protected. For example, it is often impossible to determine if existing groundwater quality has been impacted by previous mining operations or as a result of releases of hazardous constituents from the coal combustion wastes used in the minefilling applications. Additionally, data and information submitted during the public comment period indicate that if the chemistry of the mine relative to the chemistry of the coal combustion wastes is not properly taken into account, the addition of coal combustion wastes to certain environmental settings can lead to an increase in hazardous metals released into the environment. This phenomena has been substantiated by data available to the Agency that show when pyrites, which can cause acid generation, have been improperly co-managed with coal combustion wastes, high levels of metals, especially arsenic, have leached from the wastes.

Finally, we concluded in our recent study of disposal of cement kiln dust that placement of cement kiln dust directly in contact with ground water led to a substantially greater release of hazardous metal constituents than we predicted would occur when such placement in ground water did not occur. We are aware of situations where coal combustion wastes are being placed in direct contact with ground water in both underground and surface mines. This could lead to increased releases of hazardous metal constituents as a result of minefilling. Thus, if the complexities related to site-specific geology, hydrology, and waste chemistry are not properly taken into account when minefilling coal combustion wastes, we believe that certain minefilling practices have the potential to degrade, rather than improve, existing groundwater quality and can pose a potential danger to human health and the environment. Subsequent impacts on human health would depend in part on the proximity of drinking water wells, if any, to elevated levels of metals in the water. To date we are unaware of any proven damage cases resulting from minefilling operations.

7. How Did Commenters React to EPA's Tentative Reliance on State Programs and Voluntary Industry Implementation of Improved Management Practices To Mitigate Potential Risks From Coal Combustion Waste Management?

In the RTC, EPA considered retaining the exemption for coal combustion wastes disposed in surface impoundments and landfills and for mill rejects (pyrites) that are managed with those wastes. The Agency cited a reliance on state programs that have improved substantially over the past 10 to 15 years and continue to improve, combined with voluntary industry implementation of guidance for improved management practices to mitigate risk. In addition, we stated that we would continue to work with industries and states to promote and monitor improvements.

To assess the adequacy of state programs and the potential for voluntary implementation of improved practices, we looked at the current number of facilities with liners and groundwater monitoring (which may reflect voluntary industry upgrading as well as state requirements), and the number of state programs that currently have authority to require a broad range of environmental controls. For units operating as of 1995, we found that among utilities, slightly more than half of the disposal units were surface impoundments. Of these

impoundments, 38 percent had groundwater monitoring and 26 percent had liners. Eighty-five percent of the utility landfills had groundwater monitoring and 57 percent had liners. For non-utility landfills, 94 percent had groundwater monitoring, and between 16 percent and 52 percent had liners. Between 1985 and 1995, 75 percent of new landfills and 60 percent of new surface impoundments within the utility sector had been lined. We have no information regarding the percentage of units built since 1995 (the date when the study we have relied on ended) that have liners or groundwater monitoring programs.

In looking at state programs, we found that for landfills, more than 40 states have the authority to require permits, siting restrictions, liners, leachate collection, groundwater monitoring, closure controls, and cover/dust controls. Forty-three states can require liners and 46 can require groundwater monitoring compared to 11 and 28 states, respectively, in the 1980's. For surface impoundments, more than 40 states have authority to require permits, siting restrictions, liners, groundwater monitoring, and closure control; 33 can require leachate collection (there is no earlier comparison data for surface impoundments). Forty-five states can require liners and 44 can require groundwater monitoring for impoundments.

Comments. Industry and state agency commenters generally stated that the Agency presented an accurate and comprehensive analysis of state programs and that existing state regulations are adequate. Public interest commenters raised many concerns about the adequacy of state programs: Either they do not have provisions to cover all elements of a protective program; they do not consistently impose the requirements for which they have authority; and/or enforcement is lax. Evidence commenters cited for the inadequacy of state programs included grandfathering for older management units and an apparent lack of controls for surface impoundments. For these reasons, some found EPA's review of state programs inaccurate or incomplete.

Public interest commenters were also skeptical of programs or efforts that rely on voluntary industry implementation because adherence to guidance is not guaranteed. Several commenters, primarily from industry, urged the Agency not to regulate pyrite co-management because of the voluntary, industry-developed guidance.

EPA's Analysis of Comments. We believe that state programs have, in fact, substantially improved over the last 15

years or so. A high percentage of states have authority to impose protective management standards on surface impoundments and landfills, especially for groundwater monitoring, liners, and leachate collection, which mitigate potential risks posed by these units. Over 40 states today have these authorities (33 states have authority to require leachate collection in surface impoundments). When authority under state groundwater and drinking water regulations are considered, some commenters have suggested that nearly all states can address the management of these wastes. In addition, we believe that the trend to line and install groundwater monitoring for new surface impoundments and landfills is positive. However, as some commenters noted, we acknowledge that our state program review looked at the authorities available to states and their overall regulatory requirements, not the specific requirements applied to given facilities, which could be more or less stringent. In addition, we recognize that individual state programs may have some gaps in coverage, as indicated below, so that some controls may not now be required at coal combustion waste impoundments and landfills. We would expect to see some differences in the application of requirements, depending on site-specific conditions.

One consistent trend that raises concern for the Agency is that controls are much less common at surface impoundment than at landfills. Even for newer units at utilities (constructed between 1985 and 1995), liners are used at 75 percent of landfills and only 60 percent of surface impoundments. Also at newer units, groundwater monitoring is implemented at 88 percent of landfills and at only 65 percent of surface impoundments. Approximately one-third of coal combustion wastes were managed in surface impoundments in 1995. Hydraulic pressure in a surface impoundment increases the likelihood of releases. We believe that groundwater monitoring, at a minimum, in existing as well as new impoundments, is a reasonable approach to monitor performance of the unit and a critical first step to addressing groundwater damage that may be caused by the unit. As of 1995, 38 percent of currently operating utility surface impoundments had groundwater monitoring and only 26 percent had liners.

While liners and groundwater monitoring are applied more frequently at landfills, there are still many utility and non-utility landfills that do not have liners. In addition, 15 percent of utility landfills do not have groundwater monitoring, and some six

percent of non-utility landfills do not have groundwater monitoring, based on a limited survey.

The utility industry through its trade associations has demonstrated a willingness to work with EPA to develop protective management practices, and individual companies have committed to upgrading their own practices. However, the Agency recognizes that participation in voluntary programs is not assured. Also, individual facilities and companies may not implement protective management practices and controls, for a variety of reasons, in spite of their endorsement by industry-wide groups.

We see a trend toward significantly improving state programs and voluntary industry investment in liners and groundwater monitoring that we believe can mitigate potential risks over time. However, we identified significant gaps in controls already in place and, in particular, requirements that may be lacking in some states, either in authority to impose the requirements or potentially in exercising that authority. In response to comments, we further analyzed risks posed by coal combustion wastes taking into account waste characteristics and potential and actual damage cases. Based on these analyses, we concluded that coal combustion wastes, in certain circumstances, could unnecessarily increase risks to human health and the environment, and that a number of proven damages have been documented, and that more are likely if we had been able to conduct a more thorough search of available state records and if groundwater monitoring data were available for all units. We recognize there will probably continue to be some gaps in practices and controls and are concerned at the possibility that these will go unaddressed. We also believe the time frame for improvement of current practices is likely to be longer in the absence of federal regulations.

D. What Is the Basis for Today's Decisions?

Based on our collection and analysis of information reflecting the criteria in section 8002(n) of RCRA that EPA must consider in making today's regulatory determination, materials developed in preparing the RTC and supportive background materials, existing state and federal regulations and programs that affect the management of coal combustion wastes, and comments received from the public on the findings we presented in the RTC, we have concluded the following:

1. Beneficial Uses

To the extent coal combustion wastes are used for beneficial purposes, we believe they should continue to remain exempt from being regulated as hazardous wastes under RCRA. Beneficial purposes include waste stabilization, beneficial construction applications (e.g., cement, concrete, brick and concrete products, road bed, structural fill, blasting grit, wall board, insulation, roofing materials), agricultural applications (e.g., as a substitute for lime) and other applications (absorbents, filter media, paints, plastics and metals manufacture, snow and ice control, waste stabilization). For the reasons presented in section 3 below, we are separately addressing the use of coal combustion wastes to fill surface or underground mines.

For beneficial uses other than minefilling, we have reached this decision because: (a) We have not identified any beneficial uses that are likely to present significant risks to human health or the environment; and (b) no documented cases of damage to human health or the environment have been identified. Additionally, we do not want to place any unnecessary barriers on the beneficial use of coal combustion wastes so that they can be used in applications that conserve natural resources and reduce disposal costs.

Disposal can be burdensome and fails to take advantage of beneficial characteristics of fossil fuel combustion wastes. About one-quarter of the coal combustion wastes now generated are diverted to beneficial uses. Currently, the major beneficial uses of coal combustion wastes include: Construction (including building products, road base and sub-base, blasting grit and roofing materials) accounting for approximately 21%; sludge and waste stabilization and acid neutralization accounting for approximately 3%; and agricultural use accounting for 0.1%. Based on our conclusion that these beneficial uses of coal combustion wastes are not likely to pose significant risks to human health and the environment, we support increases in these beneficial uses of coal combustion wastes.

Off-site uses in construction, including wallboard, present low risk due to the coal combustion wastes being bound or encapsulated in the construction materials or because there is low potential for exposure. Use in waste and sludge stabilization and in acid neutralization are either regulated (under RCRA for hazardous waste stabilization or when placed in

municipal solid waste landfills, or under the Clean Water Act in the case of municipal sewage sludge or wastewater neutralization), or appear to present low risk due to low exposure potential. While in the RTC, we expressed concern over risks presented by agricultural use, we now believe our previous analysis assumed unrealistically high-end conditions, and that the risk, which we now believe to be on the order of 10^{-6} , does not warrant national regulation of coal combustion wastes that are used in agricultural applications.

