

ENGINEERING AND ENVIRONMENTAL SPECIFICATIONS OF STATE AGENCIES FOR UTILIZATION AND DISPOSAL OF COAL COMBUSTION PRODUCTS: VOLUME 2 – ENVIRONMENTAL REGULATIONS

CBRC Project Number: 02-CBRC-W12

Final Report

(for the period September 1, 2004, through August 31, 2005)

Prepared by:

Bruce A. Dockter
University of North Dakota
Energy & Environmental Research Center

Diana M. Jagiella
Howard & Howard
Law for Business

July 2005

DOE Award Number: DE-FC26-98FT40028

University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street
PO Box 9018
Grand Forks ND 58202-9018

2005-EERC-07-05

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

EERC DISCLAIMER

LEGAL NOTICE This research report was prepared by the Energy & Environmental Research Center (EERC), an agency of the University of North Dakota, as an account of work sponsored by DOE. Because of the research nature of the work performed, neither the EERC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement or recommendation by the EERC.

**ENGINEERING AND ENVIRONMENTAL SPECIFICATIONS OF STATE AGENCIES
FOR UTILIZATION AND DISPOSAL OF COAL COMBUSTION PRODUCTS:
VOLUME 2 – ENVIRONMENTAL REGULATIONS**

ABSTRACT

The objective of this report is twofold. The first is to present a state-by-state comparison of Department of Transportation (DOT) specifications governing the use of coal combustion products. Because of lack of resources, namely, time and funding, most transportation and materials engineers cannot fully research all the current technologies of coal ash utilization. This compilation allows these professionals to become familiar with other department practices and to identify areas where specifications need to be developed within their own transportation offices. Engineering practices are slow to change for many reasons. To facilitate changes, a systematic approach must be taken. The results from this effort will help familiarize DOT engineers and officials with coal ash use applications and will help the coal ash industry develop a plan to work with these departments and individuals in expanding their knowledge and familiarity while expanding coal ash markets.

The second goal is to establish a comparison of state environmental laws and regulations as they pertain to utilization and/or disposal. As a result of the interpretation of the Beville Amendment, utilization and disposal are not regulated at the federal level. These issues have been left to the states. Many states have enacted laws and adopted regulations, or both, governing the utilization and disposal of coal combustion by-products. These laws and regulations vary widely. Thus a particular utilization authorized in one state may not be authorized in the adjoining state. The objective of this report is to present a survey of the state laws and regulations authorizing beneficial reuse of coal combustion by-products.

TABLE OF CONTENTS

LIST OF TABLES ii

INTRODUCTION 1

EXECUTIVE SUMMARY 2

RESULTS AND DISCUSSION 3

 Federal Regulation of CCBs 3

 State Regulation of CCBs 8

 Alabama 9

 Alaska 10

 Arizona 12

 Arkansas 12

 California 13

 Colorado 13

 Connecticut 14

 Delaware 15

 District of Columbia 16

 Florida 16

 Georgia 17

 Hawaii 17

 Idaho 18

 Illinois 18

 Indiana 20

 Iowa 22

 Kansas 24

 Kentucky 24

 Louisiana 26

 Maine 26

 Maryland 27

 Massachusetts 27

 Michigan 28

 Minnesota 29

 Mississippi 30

 Missouri 31

 Montana 32

 Nebraska 33

 Nevada 34

 New Hampshire 34

 New Jersey 35

 New Mexico 36

continued . . .

TABLE OF CONTENTS (continued)

New York 36
North Carolina 38
North Dakota 41
Ohio 41
Oklahoma 43
Oregon 43
Pennsylvania 44
Rhode Island 46
South Carolina 46
South Dakota 47
Tennessee 47
Texas 50
Utah 51
Vermont 52
Virginia 52
Washington 54
West Virginia 54
Wisconsin 56
Wyoming 59

CONCLUSION 60

LIST OF TABLES

1 Uses of CCPs by State 4

**ENGINEERING AND ENVIRONMENTAL SPECIFICATIONS OF STATE AGENCIES
FOR UTILIZATION AND DISPOSAL OF COAL COMBUSTION PRODUCTS:
VOLUME 2 – ENVIRONMENTAL REGULATIONS**

INTRODUCTION

The efforts on this project were made possible by funding from the National Energy Technology Laboratory Combustion Byproducts Recycling Consortium (NETL CBRC) with industry support from the American Coal Ash Association (ACAA) and the Utility Solid Waste Activities Group (USWAG). Although the twofold objectives of this report are similar in presentation (state-by-state comparisons), the contents are very distinct from one another. For these reasons, this report will be presented in a two-volume series. This portion of the report, Volume 2, details the survey of state laws and regulations authorizing beneficial use of coal combustion by-products. Volume 1 presents existing U.S. Department of Transportation engineering specifications as they pertain to the use of coal combustion products. Specifications for the utilization and disposal of coal combustion products are continuously being updated and modified to express the trends for that particular state. The results here are but a summary of current laws and regulations at the time of publication of this report.

Extensive research for this project began in 2004. The laws and regulations of each state were reviewed to identify statutory or regulatory provisions authorizing the beneficial reuse of coal combustion by-products. Information was collected through Internet and Westlaw searches. Additionally, a survey letter was sent to all the states requesting copies of any legal authority upon which the state relies to authorize beneficial reuse of coal combustion by-product (CCB). In many cases, personal contact was also made with state agencies. Based on the information obtained, a summary of the CCB laws and regulation in each state was prepared.

The information in this report provides an overview of state solid waste laws and regulations governing reuse of CCBs. This report will be useful to persons familiar with “beneficial use” regulations for CCBs in their particular state and will assist in the exchange of regulatory guidance to enhance the use of CCBs. This report is not intended to identify landfill or similar disposal requirements.

The information presented in this report was obtained from numerous sources through February 2005. Although the report seeks to accurately describe authorized state CCB reuses in the states, the reader is cautioned to seek appropriate technical, environmental, and legal advice with respect to any actions that may be undertaken concerning the management and use of CCBs in any state. This report does not constitute legal or technical advice. Further, this report is not intended to advise the reader regarding legal or regulatory requirements applicable to CCB reuse projects in any state and should not be relied upon for this purpose.

This report summarizes state laws, regulations, policies, and/or agency guidance regarding the use of CCBs. It is important the reader recognize that information presented in this section is merely a summary overview of various state requirements. The reader should carefully review and

understand the briefly stated limitations of this report as well as the formal disclaimer of warranties and limitation of liabilities.

For consistency, this report utilizes the term CCBs. The term is intended to generically refer to fly ash, bottom ash, boiler slag, flue gas desulfurization sludge, or fluidized-bed combustion material. The reader must recognize that each state has different approaches to classification of CCBs and that these respective classifications may limit or expand allowable uses of CCBs. For example, in Pennsylvania, CCBs are referred to as “coal ash” which is defined to include fly ash, bottom ash, and boiler slag. Conversely, some states include within the definition of CCB wastes which have been combusted with other materials, such as petroleum coke, tire-derived fuel, and/or wood. In some cases, these distinctions are noted herein. However, the reader should not assume that use of the term CCB infers that all types of CCBs are included within the scope of a particular state’s regulations.

EXECUTIVE SUMMARY

The information in this report provides an overview of state solid waste laws and regulations governing reuse of coal combustion by-products (CCBs). This report will be useful to persons familiar with “beneficial use” regulations for CCBs in their particular state and will assist in the exchange of regulatory guidance to enhance the use of CCBs. This report does not constitute legal or technical advice. Further, this report is not intended to advise the reader regarding legal or regulatory requirements applicable to CCB reuse projects in any state and should not be relied upon for this purpose. This report summarizes state laws, regulations, policies, and/or agency guidance regarding the use of CCBs. This report does not constitute legal or technical advice and is not intended to advise the reader regarding legal or regulatory requirements applicable to CCB reuse projects in any state and should not be relied upon for this purpose.

CCB reuse options are determined by state law. CCBs are generally exempt from hazardous waste regulations, and the states have elected to regulate these materials as solid, special, or industrial wastes. States that do not exempt CCBs from hazardous waste regulations require testing to determine hazardousness, and if shown to be nonhazardous, the CCBs are regulated as solid waste.

Most states currently do not have specific regulations addressing the use of CCBs, and requests for CCB uses are handled on a case-by-case basis or under generic state recycling laws or regulations. Many states have “generic” laws and regulations which authorize limited reuse and recycling of hazardous and/or solid wastes. These generic laws do not apply specifically to CCBs or any other materials. In general, under these regulations, materials are not considered solid wastes when they can be recycled by being:

- Used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed.
- Used or reused as effective substitutes for commercial products.

- Returned to the original process from which they are generated, without first being reclaimed. The materials must be returned as a substitute for raw materials feedstock, and the process must use raw materials as principal feedstocks.

A number of states have adopted laws and regulations or issued policies and/or guidance specifically pertaining to CCB use. The CCB uses authorized within these states vary widely. Some states authorize liberal use of CCBs, while others authorize CCB use only in limited applications. In addition, the level of regulatory control and oversight varies significantly. CCB uses presenting the greatest concern to state regulators are those which involve land application, such as use of CCBs in agricultural applications, structural fills, mine applications, and embankments. Some states consider these applications to be waste disposal and not reuse or recycling.

Finally, other states have elected to adopt “industrial solid waste beneficial use” rules intended to authorize use of a variety of materials such as coal ash, paper mill sludge, and foundry sand. These reuse rules with application to multiple materials may represent a growing trend. Table 1 summarizes the use of CCPs that are “authorized” (●) or “allowed” (□) on a state-by-state basis as presented in the remainder of this report.

RESULTS AND DISCUSSION

Federal Regulation of CCBs

The principal federal statute under which hazardous and solid wastes are regulated is the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901-6991. RCRA establishes a comprehensive cradle-to-grave system for regulating hazardous wastes. Specifically, Subtitle C of RCRA and its implementing regulations impose requirements on the generation, transportation, storage, treatment, and disposal of hazardous wastes. To trigger these requirements, a material must be a “solid waste,” and the solid waste must be “hazardous.”

Subtitle D of RCRA pertains to State or Regional Solid Waste Plans. Wastes which are not considered hazardous under Subtitle C fall under Subtitle D and are subject to regulation by the states as solid waste. As originally drafted, RCRA did not specifically address whether CCBs fell under Subtitle C as a hazardous waste or Subtitle D as a solid waste.

In 1980, Congress enacted the Solid Waste Disposal Act Amendments to RCRA. Under the amendments, certain wastes, including CCBs, were temporarily excluded from Subtitle C regulation. This regulatory exemption is commonly referred to as the “Bevill Exemption.” 42 U.S.C. §6921(b)(3)(A)(i). As a result, CCBs fell under Subtitle D and became subject to regulation under state law as solid waste.

As the Bevill Exemption was temporary, the amendments further directed that the U.S. Environmental Protection Agency (EPA) produce a report regarding CCBs and to pursue appropriate regulation. 42 U.S.C. §6982(n). In accord with this mandate, EPA issued its first report to Congress in 1988 titled *Waste from the Combustion of Coal Electric Utility Power Plants*

Table 1. Uses of CCPs by State

	AL	AK	AR	AZ	CA	CO	CT	DE	FL	GA	HI	ID	IL	IN	IA	KS	KY
Cement/Concrete Products	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	●	☐	●	☐	●
Flowable Fill		●											●	●	●		
Structural Fill		●											●	●	●		●
Road Base/Subbase								☐					●	●	●		●
Mineral Filler in Asphalt															●		
Snow and Ice Control													●	●			●
Roofing Shingles													●				●
Blasting Grit															●		●
Grouting						☐											
Mining Applications																	●
Wallboard										☐			●	●			
Waste Stabilization								☐									
Filler in Plastics/Paints/Metals													●		●		●
Mineral Recovery													●	●	●		
Soil Amendment	●												●				
Ingredient in Product			●		●					●				●			●
Aggregate																	
Ice Control (rivers)																	
Landfill Cover		●													☐		
Walking/Driving Surface															●		
Concrete Block																	
Bricks/Ceramics/Insulation																	
Artificial Reefs																	
Well Construction																	
Railroad Ballast																	

● = Authorized ☐ = Allowed

continued . . .

Table 1. Uses of CCPs by State (continued)

	LA	ME	MD	MA	MI	MN	MS	MO	MT	NE	NV	NH	NJ	NM	NY	NC	ND
Cement/Concrete Products	☐	☐	☐	☐	●	☐	☐	●	☐	●	☐	●	●	☐	●	●	☐
Flowable Fill		☐		●	●			●		●					●	●	
Structural Fill			●	●	●			●		●			●		●	●	●
Road Base/Subbase				●	●			●		●			●			●	●
Mineral Filler in Asphalt					●	●				●			●		●		
Snow and Ice Control								●							●	●	
Roofing Shingles						●							●		●	●	
Blasting Grit						●				●						●	
Grouting					●												
Mining Applications													●				
Wallboard													●		●		●
Waste Stabilization										●							
Filler in Plastics/Paints/Metals																●	
Mineral Recovery																●	
Soil Amendment			●					●		●						●	
Ingredient in Product				●		☐				●		●			●	●	
Aggregate				●	●	●				●		●	●	●	●	●	
Ice Control (rivers)										●							
Landfill Cover				●				●									
Walking/Driving Surface																	
Concrete Block				●									●	●			
Bricks/Ceramics/Insulation																	
Artificial Reefs																	
Well Construction									●								
Railroad Ballast																	

● = Authorized ☐ = Allowed

continued . . .

Table 1. Uses of CCPs by State (continued)

	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY
Cement/Concrete Products	●	□	□	●	□	□	□	□	●	□	□	□	□	●	●	□
Flowable Fill	●								●					●	●	
Structural Fill	●			●				●				●			●	
Road Base/Subbase	●	□		●				●	●	●		●		●	●	
Mineral Filler in Asphalt	●								●							
Snow and Ice Control	●			●						●		●		●	●	
Roofing Shingles	●								●					●		
Blasting Grit	●								●					●		
Grouting	●								●							
Mining Applications	●	●		●								●		●		
Wallboard									●							
Waste Stabilization	●								●					●	●	
Filler in Plastics/Paints/Metals	●								●					●		
Mineral Recovery	●			●								●		●		
Soil Amendment	●	□		●								●		●		
Ingredient in Product	●	□		●					●		●			●	●	
Aggregate	●			●				●	●	●				●		
Ice Control (rivers)																
Landfill Cover		□												●	●	
Walking/Driving Surface	●	□							●			●		●		
Concrete Block	●								●					●		
Bricks/Ceramics/Insulation	●								●							
Artificial Reefs									●							
Well Construction																
Railroad Ballast										●						

● = Authorized □ = Allowed

(EPA/5-30-SW-88-002). This EPA report concluded that CCBs generally do not exhibit hazardous characteristics and that regulation of CCBs should remain under state Subtitle D authority.

Following litigation against EPA by the Bull Run Coalition because EPA failed to timely issue a regulatory determination as stated in its 1988 report to Congress, EPA entered into a consent decree with the Bull Run Coalition which included a time frame for EPA to issue a formal recommendation regarding regulation of CCBs. Pursuant to the consent decree, EPA issued a final regulatory determination applicable to fly ash, bottom ash, boiler slag, and FGD material which became effective September 2, 1993, 58 *Federal Register* 42, 466 (August 9, 1993). The rule states that regulation of CCBs generated by coal-fired electric utilities and independent power producers as hazardous waste is unwarranted and that the materials will remain exempt from regulation as a hazardous waste under RCRA.

