

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

FOR THE MINNESOTA POLLUTION CONTROL AGENCY

In the Matter of the Proposed
Rules of the PCA Governing
Municipal Solid Waste Combustor
Ash Facility Permits, and Testing
and Disposal of Municipal Solid
Waste Combustor Ash, Minn. Rules,
Pts. 7001.0040 to 7035.2915.

REPORT OF THE
ADMINISTRATIVE LAW JUDGE

The above-entitled matter came on for hearing before Administrative Law Judge Phyllis A. Reha on August 5, 1991, at 9:00 a.m., resumed at 7:00 p.m., and again on August 6, 1991, at 9:00 a.m. in the Board Meeting Room of the Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road, St. Paul, Minnesota. The hearing was recessed and resumed on August 6, 1991, at 7:00 p.m. in the Third Floor City Council Room in the City Hall of Mankato, Minnesota. The hearing resumed in Mankato on August 7, 1991. The last part of the hearing was commenced at 9:00 a.m. in the Detroit Lakes City Council Chamber, 202 East Jackson Street, Detroit Lakes, Minnesota on August 12, 1991.

This Report is part of a rulemaking proceeding held pursuant to Minn. Stat. §§ 14.131 to 14.20, to hear public comment, to determine whether the MPCA has fulfilled all relevant substantive and procedural requirements of law applicable to the adoption of the rules, whether the proposed rules are needed and reasonable and whether or not modifications to the rules proposed by the MPCA after initial publication are impermissible, substantial changes.

Dwight S. Wagenius, Special Assistant Attorney General, Suite 200, 520 Lafayette Road, St. Paul, Minnesota 55155, appeared on behalf of the MPCA at all the hearings. The MPCA's hearing panel consisted of Carol Andrews, a registered professional engineer in the Program Development Section of the MPCA. John Ikeda, a supervisor for the MPCA was present at the hearings but did not act as a member of the hearing panel.

Twenty-nine persons attended the hearings in St. Paul. Twenty-one persons signed the hearing register. The hearing was reconvened in Mankato pursuant to the MPCA's Order for Hearing. Forty-five persons attended the Mankato hearings. Forty-one persons signed that hearing register. The scheduled meeting in Detroit Lakes was attended by twenty-six persons. Twenty-four persons signed the Detroit Lakes hearing register. The hearings were conducted in each location until all interested persons, groups or associations had an opportunity to be heard concerning the adoption of these rules.

The record remained open for the submission of written comments for twenty calendar days following the date of the Detroit Lakes hearing, to

September 3, 1991. Pursuant to Minn. Stat. § 14.15, subd. 1 (1988), three business days were allowed for the filing of responsive comments. At the close of business on September 6, 1991, the rulemaking record closed for all purposes. The Administrative Law Judge received written comments from interested persons during the comment period. The MPCA submitted written comments responding to matters discussed at the hearings and proposing further amendments to the rules.

The MPCA must wait at least five working days before the agency takes any final action on the rule(s); during that period, this Report must be made available to all interested persons upon request.

Pursuant to the provisions of Minn. Stat. § 14.15, subd. 3 and 4, this Report has been submitted to the Chief Administrative Law Judge for his approval. If the Chief Administrative Law Judge approves the adverse findings of this Report, he will advise the MPCA of actions which will correct the defects and the MPCA may not adopt the rule until the Chief Administrative Law Judge determines that the defects have been corrected. However, in those instances where the Chief Administrative Law Judge identifies defects which relate to the issues of need or reasonableness, the MPCA may either adopt the Chief Administrative Law Judge's suggested actions to cure the defects or, in the alternative, if the MPCA does not elect to adopt the suggested actions, it must submit the proposed rule to the Legislative Commission to Review Administrative Rules for the Commission's advice and comment.