In the RTC, we were not able to identify damage cases associated with these types of beneficial uses, nor do we now believe that these uses of coal combustion wastes present a significant risk to human health or the environment. While some commenters disagreed with our findings, no data or other support for the commenters' position was provided, nor was any information provided to show risk or damage associated with agricultural use. Therefore, we conclude that none of the beneficial uses of coal combustion wastes listed above pose risks of concern.

2. Disposal in Landfills and Surface Impoundments

In this section, we discuss available information regarding the potential risks to human health and the environment from the disposal of coal combustion wastes into landfills and impoundments. In sum, our conclusion is these wastes can pose significant risks when mismanaged and, while significant improvements are being made in waste management practices due to increasing state oversight, gaps in the current regulatory regime remain.

We have determined that the establishment of national regulations is warranted for coal combustion wastes when they are disposed in landfills and surface impoundments, because: (a) The composition of these wastes has the potential to present danger to human health and the environment under some circumstances and "potential" damage cases identified by EPA and commenters, while not definitively demonstrating damage from coal combustion wastes, lend support to our conclusion that these wastes have the potential to pose such danger; (b) we have identified eleven cases of proven damage to human health and the environment by improper management of these wastes when land disposed; (c) while industry management practices have improved measurably in recent years, there is sufficient evidence these wastes are currently being managed in

a significant number of landfills and surface impoundments without proper controls in place, particularly in the area of groundwater monitoring; and (d) while there have been substantive improvements in state regulatory programs, we have also identified significant gaps either in states' regulatory authorities or in their exercise of existing authorities. Moreover, we believe that the costs of complying with regulations that specifically address these problems, while large in absolute terms, are only a small percentage of industry revenues.

When we considered a tailored subtitle C regulatory approach, we estimated the potential costs of regulation of coal combustion wastes (including the utility coal combustion wastes addressed in the 1993 Part 1 determination) to be \$1 billion per year. While large in absolute terms, we estimate that these costs are less than 0.4 percent of industry sales. Our preliminary estimate of impact on profitability is a function of facility size, among other factors. For the larger facilities, we estimate that reported pre-tax profit margins of about 13 percent may be reduced to about 11 percent. For smaller facilities, margins may be reduced from about nine percent to about seven percent.

We identified that the constituents of concern in these wastes are metals, particularly hazardous metals. We further identified that leachate from various large volume wastes generated at coal combustion facilities infrequently exceed the hazardous waste toxicity characteristic, for one or more of the following metals: arsenic, cadmium, chromium, lead, and mercury. Additionally, when we compared waste leachate concentrations for hazardous metals to their corresponding MCLs (or potential MCLs in the case of arsenic), we found that there was a potential for risk as a result of arsenic leaching from these wastes. The criteria we examined included the existing arsenic MCL, a lower health based number presented in the RTC, and two assumed values in between. We examined this range of values because, as explained earlier in this notice, EPA is in the process of revising the current MCL for arsenic to a lower value as a result of a detailed study of arsenic in drinking water and we wanted to assess the likely range of values that would be under consideration by EPA. Once we have completed a review of our groundwater model and made necessary changes, we will reevaluate the potential risks from metals in coal combustion wastes and compare any

projected groundwater contamination to the MCLs that exist at that time.

We also identified situations where the improper management of mill rejects, a low volume and uniquely associated waste, with high volume coal combustion wastes has the potential to cause releases of higher quantities of hazardous metals. When these wastes are improperly managed, the mill rejects can create an acidic environment which enhances leachability and can lead to the release of hazardous metals in high concentrations from the co-managed wastes to ground water or surface waters. Thus, our analysis of the characteristics of coal combustion wastes leads us to conclude that these wastes have the potential to pose risk to human health and the environment. We also plan to address such waste management practices in our subsequent rulemaking.

Additionally, we identified 11 proven damage cases that documented disposal of coal combustion wastes in unlined landfills or surface impoundments that involved exceedences of primary MCLs or other health-based standards in ground water or drinking water wells. Three of the proven damage cases were on the EPA Superfund National Priorities List. Although these damage cases indicate that coal combustion wastes can present risks to human health and the environment, they also show the effectiveness of states' responses when damages were identified. All of the sites were at older, unlined units, with disposal occurring prior to 1993. None of these cases involved actual human exposure. Given the large number of facilities that do not now conduct groundwater monitoring, we have a concern that additional cases of damage may be undetected.

As detailed in the RTC and explained earlier in this notice, we identified that the states and affected industry have made considerable progress in recent years toward more effective management of coal combustion wastes. We also identified that the ability for most states to impose specific regulatory controls for coal combustion wastes has increased almost three-fold over the past 15 years. Forty-three states can now impose a liner requirements at landfills whereas 15 years ago, 11 had the same authority. In addition to regulatory permits, the majority of states now have authority to require siting controls, liners, leachate collection, groundwater monitoring, closure controls, and other controls and requirements for surface impoundments and landfills.

Nonetheless, we have concluded that there are still gaps in the actual application of these controls and

requirements, particularly for surface impoundments. While most states now have the appropriate authorities and regulations to require liners and groundwater monitoring that would reduce or minimize the risks that we have identified, we have also identified numerous situations where these controls are not being applied. For example, only 26 percent of utility surface impoundments and 57 percent of utility landfills have liner systems in place. We have insufficient information to determine whether the use of these controls is significantly different for non-utility disposal units, due to a small sample size.

While many of these unlined units may be subject to grandfathering provisions that allow them to continue to operate without being lined, or may not need to be lined due to site-specific conditions, we are especially concerned that a substantial number of units do not employ groundwater monitoring to ensure that if significant releases occur from these unlined units, they will be detected and controlled. In 1995, groundwater was monitored at only 38 percent of utility surface impoundments. While monitoring is more frequent at landfills, there are still many units at which releases of hazardous metals could go undetected. For example, of the approximately 300 utility landfills, 45 newer landfills (15%) do not monitor ground water. We are concerned that undetected releases could cause exceedences of drinking water or other health-based standards that may threaten public health or groundwater and surface water resources. Thus, we conclude that national regulations would lead to substantial improvements in the management of coal combustion wastes.

3. Minefilling

We have determined that the establishment of national regulations is warranted for coal combustion wastes when they are placed in surface or underground mines because: (a) We find that these wastes when minefilled have the potential to present a danger to human health and the environment, (b) minefilling of these wastes has been an expanding practice and there are few states that currently operate comprehensive programs that specifically address the unique circumstances of minefilling, making it more likely that any damage to human health or the environment would go unnoticed or unaddressed, and (c) we believe that the cost of complying with regulations that address these potential dangers may not have a substantial impact on this practice because

minefilling continues to grow in those few states that already have comprehensive programs.

We recognize that at this time, we cannot quantify the nature of damage that may be occurring or may occur in the future as a result of using coal combustion wastes as minefill. It is often impossible to determine if existing groundwater quality has been impacted by previous mining operations or as a result of releases of hazardous constituents from the coal combustion wastes used in minefilling applications. We have not as yet identified proven damage cases resulting from the use of coal combustion wastes for minefilling.

We also acknowledge that when the complexities related to site-specific geology, hydrology, waste chemistry and interactions with the surrounding matrix, and other relevant factors are properly taken into account, coal combustion wastes used as minefill can provide significant benefits. However, when not done properly, minefilling has the potential to contaminate ground water to levels that could damage human health and the environment. Based on materials submitted during the public comment period, coal combustion wastes used as minefill can lead to increases in hazardous metals released into ground water if the acidity within the mine overwhelms the capacity of the coal combustion wastes to neutralize the acidic conditions. This is due to the increased leaching of hazardous metals from the wastes. The potential for this to occur is further supported by data showing that management of coal combustion wastes in the presence of acid-generating pyritic wastes has caused metals to leach from the combustion wastes at much higher levels than are predicted by leach test data for coal combustion wastes when strongly acidic conditions are not present. Such strongly acidic conditions often exist at mining sites.

Although we have identified no damage cases involving minefilling, we are also aware of situations where coal combustion wastes are being placed in direct contact with ground water in both surface and underground mines. We concluded in our recent study of cement kiln dust management practices that placement of cement kiln dust in direct contact with ground water led to a substantially greater release of hazardous metals than we predicted would occur when the waste was placed above the water table. For this reason, we find that there is a potential for increased releases of hazardous metals as a result of placing coal combustion wastes in direct contact with groundwater. Also, there are damage

cases associated with coal combustion wastes in landfills. The Agency believes it is reasonable to be concerned when similar quantities of coal combustion wastes are placed in mines, which often are not engineered disposal units and in some cases involve direct placement of wastes into direct contact with ground water.

We are concerned that government oversight is necessary to ensure that minefilling is done appropriately to protect human health and the environment, particularly since minefilling is a recent, but rapidly expanding use of coal combustion wastes. Government oversight has not yet "caught up" with the practice consistently across the country. There are some states that have programs that specifically address minefilling practices. We are likely to find that their programs or certain elements of their programs could serve as the basis for a comprehensive, flexible set of national management standards that ensure protection of human health and the environment. We also believe that these state programs will provide valuable experience in coordinating with SMCRA program requirements. However, at this time, few of the programs are comprehensive. Commenters pointed out, and we agree, there are significant gaps in other states. We believe that additional requirements for long-term groundwater monitoring, and controls on wastes placed directly into groundwater might be prudent.

E. What Approach Will EPA Take in Developing National Regulations?

We will not promulgate any regulations for beneficial uses other than minefilling. We do not wish to place any unnecessary barriers on the beneficial use of fossil fuel combustion wastes so that they can be used in applications that conserve natural resources and reduce disposal costs.