EPA has narrowly interpreted this exemption. According to EPA, the exemption applies only to coal-fired electric utilities and independent power producers. It does not include CCBs generated at any other industrial activity (*in re: Wheland Foundry*, EAB, No. 93-2, December 22, 1993). Further, fluidized-bed combustion wastes, low-volume wastes (boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant rinses, metal and boiler cleaning wastes), and pyrites and comanaged wastes (referred to as remaining wastes) are not covered by the rule. EPA decided that more study was needed on these remaining wastes before an exemption determination could be made.

EPA was initially scheduled to complete a study of remaining wastes by September 30, 1998, and issue a final regulatory determination regarding these wastes by April 1, 1999, pursuant to the consent decree in the Bull Run Coalition litigation. Based on this obligation, EPA's study of fluidized-bed combustion wastes, low-volume wastes (boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant rinses, metal and boiler cleaning wastes), and pyrites and comanaged wastes (referred to as remaining wastes) were subsequently discussed in a March 31, 1999, Report to Congress. The report indicated that fluidized-bed combustion wastes, low-volume wastes, and remaining wastes should continue to maintain their "Bevill Exemption" and that regulation under Subtitle C was not warranted.

Based on extensions of the consent decree mentioned above, EPA was to issue a final regulatory determination addressing fluidized-bed combustion wastes, low-volume wastes, and remaining wastes by April 10, 2000. In early March, EPA circulated a draft regulatory determination which indicated that, contrary to the 1999 Report to Congress, these wastes would be regulated under Subtitle C. EPA's stated basis for this shift in position was that remaining wastes did present environmental concerns, particularly concerns regarding groundwater leaching and the effects on drinking water standards, as well as effects associated with mercury exposure. The ACAA, as well as other shareholder groups, did not agree that regulation of CCBs as hazardous was warranted and met with EPA to discuss concerns associated with the draft approach.

After much debate and discussion among EPA, industry, and environmental groups (as well as an extension of the consent decree), EPA issued its final regulatory determination April 25, 2000, which was published in the *Federal Register* on May 22, 2000 (65 *Federal Register* 32213).

The final regulatory determination states that fluidized-bed combustion wastes, comanaged wastes, and coal combustion wastes from nonutilities, petroleum coke combustion wastes, coburning of coal and fuel, and oil and natural gas combustion will not be regulated under Subtitle C and would continue to maintain their “Bevill Exemption.”

However, in determining if low-volume wastes are subject to Subtitle C regulation, EPA divided the low-volume wastes into two new categories: uniquely associated wastes and nonuniquely wastes. EPA took the position that when uniquely associated low-volume wastes are comanaged, those wastes would continue to be exempt from regulation under Subtitle C. However, if these wastes are managed independently and if they exhibit hazardous characteristics, they are subject to Subtitle C regulation. EPA defined these uniquely associated low-volume wastes to include coal pile runoff, coal mill rejected and waste coal, air heater and precipitation wastes, flow and yard drains and sumps, wastewater treatment sludge, and boiler fireside chemical cleaning waste.

EPA defined nonuniquely associated wastes as boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant rinses, metal and boiler cleaning wastes (which was the historical definition for all low-volume wastes). Under EPA's final regulatory determination, when these nonuniquely associated wastes are comanaged or managed independently, they are not automatically exempt from regulation under Subtitle C, but must rather go through a RCRA hazardous waste determination.

The determination also indicated that EPA would be looking to the states to ensure proper regulation for certain CCB applications. In particular, EPA expressed the view that CCBs disposed in landfills or surface impoundments, or used to fill surface or underground mines, should be regulated by the states. Alternatively, EPA stated it would develop federal regulations of these applications under Subtitle D of RCRA. EPA indicated in the regulatory determination that in developing/reviewing regulations, it would look at the extent to which CCBs caused actual or potential damage to human health and/or the environment, the environmental effects of filling mines with CCBs, the adequacy of existing regulations, and the effects of mercury exposure from these activities. EPA further indicated any federal regulations would be developed through notice and comment rulemaking.

State Regulation of CCBs

As a result of the federal law developments described above, CCB reuse options are determined by state law. CCBs are generally exempt from hazardous waste regulations, and the states have elected to regulate these materials as solid, special, or industrial wastes. States that do not exempt CCBs from hazardous waste regulations require testing to determine hazardousness, and if shown to be nonhazardous, the CCBs are regulated as solid waste.

Most states currently do not have specific regulations addressing the use of CCBs, and requests for CCB uses are handled on a case-by-case basis or under generic state recycling laws or regulations. Many states have “generic” laws and regulations which authorize limited reuse and recycling of hazardous and/or solid wastes. These generic laws do not apply specifically to CCBs or

any other materials. In general, under these regulations, materials are not considered solid wastes when they can be recycled by being:

- Used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed.
- Used or reused as effective substitutes for commercial products.
- Returned to the original process from which they are generated, without first being reclaimed. The materials must be returned as a substitute for raw materials feedstock, and the process must use raw materials as principal feedstocks.

The following materials remain regulated solid wastes, even if the recycling involves use, reuse, or return to the original process:

- Materials used in a manner constituting disposal or used to produce products that are applied to the land.
- Materials burned for energy recovery, used to produce a fuel, or contained in fuels.
- Materials accumulated speculatively.
- Inherently wastelike materials.

In addition, there is little consistency amongst the states regarding use of CCBs in mine applications. Some states have detailed regulations for reuse of CCBs in mine applications (some of which are discussed herein). Other states address this common use of CCBs by reference to fly ash and flue gas desulfurization (FGD) material as materials which may be permitted as "discharges" to the mine upon approval by the state mining agency.

In general, the legal and technical requirements for mine applications are complex. For this reason, these regulations are not discussed in detail but are noted so further research can be done in the event the reader is interested in the potential application of these regulations to a proposed project. There may be significant changes in the regulations applicable to mine reuse applications. EPA has identified this as an area where greater regulation is warranted.

Alabama

Under Alabama regulations, fly ash, bottom ash, boiler slag and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, industrial solid waste, or solid waste, ALA.CODE §22-27-3, ALA.ADMIN.CODE R.335-13-1-.03(12) and (63); 335-14-2-.01(4)(b)(4). However, under ALA.ADMIN.CODE R.335-13-1-.03(134), fly ash and bottom ash may be considered special wastes which require specific processing, handling, or disposal techniques.

Currently, reuse of CCBs is not specifically authorized under Alabama law or regulations. Nevertheless, CCB reuse may be authorized pursuant to the reported Department of Environmental Management (DEM) interpretation of CCBs as nonregulated solid wastes, ALA.ADMIN.CODE R.335-13-1-.03.

Alabama Department of Environmental Management, 1400 Coliseum Boulevard, Montgomery, AL 36110. Contact: **Larry Bryant**, Solid Waste Branch (334) 271-7771; Fax No.: (334) 279-3050; E-Mail: jlbandem.state.al.us; Web Site: www.adem.state.al.us.

Alaska

Alaska regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, 18 AAC 62.020(a); 40 CFR 261.4(b)(4). Alaska also specifically excludes fly ash as an industrial solid waste. 18 AAC 60.990(63). Ash is generally considered an inert waste (waste having a low potential to pollute air or water and that does not normally attract wildlife) 18 AAC 60.990(64).

Currently, the reuse of CCBs is allowed under Alaska law either by permit or prior approval. The Alaska Department of Environmental Conservation (DEC) has developed a “General Permit” effective through January 31, 2008, to authorize CCB disposal or use as fill for construction projects. The General Permit excludes from eligibility areas subject to the Alaska Coastal Zone Management regulations (6 AAC 80). The current General Permit replaces an earlier version effective through April 20, 2004.

An application to rely on the General Permit must be submitted to the Alaska DEC and approved by the Agency before the project proceeds. The ash must be tested for total metals content and must undergo the toxicity characteristic leaching procedure test (TCLP). The test results must show there is a low potential for leaching of metals from the ash and must be submitted with the application.

After the project is approved by the DEC, the permit holder must comply with various requirements including:

- A minimum horizontal separation distance of 50 feet must be maintained between the ash disposal area and the property boundary.
- A 1-foot layer of clean soil or gravel must be placed on the area prior to placement of the coal ash if the area is a wetland (this requirement does not apply to upland locations).
- A soil or gravel berm must be constructed to accommodate the ash if necessary.
- Ash must be handled so as to minimize air quality violations and fugitive dust emissions. Ash must be transported in covered trucks and wetted down during transport or placement if necessary to control fugitive dust emissions.

- The working face may not exceed 100 feet in length and must be kept as small as practical to reduce potential for windblown ash or erosion.
- Drainage must be controlled to prevent potential water quality violations.
- Ash-filled areas must be covered with a minimum of 6 inches of soil prior to the soils becoming frozen.
- Ash-filled areas must be covered with soil during the summer months at a sufficient frequency to prevent fugitive dust emission violations.
- Public access to the site must be controlled.
- The site must be visually monitored monthly for signs of damage. Records of the monitoring results must be retained. Any damage identified during the monitoring must be immediately corrected.
- An inventory of the ash used must be maintained, including the source, amount, and analytical results. Ash from new coal sources must be subjected to analytical testing and the results maintained.

Once the project is nearing completion, the permit holder must comply with the following requirements:

- Notify the DEC at least 30 days before the site is to be closed.
- Ensure that the final cover is applied within 30 days after the last placement of ash. The final cover must consist of a minimum of 1 foot of clean soil or gravel on top surfaces and 2 feet of soil on the side slopes which has been properly graded.
- Prepare a survey as-built or updated record drawings showing location of ash disposal area within property boundary and a property record annotating on the deed with the State Recorder's office within 60 days of closure.

According to the DEC, surface water monitoring may be required if ash is used in Alaskan wetlands.

Reuse of coal ash as fill is also allowed under a "waste as fill" regulation (18 AAC 60.007) implemented in 2002. This regulation allows coal ash to be used as fill material on projects that increase the market value of the property. Such projects are authorized by approval rather than by permit, and the state has approved about a dozen such projects under this regulation. The regulation requires submitting a written proposal that provides specific information and describes specific aspects of the fill project. Approval of the project is granted upon review of the proposal as long as it is determined that the project will:

- Increase the market value of the property.
- Not shift, erode, or settle in a way that will preclude proposed future use of the site.
- Not create any harmful leachate.
- Not undergo combustion.
- Not cause a threat to the public health, safety, or welfare or to the environment.

The reuse of coal ash may also be authorized under the guidelines of 18 AAC 60.008. This regulation allows solid waste to be used for “beneficial purposes” other than fill projects. Projects authorized under this regulation are authorized by approval rather than by permit. The approval process requires submittal of a written proposal that describes the proposed use of the waste and how the proposed use will protect public health, safety, and welfare and the environment. Approval is granted if these concerns are adequately addressed.

Alaska Department of Environmental Conservation, 610 University Avenue, Fairbanks, AK 99709-3643. Contact: **Doug Buteyn**, (907) 451-2135; Fax No.: (907) 451-2188; E-Mail: doug_buteyn@dec.state.ak.us; Web Site: www.state.ak.us/dec/index.htm.

Arizona

Arizona regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, ARIZ. COMP. ADMIN. R & REGS. 18-8-261(A); 40 CFR 261.4. Currently, reuse of CCBs is not specifically authorized under Arizona law or regulations.

Arizona Department of Environmental Quality, Mailcode: 4415B-2, Adeq Central Office, 1110 West Washington Street, Phoenix, AZ 85007. Contact: Martha L. Seaman; Telephone No.: (602) 207-2221; E-Mail: ms2@azdeq.gov; Web Site: www.adeq.state.az.us.

Arkansas

Arkansas regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, APC&EC Hazardous Waste Regulation No. 23 §261.4(b)(4); 40 CFR 261.4.

Currently, reuse of CCBs is not specifically authorized under Arkansas law or regulations. Arkansas has adopted generic regulations under its solid waste program which allows “recovered materials” to be reused. Recovered materials include materials that have known recycling potential, can be feasibly recycled, and have been removed from the waste stream for sale, use, or reuse as raw materials. Use constituting disposal is prohibited, APC&EC Solid Waste Regulation No. 22 §102. Reuse of recovered materials does not constitute disposal provided the use will not result in adverse impacts to the air or surface and groundwater quality, APC&EC Solid Waste Regulation No. 22 §103(I).

According to the Arkansas Department of Environmental Quality, utility companies in the state have extensive programs for use of fly ash and bottom ash in soil stabilization, roadway construction, and as an additive in portland cement concrete based on these generic reuse regulations.

Arkansas Department of Environmental Quality, PO Box 8913, Little Rock, AR 72219-8913. Contact: **Ryan Benefield**, (501) 682-0602; Fax No.: (501) 682-0611; E-Mail: benefield@adeq.state.ar.us; Web Site: www.adeq.state.ar.us.

California

Under California law, fly ash and bottom ash are presumed to be hazardous waste unless the ash satisfies certain testing requirements and does not exhibit a characteristic of hazardous waste. CAL.CODE REGS. tit. 22 §66261.126, Appendix X; CAL.CODE REGS. tit. 22 §66261.4. Fly ash and bottom ash which contain metals at certain levels have been prohibited from land disposal since January 1, 1991, CAL.CODE REGS. 22 §66268.100(a)(4),106.

Ash from the combustion of fossil fuels may be classified and managed as a special waste following department approval of an application for such classification, CAL.CODE REGS. tit. 22 §66261.120, 122. Special waste may be disposed of in nonhazardous waste landfills under certain conditions, CAL.CODE REGS. tit. 22 §66261.126. Currently, reuse of CCBs is not specifically authorized under California law or regulations.

California Environmental Protection Agency, Department of Toxic Substances Control, PO Box 806, Sacramento, CA 95812. Contact: **Charles Corcoran**, Waste Identification and Recycling; Web Site: www.dtsc.ca.gov.

Colorado

Under Colorado regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, 6 COLO. CODE REGS. §1007-3.261.4(b)(4). The use of CCBs may be regulated as solid waste under Colorado statutes and regulations, 30-20-101 et seq. Additionally, the disposal of coal combustion ash at power plants must be conducted under the broad requirements set forth in the regulations pertaining to solid waste disposal sites and facilities, 6 OCCR 1007-2. The application of the rules is on a case-by-case basis.

Reuse of CCBs is not specifically authorized under Colorado law or regulations; however, fly ash may be blended with portland cement for grouting wells, 2 COLO. CODE REGS. §402-2. Rule 10.5.1, Table 3. In 2004, Colorado adopted recycling rules as part of its solid waste regulations (6 COLO. CODE REGS §1007-2(8)). The regulations authorize recycling of solid wastes in accordance with specific requirements. In summary, recycling facilities must register with the Colorado Department of Public Health and the Environment and submit an annual report regarding their recycling activities. The facility must recycle material at specified rates (75% of the accumulated material during the calendar year). The criteria relevant to whether a facility is engaged in approved recycling under the rules include:

- Adherence to established engineering or other appropriate specifications.
- Adherence to established product, end user specifications, or customer conditions of acceptance.
- Environmental impacts relative to available commercial products.
- Benefit associated with use.
- Use as a substitute for, or in conjunction with, a commercial product or raw material.

