Comments on the Proposed Maryland Department of the Environment Coal Combustion Byproduct Regulations for Disposal in Dedicated Units and Utilization in Coal and Noncoal Mines

Submitted by:

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Power Plant Research Program

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Maryland's Power Plant Research Program (PPRP) appreciates the opportunity to comment on the proposed Coal Combustion Byproduct (CCB) regulations developed by the Maryland Department of the Environment (MDE) addressing CCB disposal in dedicated units as well as use in coal and noncoal mine reclamation. The comments provided herein address the proposed CCB regulations released to the public and in some cases address the forthcoming CCB beneficial use regulations and draws from PPRP's decades of experience with disposal, utilization and beneficial use applications in Maryland and surrounding states. PPRP would welcome an occasion to meet with MDE to clarify and discuss comments.

PPRP understands that written comments are currently being solicited by MDE for regulations to be promulgated at a future date concerning CCB beneficial utilization.

Prior to the public release of the proposed CCB utilization design standards and beneficial use regulations, PPRP respectfully requests an opportunity for review and comment, and to discuss issues for MDE's consideration.

Comments

[1] **26.04.10 Management of Coal Combustion Byproducts,** .06 Mine Reclamation, Page 14: PPRP views mine reclamation as a high volume beneficial use when properly mixed to cure to an environmentally benign material. Please consider re-wording section A to say "A person may not use coal combustion byproducts that have not been properly stabilized/solidified in accordance with the EPA's current definition in a mine reclamation activity ....." Some demonstrated benefits of utilizing stabilized/solidified coal combustion byproducts in mine reclamation include the reduction of acid mine discharge and prevention of future subsidence.

[2] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .02 Definitions B. (c), Page 33 and .03 B. General Requirements, (1), Page 37: FGD should not be excluded from utilization of CCBs in mine reclamation. Used in conjunction with a lime activator, fly ash and bottom ash, an addition of FGD contributes to an extremely low porosity CCB material that is suitable as structural fill. A good example of FGD utilization in a fill is Rostraver, PA Airport runway – a mix of FGD (calcium sulfite and calcium sulfate), fly ash, quicklime, and, in some cases, bottom ash. Please see additional information at the website address listed below. The material is suitable for conventional construction methods of loading, hauling, and placement.
http://wvwri.nrcce.wvu.edu/programs/cbrc/publications/2004/Winter_04.pdf

[3] **26.04.10 Management of Coal Combustion Byproducts,** .02 Definitions: The EPA solidification/stabilization definition (Attachment A) should be included in COMAR **26.04.10 Management of Coal Combustion Byproducts** .02 Definitions for reference.

COMAR 26.20.24 Special Performance Standards, .08 Utilization of Coal Combustion Byproducts: Leachate and pH characteristics for the resulting CCB solidification/stabilization product should be as specified in **COMAR 26.20.24 Special Performance Standards** .08 Utilization of Coal Combustion Byproducts.

26.04.10 Management of Coal Combustion Byproducts, .04 Disposal, C., Page 10 should be rewritten to reflect the solidification/stabilization provisions above. Each succeeding section would remain the same.

[4] By its physical and chemical properties coal fly ash is a pozzolan; therefore, there appears to be no need to specifically call out pozzolan in the definition of CCBs. The definition of pozzolan should be merged with the CCB definition. All definitions should be consolidated into one section to provide for consistency and to eliminate redundancy in the proposed regulations.

[5] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .03 Authorization of Use and General Requirements: There is no explicit specification of CCB placement in proximity to potable or water supply wells. Similarly .04 Application for Use, (3), (g), Page 42 makes reference to depicting "Existing wells within 1250 feet of the boundaries of the site," on a topographic map; however, no direct specification is made for a permissible minimal distance between a CCB fill location and a potable well.

[6] The proposed regulations would benefit from a short (one or two page) preamble outlining the intent, purpose and objectives of the regulations.

[7] To be consistent with industry standards, PPRP recommends that "by-products" is spelled "byproducts" and "flyash" is spelled "fly ash" throughout the regulations.

[8] The document on multiple occasions reads "flyash, bottom ash, boiler slag, pozzolan, and other solid residuals removed from air pollution control devices". To PPRP's knowledge, fly ash is the only pozzolan removed by air pollution control devices after coal combustion. If any other pozzolans are anticipated from coal combustion, language should include "...fly ash and other pozzolans...".

