Joint IMCC-EPA Summary Meeting Notes[1]
from the
IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Waste
May 15-16, 2001

Opening Remarks

(Greg Conrad, Executive Director, IMCC)

Greg Conrad welcomed attendees and provided an introduction to IMCC. The impetus for this meeting was the need for a forum specifically on regulatory issues associated with EPA's regulatory determination on coal combustion wastes (CCW).[2] Its purpose is to initiate a dialog among EPA, other federal agencies (OSM), and State regulators (including tribal regulators). The meeting's focus is on the mine placement of CCW, not on the landfill disposal aspect of EPA's rulemaking.

It was noted that EPA and a number of States have concerns that extend beyond the placement of CCW in coal mines to the placement of CCW in mineral, sand, gravel, and other non-coal mines.

IMCC is interested in the following outcomes for the meeting:

- Identifying data needs
- Setting up a system for information collection assistance
- Addressing implementation concerns
- Considering how to involve other stakeholders. Interest in this forum from industry and academia was noted. If there is a continuing dialog, there needs to be some consideration of the degree of involvement by these parties.
- Benchmarking and providing opportunities for States to share the status of their regulatory programs
- Identifying opportunities for improvement in regulatory programs
- Achieving an effective degree of intergovernmental cooperation, especially between EPA and OSM

[1] These meeting notes are summary in nature and should be read in conjunction with the meeting materials and handouts. Electronic copies of the meeting materials and handouts are included on this same CD.

[2] Throughout this meeting, speakers used various terms to refer to the solid materials generated as a result of the combustion of coal, including: coal combustion waste, coal combustion byproducts, coal combustion products, and coal ash. For ease of presentation, these notes use the abbreviation "CCW" throughout, except in cases where the speaker was making a point regarding distinctions between the terms used. The use of "CCW" in these notes is not meant to imply a preference for the categorization of these materials as "waste."

Part I: Presentations[3]

EPA Presentation (Dennis Ruddy, US EPA, Office of Solid Waste)

History of regulatory development effort:

- RCRA required EPA to study four "special" wastes. The last of these four was fossil fuel combustion waste (including not only from coal combustion, but also from oil and natural gas combustion). The statute required a Report to Congress (RTC) incorporating specific study factors.
- EPA completed the RTC in March 1999. The RTC acted as draft conclusions for regulatory determination (similar to a proposed rule). The RTC found no compelling need to regulate these wastes as hazardous on a national basis. The RTC, however, found some instances of mismanagement.
- EPA has completed its final regulatory determination. The regulatory determination also concluded there is no need for regulation of these wastes as hazardous. For some instances (specifically for CCW), however, the regulatory determination concluded that national regulations are warranted under RCRA Subtitle D (which regulates non-hazardous wastes).
- The specific areas where Subtitle D regulation is warranted are: disposal of CCW in surface impoundments (SIs) and landfills (LFs) and placement of CCW in mines (not limited to coal mines).

Planned regulatory development efforts:

- Part I: disposal of CCW in SIs and LFs by electric power producers (utilities and some Independent Power Producers). Proposal in February of 2002. Final in February of 2003.
- Possible elements of the Part I regulation include: ground-water monitoring, choice between performance/design standards, possible corrective action. EPA is mindful of existing State programs. EPA's concern is with gaps – e.g., at least at utilities, there is infrequent ground-water monitoring for SIs (fewer than 30%).
- Part II: disposal of CCW in SIs and LFs by non-utilities AND mine placement and minefilling of CCW. Proposal in March 2003. Final in July 2004.
- For the Part II regulation, there are no preconcieved notions on EPA's part; the Agency's intent is not to ban mine placement. EPA is looking to see that the practice is conducted in an environmentally protective manner. EPA is seeking to identify best management practices. Issues currently under consideration include: direct placement in ground water, leaching potential in various environments, and a need to rethink current monitoring practices (location and duration to adequately detect problems).
- A fundamental tenet of EPA's regulatory development effort is to consult with the States. The Agency is mindful to not duplicate or supercede existing State programs. OSM has been working with EPA since EPA announced its intention to proceed with regulatory development. EPA also consults with DOE and ASTSWMO.
- EPA notes that 40 CFR 258 (which covers municipal solid waste) is a possible template for regulation. Some elements of this section, however, are not necessarily applicable to minefills.

[3] Some of the points cited under certain State program presentations were not part of the State's formal presentation, but were noted during discussions later in the forum. For continuity, these points are presented in this section at the end of the appropriate State's formal presentation.

Technical background:

- The Agency's concern is with metals concentrations (not organics) – e.g., arsenic, lead, mercury, selenium.
- Total production of CCW is 120-130 million tpy. Electric utilities generate >90% of this.
- As much as 30% of electric utility CCW goes to beneficial uses. Mine placement is an estimated 10-12 million tons per year.
- There appears to be an increasing popularity for beneficial uses.
- A significant increase in coal combustion is expected, meaning significant increase in CCW generation.
- EPA is exploring the possiblity of promoting bona fide beneficial uses of CCW.

Noteworthy developments:

- EPA's air office has announced development of hazardous air pollutant regulations targeting mercury emissions from electric power plants (1/3 of all anthropogenic mercury). A final rule is anticipated in December 2004. This regulation could significantly affect the quality of CCW. The technologies needed for compliance are likely to remove more than just mercury. Waste generated by these technologies likely is not segregable from CCW. This regulation may require EPA to revisit its hazardous/non-hazardous determination for CCW.
- In examining damage cases (one of the eight RCRA study factors), EPA found no cases relating to coal mine placement, but found five or six cases involving sand and gravel pits. State requirements for ground-water monitoring are variable, making damage detection more problematic. Potential problems can take decades or centuries to emerge; thus EPA's concern with duration of monitoring. DOE had a similar conclusion in a recent study of mine placement.
- EPA notes the considerable technical development and research at OSM and DOE, including efforts involving AMD remediation, waste characterization, leaching test methods, combustion byproducts recycling, new & improved beneficial uses and impact thereof, clean coal combustion technologies, air pollution control technologies. DOE's EIA has provided a wealth of information, as has ASTSWMO.
- EPA Industrial D guidance effort is currently in draft form. Working with the States through ASTSWMO, EPA expects to finalize the guidance by next April. EPA's regulatory development for CCW is to remain compatible and consistent with this guidance.