Once we concluded there is a need for some form of national regulation of coal combustion wastes disposed in landfills and surface impoundments and used as minefill, we considered two approaches. One approach would involve promulgating subtitle D regulations, pursuant to sections 1008 and 4004(a) of RCRA, that would contain criteria defining landfills and impoundments that would constitute "sanitary landfills." Any facility that failed to meet the standards would constitute an open dump, which is prohibited by section 4005(a) of RCRA. Such standards would set a consistent baseline for protective management throughout the country. We would also work with the Department of Interior,

Office of Surface Mining to evaluate whether equivalent protectiveness for minefilling could be afforded by relying on revision of existing SMCRA regulations or by relying on a combination of RCRA and SMCRA authorities.

The second approach was to promulgate regulations pursuant to Subtitle C of RCRA, that would have been similar to our recent proposed regulation of cement kiln dust. Following this approach, EPA would develop national management standards based on the Subtitle D open dump criteria as discussed above, as well as a set of tailored Subtitle C requirements promulgated pursuant to RCRA section 3004(x). If the wastes were properly managed in accordance with the subtitle D-like standards, they would not be classified as hazardous wastes. When they were not properly managed, they would become listed hazardous wastes subject to tailored subtitle C standards. This scheme would be effective in each state authorized for the hazardous waste program when that state modified its hazardous waste program to incorporate the listing.

Under this approach, after states have adopted the contingent listing, facilities that have egregious or repeated violations of the management standards would be moved into the subtitle C program (subject to the tailored RCRA 3004 (x) requirements, rather than to the full set of subtitle C requirements). Thus, EPA would have authority to enforce the management standards.

The decision whether to establish regulations under subtitle C or D of RCRA for disposal of coal combustion wastes in landfills and surface impoundments and when minefilled was a difficult one. EPA believes that, in this case, either approach would ensure adequate protection of public health and the environment. Either subtitle C or D provides EPA with the authority to prescribe protective standards for the management of these wastes. Moreover, as described above, the standards that EPA would adopt under either regime, because of the flexibility provided by section 3004 (x), would be substantively the same. Also, under either approach, a facility that fails to comply with the standards is in violation of RCRA—in the case of subtitle C, the facility would be in violation of the tailored standards promulgated under section 3004(x). In the case of subtitle D, the facility would be in violation of the prohibition in section 4005(a) of RCRA against "open dumping." The prohibition against open dumping is, however, enforceable only by private citizens and states, not EPA.

Management standards established under the authority of subtitle C (including tailored section 3004(x) standards) are also enforceable by EPA. It appears that more than 40 states already have sufficient authority to implement most, if not all of the national standards we contemplate would be appropriate for surface impoundments and landfills. One difference between the two regimes may be that states could cite revised subtitle D standards as a basis for exercising their existing authorities more vigorously, potentially promoting swifter adoption of appropriate controls for surface impoundments and landfills. In addition, subtitle D standards would be applicable and enforceable by citizens as soon as the federal rule becomes effective. subtitle C standards in contrast, would not apply until incorporated into state subtitle C programs. For minefilling, we would also explore SMCRA as a possible mechanism to speed implementation, even if we relied on subtitle D to establish protective standards, because minefilling operations already are subject to SMCRA permitting authority.

Taking into account the common and distinct features of these alternative approaches, EPA believes at this time, based on the current record, that subtitle D regulations are the more appropriate mechanism for a number of reasons. In view of the very substantial progress that states have made in regulating disposal of fossil fuel combustion wastes in surface impoundments and landfills in recent years, as well as the active role that this industry has played recently in facilitating responsible waste disposal practices, EPA believes that subtitle D controls will provide sufficient clarity and incentive for states to close the remaining gaps in coverage, and for facilities to ensure that their wastes are managed properly.

For minefilling, although we have considerable concern about certain current practices (e.g., placement directly into groundwater), we have not yet identified a case where placement of coal wastes can be determined to have actually caused increased damage to ground water. In addition, there is a federal regulatory program—SMCRA—expressly designed to address environmental risks associated with coal mines. Finally, given that states have been diligent in expanding and upgrading programs for surface impoundments and landfills, we believe they will be similarly responsive in addressing environmental concerns arising from this emerging practice. In short, we arrive at the same conclusions, for substantially the same reasons, for

this practice as we did for landfills and surface impoundments: that subtitle D controls, or upgraded SMCRA controls or a combination of the two, should provide sufficient clarity and incentive to ensure proper handling of this waste when minefilled. Having determined that subtitle C regulation is not warranted for all other management practices, EPA does not see a basis in the record for carving this one practice out for separate regulatory treatment.

Once these subtitle D regulations are effective, facilities would be subject to citizen suits for any violation of the standards. If EPA were addressing wastes that had not been addressed by the states (or the federal government) in the past, or an industry with wide evidence of irresponsible solid waste management practices, EPA may well conclude that the additional incentives for improvement and compliance provided by the subtitle C scheme—the threat of federal enforcement and the stigma associated with improper management of RCRA subtitle C waste—were necessary. But the record before us indicates that the structure and the sanctions associated with a subtitle D approach (or a SMCRA approach if EPA determines it is equivalent) should be sufficient.

We also see a potential downside to pursuing a subtitle C approach. Section 8002(n)(8) directs us to consider, among other factors, "the current and potential utilization of such materials." Industry commenters have indicated that they believe subjecting any coal combustion wastes to a subtitle C regime would place a significant stigma on these wastes, the most important effect being that it would adversely impact beneficial reuse. As we understand it, the concern is that, even though beneficially reused waste would not be hazardous under the contemplated subtitle C approach, the link to subtitle C would nonetheless tend to discourage purchase and re-use of the wastes or products made from the wastes. We do not wish to place any unnecessary barriers on the beneficial uses of these wastes, because they conserve natural resources, reduce disposal costs and reduce the total amount of waste destined for disposal. States and industry have also expressed concern that regulation under subtitle C could cause a halt in the use of coal combustion wastes to reclaim abandoned and active mine sites. If this were to occur, it would be unfortunate in that when done properly, we recognize this practice can lead to substantial environmental benefits. EPA believes the contingent management scheme we discussed should diminish

any stigma that might be associated with the subtitle C link. Nonetheless, we acknowledge the possibility that the approach could have unintended consequences. We would be particularly concerned about any adverse effect on the beneficial re-use market for these wastes because more than 23 percent (approximately 28 million tons) of the total coal combustion waste generated each year is beneficially reused and an additional eight percent (nine million tons) is used for minefilling. EPA believes that such reuse when performed properly, is by far the environmentally preferable destination for these wastes, including when minefilled. Normally, concerns about stigma are not a deciding factor in EPA's decisions under RCRA, given the central concern under the statute for protection of human health and the environment. However, given our conclusion that the subtitle D approach here should be fully effective in protecting human health and the environment, and given the large and salutary role that beneficial reuse plays for this waste, concern over stigma is a factor supporting our decision today that subtitle C regulation is unwarranted in light of our decision to pursue a subtitle D approach.

As we proceed with regulation development, we will also take enforcement action under RCRA section 7003 when we identify cases of imminent and substantial endangerment. We will also use Superfund remedial and emergency response authorities under the Comprehensive Environmental Response Compensation and Liabilities Act (CERCLA), as appropriate, to address damages that result in risk to human health and the environment. We will also take into account new information as it becomes available. We are awaiting a National Academy of Sciences report scheduled to be released in June 2000. This report will present a comprehensive review of mercury and recommendations on appropriate adverse health effects levels for this constituent. We believe that this report will enhance our understanding of the risks due to exposure to mercury, and we will review and assess its implications for today's decision on fossil fuel combustion wastes. These efforts may result in a re-evaluation of the risks posed by managing coal combustion wastes.

3. What Is the Basis for EPA's Regulatory Determination for Oil Combustion Wastes?

A. What Is the Agency's Decision Regarding the Regulatory Status of Oil Combustion Wastes and Why Did EPA Make This Decision?

We have determined that it is not appropriate to issue regulations under subtitle C of RCRA applicable to oil combustion wastes because: (a) We have not identified any beneficial uses that are likely to present significant risks to human health or the environment; and (b) except for a limited number of unlined surface impoundments, we have not identified any significant risks to human health and the environment associated with any waste management practices.

We intend to work with the State of Massachusetts and the owners and operators of the remaining two oil combustion facilities that currently manage their wastes in unlined surface impoundments to ensure that their wastes are managed in a manner that protects human health and the environment.

B. What Were EPA's Tentative Decisions as Presented in the Report to Congress and Why Did EPA Make That Decision?

In the Report to Congress, we stated that the only management scenario for which we found risks posed by management of oil combustion wastes was when oil combustion wastes are managed in unlined surface impoundments. The Report to Congress further explained that we were considering two approaches to address these identified risks. One approach was to regulate using RCRA subtitle C authority. The other approach was to encourage voluntary changes so that no oil combustion wastes are managed in unlined surface impoundments. This voluntary approach is based on recent industry and state regulatory trends to line oil combustion waste disposal units and implement groundwater monitoring.

We also tentatively decided that the existing beneficial uses of oil combustion wastes should remain exempt from RCRA subtitle C. There are few existing beneficial uses of these wastes, which include use in concrete products, structural fill, roadbed fill, and vanadium recovery. We determined that no significant risks to human health exist for the beneficial uses of these wastes. For the case of facilities that accept these wastes to recover vanadium from them, we explained that if the wastes resulting from the metal recovery processes are hazardous, they will be

subject to existing hazardous waste requirements.