Based on these specifications, many CCB reuses should be acceptable under the new Colorado recycling regulations.

Colorado Department of Public Health and Environment, 4300 Cherry Creek Drive South, Denver, CO 80246-1530. Contact: **Glenn Mallory**, (303) 692-3445; E-Mail: glenn.mallory@state.co.us; Web Site: www.state.co.us.

Connecticut

Connecticut regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, CONN. AGENCIES REGS. §22a-449(c)-101(a)(1); 40 CFR 261.4. CCBs are classified as either special waste or regulated waste, CONN. AGENCIES REGS. §22a-209-8.

General permits may be issued for the beneficial reuse of solid waste in Connecticut. Connecticut General Statutes §22a-209f. A permit may be issued authorizing beneficial use of a solid waste in a manufacturing process to make a product or product substitute provided the permit is not inconsistent with RCRA, the wastes are proposed for the same or similar operations and have the same or similar physical character and chemical composition, the wastes are proposed for the same or similar beneficial use or processing activities, and the activities can be adequately regulated to protect the environment.

The Connecticut Department of Environmental Protection (DEP) has published guidance documents on its Web site detailing the Beneficial Use of Solid Waste Permit Program (<http://www.dep.state.ct.us/wst/beneficialuse>).

Additionally, the DEP formed a Solid Waste Beneficial Reuse subcommittee comprised of business and industry representatives to provide assistance regarding development of policy and regulations to control beneficial reuse of solid waste. The subcommittee prepared a guidance document in 1998 describing how waste generators may apply for a beneficial use general permit for their particular waste stream. The guidance identifies the following criteria a waste generator must present to the DEP to obtain a beneficial use general permit:

- General legal background information about the applicant.
- The origin of the waste proposed for beneficial use.
- A detailed description of the proposed type of beneficial use and/or processing activity to be covered by the permit.
- A description of the process by which the solid waste is generated.
- A demonstration that the generator has minimized the quantity and toxicity of the solid waste proposed for beneficial use to the greatest extent.
- A detailed description and full characterization of the waste proposed for beneficial use and of the end use material.
- A detailed description of how the waste will be processed, manufactured, and/or otherwise incorporated into a material for beneficial use.
- A detailed description of how the waste will be handled and stored before and after it is processed.
- A detailed evaluation of potential human health and environmental impacts from the proposed beneficial use.
- A demonstration that a sufficient or probable market exists for the material proposed for beneficial use.

The DEP is currently reviewing the first formal application for coal ash reuse under the state law. The application proposes reuse of coal ash in cement and concrete products and asphalt subbase. The agency expects to submit a draft permit for first public notice and comment in spring 2005.

Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106. (860) 424-3365; Contact: **Carey Hurlburt**, Beneficial Reuse Contact Person, (860) 424-3248; Web Site: www.dep.state.ct.us.

Delaware

Under Delaware regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, DEL. HAZARDOUS WASTE REGS. §261.4(b)(4). CCBs are classified as nonhazardous industrial waste. The Department of Natural Resources and Environmental Control (DNREC) requires TCLP testing to confirm CCBs are nonhazardous.

Currently, reuse of CCBs is not specifically authorized under Delaware law or regulations. The DNREC has reportedly been in the process of developing regulations regarding reuse of CCBs

for the past few years. As of early 2005, the agency reports work on the rulemaking has not been possible based on available resources.

The DNREC previously developed an informal CCB beneficial use program with the state's electric utility. The program is not set forth in a regulation or written policy, but according to a written summary of the program, the DNREC approves CCB beneficial uses on a case-by-case basis. To date, approved projects have included highway construction, landscaping, sidewalk and foundation construction, berm materials, and sewage sludge stabilization projects. Although a permit is not required, proposed beneficial reuse projects must be approved in advance in writing by the DNREC. TCLP test results demonstrating the CCB is not hazardous must accompany any request to DNREC for CCB beneficial use approval.

Delaware Department of Natural Resources and Environmental Control, 89 Kings Highway, Dover, DE 19901. Contact: **James Short**, Solid Hazardous Waste Management Branch, (302) 739-3689, Web Site: www.dnrec.state.de.us; E-Mail: James.Short@state.de.us.

District of Columbia

District of Columbia regulations specifically exempt fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal from regulation as hazardous waste, 20 DCR 4100.16. Currently, reuse of CCBs is not specifically authorized under District of Columbia law or regulations. While reuse of CCBs is not specifically authorized, the District of Columbia Housing Authority advocates the use of green building materials including fly ash.

District of Columbia Environmental Health Administration, 51 North Street, NE Washington, DC 20002. Contact: Hazardous Waste Division, (202) 535-2270; Web Site: www.dchealth.com/eha.

Florida

Florida regulations adopt the federal regulations which exempt fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels from regulation as hazardous waste, FAC 62-730.030. CCBs are regulated as solid waste (FAC 62-701).

Ash residue from CCBs for use in concrete is specifically authorized under Florida law. FLA. STAT. 336.044

The Florida Solid Waste Management Act, FLA. STAT. 403.704.5(1), generally authorizes recycling of solid waste and industrial by-products as long as:

- A majority of the materials are recycled within 1 year.
- The materials are not managed so as to pose a threat of contamination in excess of water quality standards or air quality standards.

- The materials are not hazardous waste.

Because of a prohibition against placement of any solid waste on land and other ambiguities in this recycling statute, the current statutory reuse provisions are considered inadequate to clearly authorize many coal ash reuses. To address these ambiguities, in 2003 the DEP began the process of developing a new Industrial Waste Disposal and Reuse rule (FAC 62-705) (IWDR) by holding a workshop for interested parties. The DEP reports it plans to actively begin work on development of an IWDR in late 2005. The disposal, storage, and beneficial use of coal ash will likely be addressed under the new rule. The status of the progress in this rulemaking can be monitored on the agency's Web site at www.dep.state.fl.us/waste/categories/solid-waste/pages/IWDR.htm. Until a final rule is developed, beneficial use projects are considered on a case-by-case basis.

Florida Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, FL 32399-2400. Contact: **Lee Martin**, Solid Waste Section, (850) 245-8734; Web Site: www.dep.state.fl.us.

Georgia

Georgia regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, GA.COMP.R.& REGS. r. 391-3-11-.07(1); 40 CFR 261.4. CCBs are classified under Georgia law as industrial waste, GA.CODE ANN. 10-12-8-22(12.1). Currently, reuse of CCBs is not specifically authorized under Georgia law or regulations, GA COMP R®S. r. 391-3-4-.01(27).

Georgia does have generic regulations authorizing reuse of solid waste to make products (contact with land constituting disposal is prohibited), GA. COMP. R. & REGS. r. 391-3-4.04(7).

Informal ash reuse applications appear to primarily involve concrete and gypsum wallboard applications.

Georgia Department of Natural Resources, 4244 International Parkway, Suite 104, Atlanta, GA 30354. Contact: **Harold Gillespie**, Program Manager, Solid Waste Management Program; E-Mail: harold-gillespie@mail.dnr.state.ga.us.

Hawaii

Under Hawaii regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, HAWAII REGS. §11-261-4(b)(4).

Currently, reuse of CCBs is not specifically authorized under Hawaii law or regulations. Applications may be approved by the Hawaii Office of Solid Waste Management on a case-by-case basis after TCLP and total metals testing.

Department of Health, Office of Solid Waste and Hazardous Waste Branch, PO Box 3378, Honolulu, HI. Contact: **Lene Ichinotsubo**, (808) 586-4240; Fax No.: (808) 586-7509; Web Site: www.state.hi.us.

Idaho

Idaho regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, IDAPA 16.01.05.005; 40 CFR 261.4. CCBs are regulated as industrial solid waste, IDAHO CODE §39-7403(22). Currently, reuse of CCBs is not specifically authorized under Idaho law or regulations.

Idaho Department of Environmental Quality, 1410 North Hilton, Boise, ID 83706-1255. Contact: **Dean Ehlert**, Department of Environmental Quality, (208) 373-0416; Fax No.: (208) 373-0154; E-Mail: dehlert@deq.state.id.us; Web Site: www.deq.state.id.us.

Illinois

Under Illinois regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, 35 ILL. ADMIN. CODE §721.104(b)(4).

In 1995, Illinois enacted legislation specifically authorizing reuse of coal combustion waste, 415 ILCS 5/3.135 and 415 ILCS 5/3.140 (P.A. 89-93). P.A. 92-574 created two classifications of coal ash: coal combustion waste (CCW) and coal combustion by-product (CCB). CCW is subject to limited management and disposal options. CCB, on the other hand, may be used in multiple applications as discussed below. The term CCW includes fly ash, bottom ash, slag or flue gas, or fluid-bed boiler desulfurization by-products generated through combustion of coal. The term also includes waste from coal combusted with the following:

- Fuel-grade petroleum coke, other fossil fuel, both fuel grade petroleum coke and other fossil fuel.
- Fuel-grade petroleum coke, other fossil fuel, or both fuel-grade petroleum coke and other fossil fuel in combination with no more than 20% tire-derived fuel or wood or other materials by weight of the material combusted. Note: An Agency determination is required that storage and disposal of the resultant wastes will not result in an environmental impact greater than waste from the combustion of coal alone and that the storage and disposal of the resultant wastes will not violate federal law.

CCW can be classified as CCB under certain conditions (satisfactory analytical testing results) and reused based on this classification. CCB may be reused as follows:

- For the extraction and recovery of materials and compounds within the ash.

- As a raw material in the manufacture of cement, concrete, concrete products, and concrete mortars.
- For asphalt or cement-based roofing shingles.
- In plastic products, paints and metal alloys.
- In conformance with the specifications and under the approval of the Illinois Department of Transportation (IDOT).
- As anti-skid material, athletic tracks, or foot paths (bottom ash).
- As a lime substitute in the lime modification of soils so long as the CCBs meet the IDOT specifications for by-product limes and the functional equivalent for agricultural lime as a soil conditioner.
- In non-IDOT pavement base, pipe bedding, or foundation backfill (bottom ash).
- As structural fill when used in an engineered application or combined with cement, sand, or water to produce a controlled-strength fill material and covered with 12 inches of soil unless infiltration is prevented by the material itself or other cover material.
- For mine subsidence, mine fire control, mine sealing, and mine reclamation.

Certain restrictions apply to reuse of CCBs. The user of CCBs in certain applications must notify the Illinois Environmental Protection Agency ("IEPA") of each project utilizing CCBs, document the quantity of CCBs that will be utilized, and certify that the CCBs have not been mixed with hazardous waste prior to use and that the CCBs do not exceed Class I groundwater quality standards for metals when tested utilizing ASTM method D3987-85. Dust generation in fly ash applications must be minimized. CCBs may not be accumulated speculatively. Note: CCBs are not accumulated speculatively if 75% of the CCBs accumulated at the beginning of a calendar year are used during the calendar year.

Mine applications of CCW and/or CCBs must meet the requirements specified in 415 ILCS 5/21(r) and certain guidance memoranda issued by the Illinois Department of Mines and Minerals (IDMM) and IEPA. IDMM and IEPA have dual jurisdiction over mine disposal of CCBs. IDMM and IEPA have issued joint memoranda detailing the procedures and requirements for mine disposal of CCBs (Land Reclamation Memorandum 92-11 and Land Reclamation Memorandum 95-8, 95-9). Groundwater monitoring and liners may be required by IDMM and IEPA in certain applications. In addition, CCW requirements are more stringent than those for CCB. Specifically:

- CCW waste disposal must be associated with coal sales (on a companywide basis) of the coal company. A coal company may not dispose of CCW from a company that has not purchased coal from the mine.

- CCW disposal may not exceed 35% of coal sales unless information is submitted justifying a higher percentage (according to Scott Schmitz of IDMM, additional volumes will be allowed if it is established that the particular combusted coal generates a greater volume of ash). Initially, this restriction was stated as a limitation applicable to each coal sales source. This requirement was clarified in a November 20, 1995, IDMM memo which states that IDMM is not limiting each CCW source to a 35% disposal limit, but that the 35% limit applies to total coal company sales. The quantity of CCW from each source as well as the total quantity of CCW received at the disposal site must be reported quarterly.

Other CCB applications may be authorized upon IEPA's written determination that the proposed use has no greater adverse environmental impact than the beneficial uses specified in the law. However, IEPA reports it currently has no procedures in place to approve other uses and that to date, it has not approved other uses.

The Illinois Department of Commerce and Economic Opportunity has a number of programs promoting the use of coal and coal by-products. One of the programs, the Illinois Coal Research Program, funds research in areas including coal preparation, combustion, utilization of by-products, flue-gas cleaning, and business practices. The funding supports 15–20 research projects each year.

Illinois Environmental Protection Agency, 1021 North Grand Avenue East, PO Box 19276, Springfield, IL 62794-9276. Contact: **Joyce Munie**, (217) 524-3300, E-Mail: permit-section-bol@epa.state.il.us; Web Site: www.epa.state.il.us.

Indiana

Under Indiana law (IN. Code 13-19-3-3(1)), coal combustion fly ash, bottom ash, or coal combustion fly ash or bottom ash in a mixture with flue gas desulfurization by-products generated by the combustion of coal is not included in the definition of hazardous waste and is exempt from the hazardous waste regulations. Additionally, fly ash, bottom ash, or such ash when mixed with flue gas desulfurization by-products or boiler slag may not be regulated by the Solid Waste Management Board when used in the following manner:

- For the extraction and recovery of materials and compounds within the ash.
- As an anti-skid material (bottom ash).
- As a raw material for the manufacturing of another product.
- For mine subsidence, mine fire control, and mine sealing (note: restrictions may apply under the laws and regulations applicable to mining. See Indiana Department of Natural Resources regulations).
- As structural fill when combined with cement, sand, or water to produce a controlled-strength fill material.
- As a base in road construction.

- Cover for coal processing waste disposal locations to inhibit infiltration at surface and underground mines in accordance with specific requirements.
- To buffer or enhance structural integrity for refuse piles at surface and underground mines in accordance with specified requirements.
- For agricultural applications, when applied using appropriate agronomic amounts to improve crop or vegetative production.

IN. Code 13-19-3-3(2).

On August 17, 1998, the Indiana Department of Environmental Management (IDEM) prepared draft Coal Ash Waste Classification Guidelines specifying sampling and testing requirements for CCBs for land disposal at facilities other than municipal solid waste landfills and for uses other than specified above. For uses other than those listed above, specific written approval must be obtained from the IDEM. Copies of the regulations and guidelines may be obtained by contacting the Industrial Waste Section at (317) 308-3103.

According to the IDEM Web site, these guidelines are currently under revision.

CCBs may be disposed of in a restricted waste site Type I without specific testing. CCBs may be disposed at other restricted waste site types only if:

- TCLP results for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver are within specified limits (note: the extraction procedure toxicity test is no longer used to evaluate the toxicity of these parameters).
- Neutral leaching (TCLP test using deionized water instead of TCLP extraction fluids) results for barium, chlorides, copper, total cyanide, fluoride, iron, pH, manganese, nickel, phenols, sodium, sulfate, total sulfide, total dissolved solids, and zinc are within the specified limits.

Resampling to verify waste type is conducted every 5 years, whenever the characteristics of the coal change, whenever the process generating the waste changes, or according to a schedule for resampling specified by the commissioner of IDEM based on variability noted in previous sampling and other factors affecting the predictability of the waste characteristics.