<u>OSM Presentation</u> (Kimery Vories, OSM MCRCC)

OSM's concerns are with SMCRA regulated mine sites.

OSM described some of its CCW initiatives:

- Continuing technical outreach forums
- A CCW information network website
- Combustion Products Recycling Consortium (OSM and IMCC are members)
- Cooperative efforts with DOE in technical development
- Participation in an interagency advisory group to EPA as part of the regulatory determination
- Joint EPA-OSM fact finding efforts on mine placement
- Technical assistance to ASTM (In response to a question, OSM noted that the ASTM effort is primarily concerned with testing methods appropriate to use)

The questions at hand are:
- Are additional federal regulations on mine placement needed?
- If not, why not?
- If so, what is the appropriate vehicle (RCRA, SMCRA)?

From OSM's perspective, EPA's logic regarding mine placement is as follows:
- CCW generates toxic leachate at utilities approximately 2% of the time
- Toxic leachate at mines is equally likely
- SMCRA monitoring is inadequate
- SMCRA bond length is inadequate

OSM's position, however, is as follows:
- OSM is unaware of any scientific data showing that toxicity has occurred at mine sites
- Mine placement has been beneficial
- SMCRA controls are adequate
- There are significant differences between mine sites and utility sites (including geography, geology, ground water, CCW type, reclamation required, regulations applied)

OSM also notes that:
- CCW use at mine sites is primarily fludized bed combustion waste (FBCs), with a smaller percentage of non-FBCs
- 17 of 26 SMCRA States have placed CCWs at mine sites
- Additional federal regulation discourages reuse
- Under 30 CFR 800.13(a)(1), SMCRA bond release is triggered by performance, not time
- SMCRA includes performance standards at 30 CFR 816.41
- SMCRA includes permit requirements at 30 CFR 780.12

OSM concludes that:
- Do we know everything we need to on potential environmental effects? No
- Do we need more research? Yes

If additional Federal regulations are to be proposed the following questions must be answered:
- What is the problem?
- Where is the science?

Illinois Presentation (Dan Wheeler, Illinois Department of Natural Resources, Office of Mines and Minerals; Larry Crislip, Illinois Environmental Protection Agency, Mine Pollution Program)

- IL uses a unique approach that covers CCW at mine sites whether disposed or used beneficially. The program is a joint venture between IOMM and IEPA which has been in place approximately 10 years.
- IL has 12 disposal permits, 8 of which are active, with a total quantity of 1 million tons per year.
- Regulated as disposal if CCW quantity exceeds 35% of coal extracted.
- IL has approved 9 beneficial use projects.
- There are no known surface or ground-water quality problems.
- The program is implemented through Memorandum 90-5, Memorandum 92-11, and Memoranda 95-8 and 95-9, and Section 620.
- Later in the forum, there was a question about the enforceability of IL's memorandum-based program. The State responded that 90% of the program is backed by the Illinois Environmental Protection Act, and the other 10% by SMCRA, so the program is enforceable.

- A 1994 amendment to Section 620 defines CCW as coal combustion byproduct (CCB) when beneficially used.
- Characterization for CCBs uses ASTM, rather than TCLP, testing methods.
- Beneficial use of CCBs must meet the following conditions:
  - No mixing with hazardous waste.
  - Leachate cannot exceed GW standards using ASTM testing.
  - Notification, documentation of quantity, and certification of compliance.
  - Dust control required.
  - No speculative accumulation
- Some uses have no specific regulatory conditions – these can receive written approval as a beneficial use from IEPA in cooperation with other State agencies.
- For use, there are no additional requirements beyond SMCRA.
- Abandoned Mine Lands sites are exempt from the above programs.
- The presenters could not address issues related to CCW placement in non-coal mines.

- For disposal, CCW is specifically defined as coal combustion waste and the permitting guidelines incorporate four provisions:
  - Demonstration of vegetative cover (identical to SMCRA),
  - protection from wind and water erosion,
  - maintain pH and waste characterization (TCLP) to prevent leaching (critical element),
  - surface and ground-water protection through containment (also critical element).
- The permitting process for disposal requires joint submittal to IOMM and IEPA. Projects must meet the requirements of SMCRA, Section 620, and the IL Env Protection Act (which has the definitions and four main provisions written in). Separate permits are issued, but they are reviewed in joint application process. A joint guidance document implements requirements.
- Disposal of CCW requires ground-water monitoring for more parameters than SMCRA. Design of program is based on evaluation of site-specific conditions and leachate characterization.
- Ground-water standards are applied and there are corrective action requirements.
- IL has the authority to require liners for disposal in certain ground-water classes. In-situ fire clay can meet the liner requirement.