We found in most cases that OCW, whether managed alone or co-managed, are rarely characteristically hazardous. Additionally, we identified no significant ecological risks posed by land disposal of OCW. We identified only one documented damage case involving OCW in combination with coal combustion wastes, and it did not affect human receptors.

Although most of the disposed oil combustion wastes are managed in lined surface impoundments, we did identify six utility sites where wastes are managed in unlined units. We expressed particular concern with management of these wastes in unlined settling basins and impoundments that are designed and operated to discharge the aqueous portion of the wastes to ground water. Our risk analysis indicated that, in these situations, three metals—arsenic, nickel, and vanadium—may pose potential risk by the groundwater pathway.

C. How Did Commenters React to EPA's Tentative Decisions and What Was EPA's Analysis of Their Comments?

Because we were able to identify so few unlined surface impoundments, the only management scenario for which we found risks, the primary focus of the comments regarding oil combustion wastes was on the six unlined surface impoundments that we identified. In addition, there were extensive comments on our modeling and risk assessment methodology for the groundwater pathway that are applicable to our assessment of risks posed by oil combustion wastes.

1. How Did Commenters React to the Six Unlined Oil Combustion Waste Surface Impoundments That We Identified?

Comments. Industry commenters supported the approach to encourage voluntary changes in industry practices on a site-specific basis, and explained why they believed hazardous waste regulations are unnecessary. The environmental community supported the development of hazardous waste regulations.

EPA's Analysis of Comments. In the RTC, we identified that our only concern about oil combustion wastes was based on the potential for migration of arsenic, nickel, and vanadium from unlined surface impoundments. We requested information on this issue and did not receive any additional data and/or information to refute our tentative finding stated in the RTC that these

unlined surface impoundments could pose a significant risk.

As stated in the RTC, there are only six sites involving two companies that have unlined surface impoundments. Four of the sites are in Florida and are operated by one company. The company operating the four unlined impoundments in Florida is undertaking projects to mitigate potential risks posed by their unlined management units. At a May 21, 1999 public hearing, the company announced its plans to remove all the oil ash and basin material from its unlined impoundments and to line or close the units. The company informed us in January 2000 that it had completed the lining of all the units. Based on this information, we do not believe that these units pose a significant risk to human health and the environment.

The other two sites with unlined impoundments are operated by one utility in Massachusetts. Both sites are permitted under Massachusetts' ground water discharge permit program and have monitoring wells around the unlined basins. Arsenic is monitored for compliance with state regulations. Although the company expressed no plans to line their impoundments, they are preparing to implement monitoring for nickel and vanadium in ground water around the waste management units. We have been working with the State and the company to obtain additional information to evaluate these two management units. We will continue this effort and will work with the company and the State to ensure that any necessary measures are taken so that these wastes are managed in a manner that protects human health and the environment.

2. How Did Commenters React to the Groundwater Modeling and Risk Assessment Analyses Conducted by EPA to Support Its Findings in the Report to Congress?

Comments. Industry and public interest group commenters submitted detailed critiques of the ground water model, EPACMTP, that we used for our risk analysis. Industry commenters believe that the model will overestimate the levels of contaminants that may migrate down-gradient from disposed wastes. Environmental groups expressed the opposite belief; that is, that the model underestimates down-gradient chemical concentrations and, therefore, underestimates the potential risk posed by oil combustion wastes.

EPA's Analysis of the Comments. We are carefully reviewing all of the comments on the model and have determined that the process of

thoroughly investigating all of the comments will take substantially more time to complete than is available within the court deadline for issuing this regulatory determination. At this time, we are uncertain of the overall outcome of our analysis of the issues raised in the comments. Accordingly, we have decided not to use the results of our ground water pathway risk analysis in support of today's regulatory determination on fossil fuel combustion wastes. As explained above, we believe that actions have been taken or are under way by specific companies and/or the State of Massachusetts to address potential risks at the six impoundments that we have been able to identify. Therefore we believe that further groundwater analysis is unnecessary at this time.

Meanwhile, we will continue with our analysis of comments on the groundwater model and risk analysis. This may involve changing or restructuring various aspects of the model, if appropriate. It may also include additional analyses to determine whether any changes to the model or modeling methodology would materially affect the groundwater risk analysis results that were reported in the RTC. If our investigations reveal that a reanalysis of groundwater risks is appropriate, we will conduct the analysis and reevaluate today's decisions as appropriate.

In addition to our ongoing review of comments on the groundwater model, one element of the model—the metals partitioning component called "MINTEQ"—has been proposed for additional peer review. When this additional peer review is completed, we will take the findings and recommendations into account in any overall decision to re-evaluate today's regulatory determination.

D. What Is the Basis for Today's Decisions?

We have determined that it is not appropriate to establish national regulations applicable to oil combustion wastes because: (a) We have not identified any beneficial uses that are likely to present significant risks to human health or the environment; and (b) except for two remaining unlined surface impoundments, we have not identified any significant risks to human health and the environment associated with any waste management practices. As explained in the previous section, we intend to work with the State of Massachusetts and the owners and operators of the remaining two oil combustion facilities that currently manage their wastes in unlined surface

impoundments to ensure that any necessary measures are taken so that their wastes are managed in a manner that protects human health and the environment. Given the limited number of sites at issue and our ability to adequately address risks from these waste management units through site-specific response measures, we see no need for issuing regulations under subtitle C or D of RCRA.

4. What Is the Basis for EPA's Regulatory Determination for Natural Gas Combustion Wastes?

A. What Is the Decision Regarding the Regulatory Status of Natural Gas Combustion Wastes?

For the reasons described in the Report to Congress (pages 7-1 to 7-3), EPA has decided that regulation of natural gas combustion wastes as hazardous wastes under RCRA subtitle C or D is not warranted. The burning of natural gas generates virtually no solid waste.

B. What Was EPA's Tentative Decision as Presented in the Report to Congress?

The Agency's tentative decision was to retain the subtitle C exemption for natural gas combustion because virtually no solid waste is generated.

C. How Did Commenters React to EPA's Tentative Decision?

No commenters on the RTC disagreed with EPA's findings or its tentative decision to continue the exemption for natural gas combustion wastes.

Specific comments on this issue supported our tentative decision to retain the exemption for natural gas combustion waste. One industry association encouraged us to foster the use of natural gas as a substitute for other fossil fuels. While some public interest group commenters disagreed broadly with our tentative conclusions to retain the exemption for fossil fuel combustion wastes, they did not specifically address natural gas combustion wastes.

D. What Is the Basis for Today's Decision?

The burning of natural gas generates virtually no solid waste. We, therefore, believe that there is no basis for EPA developing subtitle C or D regulations applicable to natural gas combustion wastes.

5. What Is the History of EPA's Regulatory Determinations for Fossil Fuel Combustion Wastes?

A. On What Basis Is EPA Required To Make Regulatory Determinations Regarding the Regulatory Status of Fossil Fuel Combustion Wastes?

Section 3001(b)(3)(C) of the Resource Conservation and Recovery Act (RCRA) as amended requires that, after completing a Report to Congress mandated by section 8002(n) of RCRA, the EPA Administrator must determine whether Subtitle C (hazardous waste) regulation of fossil fuel combustion wastes is warranted.

B. What Was EPA's General Approach in Making These Regulatory Determinations?

We began our effort to make our determination of the regulatory status of fossil fuel combustion wastes by studying high volume coal combustion wastes managed separately from other fossil fuel combustion wastes that are generated by electric utilities. In February 1988, EPA published the Report to Congress on Wastes from the Combustion of Coal by Electric Utility Power Plants. The report addressed four large-volume coal combustion wastes generated by electric utilities and independent power producers when managed alone. The four wastes are fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) wastes. The report did not address co-managed utility coal combustion wastes (UCCWs), other fossil fuel wastes generated by utilities, or wastes from non-utility boilers burning any type of fossil fuel. Because of other priorities at the time, we did not immediately complete a determination of the regulatory status of these large-volume coal combustion wastes.

C. What Happened When EPA Failed To Issue Its Determination of the Regulatory Status of the Large Volume Utility Combustion Wastes in a Timely Manner?

In 1991, a suit was filed against EPA for not completing a regulatory determination on fossil fuel combustion wastes (*Gearhart v. Reilly*, Civil No. 91-2345 (D.D.C.)). On June 30, 1992, the Agency entered into a Consent Decree that established a schedule for us to complete the regulatory determination for all fossil fuel combustion wastes in two phases:

- The first phase covers fly ash, bottom ash, boiler slag, and flue gas emission control wastes from the combustion of coal by electric utilities and independent commercial power

producers. These are the four large volume wastes that were the subject of the 1988 Report to Congress described above. We refer to this as the Part 1 regulatory determination.

- The second phase covers all of the "remaining" fossil fuel combustion wastes not covered in the Part 1 regulatory determination. We refer to this as the Part 2 regulatory determination, which is the subject of today's action. Under the current court-order, EPA was directed to issue the Part 2 regulatory determination by April 25, 2000.

D. When Was the Part 1 Regulatory Decision Made and What Were EPA's Findings?

In 1993, EPA issued the Part 1 regulatory determination, in which we retained the exemption for Part 1 wastes (see 58 FR 42466; August 9, 1993). The four Part 1 large-volume utility coal combustion wastes (UCCWs) are also addressed in the Part 2 regulatory determination when they are co-managed with low-volume fossil fuel combustion wastes not covered in the Part 1 determination.

6. Executive Orders and Laws Addressed in Today's Action

A. Executive Order 12866—Determination of Significance

Under Executive Order 12866, (58 FR 51735, Oct. 4, 1993) we must determine whether the regulatory action is "significant" and therefore subject to review by the Office of Management and Budget (OMB) and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

- Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles in the Executive Order."