329 IAC 10-9-4.

As of July 1, 2000, the category of special waste in Indiana was abolished and CCBs became regulated as industrial waste when disposed of in a municipal waste landfill. Pursuant to the new legislation, CCBs may be disposed of only at a solid waste landfill cell or unit that meets or exceeds Subtitle D design standards of RCRA or at a waste-to-energy facility if the facility has an issued permit. A one-time notification to the landfill is required before disposal.

However, under certain conditions the IDEM may issue a permit to a solid waste landfill that is not designed pursuant to RCRA Subtitle D standards. CCBs may then be disposed of in the solid waste landfill.

IN. CODE 13-20-7.5-1

Indiana Department of Environmental Management, 100 North Senate Avenue, PO Box 6015, Indianapolis, IN 46206-6015. Contact: **Tracy Barnes**, IDEM, OLQ Technical Compliance Section, (317) 308-3110; Web Site: www.ai.org/idem.

Iowa

Iowa regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, IOWA ADMIN. CODE 567-141.2 (455B); 40 CFR 261.4.

Under Iowa regulations, coal combustion by-products include any solid by-product produced by the burning of coal, by itself or in conjunction with natural gas or other fossil fuel, which is suitable for disposal as solid waste in a sanitary landfill. Examples include boiler slag, bottom ash, fly ash, and flue gas desulfurization sludge produced through the combustion of coal, by itself or in combination with natural gas and other fuels. Coal combustion by-products are also referred to as coal combustion residue, IOWA ADMIN. CODE 567-108.3. New rules governing beneficial reuse of coal combustion by-products became effective April 23, 2003.

Coal combustion residues may be reused as follows:

- Coal combustion fly ash and flue gas desulfurization by-products may be used as follows:
 - Raw material in manufactured gypsum, wallboard, plaster, or similar product.
 - Raw material in manufactured calcium chloride.
 - Raw material in the manufacture of absorbents.
 - Fill material pursuant to 108.6(1).
 - Alternative cover material at a sanitary landfill pursuant to 567-108.8 (455B,455D).
- Coal combustion fly ash or bottom ash or boiler slag may be used as follows:
 - Raw material in the manufacture of cement or concrete products.
 - Raw material to be used in mineral recovery.
 - Raw material in the manufacture of asphalt products.
 - Raw material in plastic products.
 - Subbase for hard-surface road construction.
 - Soil stabilization for construction purposes.
 - Fill material pursuant to 108.6(1).
 - Alternative cover material at a sanitary landfill pursuant to 567-108.8 (455B,455D).

- Coal combustion bottom ash may also be used as follows:
 - Traction agent for surfaces used by vehicles.
 - Sandblasting abrasive.

IOWA ADMIN. CODE 567-108.4(4).

General conditions applicable to all beneficial reuses other than alternative cover material are set forth at IOWA ADMIN. CODE R. 567-108 and are summarized as follows:

- For beneficial reuses of material as fill:
 - SPLP (EPA Method 1312) results must be less than or equal to the drinking water maximum containment levels (MCLs). For coal combustion by-products, the synthetic precipitation leaching procedure (SPLP) analytes may be limited to total metals.
 - Total metals must meet Iowa standards for soil (R. 567-137). Arsenic levels must satisfy state standards or be consistent with naturally occurring levels.
 - The material pH must meet specific requirements – between 5 and 8 for growing media; between 5 and 12 if nongrowing media (although pH 10–12 is allowed only where direct contact with people will not occur for long periods of time) and for deep fills – the top 3 feet must be between 5 and 8, and below 3 feet may be between 5 and 12.
 - The material may not be placed in a waterway or waters of the state or extend within 5 feet of the high water table.
 - The material may not be placed within the 100-year floodplain except in accordance with specific requirements.
 - The material may not be placed within 200 feet of a sinkhole or well.
 - The material may not be putrescible (IOWA ADMIN. CODE R. 567-108.6[1]).
 - A solid by-product management plan must be in place. The plan must list the source of the by-product, testing procedures, and description of storage procedures (locations, maximum anticipated inventory, stockpile dimensions, run-off controls, (e.g., National Pollutant Discharge Elimination System [NPDES] permit), dust control, and maximum storage time not to exceed 6 months without authorization) (IOWA ADMIN. CODE R. 467-108.6[2]).
 - Certain recordkeeping and reporting procedures must be followed. All records regarding the management plan must be maintained for at least 5 years. Annual

reports for fill projects must be submitted within 60 days of the end of the year (IOWA ADMIN CODE R. 467-108.7).

- CCBs utilized for alternative cover material may be mixed with soil in a 50/50 volume (IOWA ADMIN. CODE R. 567-108.8[2]).

Iowa Department of Natural Resources, Wallace Building, Des Moines, IA 50319-0034. Contact: **Matt McDonald**, Energy Waste Management Bureau, (515) 281-8150; Web Site: www.iowadnr.com.

Kansas

Under Kansas law, fly ash, bottom ash, slag and flue gas emission control wastes generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, but may be regulated as an industrial solid waste, KAN. STAT. ANN. §65-3430(e)(2); KAN.ADMIN.REGS. 28-29-3. Currently, reuse of CCBs is not specifically authorized under Kansas law or regulations.

Kansas Department of Health and Environment, 1000 Southwest Jackson, Suite 320, Topeka, KS 66612. Contact: **Joe Cronin**, Environmental Engineer, Bureau of Waste Management, Permits Section, (785) 296-1667.

Kentucky

Under Kentucky regulations, CCBs are exempt from regulation as hazardous waste but are classified as special waste (high-volume, low-hazard materials). Specifically included within the definition of coal combustion by-products classified as special waste is fly ash, bottom ash, and scrubber sludge produced by coal-fired electrical generating units. Excluded is residues of refuse-derived fuels such as municipal waste, tires, and solvents, KY. REV. STAT. ANN. §224.50-760(1)(a); 401 KY. ADMIN. REGS. 45:010 §(4).

Under Kentucky law, CCBs (as defined above) may be reused under permit by rule regulation as follows:

- As an ingredient in manufacturing a product.
- As an ingredient in cement, concrete, paint, and plastics.
- As antiskid material.
- As highway base course.
- As structural fill.
- As blasting grit.

- As roofing granules.
- For disposal in an active mining operation if the mine owner/operator has a mining permit which authorizes disposal of special waste (see also KY. REV. STAT. ANN. §350.270).

Specific conditions for reuse of CCBs apply. These conditions include:

- The CCB reuse may not create a nuisance.
- Erosion and sediment controls must be undertaken.
- The CCB reuse must be at least 100 feet from a stream and 300 feet from potable wells, wetlands, or floodplains.
- The ash must be nonhazardous.
- The generator must submit an annual report identifying the type and amount of waste released for reuse, the name and address of the recipient of the waste intended for reuse, and the specific use each waste recipient made of the CCB, if known.

401 KAR 45:060.

Mine applications must be specifically authorized under the terms of a permit issued by the Department for Surface Mining, Reclamation, and Enforcement. Regulatory requirements to obtain such permit authorization along with operational requirements can be found at KY. REV. STAT. ANN. §350.270 and are summarized as follows:

- CCBs mixed with low-volume waste or material with hazardous waste characteristics may not be used in mine applications.
- CCBs generated prior to a certain date may not be used in mine applications unless a satisfactory demonstration is made that the CCBs have not been mixed with low-volume waste or material with hazardous waste characteristics.
- CCBs may be placed only in the pit or extraction area from which coal has been removed by surface mining. Placement of CCBs in other areas within the permit area may be allowed only upon a satisfactory demonstration, based on site-specific conditions and the characteristics of the CCBs, that no adverse environmental impacts will occur. Underground injection of CCBs is not authorized.
- The permittee must keep records of the source and amount of CCBs received.
- Any material that is not CCB approved for disposal must be removed. The permittee must keep records describing the removed material and its disposition.

- The permittee must maintain maps showing each CCB disposal location and the volume of CCBs disposed of at that location.
- An annual CCB lab analysis report must be submitted.
- An application to modify an existing permit to initially include CCB disposal will be considered a major permit revision application.
- An application for CCB mine disposal must demonstrate the permittee's legal right to conduct such activities. Public notice of the application is required.
- The application must contain specific information such as the annual volume of CCBs that will be received, CCB analytical results, proposed operational procedures, hydrogeologic information, and a groundwater monitoring plan.

Kentucky Environmental and Public Protection Cabinet, Kentucky Division Waste Management, 14 Reilly Road, Frankfort, KY 40601. Contact: **George Gilbert** (502) 564-6716; E-Mail: ggilbert@ky.gov, Web Site: www.environment.ky.gov.

Kentucky Environmental and Public Protection Cabinet, Department for Natural Resources, Division of Mine Permits; Division of Mine Permits, #2 Hudson Hollow Road, Frankfort, KY 40601. Contact: **Carol Ball**, (502) 564-4940; Fax No.: (502) 564-5698; E-Mail: surfacemining@ky.gov, Web Site: www.surfacemining.ky.gov.

Louisiana

Under Louisiana regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated solely from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, LAC 33:V.105(D)(2)(d). These materials are, however, regulated as industrial solid wastes, LAC 33:VII.115 (ERM LA115). Currently, reuse of CCBs is not specifically authorized under Louisiana law or regulations. Specific applications for reuse must be approved by the Louisiana Department of Environmental Quality.

Louisiana Department of Environmental Quality, PO Box 84314, Baton Rouge, LA 70871-4314. Contact: **Roselle Foote**, Department of Environmental Quality; (225) 219-3725; Fax No.: (504) 765-0299; E-Mail: solidedeg.state.la.us; Web Site: www.deq.state.la.us.

Maine

Under Maine regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated solely from the combustion of coal, other fossil fuels, or from the combustion of coal and other fossil fuels and wood are exempt from regulation as hazardous waste so long as the CCBs do not exhibit any hazardous characteristic for ignitability, corrosivity, reactivity, or toxicity, CODE ME. R. §6-096-850(3)(A)(4)(x). Under Maine regulations, coal ash is regulated as a special waste. Special wastes require special handling, transportation, and disposal procedures, CODE ME. R. §6-096-400-1(Nnn).

Maine has established a permit by rule under which CCBs may be utilized to manufacture flowable fill at concrete batch plants and cement kilns. The permit by rule requirements include maintaining records which identify the origin of the CCBs, the quantities accepted, dates of acceptance, dates of processing, and dates and locations of final disposition. The CCBs must be stored and handled in enclosed buildings or other covered areas. The beneficial use may not result in contamination to water, land, or air. Notification forms must be submitted to the department at least 18 days before receiving any shipment of CCBs, Code Me. R. §6-096-409-6.

Maine Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. Contact: **Paula Clark**, (207) 287-7688; E-Mail: paula.m.clark@maine.gov; Web Site: www.maine.gov/dep.

Maryland

Under Maryland law, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fuels are not regulated as a hazardous waste.

Maryland law authorizes certain beneficial reuses of “pozzolans.” Pozzolans are defined as “the finely divided residue which results from combustion of ground or powdered coal and is released by combustion gases, as defined by the test methods published by the American Society for Testing and Materials,” MD. ANN. CODE §15-407 (ASTM class fly ash). Under Maryland law, pozzolans may be used as follows:

- For landfill cover in a manner which complies with sound engineering practices and applicable permit requirements.
- As structural building, soil improvement, agriculture soil conditioning, or land reclamation in compliance with all silt control regulations and permit requirements of the Department of the Environment. Dust and erosion minimization are required.

Note: In locations where there may be a threat to water quality, a NPDES or state permit to protect groundwater may be necessary.

MD. ANN. CODE §15-407.

Maryland Department of the Environment, 1800 Washington Boulevard, Suite 455, Baltimore, MD 21224. Contact: **Patsy A. Allen**, (410) 537-3625; Web Site: www.mde.state.md.us.

Massachusetts

Under Massachusetts law, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as a hazardous waste, MASS.REGS.CODE 310§30.104(2)(j).

In Massachusetts, ash produced from the combustion of coal including fly ash, bottom ash, and boiler slag and economizer ash are exempt from regulation as solid waste, if beneficially reused:

- As a raw material for concrete block manufacture.
- As aggregate.
- As fill.
- As a base for road construction.
- In other approved commercial or industrial purposes (flash fill has been approved).

M.G.L. Ch. 111 §150A.

General conditions for reuse apply. The ash storage location for these reuses may be constructed, established, maintained, and operated without being construed as a refuse disposal facility, and no approval from the Board of Health or the Department of Environmental Protection (DEP) is required. However, the DEP has jurisdiction to determine whether or not the facility has created a nuisance condition because of odor, dust, fires, smoke, or other conditions and order the abatement of these conditions.

Except for CCB reuse as base for road construction or fill, land application of CCBs is prohibited, unless the place where the disposal is proposed to occur has been assigned for such disposal by the Board of Health and plans for such disposal have been approved by the DEP. CCBs may be used as intermediate cover material over rubbish at a landfill with the approval of the DEP.

MASS.REGS.CODE tit.310§19.006; MASS. GEN.LAWS ANN. ch.111 §150A.

Massachusetts Department of Environmental Protection, One Winter Street, Boston, MA 02108. Contact: **Solid Waste Branch Chief**, (617) 292-5500; E-Mail: stephen.long@state.ma.us; Web Site: www.dep.state.ma.us.

Michigan

Under Michigan regulations, fly ash, bottom ash, slag and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, MICH.ADMIN.CODE 299.9204. These materials are, however, considered low-hazard industrial wastes, MICH.ADMIN.CODE 299.4103(y); 299.4122.

Under Michigan law, fly ash or other ashes produced from the combustion of coal are not considered solid waste and may be reused:

- With a maximum of 6% of unburned carbon as a component of concrete, grout, mortar, or casting molds.
- With a maximum of 12% unburned carbon passing Michigan Department of Transportation test Method MTM 101 when used as a raw material in asphalt for road construction.

- As aggregate, road, or building material which in ultimate use will be stabilized or bonded by cement, lime, or asphalt.
- As a road base or construction fill which is covered with asphalt, concrete, or other material approved by the Michigan Department of Environmental Quality (DEQ) and which is placed at least 4 feet above the seasonal groundwater table.
- As the sole material in a depository designed to reclaim, develop, or otherwise enhance land, subject to the approval of the DEQ (See Rule 299.4113 - 299.4119 for conditions regarding approval for land reclamation).

MICH.COMP.LAWS ANN. §324.11506(1)(k).

Under Michigan regulations, coal ash may be used to reclaim, develop, or enhance land following submission of a plan and approval of the plan by the DEQ. The plan submitted to the DEQ must describe how the proposed use will reclaim, develop, or enhance the land and must demonstrate compliance with other requirements (see Rule 299.4113-4119).

For example, the plan must demonstrate the ash is inert, that the site conditions are sufficient to prevent the migration of ash constituents, or that the plan is otherwise protective of human health and the environment. A plan proposing to use ash designated as inert (see Rule 299.4116-4118 for the requirements to obtain an "inert" designation) must include information demonstrating the ash is inert, that the ash will not adversely affect human health or the environment from all exposure routes, topographic maps, a closure plan, documentation of landowner authorization, postclosure restrictions, and other information specified in the regulations.

A plan proposing to use ash which does not meet the inert designation criteria must include the same information, as well as engineering plans prepared by a registered professional engineer, and a hydrogeological report which verifies the presence of a natural soil barrier which will ensure that hazardous substances will be attenuated before reaching the saturated zone or which demonstrates the water quality performance standards of Rule 299.4306 will be met, MICH. ADMIN. CODE 299.4113.