Indiana Presentation (Bruce Stevens, Indiana Department of Natural Resources, Division of Reclamation)

- IN has 18 permits. 16 have been appealed and 2 are final. Total placement is 2.9 million tons. No regulatory distinction concerning beneficial use. No statutory authority to permit FBC use.
- The most recent element of the program is a guidance document. IN considers it an enforceable document because most of the document is incorporated in permit conditions.
- The program incorporates:
  - Cap requirements
  - Ground-water monitoring for 30+ parameters
  - Waste characterization using ASTM
- The program does not require ground-water modeling, but there are certain hydrogeologic conditions under which disposal is not permitted (e.g., alluvial aquifers).
- Acid mine drainage is not a problem in IN (alkaline overburden).
- CCW projects constitute a significant revision under SMCRA, and therefore require public announcement and provide for appeal
- IN has specific definitions for backfills and monofills
- Requiring liners and placement above the water table are the biggest most issues. IN can require a liner, but generally does not allow disposal in conditions that would warrant a liner. In-situ fire clay serves well as a liner.
- While CCW is not deposited into ground water, facilities generally re-hydrate over time such that the water table rises into the CCW.
- Preplacement conditions are such that placement of CCW does not result in degradation. A survey of 29,000 water supplies showed that there is no use of spoil water as a drinking water resource in IN and there is significant attenuation.
- The biggest environmental justice issue is in Southwest IN, where most mines are located.
- IDEM has not yet promulgated ground-water standards. NPDES provisions apply.
- There is no CCW volume restriction in Memorandum 92-1. Volume restrictions can be incorporated on a site-specific basis. This has been done at only one site. IN's proposed new requirements incorporate a volume restriction: 50% of the quantity of coal removed.
- Ground-water monitoring wells are constructed to collect from multiple strata, unless there is a single zone drinking water use, in which case zone-specific monitoring would be required.
- Bond release provisions are the same as SMCRA. IDNR proposed more stringent requirements, but these were found to go beyond the Department's authority (under State statutes, IN cannot regulate more stringently than SMCRA).
- There is a State fund to replace water supply wells if contamination occurs after bond release. This fund has not been used yet.
- The first instance of disposal in IN was an illegal operation. EP tox was required at that site for characterization.
- IN has provisions for structural fill projects.

- IN has post-closure authority for 30 years for landfills. SMCRA bond release usually occurs in 5 to 13 years following closure.

Missouri Presentation (Bruce Waltrip, Missouri Department of Natural Resources, Solid Waste Program; Brian Hicks, Missouri Department of Natural Resources, Land Reclamation Program)

- In MO, CCW is regulated as a solid waste.
- There are 5 coal ash landfills in MO. All have monitoring. Probably all have clay liners, at least one has membrane. Liners are required for new landfills.
- Under the solid waste program, there are specific regulatory exemptions for a number of beneficial uses. Other uses fall under the State's Section 9(b) generic exemption. Requirements under this generic exemption are mostly logistical, but the exemption does incorporate some testing.
- For beneficial use, hydrogeologic characterization is required that proves placement is above seasonal high water mark. Because this process requires a certified hydrogeologist, it effectively limits beneficial use to users with resources (larger companies).
- If placement is covered by an engineered clay cap, the only characterization requirement is to show the CCW is non-hazardous using TCLP. If there is any potential for ground-water contact or no cap, ASTM characterization is required.
- The solid waste program has no monitoring requirements, closure requirements, or financial assurance requirements. The land reclamation program does have such requirements.
- There are no volume restrictions, other than a 2 foot limit on structural fills.
- There is no sand or gravel pit placement in MO, although clay pit reclamation with CCW has occurred.

- Under the land reclamation program, MO has two laws: one for coal mines, one for industrial minerals mines.
- If there is a beneficial use exemption from the solid waste program, the land reclamation program regulates by incorporating it under mining permit.
- The land reclamation program requires:
  - A surface water monitoring plan
  - Hydrologic balance requirements
  - Bonding
  - Annual ground-water monitoring for 16 parameters.
  - An annual report showing placement locations and volume of materials.
- One coal mine currently has a beneficial use exemption.
- Bond release requires analysis of monitoring data to determine if there has been impact.

- In MO, fly ash slurries that are injected are exempt from solid waste regulations and are regulated by the underground injection control program (water office).
- There are specific exemptions for CCW when beneficially use as road base, soil stabilization or amendment (limited to 6 inches), and for stabilizing underground mines (limited to 2 feet).

Pennsylvania Presentation (Michael Menghini, Pennsylvania Department of Environmental Protection, District Mining Operations; Bill Pounds, Pennsylvania Department of Environmental Protection/ASTSWMO)

- PA has had a regulatory program since 1973, a beneficial use policy since 1986, and an ash certification program since 1997. Ash disposal is handled via an MOU between the mining and solid waste divisions of DEP.
- PA has 100+ placement projects; significant mine acreage is reclaimed annually.
- PA receives CCW from out of state (CT, NY, NJ) for abandoned mine lands remediation.
- Total placement is 7-8 million tons per year, 75% of which is FBC.
- For an active mine, CCW quantity cannot exceed the quantity of coal removed; otherwise, regulated as disposal. For inactive mines, DEP decides how much CCW can be placed for reclamation.
- 95% of placement is in pre-SMCRA sites (non-virgin) related to remining operations or reclamation areas.
- Placement methods vary. Many are monofills. Ash also is used as alkaline addition as part of remining operations to address acid mine drainage. Most placement continues for an extended period of time, i.e, some sites are over 10 years old and some of those sites still have another 10 years of placement area.
- The Bureau of Mining and Reclamation enforces the Land Recycling Program's regulations under a Memorandum or Agreement.
- All project types except for soil additive require public notice.
- PA requires:
  - A permit
  - An approved ground-water monitoring plan
  - Monitoring before and after placement
  - All ash must meet minimum pH and leaching limits to be approved for placement under the terms of any permit
  - Placement 8 feet above the regional ground-water table
  - A 4 foot soil cap at closure
  - Annual sampling for 16 parameters; quarterly sampling for indicators
  - Twice-yearly ash characterization
  - Compaction analysis is required for monofill ash placement (to eliminate infiltration and leaching)
  - Optimal moisture content to ensure compaction and minimize fugitive dust.
- Receipt of CCW from new sources does not require public notice in newspaper, but approval of new sources is appealable. Public notice is required for any disposal.
- Bond release is in three stages: (1) *pre-vegetative cover*: requires examination of ground-water impact; (2) *70% vegetative cover complete:* requires examination of ground-water impact, but further monitoring can be eliminated at this point; (3) *final release*.
- FGD sludge is not covered under the ash regulations, but general permitting exemption program can be used to incorporate this material in Land Reclamation Permits.
- PA has corrective action authority for mine placement of CCW.