Under Executive Order 12866, this is a "significant regulatory action." Thus, we have submitted this action to OMB for review. Changes made in response to OMB suggestions or recommendations are documented in the public record.

B. Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

Today's action is not subject to the RFA, which generally requires an agency to prepare a regulatory flexibility analysis for any rule that will have a significant economic impact on a substantial number of small entities. The RFA applies only to rules subject to notice-and-comment rulemaking requirements under the Administrative Procedure Act (APA) or any other statute. This action is not subject to notice and comment requirements under the APA or any other statute. Today's action is being taken pursuant to section 3001(b)(3)(C) of the Resource Conservation and Recovery Act. This provision requires EPA to make a determination whether to regulate fossil fuel combustion wastes after submission of its Report to Congress and public hearings and an opportunity for comment. This provision does not require the publication of a notice of proposed rulemaking and today's action is not a regulation. See *American Portland Cement Alliance v. E.P.A.*, 101 F.3d 772 (D.C.Cir. 1996).

C. Paperwork Reduction Act Information Collection Requests

Today's final action contains no information collection requirements.

D. Unfunded Mandates Reform Act

Today's action is not subject to the requirements of sections 202 and 205 of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4. Title II of UMRA establishes requirements for federal agencies to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "federal mandates" that may result in expenditures to state, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any one year.

Before we issue a rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the rule's objectives. Section 205 doesn't apply when it is inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective, or least

burdensome alternative if the final rule explains why that alternative was not adopted. Before we establish any regulatory requirements that may significantly affect small governments, including tribal governments, we must have developed under section 203 of the UMRA a small-government-agency plan. The plan must provide for notifying potentially affected small governments, enabling them to have meaningful and timely input in the developing EPA regulatory proposals with significant federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Today's final action contains no federal mandates (under the regulatory provisions of Title II of the UMRA) for state, local, or tribal governments or the private sector. Today's final action imposes no enforceable duty on any state, local or tribal governments or the private sector.

In addition, we have determined this action contains no federal mandate that may result in expenditures of \$100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled Federalism (64 FR 43255, August 10, 1999) requires us to develop an accountable process to ensure meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications. The executive order defines policies that have federalism implications to include regulations that have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

Under section 6 of Executive Order 13132, we may issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that isn't required by statute, only if the federal government provides funds the direct compliance costs incurred by state and local governments, or if EPA consults with state and local officials early in the development of the proposed regulation. Also, EPA may issue a regulation that has federalism implications and that preempts state law, only if we consult with state and local officials early in the development of the proposed regulation.

If EPA complies by consulting, Executive Order 13132 requires us to provide OMB, in a separately identified section of the rule's preamble, a

federalism summary impact statement (FSIS). The FSIS must describe the extent of our prior consultation with state and local officials, summarizing the nature of their concerns and our position supporting the need for the regulation, and state the extent to which the concerns of state and local officials have been met. Also, when we transmit a draft final rule with federalism implications to OMB for review under Executive Order 12866, our federalism official must include a certification that EPA has met the requirements of Executive Order 13132 in a meaningful and timely manner.

Today's final action does not have federalism implications. It will not have a substantial direct affect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This is because no requirements are imposed by today's action, and EPA is not otherwise mandating any state or local government actions. Thus, the requirements of section 6 of the Executive Order do not apply to this final action.

F. Executive Order 13084: Consultation and Coordination With Indian Tribal Governments

Under Executive Order 13084, EPA may take an action that isn't required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, only if the federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires us to describe in a separately identified section of the preamble to the rule the extent of our prior consultation with representatives of affected tribal governments, summarizing of the nature of their concerns, and state the need for the regulation. Also, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities."

Today's final action does not significantly or uniquely affect the communities of Indian tribal governments. This is because today's action by EPA involves no regulations or other requirements that significantly

or uniquely affect Indian tribal governments. So, the requirements of section 3(b) of Executive Order 13084 do not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

"Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the planned rule on children and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

Today's final action isn't subject to the Executive Order because it is not economically significant as defined in Executive Order 12866, and because we have no reason to believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. Risks were thoroughly evaluated during the course of developing today's decision and were determined not to disproportionately affect children.

H. National Technology Transfer and Advancement Act of 1995

As noted in the proposed rule, section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law. No. 104-113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary-consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary-consensus standards are technical standards (such as materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary-consensus standards bodies. The NTTAA directs us to explain to Congress, through OMB, when we decide not to use available and applicable voluntary-consensus standards.

Today's final action involves no technical standards. So, EPA didn't consider using any voluntary-consensus standards.

*I. Executive Order 12898:
Environmental Justice*

EPA is committed to addressing environmental justice concerns and is assuming a leadership role in environmental justice initiatives to enhance environmental quality for all populations in the United States. The Agency's goals are to ensure that no segment of the population, regardless of race, color, national origin, or income bears disproportionately high and adverse human health or environmental impacts as a result of EPA's policies, programs, and activities, and that all people live in safe and healthful environments. In response to Executive Order 12898 and to concerns voiced by many groups outside the Agency, EPA's Office of Solid Waste and Emergency Response formed an Environmental Justice Task Force to analyze the array of environmental justice issues specific to waste programs and to develop an overall strategy to identify and address

these issues (OSWER Directive No. 9200.317).

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, does not apply because this action is not a rule for purposes of 5 U.S.C. 804(3). Rather, this action is an order as defined by 5 U.S.C. 551(6).

7. How To Obtain More Information

Documents related to this regulatory determination, including EPA's response to the public comments, are available for inspection in the docket. The relevant docket numbers are: F-99-FF2D-FFFFF for the regulatory determination, and F-99-FF2P-FFFFF for the RTC. The RCRA Docket Information Center (RIC), is located at Crystal Gateway I, First Floor, 1235 Jefferson Davis Highway, Arlington, VA.

The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. To review docket materials, it is recommended that the public make an appointment by calling 703-603-9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost \$0.15/page. The index and some supporting materials are available electronically. See the Supplementary Information section for information on accessing them.

List of Subjects in 40 CFR Part 261

Fossil fuel combustion waste, Coal combustion, Gas combustion, Oil combustion, Special wastes, Bevill exemption

Dated: April 25, 2000.

Carol M. Browner,
Administrator.

[FR Doc. 00-11138 Filed 5-19-00; 8:45 am]
BILLING CODE 6560-50-U

specific data under section 4(g)(2)(B) and any necessary changes to the registration and labeling (either to address any concerns identified in the RED or as a result of product specific data), EPA will make a final reregistration decision under section 4(g)(2)(C) for products containing sodium carbonate; weak mineral bases.

EPA is applying the principles of public participation to all pesticides undergoing reregistration and tolerance reassessment. The Agency's Pesticide Tolerance Reassessment and Reregistration; Public Participation Process, published in the **Federal Register** on May 14, 2004, (69 FR 26819) (FRL-7357-9) explains that in conducting these programs, the Agency is tailoring its public participation process to be commensurate with the level of risk, extent of use, complexity of issues, and degree of public concern associated with each pesticide. EPA can expeditiously reach decisions for pesticides like sodium carbonate; weak mineral bases, which pose no risk concerns, have low use, affect few if any stakeholders, and require no risk mitigation. Once EPA assesses uses and risks for such low risk pesticides, the Agency may go directly to a decision and prepare a document summarizing its findings, such as the sodium carbonate; weak mineral bases RED.

The reregistration program is being conducted under Congressionally mandated time frames, and EPA recognizes the need both to make timely decisions and to involve the public in finding ways to effectively mitigate pesticide risks. Sodium carbonate; weak mineral bases, however, poses no risks that require mitigation. The Agency therefore is issuing the sodium carbonate; weak mineral bases RED, its risk assessments, and related support materials simultaneously for public comment. The comment period is intended to provide an opportunity for public input and a mechanism for initiating any necessary amendments to the RED. All comments should be submitted using the methods in **ADDRESSES**, and must be received by EPA on or before the closing date. These comments will become part of the Agency Docket for sodium carbonate; weak mineral bases. Comments received after the close of the comment period will be marked "late." EPA is not required to consider these late comments.

EPA will carefully consider all comments received by the closing date and will provide a Response to Comments Memorandum in the Docket and regulations.gov. If any comment significantly affects the document, EPA

also will publish an amendment to the RED in the **Federal Register**. In the absence of substantive comments requiring changes, the sodium carbonate; weak mineral bases RED will be implemented as it is now presented.

B. What is the Agency's Authority for Taking this Action?

Section 4(g)(2) of FIFRA as amended directs that, after submission of all data concerning a pesticide active ingredient, "the Administrator shall determine whether pesticides containing such active ingredient are eligible for reregistration," before calling in product specific data on individual end-use products and either reregistering products or taking other "appropriate regulatory action."

List of Subjects

Environmental protection, Pesticides and pests, sodium carbonate; weak mineral bases.

Dated: August 9, 2007.

Frank Sanders,

Director, Antimicrobials Division, Office of Pesticide Programs.

[FR Doc. E7-16806 Filed 8-28-07; 8:45 am]

BILLING CODE 6560-50-S

ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-RCRA-2006-0796; FRL-8462-2]

RIN 2050-AE81

Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Data Availability.

SUMMARY: This notice announces the availability of new information and data contained in three documents that the Agency is requesting public comments on concerning the management of coal combustion wastes (CCW) in landfills and surface impoundments. The Agency is seeking public comments on how, if at all, this additional information should affect the Agency's decisions as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments. The three documents that the Agency is requesting comment on include: a joint U.S. Department of Energy (DOE) and EPA report entitled, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*; a draft risk assessment conducted by EPA on the management

of CCW in landfills and surface impoundments; and EPA's damage case assessment. The Agency solicits comments on the extent to which the damage case information, the results of the risk assessment, and the new liner and ground water monitoring information from the DOE/EPA report should affect the Agency's decisions. EPA is also requesting direct comment on the draft risk assessment document to help inform a planned peer review. In addition, the Agency has included in the Docket to this Notice of Data Availability (NODA) a rulemaking petition submitted by a number of citizens' groups and several approaches, one prepared by the electric utility industry and the other prepared by a number of citizens' groups, regarding the management of CCW. The Agency will consider all the information provided through this notice, the comments and new information submitted on this notice, as well as the results of a subsequent peer review of the risk assessment as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments.