Michigan Department of Environmental Quality, PO Box 30241, Lansing, MI 48909. Contact: **Duane Roskoskey**, Solid Waste Section; (800) 662-9278 or (517) 335-4712; E-Mail: roskoskd@state.mi.us; Web Site: www.deq.state.mi.us.

Minnesota

Under Minnesota regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated from the combustion of fuel which is at least 51% coal or other fossil fuel and the balance of the fuel does not contain hazardous waste is exempt from regulation as hazardous waste, MINN. R. 7045.0120(1)(F).

Minnesota regulations provide that CCB, when used in accordance with MINN. R. 7035.2860, have a standing beneficial use determination. A standing beneficial use determination

means the generator or end user of a material can do so in accordance with applicable rules without contacting the agency. Standing beneficial uses for coal ash include:

- Coal combustion slag when used as a component in manufactured products such as roofing shingles, ceiling tiles, or asphalt products.
- Coal combustion slag when used as a sand blast abrasive.
- Coal combustion fly ash as defined by ASTM C618 when used as a pozzolan or cement replacement in the formation of high-strength concrete.
- Coal combustion fly ash or coal combustion gas scrubbing by-products when used as an ingredient for production of aggregate that will be used in concrete or concrete products. This does not include use in flowable fill.

MINN R. 7035.2860(4)(K), (L), (M), (N).

Materials that are beneficially reused are not exempt from storage standards set forth in MINN. R. 7035.2855. The storage design standards are intended to prevent contaminants from migrating into ground or surface waters and prevent nuisance conditions from occurring on the storage facility. The Minnesota Pollution Control Agency will consider proposed beneficial uses not listed as a standing beneficial use on a case-by-case basis. To be considered a beneficial use, the material:

- May not be special actively accumulated.
- Must be characterized in accordance with R. 7035.2861.
- Must be an effective substitute for an analogous material or a necessary ingredient in a new product.
- Will not adversely impact human health or the environment.
- Is not used in quantities that exceed accepted engineering or commercial standards.

Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155-4660. Contact: **Matt Herman**, (651) 296-6603; Web Site: www.pca.state.mn.us.

Mississippi

Mississippi regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, MISS. REG. PART 261; 40 CFR 261.4. Coal ash and coal combustion by-products are generally regulated as industrial solid wastes in the State of Mississippi under the provisions of the Mississippi Nonhazardous Waste Management Regulations. Currently, reuse of CCBs is not specifically

authorized under Mississippi law or regulations; however, projects may be authorized on a case-by-case basis and/or under individual solid waste management permits.

State of Mississippi Department of Environmental Quality, PO Box 10385, Jackson, MS 39289-0385. Contact: **Mark Williams**, (601) 961-5304; Web Site: www.deq.state.ms.us.

Missouri

Missouri regulations adopt by reference the federal regulations which exempt CCBs from classification as hazardous waste except that fly ash which fails TCLP must be disposed of in a hazardous waste landfill, MO. CODE REGS 10, §25-4.261.

Missouri regulations authorize CCB reuse for:

- Snow and ice control (bottom ash or boiler slag).
- Concrete/flowable fill additive (fly ash).

MO.CODE REGS tit.10 §80-2.020(9)(A)(11) and (12)

Missouri regulations also authorize the Missouri Department of Environmental Quality (DEQ) to grant a general exemption from solid waste permitting requirements for the following beneficial reuse of CCBs:

- Use of Type C fly ash and associated bottom ash and boiler slag as road base or structural fill (note: for road base applications, the total mixture of soil and ash beneath the road may not exceed 2 feet. For structural fill applications, the area may not exceed 5 acres, and the maximum depth of ash may not exceed 2 feet).
- Use of Type C fly ash as solid amendment or for soil stabilization. Note: for soil amendment applications, the total mixture of soil and ash may not exceed 6 inches. For soil stabilization applications, the area may not exceed 5 acres, and the maximum ash depth may not exceed 2 feet.
- Note: for road base, structural fill, soil amendment, and soil stabilization applications, a renewed permit exemption must be obtained if the coal source changes or if coal processing changes affect the ash produced. The renewal request must be submitted at least 30 days prior to such a change. The DEQ may also authorize greater volumes of ash in these applications if the beneficial use is subject to a permit or exemption issued by the Missouri Clean Water Commission.
- Daily cover in a landfill (bottom ash or boiler slag).

Other proposed applications may be authorized by the DEQ under the agency's general authority to exempt solid waste beneficial reuse applications from permit requirements. The exemption must be requested in writing from the state and it must be shown that pollution, a public

nuisance, or a health hazard will not occur. The request must meet numerous informational requirements, including:

- An explanation of the beneficial use or reclamation.
- Documentation identifying the site location, surrounding land use and site characteristics.
- An operational plan identifying the area involved.
- An estimate of the quantity of waste to be disposed and the time required for disposal procedures.
- A description of the physical and chemical characteristics of the waste.
- Verification that the material will be above the seasonal high groundwater table unless a variance is obtained.
- A description of the proposed operational procedures for waste disposal and complications.
- Provisions for closing the area.

MO.CODE REGS tit.10 §80-2.020(9).

Missouri Department of Environmental Quality, 10805 Sunset Office Drive, Suite 100, St. Louis, MO 63127. Contact: **Joe Trunko**, (314) 301-7100. Web Site: www.dnr.state.mo.us/deq/swmp.

Montana

Under Montana regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, MONTANA ADMIN.R. 17.54.307(2)(b). These materials, however, are classified as an industrial solid waste, MONTANA ADMIN.R. 17.50.502(22). Industrial solid wastes are considered "Group II" wastes, MONTANA ADMIN.R. 17.50.503(1)(a)(1). Under 75-10-214(1)(b), electrical generation facilities are exempt from the solid waste licensing regulations for disposal of coal ash waste on site. Under Montana regulations, by-products or materials which have economic value and may be used by the person producing the material or sold to another person for resource recovery or use in a beneficial manner are not wastes, MONTANA ADMIN. R. 17.50.502(52).

Currently, reuse of CCBs is not specifically authorized under Montana law or regulations although fly ash may be substituted for up to 25% of portland cement in connection with monitoring well construction, MONTANA ADMIN. R. 36.21.801(39)(h). According to the Montana Department of Environmental Quality (DEQ), it encourages the reuse of CCBs, especially in construction projects, and provides referrals to companies wishing to reuse CCBs. Further, in mid-

2004, the DEQ was evaluating a request from a utility to actively market its coal ash rather than dispose of the material in permitted ponds.

Montana Department of Environmental Quality, PO Box 200901, Helena, MT 59620-0901. Contact: **Ms. Lou Moore**, Planning Prevention and Assistance Bureau, (406) 841-5240. **Mr. Rick Thompson**, Waste and Underground Tank Management Bureau; Web Site: www.deq.state.mt.us.

Nebraska

Under Nebraska regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste and are classified as special waste, NEB. ADMIN. R. & REGS. 128-2-9.02.

In June 2004, the Nebraska Department of Environmental Quality (NDEQ) issued a revised policy on CCB reuse titled "Beneficial Use of Coal Combustion By-Products and Other Similar Materials." Under the updated guidance, CCBs may be reused:

- In the construction or manufacture of products (i.e., concrete, aggregate).
- For hazardous waste stabilization.
- For ice control (ice jams) in rivers. Note: A NPDES permit is required for this application.
- As stabilizing agents and soil modification (i.e., base/subbase/subgrade under concrete, asphalt, armor coat, sand-gravel/limestone surfaces for roads, parking lots, or building sites).
- As aggregate for roads, including armor coat and chip seal aggregate.
- As structural fill including backfill of utility trenches and behind foundation walls, buildup of grade, or as an embankment for roadways/overpasses.
- As controlled density/slurry fill for closure of pipelines, tanks, and sewers.
- As a soil amendment (fly ash) under specific conditions. The fly ash must have a minimum calcium carbonate equivalence of 20%. The fly ash application rate must be based upon its neutralizing capacity and the amount of fly ash needed to raise the soil pH to an optimum level (pH 6.5 to 7.0). The application rate may not exceed 10 tons per acre per annual application.
- Feedlot applications are conditionally approved so long as plans are submitted to NDEQ in advance for review and approval. The plans must describe the type and quantity of material to be used, application methods and procedures, and the steps to be taken to ensure surface and groundwater will not be impacted.

The use of CCBs in other applications may be approved by the DEQ on a case-by-case basis. The following criteria will be evaluated by NDEQ in determining whether an application for other uses should be approved:

- Is the material classified as a hazardous waste or held to other regulatory standards?
- Is the material contaminated with other wastes?
- Does the material pose a potential threat to human health or the environment? In making this evaluation, the types of contaminant present, analytical data, and transport characteristics of the material will be considered.
- Does the end use of the material constitute disposal?

State of Nebraska Department of Environmental Quality, 400 The Atrium, 1200 North Street, PO Box 98922, Lincoln, NE 68506-8922. Contact: **Dave Johnson**, (402) 471-4210; Web Site: www.deq.state.ne.us.

Nevada

Under Nevada regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, 40 NEV. REV. STAT. §459.465. CCBs are classified as industrial waste, NEV. ADMIN. CODE §444.585(1)(a). Currently, reuse of CCBs is not specifically authorized under Nevada law or regulations.

Nevada Division of Environmental Protection, Bureau of Waste Management, 123 West Nye Lane, Carson City, NV 89706-0851. Contact: **Les Gould**, (702) 687-9468; Web Site: www.ndep.nv.gov.

New Hampshire

Under New Hampshire regulations fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, N.H.CODE ADMIN. R Env-Wm 401.03(b)(4).

New Hampshire adopted revised regulations pertaining to reuse of solid waste on October 29, 1997. The regulations establish criteria and procedures under which “waste-derived products” will be certified for distribution and use by rule.

Under the rule, coal ash (boiler slag) is specifically deemed certified for distribution and use as a raw material for industrial and commercial purposes, N.H.CODE ADMIN. R Env-Wm 3203.14.

Waste-derived products that meet a published standard are also deemed certified for distribution and use by rule. Fly ash used as a lightweight aggregate in concrete masonry units

meeting the standard published in ASTM C-331-89 are specifically deemed certified for distribution and use by rule, N.H.CODE ADMIN. R Env-Wm 3203.07(c)(1).

Other proposed reuses may be certified by application to and approval by the state agency. In general, to obtain Agency approval for other proposed reuses, the applicant must demonstrate:

- The benefit of using the waste-derived product exceeds the benefit of using a “non-waste-derived product.” This determination is made based on the following criterion:
 - The waste-derived product: 1) is comparable in form and function to an existing non-waste-derived product and performs as effectively or more effectively or 2) satisfies an identifiable and unfulfilled need without violating the Env-Wm 2702 standards.
 - A buyer or user has been identified.
 - There is an identifiable benefit to sites upon which the product is land-applied.
- The waste-derived product will not cause a violation of environmental regulations or pose a risk to health or the environment which is greater than the risk posed by production of an existing comparable non-waste-derived product or direct disposal.
- The physical and analytical characteristics of the waste used to produce the product must be defined in a specification.
- The physical and analytical characteristics of the waste-derived product must be defined in a specification.
- The production process must include quality assurance/quality control procedures to ensure the specifications are met.

New Hampshire Department of Environmental Services, Six Haven Drive, PO Box 95, Concord, NH 03302-0095. Contact: **Mike Guilfooy**, Solid Waste Management Director, (603) 271-6467; E-Mail: mguilfooy@des.state.nh.us; Web Site: www.state.nh.us/des.

New Jersey

New Jersey regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste, NJAC 7:26G-5.1. CCBs are regulated as solid waste, NJAC7:26-1.6

New Jersey adopted CCB beneficial use rules December 16, 1996. Under the New Jersey regulations, CCBs are exempt from regulation as a solid waste when reused as follows:

- As a component in the manufacture of roofing shingles or bituminous asphalt products (bottom ash).

- As an ingredient to produce lightweight block, lightweight aggregate, manufactured gypsum, or manufactured calcium chloride (fly ash or FGD material).
- As cement or aggregate substitute in structural concrete, structural concrete products, or as a raw feedstock in the manufacture of cement or as a cement substitute for structural grade products, or subbase in road construction (fly ash or bottom ash).
- As an aggregate substitute in structural asphalt product (fly ash or bottom ash).

7:26-1.7(g)(4)(vii-x).

Other beneficial use projects may be approved by the state agency on a case-by-case basis. A certificate of authority will be issued for such projects once approved, 7:26-1.7(g)(5). The New Jersey Department of Environmental Protection has developed a guidance document on the beneficial use project approval guidance process which is located at www.state.nj.us/dep/dshw/rrtp/bud.htm.

Fly ash is expressly prohibited for use as a daily and intermediate landfill cover, 7:26-2A.8.

New Jersey Department of Environmental Protection, PO Box 414, 401 East State Street, Trenton, NJ 08625-0414. Contact: **Robert M. Confer**, Bureau of Resource Recovery and Technical Programs, Division of Solid & Hazardous Waste, (609) 984-6985; Fax No.: (609) 633-9839; Web Site: www.state.nj.us/dep/dshw.

New Mexico

Under New Mexico law, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous and solid waste, N.M. Code 74-4-3(K)(2), N.M.Code 74-9-3(N)(2), N.M.Reg. 20-9-1-I-105(I).

Currently, reuse of CCBs is not specifically authorized under New Mexico law or regulations. According to the New Mexico Environment Department, CCBs are reused in cinder blocks and other applications.

New Mexico Environment Department, PO Box 26110, Santa Fe, NM 87502. Contact: **Chuck Hules**, (505) 827-2924; E-Mail: chuck_hules@nmenv.state.nm.us; Web Site: www.state.nm.us.

New York

Under New York regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, N.Y. COMP. CODES R. & REGS. 6, Ch. IV, subchapter B, §371.1(e)(2)(iv).

Under New York regulations, CCBs may be reused in the following manner:

- Bottom ash may be used as a component in the manufacture of roofing shingles or asphalt products, or as a traction agent on roadways, parking lots, and other driving surfaces.
- Fly ash or “gas scrubbing products” may be used as an ingredient in producing lightweight block, lightweight aggregate, low-strength backfill material, manufactured gypsum, or manufactured calcium chloride (fly ash or FGD material).
- Fly ash or bottom ash may be used as a cement or aggregate substitute in concrete or concrete products, as raw feed in the manufacturing of cement, or as structural fill within building foundations when placed above the seasonal high groundwater table (fly ash or bottom ash).

6 N.Y. COMP. CODES R. & REGS. 6, Ch. IV, subchapter B, §360-1.15(b)(14) - (16).

Other proposed beneficial reuses may be approved on a case-by-case basis. To request approval for a proposed beneficial reuse project not included in the foregoing, a written petition must be submitted to the New York Department of Environmental Conservation (NYDEC) containing specified information regarding the proposed reuse. NYDEC will determine whether the proposal constitutes a beneficial reuse based on a showing that all the following criteria have been met:

- The proposal constitutes a reuse rather than a disposal.
- The proposal is consistent with solid waste management philosophy.
- The material under review is intended to function or serve as an effective substitute for an analogous raw material or fuel.
- Decontamination of the material must not be required.
- A market must exist or be reasonably certain to develop for the proposed use of the material or the product into which the material is proposed to be incorporated.
- Any other criteria established by the NYDEC.