- PA has several current demonstration projects (e.g., placement in water filled pit; wet to dry placement) to examine new disposal methods. PA is trying to find methods that can safely be used to remediate safety hazard sites that are within the regional ground-water table.

- A major concern is dealing with different types of ash. FBC sets up well, while bituminous ash creates fugitive dust concerns.
- PA has provided some upgradient monitoring waivers due to historical mining impacts.
- PA has 12+ years of data, with no evidence of degradation. This ground-water database is available.
- PA has faced a number of issues that other States seem to be concerned with right now.

- One reason there is not more use of power company CCWs in PA is that the companies have already sunk the costs for the disposal facility. Disposal in an existing solid waste management unit is cheaper than transportation to a mine site.
- Deep mine injection is under a different program in PA — combination of mining, solid waste, and water regulatory program.

- PA regulations allow utilization of CCW in non-coal mines, but little has happened yet. Under a demonstration projection, CCW was placed in a limestone quarry and monitored for ten years. The State has denied subsequent permit applications for placing ash in quarries.
- PA has 25 years of monitoring data. This shows that sulfates and chlorides go up, but there are few metals exceedences. This is true even at limestone quarry demonstration site in PA.

<u>Ohio Presentation</u> (Bob Baker, Ohio Department of Natural Resources, Division of Mineral Resource Management)

- OH's mining program just began regulating beneficial uses (not disposal) under a law passed in 1999. This includes CCW placement in mines. The program's guidelines are still in draft.
- The guidelines include:
  - Ground-water monitoring
  - Acid-base accounting
  - Ground-water standards
  - Leaching tests for waste characterization with maximum acceptable concentrations 30x drinking water standards
  - pH limits for acid mine drainage projects
  - Hydraulic conductivity limits
  - Background ground-water sampling
  - Placement 8 feet above regional ground-water table, unless it is demonstrated that this is not needed
  - Location restrictions with respect to streams, wetlands, drinking water sources, occupations
  - Limits for boron, or a requirement for cover, for soil additive applications
  - Public notice as in the normal coal mining permit
  - Coordination with other agencies
- The guidelines will be used only as a reference for abandoned mine lands projects.
- 4 projects have been accepted. One was rejected because the volume constituted disposal. In addition, this project proposed to use CCW from an out of state source.

- Some of the limitations incorporated in the guidelines are based on OH's experience. For example:

  - The Broken Arrow project: An acid mine drainage abatement project under the abandoned mine lands program that incorporated sealing an underground mine with FGD. The project found a 97% pollutant reduction. Available as a University of Ohio study.
  - Rehobeth: This project involved a gob pile and drainage abatement. This project tested several applications: FGD 2' cap for coal refuse, buffer material of FGD/coal waste mixed, and FGD/yard waste/spoil mixed. Boron problems arose, resulting in degradation of vegetative cover. Coal refuse overwhelmed alkalinity, mobilized boron. Also, the project tested a CCW liner system for a pond with no problems observed.
  - Fleming project: A PFBC project with 6 years of monitoring. High boron, but no impact on vegetation. Available as EPRI study.

- OH would like comments on its draft mine placement program.

West Virginia Presentation (Harold "Rocky" Parsons, West Virginia Department of Environmental Protection, Office of Mining and Reclamation)

- WV's first policy was developed in the 1980s. The current policy was issued in 1998.
- The policy covers beneficial uses, maximum volume limit is 8:1 ratio.
- CCW use was initially treated as a significant modification to the SMCRA permit (meaning public comment and more stringent review). As WV has become more comfortable with the practice, CCB use has become treated as a minor modification, and some uses are pre-approved (notification only).
- The program incorporates:
  - Waste characteristic limits
  - Maps and geologic information as part of the permit application
  - Waste characterization when the CCW source changes. Companies using the same source are allowed to share information.
  - Preplacement water quality monitoring
  - Specific formulas for alkaline amendment.
- The ground-water program is tied to the SMCRA program and details are determined on a site-specific basis.
- Disposal of CCW at a mine would be covered under the solid waste program.

- WV has observed that as long as a site is alkaline, there are no metal leaching problems.
- Alkaline addition is a significant use in WV, particularly with regard to remining operations because of the presence of acid mine drainage. Encapsulation also. Other uses include capping refuse piles; lining pits; and backstoing deep mines for subsidence control.
- WV would like to see acid-base accounting procedures updated.
- WV has observed some stability problems with scrubber sludge, and does not consider this an acceptable cap material on steep slopes. Also, some ash does not make a good soil amendment; significant amounts of alkaline ash are used to counteract acid mine drainage.
- WV has 3 FBC facilities. WV will not issue a permit to mine sites with marginally acidic overburden without an alkaline amendment and best material for that is FBC. Also, WV allows substituting 1' of FBC for 2' of soil in encapsulation. The result is a lot of FBC material beneficially used. The only use of scrubber sludge is out of state in Maryland.
- A small limestone quarry accepts CCW under a solid waste permit.

- A UIC permit is required for injection of wastes into underground mines.

Maryland Presentation (Connie Lyons, Maryland Department of the Environment, Mining Program)

- MD regulates CCW mine placement by policy only. The solid waste program signs off on the mining program's policy.
- Pozzolan definition in MD's law allows an exception for FBC ashes.
- The policy requires:
  - Maintaining documentation as part of the SMCRA permit program
  - TCLP testing of materials, with additional characterization for soil amendment uses
  - A CCW disposal plan
  - Description of dust controls and methods for mitigation of any potential ground-water, surface water, or worker safety hazards.