DATES: Submit comments on or before November 27, 2007.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-RCRA-2006-0796, by one of the following methods:

- www.regulations.gov: Follow the on-line instructions for submitting comments.
- E-mail: Comments may be sent by electronic mail (e-mail) to rcra-docket@epa.gov, Attention Docket ID No. EPA-HQ-RCRA-2006-0796. In contrast to EPA's electronic public docket, EPA's e-mail system is not an "anonymous access" system. If you send an e-mail comment directly to the Docket without going through EPA's electronic public docket, EPA's e-mail system automatically captures your e-mail address. E-mail addresses that are automatically captured by EPA's e-mail system are included as part of the comment that is placed in the official public docket, and made available in EPA's electronic public docket.
- Fax: Comments may be faxed to 202-566-0272. Attention Docket ID No. EPA-HQ-RCRA-2006-0796.
- Mail: Send two copies of your comments to Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments, Environmental Protection Agency, Mailcode: 5305T, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Attention

Docket ID No. EPA-HQ-RCRA-2006-0796.

- **Hand Delivery:** Deliver two copies of your comments to the Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC 20460. Attention Docket ID No. EPA-HQ-RCRA-2006-0796. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-HQ-RCRA-2006-0796. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at <http://www.regulations.gov>, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through www.regulations.gov or e-mail. The www.regulations.gov Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov, your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket, visit the EPA Docket Center homepage at <http://www.epa.gov/epahome/dockets.htm>. For additional instructions on submitting comments, go to the **SUPPLEMENTARY INFORMATION** section of this document.

Docket: All documents in the docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as

copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at the Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The Docket telephone number is (202) 566-0270. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744.

FOR FURTHER INFORMATION CONTACT: Alexander Livnat, Office of Solid Waste (5306P), U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460-0002, telephone (703) 308-7251, e-mail address livnat.alexander@epa.gov. For more information on this rulemaking, please visit <http://www.epa.gov/epaoswer/other/fossil/index.htm/>.

SUPPLEMENTARY INFORMATION:

I. What Should I Consider as I Prepare My Comments for EPA?

1. *Tips for Preparing Your Comments.* When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Follow directions—The agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.
- Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible.
- Make sure to submit your comments by the comment period deadline identified.

2. *Docket Copying Costs.* The first 100-copied pages are free. Thereafter, the charge for making copies of Docket materials is 15 cents per page.

II. How Should I Submit CBI to the Agency?

Do not submit information that you consider to be CBI electronically through <http://www.regulations.gov> or by e-mail. Send or deliver information identified as CBI only to the following address: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, Attention Docket ID No. EPA-HQ-RCRA-2006-0796. You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD ROM, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is CBI). Information so marked will not be disclosed, except in accordance with procedures set forth in 40 CFR Part 2.

In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket and EPA's electronic public docket. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and EPA's electronic public docket without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please contact: LaShan Haynes, Office of Solid Waste (5305W), U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460-0002, telephone (703) 605-0516, e-mail address haynes.lashan@epa.gov.

III. Disposal of CCW in Landfills and Surface Impoundments

A. Background

In May 2000, EPA published its Final Regulatory Determination on Wastes From the Combustion of Fossil Fuels (65 FR 32214). The Agency concluded that these wastes do not warrant regulation under Subtitle C of RCRA and, therefore, retained the hazardous waste exemption of RCRA section 3001(b)(3)(C). We also determined, however, that national regulations under Subtitle D of RCRA were appropriate for coal combustion wastes (referred to as CCW throughout this

notice) when disposed of in landfills or surface impoundments.¹

Specifically, EPA's determination to develop regulations under Subtitle D of RCRA was based on a factual record developed prior to 1995 which led to the following considerations: (i) The constituents present in these wastes include metals, such as arsenic, cadmium, chromium, lead and mercury, that could present a danger to human health and the environment under certain conditions; (ii) while testing of the CCW using the toxicity characteristic leaching procedure (TCLP) rarely exceeds the hazardous waste toxicity characteristic (or TC), the Agency identified eleven documented cases of proven damages² to human health and/or the environment by improper management of these wastes in landfills and surface impoundments; (iii) at the time the Regulatory Determination was made, between 40 and 70 percent of CCW disposal sites lacked controls, such as liners and/or ground water-monitoring; and (iv) while there had been substantive improvements in state regulatory programs, the Agency also identified gaps in state oversight. In deciding to pursue Subtitle D in lieu of Subtitle C regulation, the decisive factors which guided the Agency's thinking at that time included the improving trends in disposal and utilization practices, and the current and potential utilization of

¹ In addition, EPA determined that regulations under Subtitle D of RCRA and/or modifications to the existing regulations established under authority of the Surface Mining Control and Reclamation Act (SMCRA) were appropriate when these wastes are used to fill surface or underground coal mines. As recommended in a recent National Academy of Sciences Report entitled, "Managing Coal Combustion Residues in Mines," National Research Council of the National Academies, 2006, EPA will be collaborating with the U.S. Department of Interior, Office of Surface Mining (OSM) to develop national standards for the placement of CCW in coal mines. A separate notice was issued by OSM regarding this effort (see 72 FR 12026, March 14, 2007; available at <http://a257.g.akamai.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/pdf/E7-4669.pdf>).

² Per the May 2000 Regulatory Determination, 65 FR 32224 and Section 1.4.4 of the 1999 Report to Congress, proven damage cases are those with (i) documented exceedances of primary MCLs or other health-based standards measured in ground water at sufficient distance from the waste management unit to indicate that hazardous constituents have migrated to the extent that they could cause human health concerns, and/or (ii) where a scientific study demonstrates there is documented evidence of another type of damage to human health or the environment (e.g., ecological damage), and/or (iii) where there has been an administrative ruling or court decision with an explicit finding of specific damage to human health or the environment. In cases of co-management of CCWs with other industrial waste types, CCWs must be clearly implicated in the reported damage.

the wastes, which the Agency believes it should encourage.

B. Additional Information on Management of CCW in Landfills and Surface Impoundments

Since EPA issued the 2000 Regulatory Determination, which was based on information collected prior to 1995, additional information and data have become available that we believe should be considered as part of the Agency's evaluation regarding the development of regulations under Subtitle D of RCRA for CCW. Therefore, today's Notice of Data Availability (NODA) is soliciting public comment on how, if at all, the following additional information and data should affect the Agency's decisions as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments: (1) A joint U.S. Department of Energy (DOE) and EPA report entitled, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*; (2) a draft risk assessment conducted by EPA on the management of CCW in landfills and surface impoundments; and (3) EPA's recently completed damage case assessment. EPA is also seeking direct comment on the draft risk assessment document to help inform a planned peer review. In addition, the Agency is also including in the docket to today's NODA a February 2004 Petition for Rulemaking submitted by the Clean Air Task Force and the Hoosier Environmental Council, jointly with a number of citizens' groups to Prohibit the Placement or Disposal of CCW into Groundwater and Surface Water; and two suggested approaches for managing CCW in landfills and surface impoundments. One approach is a Voluntary Action Plan that was formulated by the electric utility industry through their trade association, the Utility Solid Waste Activities Group (USWAG).³ The second approach is a proposed framework prepared by a number of citizens' groups⁴ for federal

³ USWAG members include approximately 80 utility companies, the Edison Electric Institute (EEI), the Natural Rural Electric Association (NRECA), the American Public Power Association (APPA), and the American Gas Association (AGA) and represent more than 85% of total U.S. electric generating capacity.

⁴ The proposed framework was jointly prepared by Earthjustice, Clean Air Task Force, Environmental Integrity Project, Sierra Club, Natural Resources Defense Council, Waterkeeper Alliance, Hoosier Environmental Council, Public Citizen, Jefferson Action Group, Dine CARE, Army for a Clean Environment, Plains Justice, Appalachian Center for the Economy and the Environment, People in Need of Environmental Safety, Valley Watch, West Virginia Highlands Conservancy, Montana Environmental Information

regulation of CCW disposed of in landfills and surface impoundments under Subtitle D of RCRA generated by U.S. coal-fired power plants. The Agency is making these documents available in the Docket to allow all interested parties to be aware of the various documents that EPA will consider as it continues to follow up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments.⁵

These documents are available for review and downloading through the docket for today's action (see the **ADDRESSES** section above for instructions on accessing this information from the docket). The remainder of this notice briefly describes the various documents that are being made available for review and/or comment.

1. DOE/EPA Report

In reaching its determination in May 2000 to develop national Subtitle D regulations under RCRA for the management of CCW in landfills and surface impoundments, the Agency generally relied on information and data on industry practices that were available prior to 1995. For information on industry practices, the Agency based its Regulatory Determination on information contained in a report prepared by the Electric Power Research Institute (EPRI)⁶ addressing waste management units that were constructed between 1985 and 1995. The Agency, however, recognized that the electric utility industry was changing its management practices. Therefore, in 2005, DOE and EPA conducted a joint study to collect more recent information on CCW management practices by the electric power industry. Specifically, this report presents information and data on CCW disposal practices and state regulatory requirements at landfills and surface impoundments that were permitted, built, or laterally expanded between January 1, 1994, and December

Center, San Juan Citizens Alliance, Clean Wisconsin, Residents Against the Power Plant, Ohio Valley Environmental Coalition, Neighbors for Neighbors, Delaware Riverkeeper Network, Healthlink, Wenham Lake Watershed Association, Coal River Mountain Watch, Dakota Resource Council and Save Us From Future Environmental Risks.