6 N.Y. COMP. CODES R 6 REGS. 6, Ch. IV, subchapter B, §360-1.15(d)(2).

Annual reporting requirements apply. No later than 60 days after each January 1, CCB generators must submit a report to the NYDEC identifying the quantities of fly ash, bottom ash, and gas scrubbing products it generated during the year. The generator must also specify how much bottom ash and fly ash was sent for reuse and in what manner (e.g., cement, roofing shingles), 6 N.Y. COMP. CODES R. & REGS. 6, Ch. IV, subchapter B, §360-1.15(c).

A list of beneficial use determinations made by NYDEC can be found at www.dec.state.ny.us/website/dshm/redrey/buduse.pdf.

New York State Department of Environmental Conservation, Bureau of Solid Waste, Reduction and Recycling, 625 Broadway, Albany, NY 12233-7253. Contact: **Tom Lynch**, Supervisor, Beneficial Use and Special Projects Section, (518) 402-8678, Fax No.: (518) 457-1283; E-Mail: tjlynch@gw.dec.state.ny.us; Web Site: www.dec.st.ny.us.

North Carolina

North Carolina regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, N.C.ADMIN.CODE 15A r.13A.0106(a). CCBs may be regulated as solid industrial waste in North Carolina and must meet certain landfill requirements if disposed of, N.C. ADMIN. CODE 15A r.13B.0503(2)(d)(ii).

Under North Carolina regulations, CCBs which may be reused are defined to include fly ash, bottom ash, boiler slag, and flue gas desulfurization residue produced by coal-fired electrical or steam generation units. These CCBs may generally be beneficially reused as an ingredient in an industrial process to make a product, as an effective substitute for a commercial product or natural resource, and in structural fill. North Carolina regulations specify the following permissible CCB reuses:

- In structural fill applications which comply with substantive requirements set forth in the regulations. Substantive regulatory requirements for structural fill applications include:
 - Written notice to the state at least 30 days prior to commencement of structural fill projects containing 1) a description of the nature, purpose, and location of the project, the location of the project on USGS maps, and a DOT map or topographic map showing the project; 2) the estimated start and completion dates for the project; 3) an estimate of the volume of CCBs to be used in the project; 4) TCLP analysis from a sample of each source of CCBs intended for use in the project; 5) a statement by the owner agreeing to comply with the County Recorder of Deed recording requirements in §.1707; and 6) specified information regarding the CCB generator.
 - In projects using more than 10,000 cubic yards of CCBs, written notice to the state at least 30 days prior to commencement of CCB use containing construction plans for the structural fill facility, including a stability analysis when necessary, prepared, signed, and sealed by a registered professional engineer.
 - Compliance with location restrictions. CCBs used in structural fills may not be located within 50 feet of a jurisdictional wetland (absent additional regulatory approvals), a perennial stream or other water body, within 25 feet of any property boundary or bedrock outcrop, within 2 feet of the seasonal high groundwater table,

within 100 feet of any drinking water source, or within a 100-year floodplain (absent additional regulatory approvals).

- Compliance with the following design, construction, and operational requirements set forth in §.1705: the structural fill facility must be designed, constructed, operated, closed, and maintained to minimize potential releases of CCBs and nuisance conditions; CCBs must be collected and transported to prevent public nuisances and hazards, must be moisture-conditioned as needed, and transported in covered trucks to prevent dusting; CCBs must be placed uniformly and compacted in lifts not to exceed 1 foot in thickness and compacted to standards specified by a registered professional engineer for a specific end use purpose; equipment capable of placing and compacting CCBs and handling earth work must be present when CCBs are received at the area; the structural fill facility must be maintained and operated as a nondischarge system to prevent discharge to surface water and operated to ensure no violations of groundwater standards occur; surface waters resulting from precipitation must be diverted away from active CCB placement areas during filling and construction activity; site development must comply with the North Carolina Sedimentation Pollution Control Act of 1973; dust control measures must be undertaken to minimize airborne emissions and to prevent dust from creating a nuisance or safety hazard, and the project must not violate applicable air quality regulations; all structural fills must be covered with a minimum of 12 inches of compacted earth and an additional surface of 6 inches of soil capable of supporting native plant growth; and CCBs utilized on an exterior slope of a structural fill shall not be placed with a slope greater than 3.0 horizontal to 1.0 vertical.
- Compliance with the following closure requirements set forth in §.1706: no later than 30 working days or 60 calendar days, whichever is less after CCB placement has ceased, the final cover must be applied over the area; the final surface of the structural fill must be graded and provided with drainage systems that minimize erosion of cover materials and promote drainage of area precipitation, minimize infiltration, and prevent ponding of surface water on the structural fill; other erosion control measures such as temporary mulching, seeding, or silt barriers must be installed to ensure no visible CCB product migration to adjacent property; the constructor or operator must submit a certification to the Agency signed and sealed by a registered professional engineer or the secretary of the Department of Transportation certifying that all requirements have been met. The report must be submitted within 30 days of application of final cover.
- Compliance with the recording requirements set forth in §.1707 which include Filing with the Register of Deeds, a statement signed and acknowledged by the landowners identifying the parcel of land, within 90 days of completion of any CCB structural fill project utilizing more than 1000 cubic yards of CCBs. Transfers of such property must contain a statement that CCBs have been used as fill material on the property in the body of the deed.

- Please note, at the time of this review, the Solid Waste Section of the North Carolina Department of Environmental and Natural Resources is assessing the need for additional or new rules regarding the placement of CCBs in structural fills.
- In other applications authorized in §.1708 which include the use of CCBs:
 - As soil nutrient additive or other agricultural purpose under the authority of the North Carolina Department of Agriculture.
 - Bottom ash or boiler slag as traction control material or road surface material if the use is approved by the North Carolina Department of Transportation.
 - As material in the manufacturing of another product, such as concrete products, lightweight aggregate, roofing materials, plastics, paint, flowable fill and roller-compacted concrete or as a substitute for a product or material resource, including but not limited to, blasting grit, roofing granules, filter cloth, precoat for sludge dewatering, and pipe bedding.
 - As a structural fill for the base or subbase under a structure, paved road, parking lot, sidewalk, walkway, or similar structure.
 - For the extraction or recovery of materials and compounds contained within the CCBs (note: residuals from the processing operations remain solid waste and are subject to regulation).
 - As a stabilized structural fill product when processed with a cementitious binder and spread and compacted for the construction of a project with a planned end use.

CCBs may not be accumulated speculatively. CCBs are not considered to be accumulated for speculative purposes when a minimum of 75% of the CCBs are removed from the facility and beneficially reused annually. Compliance with CCB beneficial reuse regulations does not exempt the owner from other potentially applicable laws and regulations such as the North Carolina Water Pollution Control regulations.

Annual reporting is required. By October 1 of each year, generators of CCBs must submit an annual report summarizing the volume of CCBs produced, disposed, reused in structural fill, and reused in other applications.

N.C. ADMIN. CODE 15A r.13B.1700-.1710

The North Carolina Department of Environment and Natural Resources is currently assessing the NCAC 15A.1700 regulations because of reported contaminants discovered in groundwater surrounding structural fill sites.

North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section, 401 Oberlin Road, Suite 150, Raleigh, NC 27605. Contact: **Jim**

Barber or Ellen Lorscheber (919) 733-0692, ext. 255 or 345; Fax No.: (919) 733-4810; Web Site: <http://wastenot.env.state.nc.us>.

North Dakota

Under North Dakota law and regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, N.D. Century Code §23.20.3-10; N.D. ADMIN. CODE §33-24-02-04.

The North Dakota Department of Health (DOH) has approved use of fly ash in concrete (up to 10%–15%) and has approved demonstration projects for controlled low-strength material in dry underground mines. The DOH has worked with a number of energy companies as well as with some food processors utilizing coal as a fuel to develop beneficial uses for CCBs or ash. The DOH Guideline 11 “Ash Utilization for Soil Stabilization, Fill-In Materials and Other Engineering Purposes” provides the authority and guidelines for ash reuse. Proposed reuse projects are evaluated on a case-by-case basis by DOH.

North Dakota Department of Health, 1200 Missouri Avenue, PO Box 5520, Bismark, ND 58506-5520. Contacts: **Steven J. Tillotson**, Environmental Health Section, (701) 328-5166, Fax No.: (701) 328-5200; Web Site: www.ehs.health.state.nd.us.

Debbie Pflughoeft-Hassett, Energy & Environmental Research Center of the University of North Dakota ([701] 777-5261) have been involved in CCB reuse demonstration projects.

Ohio

Under Ohio regulations, fly ash, bottom ash, slag and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste. OHIO ADMIN.CODE §3745-51-04(B)(4).

Currently, reuse of CCBs is not specifically authorized under Ohio law, regulations, or policy. From 1994 to 2003, reuse of "non-toxic" CCBs was authorized under Policy No. DSW 400.007 issued by the Ohio Environmental Protection Agency ("OEPA"), Division of Surface Water. On April 30, 2003, OEPA rescinded this policy to avoid judicial challenges because the policy was being relied upon as if it were a legally enforceable rule. Ohio EPA is considering addressing reuse of CCBs in future rule making. Under the rescinded policy, CCBs could be reused as follows:

- As a raw material in manufacturing a final product.
- As a waste stabilization/solidification agent.
- In certain composting process uses.
- In uses subject to USEPA Procurement Guidelines.

- For the extraction or recovery of materials and compounds in CCBs.
- As an antiskid material or road preparation material.
- In mine subsidence stabilization, mine fire control, and mine sealing when authorized by the Ohio Department of Natural Resources.
- As an additive in certain commercial soil-blending operations.
- As daily cover at a landfill.
- As structural fill.
- As pipe bedding, for uses other than transport of potable water.
- As a construction material for roads or parking lots.
- Other single beneficial uses of less than 200 tons.

Former OEPA Policy No. DSW400.007

Currently, OEPA considers proposals for CCB reuse on a case-by-case basis. Engineered fill and land applications are considered pursuant to OAC 3745-27-05(A)(4), the Alternative Disposal Methods Rule, and related guidance. Pursuant to this rule and guidance, alternative disposal as either engineered fill or land application is permitted with agency approval. Requests for agency approval must include the following information:

- Name and address of the applicant (person responsible for the disposal), the generator, and the land owner. The applicant must certify that the application is true and complete.
- Description of efforts at the original source of generation to prevent or reduce the generation of the waste and efforts to recycle or reuse the waste in a manner other than disposal.
- Characterization of the waste.
- Method of disposal (engineered fill or land application) and how the waste will be used or applied.
- Quantity of solid waste, rate of disposal, and disposal time frames.
- Plan drawing of the proposed limits for solid waste disposal.
- Signed written consent from the generator(s) and land owner(s) to the use of the solid waste in the project and at the location.

- Contingency plan for disposal of any solid waste brought to the property that is not acceptable or is otherwise not disposed of on the property.

- Description of other projects, if known, where the waste has been used.

Ohio Environmental Protection Agency, Division of Surface Water, 122 South Front Street, PO Box 1049 Columbus, OH 43216-1049. Contact: **Chris Bowmann and/or Suzanne Matz**, (614) 644-2134; Division of Solid Waste – Contact: **Annette Dehavilland**, (614) 728-5373; Web Site: www.epa.ohio.gov.

Oklahoma

Oklahoma regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, OK. REG. 252:205-3-2(c); 40 CFR 261.4.

According to a February 29, 2000, CCB Policy Statement, the Oklahoma Department of Environmental Quality currently allows the following uses of CCBs without prior approval when used according to the applicable standard (generally ASTM): cementitious material production, daily landfill cover (with permit modification), as manufactured product, road base, road surfacing material, solidification/chemical fixation, deicing, soil stabilization, subgrade treatment, engineering applications, and mine reclamation. Records of reuse and disposal of CCBs must be kept. Storage of material shall be in an environmentally appropriate manner to prevent releases to the environment.

Note: fly ash and bottom ash over 200 tons and generated outside the state must be constructively reutilized or disposed only in active or inactive mining operations subject to state laws and regulations, OKLA. STAT. 27A §2-10-801(F). CCBs are exempt from solid waste regulations if constructively reutilized in approved mine applications, OKLA. STAT. 45-12- §940.

Oklahoma Department of Environmental Quality, PO Box 1677, Oklahoma City, OK 73101-1677. Contact: **Dee Ready**, Environmental Programs Manager; (405) 702-5218; Web Site: www.deq.state.ok.us.

Oregon

Oregon regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, OR. ADMIN. R. 340-100-002; 40 CFR 261.4.

Currently, reuse of CCBs is not specifically authorized under Oregon law or regulations.

Oregon Department of Environmental Quality, 811 Southwest Sixth Avenue, Portland, OR 97204. Contact: **Rick Vopel** (503) 229-6753; E-mail: vopel.rick@deq.state.or.us; Web Site: www.deq.state.or.us.

Pennsylvania

The Pennsylvania regulations adopt by reference the federal regulations exempting fly ash, bottom ash, slag, and flue ash gas emission control waste generated primarily from the combustion of coal or other fossil fuels as hazardous waste, 40 CFR 261.4(b)(4) (25 Pa. Code §261.a.1). Coal ash is regulated under the Solid Waste Management Act and the residual waste management regulations. In December 1986, this act was amended to authorize the beneficial use of coal ash. Beneficial use of coal ash was implemented through Department of Environmental Protection (DEP) guidelines under the residual waste management regulations, 25 Pa. Code Chapter 287, which were amended in July 1992 to include the beneficial use of coal ash, 25 Pa. Code §§287.661-287.666. On January 25, 1997, the beneficial use of coal ash regulations, 25 Pa. Code §§287.663 and 287.664, were amended to change the requirements concerning groundwater monitoring, reporting to the Department, coal ash beneficial uses, and the amounts of coal ash that could be used at active coal mine and abandoned mine sites.

Coal ash is defined in Pennsylvania's Solid Waste Management Act as fly ash, bottom ash, or boiler slag resulting from the combustion of coal and may be beneficially used.

Pennsylvania residual waste management regulations provide that coal ash may be beneficially used. Other coal ash that is not beneficially used is a "residual waste."

Pennsylvania residual waste management regulations provide that coal ash may be beneficially used:

- As a structural fill upon approval from the Department if the person proposing the use complies with specified requirements (any other use as a structural fill requires a disposal permit).
- As a soil substitute or soil additive if the person proposing the use complies with specified requirements.
- For reclamation at an active surface coal mine site, a coal refuse reprocessing site, or a coal refuse disposal site if the use complies with all specified requirements under 25 Pa. Code §287.663, the Clean Streams Law and regulations promulgated thereunder, the Surface Mining Conservation and Reclamation act (52 P.S. §§1396.1-1396.19a), the Coal Refuse Disposal Control Act (52 P.S. §§30.51-30.66), and the applicable provisions of Chapters 86-90.
- For reclamation at an abandoned coal or an abandoned noncoal (industrial mineral) mine site if the reclamation work is approved by the Department or is performed under a contract with the Department and the use complies with 25 Pa. Code §287.664 and the applicable environmental statutes and regulations promulgated thereunder.
- In the manufacture of concrete.