- MD's is a small program. There is only one major mine, with no large utilities near the mining region, except one FBC plant.
- There are two non-coal mines using CCW. These projects incorporate a 100' buffer, ground-water monitoring on-site, and characterization every 3 months. The results so far are that the only problem is higher levels of SO4 in a well near fill area.
- MD has one remining permit using FBC ash.
- The Kempton mine is using CCW as grout to seal off manshaft to keep clean ground water from being lost to deep mine.
- Mettiki mine uses scrubber sludge from West Virginia for alkaline addition. pH has gone from 3 to 6. They have observed no increase in metals, some sulfate increase. Primary interest is in alkaline addition benefits.

- MD has an active research program. Examples include:
  - A culm/ash/overburden mixture leach testing study (study published in 1995)
  - A grout demonstration project (Winding Ridge) with mixed results (report available)
  - TCLP tests on Warrior Run power plant CCW

Louisiana Presentation (Tony Duplechin, Louisiana Department of Natural Resources)

- LA's is a new program. The issue of mine placement of CCW just came up in the last week in LA.

- LA has four power plants and only one uses local coal. CCW from this plant is disposed on site.
- Recently, LA was approached for use of CCW (pH 8.76) as a soil amendment. The solid waste and agriculture programs have already approved the project.

Colorado Presentation (Mike Long, Colorado Department of Natural Resources, Division of Minerals and Geology)

- In CO, CCW placement projects require a certificate of designation from county government.
- The solid waste program also could apply standards, but has thus far deferred to mining program.
- CO's mining program has a SMCRA program for coal mines and a non-coal mining program. Many of the coal mining site requirements also apply to non-coal mines, except for inspection frequency.
- CO finds the baseline SMCRA requirements sufficient to characterize a project for CCW application. There are no pre-established criteria for accepting and rejecting projects; requirements are determined on a site-specific basis.

- Two mines (Keensburg, Trapper) in CO currently dispose of CCW. One more is closed.
- Requirements, as incorporated for these two projects, include:
  - Minimum 12 months background monitoring
  - Geologic background data
  - No disposal in flood plain
  - Public notice as part of certificate of designation and SMCRA program, public involvement required, and citizen suits are possible
  - TCLP at one of the two mines
  - Clay liner required at Keensburg
  - Site-specific cover requirements
  - Zero degradation standards for ground water
  - NPDES permits
  - All placement is above the ground-water table
  - Long-term baseline ground-water and surface water monitoring
  - Volume restrictions determined on a site-specific basis
  - Closure requirements are the same as for all coal mines, 10 year minimum. There are revegetation criteria, ground-water criteria, and surface water criteria for bond release. There are no subsequent use restrictions
  - Annual hydrology reports and reclamation reports
  - Inspection at least once a month
  - Quarterly ground-water monitoring for all parameters, monthly for indicators

- The mining program maintains a close working relationship with DOH.
- No enforcement issues have been observed to date.

- CO has denied two permits for CCW placement in gravel pits.
- CO has since approved one project for a gravel pit. The CCW failed TCLP, but passed SPLP (similar to ground water that would be encountered). Disposal at this site is below the water table. Contact with ground water at this site is expected to keep the CCW in a chemically reduced state, thus preventing leaching of contaminants. The project was approved by Dept of Public Health and Environment. This ground water is a drinking water source.

New York Presentation (Steven Potter, New York State Department of Environmental Conservation)

- NY has no coal mines, but generates large quantities of CCW.
- CCW is regulated jointly by the Division of Solid Waste and the Division of Mineral Resources.
- The type of CCW dictates the standards applied. Bottom ash has performance standards; fly ash has operating standards.
- There are three types of permits applicable:
  - Disposal permit for landfills (NY provided a list of landfills receiving CCW)
  - RD&D permit for innovative technologies or processes. These permits are performance standard-based and apply for 1 year with renewal for up to 3 years.
  - Beneficial use determinations
- Mine placement currently falls under the RD&D permit.

- NY has one specific RD&D project involving CCW placement mixed with foundry sand as flowable fill in a 40 acre quarry.
- The permit for this project was issued one year ago.
- There are no pre-established requirements; these are site-specific in permit. In this case, they include:
  - No surface water in fill
  - Complete hydrogeologic characterization (this was already done under the mine permit)
  - Grab samples from each truck (TCLP, SPLP)
  - Fill samples
  - Dust controls
  - Ground-water samples quarterly on- and off-site for total metals and routine field parameters.
  - Must meet State ground-water standards
  - Cover requirements
  - Post-closure for 30 years including ground-water monitoring at reduced frequency, cover maintenance, annual report, financial assurance.

- NY plans to review this project for future approval as a beneficial use determination, but is awaiting EPA's rulemaking to determine the proper approach.
- Monitoring and inspection data are available for this project.

<u>South Carolina Presentation</u> (Art Braswell, South Carolina Department of Health and Environmental Control)

- In SC, solid waste and mining are the same division.
- SC has no coal mines and, thus, mine placement is limited to non-coal mines.
- SC currently is reviewing an application for CCW disposal in a rock quarry.
- SC has no beneficial use/re-use program for these materials. Therefore, the mine reclamation permit will regulate the project as if it were a solid waste landfill.
- For solid waste landfills, waste characterization, using TCLP or equivalent, is required every five years or when the waste changes.
- Characterization data are compared to MCLs to determine the class of the landfill. CCW usually falls into Class I (<10x MCL) industrial landfill. Class I requirements incorporate:
  - Location restrictions
  - 2' or 5' separation from ground water, 2' from bedrock

  - Run-on/off controls
  - GW monitoring with a compliance boundary 500 feet from waste boundary
  - Corrective action
  - Closure requirements, including cover
  - A post-closure period of 30 years, which can be reduced if warranted
  - Financial assurance
  - Public notice
- In SC, construction uses would be assessed on a case-by-case basis. SC has no rules for flowable fill.