⁵ In addition, the Agency is also placing in the docket to today's NODA comments that the Clean Air Task Force and the Hoosier Environmental Council submitted to EPA as Attachment 1 to a July 12, 2005 letter to Thomas P. Dunne, then Acting Assistant Administrator for the Office of Solid Waste and Emergency Response (OSWER) on the electric utility industry's Voluntary Action Plan.

⁶ Coal Combustion By-Products and Low-Volume Wastes Co-management Survey, Draft Report, EPRI, June 1997.

31, 2004.⁷ The scope of the study excluded waste units that manage CCW in active or abandoned coal mines.

Data in the report on recent and current disposal practices were derived from a survey conducted by USWAG of its members. In addition, EPA supplemented and checked the accuracy of this information by directly contacting state agencies, as well as a limited number of individual electric utilities.

In summary, the report shows an increase in the number of CCW disposal units with respect to liner design and ground water monitoring since 1994. Based on 100% member-response to USWAG's survey, plus EPA's fact-finding efforts, the report identified 56 new CCW management units, of which 38 are landfills, and 18 are surface impoundments. This number, however, does not reflect the total number of new CCW disposal units that were permitted, built or laterally expanded between 1994 and 2004. The study utilized proxy data to derive an estimate of the total number of new units. The first proxy was the tonnage of CCW available for disposal in States that have coal-fired power plant capacity, and the second was the coal-fired generating capacity of electric utilities owning the identified disposal units. The estimated net disposable CCW⁸ in the 19 states where new units were identified was then compared with the total net disposable CCW in all states with coal-fired electric generating capacity. Using this approach, it was estimated that the number of identified new CCW management units represents between 64% and 71%, respectively, of the total number of new units established between 1994 and 2004.

The report identified that the use of liners and ground water monitoring at new landfills and surface impoundments built since 1994 has increased with 98% having liners and 91% having ground water monitoring. This compares with liners installed in 75% of landfills and 60% of surface impoundments built between 1985 and 1995; and with ground water monitoring installed at 88% of landfills and 65% of surface impoundments that were established between 1985 and 1995. In

⁷ A draft of this report was peer reviewed by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the Utility Water Act Group (UWAG), and the Clean Air Task Force (CATF). Comments received on the draft report, which are included in the docket to today's NODA, have been considered and addressed by DOE and EPA in the final report entitled, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*.

⁸ Net disposable CCW is the total CCW generated minus CCW beneficially used.

addition, the frequency of dry handling in landfills appears to have increased, compared to wet handling in surface impoundments; approximately two-thirds of the new units are landfills, while the other one-third are surface impoundments. The Agency solicits comments and information on the amount or percentage of CCW that is expected to be managed in the future in landfills as opposed to surface impoundments. The percentage of composite liners has also increased for landfills from about 10%, as reported in the 1999 Report to Congress (RTC)⁹ to 53% for new units constructed between 1994 and 2004, and for surface impoundments, from 2% as reported in the 1999 RTC to 50% for new units constructed between 1994 and 2004. The number of unlined units currently in operation in the U.S. is not known. The DOE/EPA 2006 Report also provides information from a review of eleven States' CCW programs, including the regulatory designation of CCW for disposal, permitting requirements, liner requirements, ground water-monitoring requirements, and leachate collection requirements.

The Agency requests comments with supporting data on how the findings of the DOE/EPA report should affect the Agency's decision regarding the regulation of CCW in landfills and surface impoundments under RCRA Subtitle D.

2. EPA's Risk Analysis Data

As part of the rulemaking process for making the May 2000 Regulatory Determination for CCW, EPA prepared a draft quantitative risk assessment. However, because time constraints precluded the Agency from addressing public comments on the draft study, EPA did not use the draft risk assessment in making its Regulatory Determination; rather it relied on the damage cases identified. Between 2000 and 2006, EPA addressed public comments and updated the risk assessment for the management of CCW in landfills and surface impoundments.

The purpose of the risk assessment is to identify CCW constituents, waste types, liner type, receptors, and exposure pathways with potential risks and to provide information that EPA can use as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments. The risk assessment was designed to develop national

⁹ Wastes from the Combustion of Fossil Fuels, Volume 2: Methods, Findings and Recommendations, EPA-R-99-010, 1999 available at http://www.epa.gov/epaoswer/other/fossil/volume_2.pdf.

human and ecological risk estimates that are representative of onsite CCW management settings throughout the United States.¹⁰

To assess the risks posed by the onsite management of CCW, this risk assessment estimates the release of CCW constituents from landfills and surface impoundments, estimates the concentrations of these contaminants in environmental media surrounding coal-fired utility power plants, and estimates the risks that these concentrations pose to human and ecological receptors. The risk assessment does not address risks that may be due to direct discharges of CCW pollutants to surface waters, which are covered under the National Pollutant Discharge Elimination System (NPDES) program.

The risk analysis includes a full-scale Monte Carlo analysis; however, constituent screening results also are presented as part of the problem formulation discussion, along with a summary of the screening methodology. The full-scale analysis is designed to characterize five waste management scenarios that are defined by two waste management options (CCW disposal at power plant sites in landfills and surface impoundments) and three waste types, as follows:

- Conventional CCW, including fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) sludge, which are typically co-disposed in landfills and surface impoundments;
- CCW co-disposed with coal refuse in landfills and surface impoundments, which can result in more acidic disposal conditions than conventional CCW monofills; and,
- Fluidized-bed combustion (FBC) wastes, including fly ash and bed ash. FBC wastes differ from conventional wastes because the limestone mixed during fluidized bed combustion tends to make the FBC waste more alkaline. FBC wastes are only disposed of in landfills in the United States and therefore, the Agency did not model the management of FBC wastes in surface impoundments.

These three waste types provide a good representation of waste disposal practices and the waste chemical conditions that impact the release of CCW constituents from landfills and surface impoundments.

To identify the CCW constituents and exposure pathways to be addressed in this risk analysis, the Agency relied on

¹⁰ Because the main technical aspects of the CCW risk assessment were completed in calendar year 2003, the newly collected information from the DOE/EPA report on the 56 new waste management units has not been incorporated into the database utilized for the risk assessment.

a 2003 CCW database assembled over several years to characterize whole waste and waste leachate from CCW disposal sites across the country. The 2003 CCW constituent database includes all of the CCW characterization data used by EPA in its previous risk assessments supplemented with additional data collected from public comments, data from EPA regions and state regulatory agencies, industry submittals, and literature searches.

Also, as noted in footnote 10, because the main technical aspects of the CCW risk assessment were completed in 2003, the newly collected information from the more recent DOE/EPA report on the 56 new waste units established between 1994 and 2004 was not part of the database used in characterizing the CCW landfills and surface impoundments modeled in the risk assessment. The risk assessment reflected management of CCW in both lined and unlined units as part of a Monte Carlo probabilistic risk analysis. Information on lined and unlined units was derived from facility data from a 1995 industry survey.

Specific findings of the risk assessment, from the Monte Carlo analyses of both lined and unlined units, include:

- The 90th and 50th percentile risks for those units (both landfill and surface impoundments) that had a composite liner were below a cancer risk of 10^{-5} and an HQ of 1 for all constituents, waste management scenarios, and exposure pathways modeled in the CCW risk assessment.

- For humans exposed via the ground water to drinking water pathway, arsenic and thallium show risks to human health above the risk criteria for unlined and clay-lined CCW landfills. Arsenic poses a 90th percentile cancer risk of 5×10^{-4} for unlined units and 2×10^{-4} for clay-lined units (The 90th percentile arsenic cancer risk from this risk assessment of landfilled CCW falls within the range that EPA established for the arsenic MCL (i.e., 1 to 6 excess cancers in a population of 10,000 individuals)). Thallium shows a 90th percentile noncancer HQ of 3 for unlined units only. The 50th percentile results for this pathway are at or below the risk criteria for all constituents.¹¹ Other landfill constituents did not show a noncancer risk above an HQ of 1 or risk level of 1 chance in 100,000 excess cancer risk.

- Risks are higher for surface impoundments for the groundwater-to-

drinking-water pathway, with a 90th percentile arsenic cancer risk of 9×10^{-3} for unlined units and 3×10^{-3} for clay-lined units. For unlined units, five additional constituents have noncancer HQs ranging from 3 to 5 for the 90th percentile, including boron, lead, cadmium, cobalt, and molybdenum. Two constituents (boron (2) and molybdenum (3)) have HQs greater than 1 for clay-lined surface impoundments. The 50th percentile cancer risk results for arsenic are 3×10^{-4} in unlined units and 9×10^{-5} in clay lined surface impoundments.

- For arsenic, arrival times of the peak concentrations at a receptor well are relatively long for CCW landfills, with travel times ranging from hundreds to thousands of years. Arrival times are much shorter for surface impoundments, with time to peak concentrations being less than 100 years for most of the model runs.

- For humans exposed via the groundwater-to-surface-water (fish consumption) pathway, selenium (HQ = 2) and arsenic (cancer risk = 2×10^{-5}) show 90th percentile risks for unlined surface impoundments above the risk criteria. All other waste management scenarios and all 50th percentile results show risks at or below the risk criteria for the fish consumption pathway.

- Liners appear to reduce risks from all constituents for landfills and surface impoundments. The risks from clay-lined units (as modeled in the risk assessment) were reduced by about half when compared to unlined units. Composite liners appear to be effective in mitigating CCW risks from landfills and surface impoundments.