If the MPCA elects to adopt the suggested actions of the Chief Administrative Law Judge and makes no other changes and the Chief Administrative Law Judge determines that the defects have been corrected, then the MPCA may proceed to adopt the rule and submit it to the Revisor of Statutes for a review of the form. If the MPCA makes changes in the rule other than those suggested by the Administrative Law Judge and Chief Administrative Law Judge, then it shall submit the rule, with the complete hearing record, to the Chief Administrative Law Judge for a review of the changes before adopting it and submitting it to the Revisor of Statutes.

When the MPCA files the rule with the Secretary of State, it shall give notice on the day of filing to all persons who requested that they be informed of the filing.

Based upon all the testimony, exhibits, and written comments, the Administrative Law Judge makes the following:

FINDINGS OF FACT

Procedural Requirements

1. On June 7, 1991, the MPCA filed the Statement of Need and Reasonableness (SONAR) with the Chief Administrative Law Judge.

2. On June 24, 1991, the MPCA filed the following documents with the Chief Administrative Law Judge:

- (a) a copy of the proposed rules certified by the Revisor of Statutes;

- (b) a copy of the Agency's Authorizing Resolution;
- (c) the proposed Order for Hearing;
- (d) the Notice of Hearing proposed to be issued;
- (e) an estimate of the number of persons who would attend the hearings; and,
- (f) a statement of what additional notice will be provided.

3. On June 24, 1991, a copy of the proposed rules and the notice of hearing were published at 15 State Register 2704.

4. On June 28, 1991, the MPCA mailed the Notice of Hearing to all persons and associations who had registered their names with the MPCA for the purpose of receiving such notice and those persons to whom additional discretionary notice was given.

5. On July 11, 1991, the MPCA filed the following documents with the Administrative Law Judge:

- (a) the Notice of Hearing as mailed;
- (b) a copy of the State Register containing the Notice of Hearing.
- (c) the Agency's certification that its mailing list was accurate and complete; and,
- (d) the Affidavit of Mailing the Notice to all persons on the MPCA's mailing list.
- (e) a copy of the Notice of Intent to Solicit Outside opinion with copies of all comments received from interested parties; and,
- (f) the Affidavit of Additional Discretionary Notice indicating that the Notice of Hearing was mailed to persons not on the Agency's mailing list.

Nature of the Proposed Rules and Statutory Authority.

6. Waste combustor ash is a material produced through the incineration of municipal solid waste and ash resulting from the combustion of refused derived fuel. This ash was treated for an interim period as a "special waste" pursuant to Minn. Stat. § 115A.97, subd. 4. Under the special waste category, ash was not treated as a hazardous waste, nor as municipal solid waste; but it had to be stored separately from mixed municipal solid waste with adequate controls to protect the environment. This treatment was required because waste combustor ash contains levels of lead, zinc, mercury, cadmium, and other toxic heavy metals. The levels of those heavy metals in ash sometimes approach or exceed the minimum level which would require its classification as a hazardous waste. Under Minn. Stat. § 115A.97, subd. 4(a), the interim period for which ash retained the classification of "special waste" was until rules were adopted pursuant to subdivision 3, or until June 30, 1991, whichever occurred earlier. Subdivision 3 requires the MPCA to adopt rules governing "at least the testing, management, and disposal of incinerator ash." Minn. Stat. § 115A.97, subd. 3. The proposed rules set standards for ash disposal facilities. The proposed rules also set requirements for testing ash and measuring pollution caused by ash disposal. The Administrative Law Judge concludes that the MPCA has general statutory authority to adopt these rules.

Small Business Considerations in Rulemaking.