<u>DOE Presentation</u> (Lynn Brickett, US DOE, NETL)

- DOE's NETL conducts research on CCW environmental issues generally, as well as specific research on clean coal technologies and their impact on CCW marketability.
- DOE's goal is ensuring that any regulation of CCW are based on sound science.
- DOE would like to provide their data to inform the rulemaking process.

<u>USGS Presentation</u> (Rustu Kalyoncu, USGS, Minerals Information Team)

- The presenter from USGS represents a remaining section of US Bureau of Mines which was transferred to USGS. They are part of a group entitled the Minerals Information Team.
- The group produces statistical surveys of CCW as part of Mineral Commodities Yearbook, CCW annual reports, and other publications.
- They receive many questions about legal issues surrounding use of CCW.
- The group also has a research division.

<u>Illinois Commerce Department Presentation</u> (Ron Carty, Illinois Department of Commerce and Community Affairs, Illinois Clean Coal Institute)

- The Department has done considerable research on clean coal technology and on beneficial uses. This research can be examined at their website: icci.org.

Programs in Other States

A number of States did not make formal presentations, but provided valuable information about their programs during discussions. This information is presented here.

- Texas:
  - TX doesn't exercise SMCRA jurisdiction over "disposal" areas at mines; this practice is regulated under the State solid waste authority.
  - There is a basic decision about what is a solid waste, what is a product.
  - TX has constituent criteria for classifying non-hazardous waste. "Inert" material exits the State solid waste regulatory system.
  - Materials that are beneficially used also exit the State solid waste regulatory system.
  - Bond release conditions are based on proposed land use.
  - In TX there are 2 or 3 active mines with ash disposal regulated by the solid waste agency. Some of these projects are below the water table.
  - There are six beneficial reuse sites, all utilizing bottom ash.
  - TX has a no degradation policy for ground water.
  - TX has ground-water transport models for mines
  - If placement delays contemporaneous reclamation, it is regulated as disposal

- Wyoming:
  - Concerned about possible long-term ground-water impacts.
  - The WY legislature recently moved the regulatory authority for mine disposal from the solid waste agency to the mining agency. Is CCW placement disposal (regulated) or beneficial use (not regulated)?
  - The mining agency has little experience in this area, but has begun developing rules for non-coal mining waste (e.g., CCW), including mine-mouth power plant ash.
  - WY has 2 mine-mouth power plants sending CCW back to the mine.

- New Mexico: According to OSM-West, NM completely exempts CCW from regulation.

- Kentucky:
  - KY regulations discourage mine operators from using mine sites as monofills.
  - CCW haul-back cannot exceed the thickness of the coal seam extracted.
  - KY has no mechanism to correct problems after bond release (e.g., water quality) other than landowner liability through water program.

- Oklahoma:
  - Proposed CCW disposal regulations recently.
  - Expect to finalize in August 2001.

- Navajo Nation: Just beginning to address regulation of CCW placement/disposal.

- Utah:
  - UT has 5 power plants with ash going to solid waste facilities.
  - There is one co-generation facility that might eventually go to mine placement, but there is no mine placement at this time.
  - UT expects that mine placement could be proposed in the future. If CCW were hauled to a mine site, the State would probably want to regulate it as disposal.

Part II: Discussion

For ease of presentation, this section is organized by topic, rather than chronologically.

Closure Requirements for Landfills versus those for Mine Placement (i.e., 30 years post-closure under solid waste authorities for landfills; 10 to 12 years bonding for mine placement under SMCRA)

- PA: landfills are large-volume, monolithic facilities with engineered controls that must be maintained long-term. Mine placement projects have limitations on characteristics of the CCW that is placed and the quantity of CCW is limited to that sufficient to reclaim the mine.

- OSM: SMCRA bond release is performance-based – all permit conditions must be satisfied. Phase 1 bond release occurs only after untreated discharges meet NPDES limits.

- TX: if there is a disposal area at the mine, the bond release process doesn't consider that, only results of mining and reclamation.

Monitoring Well Location

- IL: well location requirements for mine placement projects in IL are very stringent (25 to 50 feet from the CCW placement area).

- IN: well placement depends on site-specific conditions. The preference is for unmined strata as close as possible to waste. The State seeks to avoid wells in spoil because water impact could be masked.

- PA: in certain areas (anthracite, extensively mined areas), wells may be as far away as a mile (using existing seeps/overflows). Mainly, locations are decided on a case-by-case basis. Often, the State does not require upgradient monitoring because of pre-existing contamination. Mine conditions are such that close-in monitoring wells wouldn't work (dry holes).

Prohibition on Placement in Water Table

- IL: allows placement in the water table because the State has stringent monitoring and characteristic limitations. IL has detected no adverse impacts since filling began in the 1980s.

- PA: State's regulations prohibit placement within 8 feet of water table. But PA does have demonstration projects, because water-filled pits need to be filled. No cases of mine placement in PA are for disposal only; rather, all are for some kind of beneficial use (reclamation, acid mine drainage remediation, etc.).

- IN: allows placement in the water table because ground water at the sites is not pristine and because of CCW characteristic limits. Requiring disposal above the ground-water table would be impractical because of the fluctuating water table. All placement in IN is below the post-mining water table. It takes 5 years to decades for spoil/aquifer to recharge following mining.

- TX allows placement below the water table because it has non-degradation policy for ground water.

Defining Disposal versus Reclamation/Beneficial Use

- PA: In PA, the only cases where placement goes beyond reclamation are overfill sites. In these cases, PA requires a structural fill permit.

- KY: fill volume may not be greater than the thickness of the coal seam.

- IN: policy is 50% of the volume of coal removed.

- TX: under SMCRA, if placement disrupts or slows down reclamation process, then it's disposal. If CCW replaces a construction material, it should be in like quantities.