- For the extraction or recovery of one or more materials and compounds contained within the coal ash.
- As an antiskid material or road surface preparation material, if the use is consistent with Department of Transportation specifications or other applicable specifications. This use applies to bottom ash or boiler slag only. The use of fly ash as an antiskid material or road surface preparation material is not deemed to be a beneficial use.
- As a raw material for a product with commercial value, including the use of bottom ash in construction aggregate (storage of coal ash prior to processing is subject to specific requirements).
- For mine subsidence control, mine fire control, and mine sealing, if the person or municipality proposing the use gives advance written notice to the Department, the pH of the coal ash is in a range that will not cause or allow the ash to contribute to water pollution, and use of the coal ash in projects funded by or through the Department is consistent with applicable Department requirements.
- Note: several significant coal ash mine reclamation projects have been authorized. Ash generated at the Seward coal-refuse-powered generating station is being used to reclaim former coal refuse piles. Coal ash was pumped into the Perg Mine in southwest Pennsylvania to create a barrier to help control and stop a fire burning for over 30 years.
- As a drainage material or pipe bedding, if the person or municipality proposing the use has first given advance written notice to the Department and has provided to the Department an evaluation of the pH of the coal ash and a chemical analysis of the coal ash that meets the specific chemical waste analysis requirements.
- As a stabilized product where the physical or chemical characteristics are altered prior to use or during placement if the person or municipality proposing the use has first given advance written notice to the Department, the coal ash is not mixed with solid waste, unless otherwise approved in writing by the Department prior to use, and the use of coal ash results in demonstrated reduction of the potential of the coal ash to leach constituents into the environment.

25 Pa. Code §§287.661-665.

Nevin Strock, Chief of the Surface Mine Permit Section, describes CCB mine reuse requirements in “Pennsylvania Regulatory Requirements for Use of Coal Combustion Ash at Coal Mining Operations.” According to Strock, Pennsylvania has over 70 coal mining operations where coal ash is being beneficially used. Mr. Strock’s summary can be found on the Internet at www.mercc.osmre.gov/pdf/Forums/CCB/3-3.pdf. Other Pennsylvania guidance documents on coal ash reuse can be found at www.amrclearinghouse.org/sub/GOBpiles/ZZSoilAmendments.htm.

Pennsylvania Department of Environmental Protection, PO Box 8472, Rachel Carson State Office Building, Harrisburg, PA 17105-8472. Contact: Bureau of Waste Management, (717) 787-7381; Bureau of Mining and Reclamation, (717) 787-5103; Web Site: www.dep.state.pa.us.

Rhode Island

Rhode Island has no coal-fired power plants. State hazardous and solid waste regulations do not specifically address the regulatory status or reuse potential of CCBs. CCBs are not automatically exempt from Rhode Island hazardous waste regulations, RHODE ISLAND REGS. HWM §3.32. Currently, reuse of CCBs is not specifically authorized under Rhode Island law or regulations. Additionally, under Rhode Island regulations, recycled or reused waste may remain subject to regulation, RHODE ISLAND REGS. HWM §3.32. The Rhode Island Department of Environmental Management reports it would likely adopt a conservative approach toward CCB use if approval for such a project were requested.

Rhode Island Department of Environmental Management, 235 Promenade Street, Providence, RI 02908-5767. Contact: **Christopher Shafer**, Office of Waste Management, (401) 222-2797; E-Mail: Christopher.shafer@dem.ri.gov; Web Site: www.state.ri.us/dem.

South Carolina

Under South Carolina regulations, fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels are exempt from regulation as hazardous waste, S.C. CODE REGS. 61-79.261.4(b)(4). CCBs are regulated in South Carolina as industrial solid waste when disposed in landfills, S.C. CODE REGS 61-107.16.

Currently, reuse of coal ash is not specifically authorized under South Carolina law or regulations.

Regulations authorizing reuse of CCBs were initially drafted in 1994 by the South Carolina Department of Health and Environmental Control (SCDHEC). The proposed draft rule defined CCBs to include fly ash, bottom ash, boiler slag, and flue gas desulfurization residue produced by coal-fired electrical or steam generation units, which are used in a manner considered beneficial. The draft rule also specified several permitted beneficial reuse activities. The SCDHEC withdrew the draft rule several years ago and is not currently working on any new coal ash reuse rules.

The SCDHEC will review proposals on a case-by-case basis. Currently, there are several trial projects under way utilizing coal ash in engineering projects.

South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, SC 29201. Contact: **Marty Lindler**, (803) 896-4205; E-Mail: lindlemaedhec.sc.gov; Web Site: www.scdhec.net.

South Dakota

South Dakota regulations adopt by reference the federal regulations which exempt CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, S.D. ADMIN. R. 74:28:22; 40 CFR 261.4. CCBs are considered solid waste and are regulated under the Solid Waste Management Program. Currently, reuse of CCBs is not specifically authorized under South Dakota law or regulations. The South Dakota Department of Environment and Natural Resources will consider reuse projects on a case-by-case basis. Approval for reuse will depend on the type of ash (bottom, fly, or both) and the proposed use.

South Dakota Department of Environment and Natural Resources, 523 East Capitol Avenue, Pierre, SD 57501-3181. Contact: **Vonni Kallemeyn**, (605) 773-3153; Web Site: www.state.sd.us/denr.

Tennessee

Under Tennessee law, fly ash, bottom ash, and flue gas emission control waste generated from the combustion of coal or other fossil fuels must be tested for a hazardous waste determination. If determined to be hazardous, certain hazardous waste generator requirements apply. TENN.COMP. R. & REGS. 1200-1-11-.02. Upon testing confirmation that the material is not hazardous, fly ash, bottom ash, and boiler slag may be disposed under permit-by-rule regulations if the following conditions are met:

- The coal ash disposed of is not hazardous as defined in Rule 1200-1-11-.02(1)(c) of the Hazardous Waste Management Regulations.
- The coal ash disposed of is fly ash, bottom ash, or boiler slag resulting primarily from the combustion of fossil fuel.
- Disposal is limited to:
 - Coal ash in engineered structures for the following projects: a highway overpass, levee, runway, or foundation backfill.
 - Such other similar uses as the Commissioner may approve in writing. Financial assurance and groundwater monitoring may be required by the Commissioner if deemed appropriate for these case-by-case projects.
- The operator complies with the notification requirement.
- The fill area is constructed, operated, maintained, and closed in such a manner as to minimize:
 - The potential for harmful release of solid wastes or solid waste constituents to the environment.

- The potential for harm to the public through unauthorized or uncontrolled access.
- The fill area, until development is complete, must have an artificial or natural barrier to control access of unauthorized entry.
- There must be equipment that is capable of spreading and compacting the coal ash and capable of handling the earthwork required during the periods that coal ash is received at the fill area.
- The coal ash fill project is designed with a geologic buffer of at least three feet with a maximum saturated hydraulic conductivity of 1×10^{-6} centimeters per second between the base of the fill and the seasonal high water table of the uppermost unconfined aquifer or the top of the formation of a confined aquifer, or such other protection as approved by the Commissioner taking into account site-specific coal ash and soil characteristics, ambient groundwater quality, and projected flows in and around the site.
- At the completion of the coal ash fill project, and no later than 90 days after operations have ceased, the final cover must meet the requirement of at least 24 inches of compacted soil on the coal ash project area, except for those areas covered by structures, asphalt, concrete (including concrete containing coal ash), or other similar barriers to water infiltration. The upper 6 inches of this cover shall be able to support the growth of suitable vegetation.
- The final surface of the coal ash fill area is graded and/or provided with drainage facilities in a manner that:
 - Minimizes erosion of cover material (e.g., no steep slopes).
 - Promotes drainage of precipitation falling on the area (e.g., prevents pooling).
 - Provides a surface drainage system which is consistent with the surrounding area and in no way significantly adversely affects proper drainage from these adjacent lands.
 - The operator must take other erosion control measures (e.g., temporary mulching or seeding, silt barriers) as necessary to control erosion of the site.
- Dust control – The operator must take dust control measures as necessary to prevent dust from creating a nuisance or safety hazard to adjacent landowners or to persons engaged in supervising, operating, and using the site. The use of any oils or other chemicals (other than water) for dust suppression must be approved in writing beforehand by the Department.
- Prior to excavation, all bore holes drilled or dug during subsurface investigation of the site, piezometers, and abandoned wells which are either in or within 100 feet of the areas to be filled must be backfilled with a bentonite slurry or other sealant approved by the Commissioner to an elevation at least 10 feet greater than the elevation of the lowest

point of the fill base (including any liner), or to the ground surface if the site will be excavated less than 10 feet below grade.

- The fill area must not be located in a 100-year floodplain unless it is demonstrated to the satisfaction of the Commissioner that:
 - Location in the floodplain will not restrict the flow of the 100-year flood, nor reduce the temporary water storage capacity of the floodplain.
 - Result in the destruction or adverse modification of the critical habitat of endangered or threatened species.
- Notice in deed to property – Except for coal ash fills on federal-, state-, or local government-owned right-of-ways, the operator must ensure that, within 90 days of meeting final cover requirements and prior to the sale or lease of the coal ash fill area property, there is recorded a notation on the deed to the property or on some other instrument which is normally examined during a title search that will in perpetuity notify any person conducting a title search that coal ash has been placed on the property.

The Tennessee Department of Environment and Conservation (TDEC) issued a March 4, 1996, guidance document setting forth the requirements and procedure to obtain **a beneficial use of a solid waste determination**. A beneficial use determination by the Department of Solid Waste Management (DSWM) will be a concurrence that such approved use **does not constitute disposal** by the Department. Current examples of beneficial use include bottom ash used in sand blasting and ash used in cement. A petition for beneficial use determination may be submitted in writing to the DSWM and include the following information:

- Identification, name, address and phone number of the solid waste generator.
- An adequate characterization of the subject waste stream. The characterization must include the quantity of solid waste generated, concentrations of all potential contaminants, and a flowchart which describes the process that generates the waste.
- A well-defined beneficial use project proposal described in adequate detail.
- Locations and property owners that are involved in the beneficial use project.
- A record keeping and reporting system which will account for actual solid waste quantities used in the project.
- A description of how the waste will be handled and stored prior to beneficial use and any run-on/runoff control measures for surface waters.
- A description of how release of solid waste into the environment will be prevented.
- A schedule proposing the project initiation, major steps, and completion.

- Other information requested by the DSWM to evaluate the petition.

Solid wastes stored for beneficial reuse are subject to provisions at Rule 1200-1-7-.02(1)(b)2(xvi) which provides a conditional exemption from permitting for such storage prior to its reuse.

Contact Information: Glen Pugh, **Tennessee Department of Environment and Conservation**, Division of Solid Waste Management, L & C Tower, 55h Floor, 401 Church Street, Nashville, TN 37243-1535. Phone: (615) 532-0818; Fax No: (615) 532-0886; Web Site: www.state.tn.us/environment.

Texas

Texas regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, TEXAS ADMIN. CODE 30 §335.2, §335.4, §335.501 *et seq.*; 40 CFR 261.4.

Under Texas regulations, CCBs may be classified as industrial solid wastes resulting from industrial processes. Texas regulations establish three different classes of industrial solid wastes under which CCBs may be classified. Class 1 industrial solid wastes includes any nonhazardous waste or mixture of wastes that because of its concentration or physical or chemical characteristics is toxic, corrosive, flammable, pose a substantial danger to human health or the environment or meet other similar characteristics. Class 2 wastes are those wastes which are not hazardous, are not Class 1, or are not Class 3 wastes. Class 3 wastes are those wastes which are inert and essentially insoluble and which pose no threat to human health or the environment, TEXAS ADMIN. CODE 30 §335.2, §335.4, §335.6, §335.17, §335.18, §335.19, §335.24, §335.501 *et seq.*

In January 1999, and revised in November 2001, the Texas Natural Resource Conservation Commission (TNRCC) issued guidance on the reuse of all nonhazardous industrial wastes, "Can I Recycle Some of My Industrial or Hazardous Waste?" RG-240. Pursuant to the guidance, CCBs are considered to be coproducts if eight criteria are met: 1) if each constituent found in the recycled material is also a constituent normally found in the raw material it is replacing, 2) a legitimate reuse market exists, 3) the recycled material is managed and protected from loss the same as the raw product would, 4) the quality of the product is not degraded, 5) the use is an ordinary use, 6) the product is not used for energy recovery, 7) the recycled material can be used a product itself, and 8) 75% of the material is recycled each year. Copies of this guidance can be found at www.tnrcc.state.texas.us under the "publications" heading. The Texas Administrative Code was amended revising the definition of solid waste to incorporate RG-240 into rule, Texas Administrative Code 335.1(131)(H). Under the amendment, industrial nonhazardous waste may be exempt from regulations as a waste if recycled in accordance with the eight criteria listed.

The TNRCC also issued guidance specifically on the reuse of CCBs on August 25, 1995. The Texas Coal Ash Utilization Group was instrumental in promoting this guidance. Under the guidance, the following types of CCBs are not subject to classification as a waste and are designated as coproducts when used in the following specified manner and in accordance with an ASTM or other accepted industry standard:

- Fly ash/bottom ash: In concrete, concrete products, cement/fly ash blends, precast concrete products, lightweight and concrete aggregate, roller compacted concrete, soil cement, flowable fill, roofing material, insulation material, artificial reefs, and as mineral filler (plastics, paints, rubber matting, carpet backing, bricks and asphalt).
- Fly ash/bottom ash/FGD material: As raw feed for concrete manufacture and in masonry.
- Fly ash: In oil well cementing and waste stabilization and solidification.
- Fly ash/bottom ash/FGD material: As road base when covered by a wear surface.
- Bottom ash: As an unsurfaced road construction material, road surface traction material, and blasting grit.
- FGD material: In wallboard and sheetrock.

CCBs that are not used as a coproduct are considered Class 2 waste if they meet the requirements of 30 TAC 335.506, but may be recycled without a permit by providing 90 days notification to the TNRCC prior to the anticipated use.

Texas Natural Resource Conservation Commission, PO Box 13087, Austin, TX 78711-3087. Contact: **Mr. Jason Sutherland**, (903) 535-5135; Web Site: www.tnrcc.state.tx.us.

Utah

Under Utah law, fly ash, bottom ash, slag, and flue gas emission control waste are exempt from regulation as hazardous waste, UAC 315-2-4. Fly ash, bottom ash, slag, and flue gas emission control waste are also exempt from regulation as solid waste unless the waste causes a public nuisance or public health hazard or test results indicate the materials is hazardous, UTAH CODE ANN. §19-6-102(16)(b)(iii).

Under Utah law, CCBs may be reused in the following applications:

- Road sanding
- Sand blasting
- Road construction
- Railway ballast
- Construction fill

- Aggregate
- Other construction-related purposes

UTAH CODE ANN. §19-6-102.1.

Utah Department of Environmental Quality, Division of Solid and Hazardous Waste, PO Box 144880, Salt Lake City, UT 84114-4880. Contact: **Ralph Bohn**, (801) 538-6170; E-Mail: rbohn@utah.gov; Web Site: www.deq.utah.gov.

Vermont

Under Vermont regulations, fly ash, bottom ash, slag, and flue gas emission control waste are exempt from regulation as hazardous waste, VT. REGS. HWM §7-203(c).

Currently, reuse of CCBs is not specifically authorized under Vermont law or regulations. Vermont has adopted generic recycling regulations; however, these regulations may not necessarily exempt a material from regulation, VT.REGS.HWM §7-204.