[9] **26.04.10 Management of Coal Combustion Byproducts,** .02 Definitions, Pages 3 through 8: Add or clarify a definition of coal "mines" to include active and abandoned surface and deep mines.

[10] **26.04.10 Management of Coal Combustion Byproducts,** .02 Definitions, B. Terms Defined, (2), (a), Page 3: Amend sentence with "...as determined by the Department." This phrase could give the Department latitude to evaluate affects in the context of the demographic and geologic setting.

[11] **26.04.10 Management of Coal Combustion Byproducts,** .02 Definitions, B. Terms Defined, (2), (b), Page 3: In order of preference: (1) strike this clause, or (2) change the wording to add a direct link with the language of COMAR **26.20** and **26.21**. PPRP considers mine reclamation a beneficial use when CCBs are properly stabilized to cure to environmentally benign material.

[12] **26.04.10 Management of Coal Combustion Byproducts,** .02 Definitions, B. Terms Defined, (4), Page 4: "Coal combustion byproducts facility" definition seems to be too broad and may include any facility (e.g., cement manufacturers, lime kilns, etc.) that may use fly ash as an ingredient in a finished product. This may lead to an unintended regulation of facilities currently beneficially using fly ash as a substitute for a raw material in a manufactured product (e.g., concrete products and cement).

[13] **26.04.10 Management of Coal Combustion Byproducts,** .04 Disposal, F., Page 11: This section should explicitly state that expansion includes vertical fill as well as lateral expansion for an existing facility.

[14] **26.04.10 Management of Coal Combustion Byproducts,** .05 Storage, Page 12 through 14: An exemption or allowance for facilities such as cement kilns, concrete product manufacturing plants, redi-mix plants, etc. would be in order for the CCBs to be used in manufactured products.

[15] **26.04.10 Management of Coal Combustion Byproducts,** .08 Reporting, D., Page 19: Amend section to read "...identification of new pollutants or *significant changes in pollutant concentrations* in CCBs...".

[16] **26.20.24 Special Performance Standards,** .08 Utilization of Coal Combustion Byproducts, B. Definitions, (2), (a), Page 20: Relative to specification of a net neutralization potential, PPRP recommends: (1) Evaluating the effectiveness of a specific net neutralization potential relative to OSM SMCRA permitting guidance (http://www.osmre.gov/obint.htm); and (2) Reviewing PADEP (1998) guidelines outlining recommended calcium carbonate equivalents as determined by testing.

Based on Pennsylvania Department of Environmental Protection (PADEP) guidelines (PADEP 1998), a calcium carbonate equivalent of 5 tons/1000 tons of CCBs in the proposed regulations seems low relative to a PADEP minimum of 100 tons/1000 tons. Of particular note is that PADEP specifies the minimal calcium carbonate equivalent as determined by a neutralization potential test in accordance with an overburden sampling and testing manual (Noll et al. 1988).

[17] **26.20.24 Special Performance Standards,** D. Coal Combustion Byproducts Utilization Request, (4), (h), Page 23: PPRP is uncertain of the intent of the sentence "Type of fuel burned to generate the coal combustion byproducts; ". The sentence seems to be redundant or inconsistent with the definition of CCBs. Please clarify whether this sentence is intended to address combustion products of co-fired operations.

[18] **26.20.24 Special Performance Standards,** D. Coal Combustion Byproducts Utilization Request, (4), (n), Page 27: For consistency, include boron and molybdenum in water quality analyses for mine permit drainage control system and initial and ongoing groundwater characterization (**26.21.04 Utilization of Coal Combustion Byproducts in Surface Mines Reclamation,** 0.05, Initial and Ongoing Characterization, B., (1), Page 45, and 0.07 Monitoring, C. Monitoring and Reporting Requirements, Table I, Page 55).

Pennsylvania (using SPLP methods) requires CCB leachate testing for boron and molybdenum. Lithium is suggested for inclusion in the leachate constituent list due to the relatively high concentrations in CCBs derived from bituminous sources in the Mid-Atlantic Highlands.

[19] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .03 Authorization of Use and General Requirements, B., (3), Page 37: This paragraph should be reworded to avoid precluding the use of accepted solidification/stabilization technology to eliminate or reduce the leaching characteristics of problematic CCBs.