- IL: Placement of CCW greater than 35% of coal sales is disposal; beneficial use is restricted to a reasonable volume (i.e., the volume needed to accomplish the use). Also, the State uses the SMCRA timetable.

- PA: for reclamation at active mines:
  - the volume of CCW cannot exceed the volume of coal and culm removed, unless more is necessary for reclamation (or to eliminate a safety and health hazard).
  - areas of the site may not be left open for disposal.
  - placement may not delay reclamation.
  - there may not be leftover spoil piles.

  For abandoned sites:
  - placement must be designed to prevent water quality degradation, treat drainage, etc.
  - the maximum volume is determined by the district mining office on a case-by-case basis.

- OH: the determination must be made, but there are no specific criteria to define "beneficial use." The mining agency regulates "beneficial use," not "disposal." The solid waste agency regulates disposal. An example of close call: a capping project proposed to use an excessive thickness of CCW, so mining rejected it as a beneficial use. The operator chose not to proceed under regulation by the solid waste agency.

- EPA: in EPA's regulatory determination, there is no definition or decision criterion on what EPA considers "beneficial use." Note that EPA exempted all beneficial uses other than mine placement. Mine placement covers the full spectrum of CCW activities at mines from remediation/reclamation to disposal.

Contentiousness of Permit Issuance

- PA: one contentious permit. Most of the non-mine reclamation beneficial uses have presented no problems. One reopening of a closed disposal site was a problem because of new housing development surrounding the site.

- IN: 16 of 18 permits have been appealed.

Use of Pre-placement Site Characterization and Assessment Data

Case examples of rejection on this basis:

- WV: A company wanted to mix Class F with really nasty refuse. WV asked for small scale field test. The results were worse than without ash placement, so the State rejected the project. Lesson: If in doubt, small scale field tests can be very helpful/informative.

- IL: sites with high potential for ground-water contamination due to geologic setting are defined and known. Proposals for waste disposal at these sites are evaluated carefully. Liners, additional wells, and additional monitoring may be required. An example is a southwestern site where vegetative rooting depth was such that the State required additional cap depth.

- SC: for the mine placement project at a rock quarry, it is difficult to define the top of the water table. SC is going to require interceptor wells/drain system to lower the ground-water table to keep it below bottom of fly ash disposal area. They are currently studying the engineering of that system.

- IN: there have been a few cases of rejection due to the waste characterization screening criteria (1/4 RCRA metals levels, 18 hr and 30 day leach tests). Also, there was a permit application (Pride Mine) in an area of an alluvial sand and gravel aquifer with a lack of attenuative material. The State required the project to stay out of that lowland area.

- PA: in two cases, applications were revised to add fill material to add safety factor on sites with fluctuating water table. Another site required a membrane to prevent infiltration in area where there was conveyance across disposal area. The State withdrew approval for a site that was already reclaimed with no basic safety problem. At a scrubber sludge general permit site, the operator changed source to one that did not meet totals requirements. The site was shut down for several months.

How do States arrive at a level of comfort with a proposed operation?

- IL: experience with use of this material. The State evaluates the best available information on potential impact and characteristics early in permit process. Pre-placement information counts a lot (6 months of background monitoring, data on water quality, ash quality, placement design). Ash sources that are well known add to the comfort level. In addition, the existence of corrective action authority via the solid waste statute is important. IL requires close-in monitoring wells and quarterly monitoring during operation. Back-end corrective action is important in case the project is not executed according to plan.

- IN: SMCRA is preventative in nature. The State's program relies on background information in the mining permit application in addition to that in the CCW placement application. The presence of underclays is very important. The placement of overburden materials provides attenuation. A Cumulative Hydrologic Impact Assessment is required.

- WV: for new sources or new uses, WV encourages a small scale, pre-placement demonstration. The State also requires appropriate characterization of sources (not TCLP). There is a need to improve on TCLP (perhaps using something like sulfuric acid) and on acid-base accounting methods.

Damage Case Identification

Case examples of damage cases or procedural problems and how they were detected and resolved:

- OH: Problem with vegetative cover toxicity attributable to boron at scrubber sludge/spoil land cover site (see OH presentation). Lab tests had indicated there would be no problem. However, it didn't work in the field (vegetation kill).

- IL: two corrective actions have been associated with pre-law conditions and were not related to CCW placement.

New Characterization Methods

- Several States expressed desire for improved test over the TCLP.

- EPA is examining new characterization methods. This may be a multi-year process.

- DOE is working on validation of tests vs field data. In practice, as many of 160 different tests have been applied. The idea is to tailor a test to be representative for the application. A rhetorical question is how do you handle the transition to a new test?

Suggestions, Additions, and Revisions to Existing Requirements

To encourage more candid discussion, EPA and IMCC agreed not to show attribution of comments during this part of the discussion. A key question for this part of the discussion was: What does any EPA rule need to address in light of SMCRA regulations and your State's existing regulatory programs (mining and solid waste)?

- The current regulatory environment is similar to that when EPA first started studying Industrial D waste – States already had programs, so guidance was appropriate. If EPA has to promulgate a regulation in this case, the Agency should not start from scratch. Approaches might include a performance standard, minimum standards, and best management practices.

- Mine placement is really a disposal activity that may happen to coincide with reclamation. SMCRA is not a solid waste regulation. SMCRA is sufficient to control placement that coincides with reclamation. But disposal needs to be regulated under solid waste authority.

- The driving force for regional differences in approach (at least under SMCRA) may be the presence or absence of acid-forming materials. Appropriate differences may be site-specific.

- SMCRA is designed to allow flexibility to deal with regional and State-specific differences. Performance standards lend flexibility. Design standards cannot account for regional differences.

- OSM rules under SMCRA are not specific to CCW. One State would like a federal OSM rule specific to CCW. This would make it easier to promulgate regulations.