State of Vermont Agency of Natural Resources, 103 Main Street, One South, Waterbury, VT 05671-0407. Contact: **James V. Surwilo**, (802) 241-3481; Fax No.: (802) 241-3396; E-Mail: james.surwilo@anr.state.vt.us; Web Site: www.anr.state.vt.us.

Virginia

Virginia regulations adopt by reference the federal regulations which exempt fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels from regulation as hazardous waste, 9 VAC 20-60-261

Under Virginia regulations, CCBs are exempt from regulation as a solid waste if beneficially reused in the following manner and managed in accordance with all applicable state agency requirements:

- As a material in the manufacturing of another product (e.g., concrete, concrete products, lightweight aggregate, roofing materials, plastics, paints, flowable fill) or as a substitute for a product or material resource (e.g., blasting grit, roofing granules, filter cloth precoat for sludge dewatering, pipe bedding).
- For mine reclamation or mine refuse disposal on a mine site permitted by the Virginia Department of Mines, Minerals and Energy when used in accordance with the standards developed by the Department of Waste Management.
- For soil nutrient additive, stabilization agent, structural improvement, or other agricultural purposes under the authority of the Virginia Department of Agriculture and Consumer Services.

- As a traction control material or road surface material if the use is consistent with Virginia Department of Transportation specifications (bottom ash or boiler slag).
- As a base, subbase, or fill material under a paved road, the footprint of a structure, a paved parking lot, sidewalk, walkway, or similar structure.
- When processed with a cementitious binder to produce a stabilized structural fill product which is spread and compacted with proper equipment for the construction of a project with a specified end use.
- For the extraction or recovery of materials and compounds contained within the CCBs.

9 VAC 20-80-160, 9 VAC 20-80-150(E)(2).

Virginia regulations also specify the terms and conditions under which CCBs may be reused through land application such as structural fills, mine reclamation, or mine refuse disposal (in conjunction with Virginia Surface Mining regulations), 9 VAC 20-85-10 et seq. The regulation allows for the use of CCBs in structural fills and mine reclamation projects. The regulation also provides for the siting of such projects, the design and construction of runoff and cover systems, the closure of projects, and establishes minimum operational requirements.

CCBs managed under these regulations are not subject to solid waste facility permitting; however, at least 30 days prior to initial placement of CCBs the facility owner must:

- Submit certification that the owner has legal control over the proposed site for the project life and closure period, that the location and operation of the site will be in compliance with all local ordinances, and that the owner will allow Department inspections to ensure compliance with applicable regulations.
- Provide a description of the intended use, reuse, or reclamation of the CCBs including a description of the site, the estimated beginning and ending dates of the operation, an estimate of the volume of CCBs to be used, and the physical and chemical characteristics of the CCBs including TCLP analyses for specified characteristics.
- Certification by a professional engineer that locational restrictions have been satisfied and that the project has been designed in accordance with specified standards.
- An operational and closure plan.

Various location restrictions apply. For example, CCBs may not be placed:

- In areas subject to base floods unless it can be shown that the CCBs can be protected from inundation or washout and that the flow of water is not restricted.
- With the vertical separation between the CCB and the maximum seasonable water table or bedrock less than 2 feet.

- Closer than 100 feet from any perennial stream, water well, and sinkhole or 25 feet from a bedrock outcrop (unless the outcrop is treated to minimize infiltration into fractured zones) or property boundaries.
- In wetlands, unless applicable federal, state and local permits are obtained.
- At the site of an active or inactive dump, unpermitted landfill, lagoon, or similar facility, even if closed.

90 VAC 20-85-70.

In addition, storage and stockpiling of materials must meet specified regulatory requirements.

9 VAC 20-85-10 et seq.

Virginia Department of Environmental Quality, 629 Main Street, Richmond, VA 23219. Contact: **Paul Farrell**, (804) 698-4214; Web Site: www.deq.state.va.us.

Washington

CCBs are not automatically exempt from regulation as hazardous waste. However, if the CCBs are exempt from regulation as hazardous waste, they are regulated as solid waste, and handling and disposal requirements must be followed, WAC 173-303-016. Currently, reuse of CCBs is not specifically authorized under Washington law or regulations.

State of Washington Department of Ecology Northwest Regional Office, 3190 160th Avenue Southeast, Bellevue, WA 98008-5452. Contact: **John Keeling**, (425) 649-7052; P/O (425) 649-7010; Web Site: www.state.wa.us.

West Virginia

West Virginia regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal.

Under West Virginia regulations, CCBs may be reused in the following manner:

- As a material in manufacturing another product (e.g., concrete, flowable fill, lightweight aggregate, concrete block, roofing materials, plastics, paint) or as a substitute for a product or natural resource (e.g., blasting grit, filter cloth precoat for sludge dewatering).
- For the extraction or recovery of materials and compounds contained within the CCBs.

- As a stabilization/solidification agent for other wastes if used singly or in combination with other additives or agents to stabilize or solidify another waste product. Advanced written notice must be submitted to the state, and the use must result in altered physical or chemical characteristics of the other waste and a reduction of the potential for the resulting established mixture to leach constituents into the environment.
- Under the authority of the West Virginia Department of Energy.
- As pipe bedding or as a composite liner drainage layer.
- As an antiskid material (bottom ash, boiler slag) if such use is consistent with Department of Highways specifications. The use of fly ash as an antiskid material is not deemed to be a beneficial use.
- As a daily or intermediate cover for certain solid waste facilities if the permit allows for such use.
- As a construction base for roads or parking lots that have asphalt or concrete wearing surfaces, if approved by the West Virginia Department of Highways and the project owner.

W.VA. REGS. §33-1-5.5.b.4.A-H

West Virginia regulations note that the current rule does not address or authorize beneficial reuse of CCBs for structural fills and as soil amendment. The rules state these uses will be addressed in future rule makings.

Beneficial use of coal ash for mine reclamation is addressed in the January 13, 1998, “Utilization of Coal Ash, Tires, Sludge and Other Items” guidance issued by the Department of Environmental Protection Division of Mining and Reclamation. Under the policy, for preapproved uses, a 30-day advance written notification to the agency satisfies permit revision application requirements. Preapproved use notifications automatically, without further agency action, constitute an insignificant permit revision. Preapproved mining uses of coal ash listed in the policy include:

- Subsidence control as part of a confined cementitious mixture.
- Abatement of underground mine fires as part of a cementitious mixture.
- Soil amendment (under certain conditions).
- Source of alkaline addition to neutralize potentially acid producing materials in course coal refuse, fine coal refuse and combined coal refuse, backfills, and to line pit floors. Additional policy requirements apply to these uses.
- Encapsulating toxic material.

- To fill underground voids or reduce acid mine drainage.
- To improve the stability and/or enhance the material handling characteristics of coal refuse disposal facilities.
- To prevent and control spontaneous combustion or to otherwise control burning of coal refuse disposal facilities.
- Return disturbed areas to approximate original contour (AOC), where additional fill is required to properly reclaim the site (only after using all available spoil material subject to the provisions of the applicable regulations).
- As antiskid material, if such use is consistent with West Virginia Division of Highways specifications.
- To construct base material for roads, parking areas, storage areas, etc., to stabilize foundation soils.
- At abandoned mine land reclamation and no-cost reclamation projects in accordance with the approval plan.
- In demonstration projects.
- For the construction of liner systems.
- For sealing of underground mine openings.

West Virginia Department of Environmental Protection, 601 57th Street, Southeast, Charleston, WV 25304. Contact: **H. Michael Dorsey**, (304) 926-0499 (ext. 1278) Web Site: www.wvdep.org.

Wisconsin

Wisconsin tracks its beneficial use of industrial by-products. According to its March 2001 Usage Report, Wisconsin estimates that almost 72% of coal ash was beneficially used as cold-weather road abrasive, confined structural fill, and daily cover. Under Wisconsin regulations, fly ash, bottom ash, slag, and flue gas emission control waste are exempt from regulation as hazardous waste, WIS. ADMIN. CODE §NR 605.05.

In Wisconsin, coal ash and bottom ash are classified as industrial by-products. Rules governing the beneficial use of coal combustion by-products are found in Chapter NR 538 BENEFICIAL USE OF INDUSTRIAL BYPRODUCTS of the Wisconsin Administrative Code.

Under the rule, the term industrial by-product includes paper mill sludge, coal ash (including slag), foundry excess system sand, foundry slag, and other nonhazardous solid waste with similar characteristics as determined by the Department. The rule establishes five different industrial product categories. Beneficial use options are based on the category the industrial

product falls into. Industrial products, such as coal ash, are not automatically assigned to a specific category. Specific testing requirements must be performed on the material to determine which category the industrial products falls into. The testing is intended to differentiate between those materials which are essentially inert (Category 1) and may be used in a wide variety of applications and those which should be used in more limited applications due to the levels of constituents in the material (Category 5). For example, testing which demonstrates an industrial product meets all the constituent parameters for a Category 1 material may be used in a broad range of applications.

Testing to determine the proper category classification for coal ash must include the following analytical tests:

<u>Category</u>	<u>ASTM Water Leach</u>	<u>Total Elemental Analysis</u>
1	21 trace elements	32 trace elements + PAHs (polycyclic aromatic hydrocarbons)
2	14 trace elements	21 trace elements
3	14 trace elements	None
4	5 trace elements	None
5	TCLP nonhazardous	None

Set forth below is a chart depicting the authorized reuses for each industrial product category:

The beneficial uses listed in the chart are described in detail in NR538.10. This chart is an abbreviated summary only.

The rule is largely self-implementing. However, various compliance requirements are associated with the authorized beneficial uses, such as prior site owner notification with a DNR form for 200 cubic yards, a sketch or drawing for 200–10,000 cubic yards, and a deed affidavit for projects using >10,000 cubic yards. Prior agency notification is necessary when specific quantities are used for certain applications (e.g., > 5000 cubic yards of confined geotechnical fill). The rules prohibit the use of industrial by-products on residential property.

	Industrial Product Category				
	5	4	3	2	1
1) Raw material for manufacturing a product (e.g., cement, lightweight aggregate structural ornamental concrete or ceramic materials, portland cement, concrete pavement, roofing materials, plastics, paint, fiberglass, minerals, wool, wallboard, plaster)	X	X	X	X	X

		Industrial Product Category				
		5	4	3	2	1
2)	Waste Stabilization/Solidification	X	X	X	X	X
3)	Supplemental Fuel Source/Energy Recovery	X	X	X	X	X
4)	Landfill Daily Cover/Internal Structures	X	X	X	X	X
5)	Confined Geotechnical Fill					
	a) Commercial, industrial, or institutional building subbase					
	b) Paved lot base, subbase and subgrade fill		X	X	X	X
	c) Paved roadway base, subbase and subgrade fill					
	d) Utility trench backfill					
	e) Bridge abutment backfill					
	f) Bank, vault, or tunnel abandonment					
	g) Slabjacking material					
6)	Encapsulated Transportation Facility Embankment		X	X	X	X
7)	Capped Transportation Facility Embankment			X	X	X
8)	Unconfined Geotechnical Fill			X	X	X
9)	Unbonded Surface Course				X	X
10)	Bonded Surface Course				X	X
11)	Decorative Stone				X	X
12)	Cold-Weather Road Abrasive				X	X
	Note: General beneficial use in accordance with s. NR 538.12(3)					X

Product generators and facility operators must submit an annual certification report by April 1 of each year documenting the amount of material in each category beneficially reused and confirmation the reused product has been properly classified as well as other required information (name and address of the generator or storage facility operator; contact name, address, and phone number; a description of each industrial product including the generation process and an estimate of annual available beneficial use volume; the volume of each industrial product beneficially used; documentation of any recharacterization test results; a summary of any project problems or

obstacles and response actions; a summary of storage facility maintenance performance problems; environmental monitoring data; and a truthfulness certification).

Public notification and participation is required for certain projects. No person may initiate a beneficial use project utilizing greater than 30,000 cubic yards of product or construct or operate a storage facility with a designed capacity greater than 30,000 cubic yards prior to giving notice to the affected public and providing for adequate public participation. Unless a different process is approved by the Agency, the notice and public participation process must include, at a minimum, the following:

- A public notice in the local newspaper at least 30 business days prior to initiation of the project (or storage facility), specifying the nature of the project (or storage facility), including the type and amount of the material to be used (or stored), how and where the material will be used, the time frame for the project (or storage facility operation), that a public informational meeting will be held, and a person for the public to contact to request a meeting.
- A public informational meeting if requested by the public, at which details of the project can be discussed. Agency staff may participate in the meeting.

Certain projects are exempt from these public participation requirements. Specifically exempt are: 1) Category 1 beneficial uses; 2) DOT projects addressed by the Department's environmental review process; 3) beneficial use projects at facilities licensed under NR 500-536; and 4) the following beneficial uses: raw material for manufacturing a product, waste stabilization/solidification, supplemental fuel source/energy recovery, and landfill daily cover/internal structure.

Prior to initiating any beneficial use project (or establishing a storage facility), each generator or storage facility operator must submit an initial certification to the Agency. The initial certification form must include the name and address of the generator or storage facility operator; a contact person's name, address, and phone number; the classification of each industrial product including test result documentation supporting the classification; and other required information.

Records must be maintained for each beneficial use project. Industrial products must be recharacterized after the initial characterization in accordance with the schedules specified in the regulations.

State of Wisconsin Department of Natural Resources, 101 South Webster Street, PO Box 7921, Madison, WI 53707-7921; (608) 266-2621; Fax No.: (608) 267-3579. Contact: Paul Kozier, Beneficial Use Coordinator, (608) 267-9388; E-Mail: Paul.Kozier@dnr.state.wi.us; Web Site: www.dnr.state.wi.us.

Wyoming

Wyoming regulations adopt by reference the federal regulation which exempts CCBs from classification as hazardous waste. Exempt from hazardous waste regulation are fly ash, bottom ash, slag, and flue gas emission control waste generated primarily from the combustion of coal, WY

ADMIN. CODE HWM CH. 2 §1; 40 CFR 261.4. Wyoming law regulates CCBs as an industrial solid waste, WY ADMIN. CODE SWM CH. 1, §1(e)(i).

Currently, reuse of CCBs is not specifically authorized under Wyoming law or regulations. According to the Wyoming Department of Environmental Quality, the agency is in the process of developing regulatory guidelines for beneficial reuse of solid waste, including CCBs.

Wyoming Department of Environmental Quality, 250 Lincoln Street, Lander, WY 82520. Contact: Bob Doctor, Solid Waste Program Manager, (307) 473-3450; Fax No.: (307) 473-3458; E-Mail: bdocto@.state.wy.us. Web Site: www.deq.state.wy.us

CONCLUSION

A number of states have adopted laws and regulations or issued policies and/or guidance specifically pertaining to CCB use. The CCB uses authorized within these states vary widely. Some states authorize liberal use of CCBs, while others authorize CCB use only in limited applications. In addition, the level of regulatory control and oversight varies significantly. CCB uses presenting the greatest concern to state regulators are those which involve land application such as use of CCBs in agricultural applications, structural fills, mine applications, and embankments. Some states consider these applications to be waste disposal and not reuse or recycling.

Finally, other states have elected to adopt "industrial solid waste beneficial use" rules intended to authorize use of a variety of material such as coal ash, paper mill sludge, and foundry sand. These reuse rules with application to multiple materials may represent a growing trend.