- For ecological receptors exposed via surface water, the 90th percentile risks for unlined and clay-lined landfills exceed an HQ of 1 for boron (200) and lead (4). For surface impoundments, 90th percentile risks for six constituents: boron (2000), lead (20), arsenic (10), selenium (10), cobalt (5), and barium (2) exceed an HQ of 1. The only exceedance from the 50th percentile risk results is HQ of 4 for boron in surface impoundments.

- For ecological receptors exposed via sediment, 90th percentile risks for lead, arsenic, and cadmium exceeded an HQ of 1 for both landfills (HQs from 2 to 20) and surface impoundments (HQs from 20 to 200). All 50th percentile results show ecological risks at or below the risk criteria for the sediment pathway.

The Agency is making the risk analysis document available in the Docket to allow interested parties to submit comments on the analytical methodology, data, and assumptions used in the analysis and to submit

additional information for the Agency to consider. In addition, the risk assessment will undergo independent scientific peer review by experts outside of the EPA following closure of the public comment period. Public comments will be made available to the peer reviewers for their consideration during the review process. The peer review will focus on technical aspects of the analysis, including the construct and implementation of the Monte Carlo analysis, the selection of models to estimate the release of constituents found in CCW from landfills and surface impoundments, and their subsequent fate and transport in the environment, and the characterization of risks resulting from potential exposures to human and ecological receptors.

3. EPA Damage Case Assessment

For the May 2000 Regulatory Determination, the Agency determined there were approximately 300 CCW landfills and 300 CCW surface impoundments used by 440 coal-fired utilities. EPA recently completed an assessment of possible environmental damages from CCW landfills and surface impoundments. Under the Beville Amendment for the "special waste" categories, EPA was statutorily required to examine "documented cases in which danger to human health or the environment has been proved." The criteria used to determine whether danger to human health and the environment has been proved are briefly described in footnote 2 to this NODA and more fully explained in the May 2000 Regulatory Determination at 65 FR 32224.

EPA has gathered or received information on 135 possible damage cases. Sixteen of these were submitted since publication of the 2000 Regulatory Determination. EPA re-evaluated the old damage cases and evaluated the new cases, and they are available in the docket to today's action and subject to comment as part of the NODA. After reviewing these 135 damage cases, EPA identified 24 proven damage cases. Sixteen were determined to be proven damages to ground water and eight were determined to be proven damages to surface water and covered by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act.¹² The overwhelming majority of the damage cases reflect management in unlined units—that is, all but one of the 24 proven damage cases involved unlined CCW

¹¹ The risk analysis presents the corresponding 50th percentile results from the Monte Carlo analyses.

¹² Of the 24 damage cases, 11 were presented and discussed in the May 2000 Regulatory Determination.

management units,¹³ including six cases involving disposal of CCW in unlined sand and gravel pits. Additionally, 43 cases were determined to be potential damages to ground water or surface water.¹⁴ Four of the potential damage cases were attributable to oil combustion wastes.

Six of the alleged damage cases were minefills which, while under the scope of the 2000 Regulatory Determination, are outside the scope of this NODA that deals exclusively with surface disposal.¹⁵ The remaining 62 alleged damage cases subject to detailed assessment were not considered damage cases due to either (1) lack of any evidence of damage, or (2) lack of evidence that damages were uniquely associated with CCW.

Of the 16 proven cases of damages to ground water, the Agency has been able to confirm that corrective actions have been completed in six cases and are ongoing in nine cases. The Agency has not received information regarding the one remaining case. Corrective action measures at these CCW management units vary depending on site specific circumstances and include formal closure of the unit, capping, the installation of new liners, ground water treatment, ground water monitoring, and combinations of these measures.

For a more detailed description, see the document [CCW_Damage_Case_Assessments.pdf](#) in the docket to today's action. Detailed information on many of these sites is also available in the docket for the 1999 Report to Congress, Docket ID # EPA-HQ-RCRA-1999-0022. The Agency solicits comments and supporting information on the extent to which the damage case information should affect the Agency's decisions regarding the regulation of CCW in landfills and surface impoundments under RCRA Subtitle D.

4. Additional Documents

In addition to the reports identified under (1) to (3) above, the Agency is also including in the docket to today's NODA a February 2004 Petition for Rulemaking submitted by the Clean Air Task Force and the Hoosier Environmental Council, jointly with a number of citizens' groups to Prohibit

the Placement or Disposal of CCW into Groundwater and Surface Water; and two suggested approaches for managing CCW in landfills and surface impoundments. One approach is a Voluntary Action Plan that was formulated by the electric utility industry through their trade association, USWAG, regarding the management of CCW. The second approach is a proposed framework prepared by a number of citizens' groups for federal regulation of CCW disposed of in landfills and surface impoundments under Subtitle D of RCRA generated by U.S. coal-fired power plants.

C. Conclusion

The Agency solicits comments on the extent to which the damage case information, the results of the risk assessment, and the new liner and ground water monitoring information should affect the Agency's decisions. The Agency will consider all the information provided through today's notice, the comments and new information submitted on this notice, as well as the results of the peer review of the risk assessment as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments.

Dated: August 23, 2007.

Susan Parker Bodine,

Assistant Administrator, Office of Solid Waste and Emergency Response.

[FR Doc. E7-17138 Filed 8-28-07; 8:45 am]

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FEDERAL COMMUNICATIONS COMMISSION

Radio Broadcasting Services; AM or FM Proposals To Change the Community of License

AGENCY: Federal Communications Commission.

ACTION: Notice.

SUMMARY: The following applicants filed AM or FM proposals to change the community of license: ABLE RADIO CORPORATION, Station NEW, Facility ID 170953, BNPH-20070403ACO, From AGUILA, AZ, To TONOPAH, AZ; ADVANCE ACQUISITION, INC., Station KQJZ, Facility ID 160700, BMP-20070725ALN, From KALISPELL, MT, To EVERGREEN, MT; AMERICAN EDUCATIONAL BROADCASTING, INC., Station KLKA, Facility ID 82692, BMPED-20070803ACY, From GLOBE, AZ, To CASA GRANDE, AZ; CANYON MEDIA CORPORATION, Station KONY, Facility ID 18140, BPH-20070726AHL, From ST. GEORGE, UT, To

HURRICANE, UT; CAPSTAR TX LIMITED PARTNERSHIP, Station KIYS, Facility ID 51855, BPH-20070726ADN, From JONESBORO, AR, To CRAWFORDSVILLE, AR; CAPSTAR TX LIMITED PARTNERSHIP, Station KTEX, Facility ID 64631, BPH-20070803ACV, From BROWNSVILLE, TX, To MERCEDES, TX; CHEHALIS VALLEY EDUCATIONAL FOUNDATION, Station KACS, Facility ID 10685, BPED-20070813AAF, From CHEHALIS, WA, To RANIER, WA; CLEAR CHANNEL BROADCASTING LICENSES, INC., Station KHKZ, Facility ID 36166, BPH-20070803ACP, From MERCEDES, TX, To SAN BENITO, TX; COLLEGE CREEK MEDIA, LLC, Station KCLS, Facility ID 55461, BPH-20070803ADM, From ELY, NV, To PIOCHE, NV; CSN INTERNATIONAL, Station KGSF, Facility ID 92987, BMPED-20070430AEP, From ANDERSON, MO, To GREEN FOREST, AR; CSN INTERNATIONAL, Station KJCC, Facility ID 122517, BPED-20070719AAU, From CARNEGIE, OK, To HINTON, OK; CSN INTERNATIONAL, Station WUJC, Facility ID 122209, BMPED-20070806AEW, From ST. MARKS, FL, To TALLAHASSEE, FL; CSN INTERNATIONAL, Station KWYC, Facility ID 87267, BMPED-20070808ACK, From ORCHARD VALLEY, WY, To CHEYENNE, WY; CSN INTERNATIONAL, Station KJCC, Facility ID 122517, BMPED-20070814AAW, From CARNEGIE, OK, To HINTON, OK; EDUCATIONAL MEDIA FOUNDATION, Station KAIS, Facility ID 88397, BMPED-20070720ABV, From REDWOOD VALLEY, CA, To HOPLAND, CA; EDUCATIONAL MEDIA FOUNDATION, Station KVLK, Facility ID 122812, BPED-20070724ACV, From SOCORRO, NM, To MILAN, NM; EDUCATIONAL MEDIA FOUNDATION, Station KAIA, Facility ID 76841, BPED-20070730ACS, From BLYTHEVILLE, AR, To BLOOMFIELD, MO; EDUCATIONAL MEDIA FOUNDATION, Station KAIC, Facility ID 78758, BPED-20070803ACO, From TUCSON, AZ, To MAMMOTH, AZ; EXPONENT BROADCASTING, INC., Station WXJO, Facility ID 25386, BMP-20070725ACM, From GORDON, GA, To DOUGLASVILLE, GA; GEORGIA EAGLE BROADCASTING, INC., Station WMCD, Facility ID 65607, BPH-20070705AAA, From CLAXTON, GA, To SULLIVAN'S ISLAND, SC; KEILY MILLER, Station NEW, Facility ID 165946, BMPH-20070727ABV, From BEATTY, NV, To CRYSTAL, NV; NAPLES EDUCATIONAL

¹³ The lone damage case from a lined unit was the result of a liner failure in a surface impoundment.

¹⁴ Per the May 2000 Regulatory Determination, 65 FR 32224, potential damage cases are those with (1) documented exceedances of primary MCLs or other health-based standards only directly beneath or in very close proximity to the waste source, and/or (2) documented exceedances of secondary MCLs or other non-health-based standards on-site or off-site.

¹⁵ See Footnote 1 regarding OSM's ANPR (72 FR 12026).