- It seems that some States lack authority under SMCRA to do things they need to do. Under State statutes, some States cannot regulate more stringently than SMCRA.

- Concerns are with volume restrictions, closure, liners, monitoring (specifically ground-water monitoring), corrective action after bond release, testing/characterization methods, clear direction on environmental justice.

- Characterization testing methods are an area of concern. Several States would like to see development of an appropriate leaching test method, maybe one specific to CCW and better than TCLP.

- Several States would like to have some mechanism to address potential environmental problems that may arise after SMCRA bond release. One State specifically suggested a fund/financial assurance instrument to cover issues that might arise after bond release – in interest of making peace with the public, not because the commenter State is concerned that major problems might arise.

- Intrastate coordination: mining people need to coordinate with their solid waste counterparts on mine placement of CCW.

- OSM/EPA coordination is a concern.

- Defining beneficial use versus disposal: should there be some consideration of the nature of the waste material? Are there some mine site activities that deserve some special consideration because they are similar to exempt beneficial uses?

- Any approach should provide for flexibility/discretion – no “one size” fits all.

- Deed notation regarding placement.

- Better assessment of how to allow or allocate potential haulback capacities among permits.

- Site investigations under some State’s programs are similar to Subtitle D solid waste investigations. These processes could utilize more information from the mine permit program.

- Important to have placement procedure/plan explicitly described so inspectors can tell over time whether placement is being done properly. More planning and reporting of placement process/practice.

- Could use more resources for inspection and enforcement – both to keep things in line and to learn.

- No regulatory framework in some States for placement in non-coal mines (industrial mineral mines) – cannot require ground-water or surface water monitoring. These could be more problematic because they are monofills.

- Structural fill (non-mine) situations generally don't require monitoring in some States. General permits valid State-wide don't incorporate public involvement for each project.

- Update acid-base accounting.

- Define disposal versus beneficial use. States with newly developing programs are concerned that mine operators will want to call all mine placement "beneficial use" to avoid regulation. One State requested clarification of what practices OSM considers reclamation or use.

- Environmental justice: States need clear direction.

- If mine ground water is already degraded, how can we identify ash impact, if any? Some suggestions were to look at parameters indicative of CCW (chlorides, molybdenum, potassium, boron) or establish performance standards that look at water quality improvement.

- There was some disagreement among States and within OSM as to whether SMCRA and current SMCRA regulations can/should handle mine placement.

- Suggestions for guidance on sound environmental practices

- Economic incentives, level playing field among States.

- How to regulate CCW where other materials (tires, papermill sludges, etc.) are co-fired with coal?

<u>Miscellaneous Questions and Answers</u>

Question (TX): Is EPA open to considering a level of contaminants where regulation is less stringent?

Answer (EPA): No, because problems could occur regardless of the level of constituents of concern in the wastes, depending on how they are placed.

Question (DOE): Does EPA have the authority to promulgate regulations under Subtitle D, particularly for beneficial use?

Answer (EPA): Yes.

Comments: ASTSWMO requested additional clarification on this point in its comments on the regulatory determination. TX, also, would like clarification regarding industrial waste in general and beneficial uses.

Question (WY): What kinds of problems arose at sand and gravel operations to cause damages?
Answer (EPA): EPA will attach to the meeting notes a summary of EPA's sand/gravel pit damage cases; e.g., which constituents were problematic.

Question (DOE): Is additional national regulation a fait accompli?
Answer (EPA): The Agency has announced its intentions to issue Subtitle D regulations. However, the specific form of the regulation is fluid at this point (among the possibilities: guidance-type content, gap-filling, minimum criteria/aspects to consider for mine placement.) State programs are not static, i.e., they change and evolve with time. As such, EPA is developing an updated status summary of State programs re: mine placement. The results of this effort may affect the Agency's conclusions and direction in this area.

Part III: Next Steps

OSM

- OSM discussed specific OSM policy explaining how OSM views CCW placement and how SMCRA should apply to it.

- OSM has found no scientific evidence of problems with CCW placement, so there is no basis for rulemaking. OSM will continue technology transfer and research. If there was evidence of a problem, they would be concerned. But there isn't, so they are satisfied with State programs.

EPA

- Based on the presentations and discussion, it is apparent that no States prohibit mine placement and all States have some process for overseeing the practice (although a diversity in levels of oversight exists).

- Oversight is not necessarily formal in all States, but is moving in that direction.

- There is variation among States in their range of experience. States with mature programs don't have much desire for additional fundamental regulatory tools.

- There are individual technical issues and variation among States in approaches and allowances.

- EPA would like to continue with this process on the individual broad issues, either in a larger or smaller group format as decided by IMCC.

IMCC:

IMCC suggested several options:
- Another benchmarking forum focused on specific topics.
- A meeting to continue dialog: beneficial use v disposal, status of State programs, agency coordination intrastate and State/federal, regulatory approaches at the national level (yes/no).
- A meeting on information needs to support EPA rulemaking (assuming that is a fait accompli).

IMCC requested opinions on the following:
- Same or smaller group to continue this process?
- At what point do we include other stakeholders?

Reactions/Discussion

- States requested an opportunity to review EPA's State regulatory survey and information on what gaps (data or regulatory) EPA still thinks exist in State programs.

Conclusion

- Another meeting to discuss critical issues - July time frame.
  1st day: States only, probably
  2nd day: States plus federal agencies

- IMCC and EPA will distribute EPA's State regulatory analysis, notes of this meeting, and information on what gaps (data or regulatory) EPA still thinks exist in State programs a month ahead of next meeting.

- This will allow some time to see the impact of the new administration on EPA and OSM and the projected impact of the new national energy policy.

- For other stakeholders, IMCC will share meeting notes, but keep the next meeting closed to other stakeholders, because EPA-State issue development is still occurring.