[20] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .03 Authorization of Use and General Requirements, B., (6), Page 38: Since most Portland cement manufactured in Maryland (and elsewhere) contains significant amounts of fly ash, this paragraph will preclude the use of most Maryland-manufactured cement in concrete to be used in tremie operations for placement under surface water or below the regional groundwater table. The language of this section should be modified to exclude manufactured products (e.g., cement, Ready Mix, concrete, etc.) containing fly ash, and CCB grouts conforming to solidification/stabilization specifications.

[21] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .05 Initial and Ongoing Characterization, C., Page 46: Add the phrase "or when required by subparagraph E which follows" to the end of the sentence to account for variable coal sources.

[22] **26.21.04 Utilization of Coal Combustion Byproducts in Surface Mine Reclamation,** .06 Leachate Control and Collection, A, (1), (b) and (c), Page 48: Add language to clarify the required permeability of "natural earthen materials".

[23] The industry cost estimate due to the proposed regulations should account for current costs already incurred by industry as well as future costs likely to be incurred from FGD production and associated disposal/utilization. The industry costs due to the proposed regulations seem to be over estimated by at least a factor of two due to the double accounting of operational costs already incurred by industry which includes existing placement as well as closure costs (i.e., a 2 foot soil cap). Future industry costs associated with proposed regulations in 2010 and beyond will increase due to initiation and sustained production of FGD (Table 1). The increase in overall CCB production volume due to FGD is likely to

significantly increase CCB disposal and utilization costs, particularly if FGD material is excluded from use in mine reclamation.

Table 1. Anticipated Future FGD Volumes in Maryland.

Plant	2010 and Beyond FGD Volume (tons/year)	
	Maximum	Estimated Average
Brandon Shores	1,200,000	1,080,000
Dickerson	310,000	229,000
Chalk Point	382,000	309,000
Morgantown	703,000	520,000

REFERENCES

PADEP 1998. Certification Guidelines for Beneficial Uses of Coal Ash. Document Number 563-2112-224. Pennsylvania Department of Environmental Protection Bureau of Mining and Reclamation. April 30, 1998.

Noll, D.A., W. Bergstresser, and J. Woodcock, 1998. Overburden Testing and Sampling Manual. Prepared under contract ME 86120 for Pennsylvania Department of Environmental Resources Bureau of Mining and Reclamation. April 29, 1988.

Attachment A
Solidification/Stabilization

From: EPA, 2000. Solidification/Stabilization at Superfund Sites. U.S. Environmental Protection Agency's Technology Innovation Office under EPA Contract Number 68-W-99-003.

The term "solidification/stabilization" refers to a general category of processes that are used to treat a wide variety of wastes, including solids and liquids. Solidification and stabilization are each distinct technologies, as described below (EPA, 1997, Portland Cement Association 1991):

• Solidification - refers to processes that encapsulate a waste to form a solid material and to restrict contaminant migration by decreasing the surface area exposed to leaching and/or by coating the waste with low-permeability materials. Solidification can be accomplished by a chemical reaction between a waste and binding (solidifying) reagents or by mechanical processes. Solidification of fine waste particles is referred to as microencapsulation, while solidification of a large block or container of waste is referred to as macroencapsulation.

• Stabilization - refers to processes that involve chemical reactions that reduce the leachability of a waste. Stabilization chemically immobilizes hazardous materials or reduces their solubility through a chemical reaction. The physical nature of the waste may or may not be changed by this process.

For S/S applications at Superfund sites, the regulatory definition of stabilization under the Resource Conservation and Recovery Act (RCRA) may be relevant to a project. Under the Land Disposal Restrictions (LDR) program (40 CFR part 268), stabilization is the required treatment standard for certain types of waste. In addition, stabilization may be used to render a RCRA hazardous waste (defined under 40 CFR part 260) non-hazardous prior to disposal. RCRA defines stabilization (40 CFR 268.42) as "[a process that] involves the use of the following reagents (or waste reagents): (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust) - this does not preclude the addition of reagents (e.g., iron salts, silicates, and clays) designed to enhance the set/cure time and/or compressive strength, or to overall reduce the leachability of the metal or inorganic."

References Cited

EPA 1997. Innovative Site Remediation Technology, Solidification/Stabilization. Design & Application, Volume 4. (EPA 542-B-97-007).

Portland Cement Association 1991. Solidification and Stabilization of Waste Using Portland Cement.