7. Minn. Stat. § 14.115, subd. 2, provides that state agencies proposing rules affecting small businesses must consider methods for reducing adverse impact on those businesses. The proposed rules are unlikely to affect small businesses because incinerating municipal solid waste is ordinarily conducted by large facilities which do not meet the definition of "small businesses." The MPCA maintains that exempting small producers of ash is not appropriate due to the level of contaminants present in most ash. SONAR, Appendix XXV. Ash without contaminants may be exempted from the disposal requirements of the rules. *Id.* The testing requirements ease if some contaminants are not found in the ash after eight test periods. *Id.* The MPCA also maintains that excluding ash produced by small generators from these rules could render the ash subject to the hazardous waste disposal requirements, which are approximately ten times more expensive than the requirements of these proposed rules. Thus, including small businesses within the requirements of these proposed rules could reduce their costs of waste disposal. The MPCA has met the requirements of Minn. Stat. § 14.115, subd. 2 to consider methods of reducing the impact of the rules on small businesses.

Economic Impact.

8. In rulemaking, the MPCA is required to consider the impact of economic factors on the feasibility and practicality of the proposed rules. Minn. Stat. § 116.07, subd. 6. The MPCA introduced the results of a computer simulation (the Minnesota Economic and Demographic Forecasting and Simulation Model) as Exhibit 15. The MPCA has interpreted the results of that simulation to be that proposed rules will have a slight impact on the State's economy. SONAR, at 128. The Agency acknowledges that the rules will have a much greater impact on the economic sectors directly regulated by these rules. SONAR, at 129. The wastes to be managed under these rules are produced across the State, and the benefits derived from the rules accrue to the entire State through protection of air and water quality. Assessment of the economic impact of the rules by examination of the economy of the State as a whole is appropriate. The MPCA has met the requirements of Minn. Stat. § 116.07, subd. 6 by taking into consideration the economic impact of the proposed rules in its determination that the rules are feasible and prudent.

Fiscal Notice.

9. Minn. Stat. § 14.11, subd. 1, requires the preparation of a fiscal notice when the adoption of a rule will result in the expenditure of public funds in excess of \$100,000 per year by local public bodies. The notice must include an estimate of the total cost to local public bodies for a two-year period. In its Notice of Hearing, the MPCA estimated that the proposed rules could require the expenditure \$30,000 to \$990,000 per year by local governments which operate municipal solid waste combustors. According to the MPCA, the range of costs is created by the volume of ash produced, the composition of the ash, and the distance between the combustor and the disposal facility. The Agency has met the requirements of Minn. Stat. § 14.11, subd. 1 through its estimate published in the Notice of Hearing.

Impact on Agricultural Land.

10. Minn. Stat. § 14.11, subd. 2 (1988), imposes additional statutory requirements when rules are proposed that have a "direct and substantial adverse impact on agricultural land in the state." The statutory requirements referred to are found in Minn. Stat. §§ 17.80 to 17.84. Adverse impact is acquisition of farmland for a nonagricultural purpose, granting a permit for the nonagricultural use of farmland, leasing state-owned land for nonagricultural purposes, or granting or loaning state funds for uses incompatible with agriculture. The evidence presented at the hearing indicated that at least one ash landfill for which a permit would be issued by the MPCA is located on 160 acres of agricultural land. Solid Waste Rules applicable to landfills have been previously adopted by the MPCA. Many of these provisions have been incorporated into the proposed rules. Due to the similarities between the Solid Waste Rules and these rules, there is no additional adverse impact to agricultural land. The proposed rules do not have an adverse impact on agricultural land. In addition, the proposed rules were designed to limit the spread of contaminants (both airborne and waterborne) from landfills to agricultural land. One present disposal method for less contaminated ash is to spread the ash over agricultural land. Placing ash in a landfill is more protective of agricultural land than dispersal of that ash over farmland. Since the use of farmland for landfill sites existed prior to these rules, the proposed rules will have no substantial adverse impact on agricultural land within the meaning of Minn. Stat. § 14.11, subd. 2 (1988).

Reasonableness of the Proposed Rules.

11. The question of whether a rule is reasonable focuses on whether it has a rational basis. The Minnesota Court of Appeals has held a rule to be reasonable if it is rationally related to the end sought to be achieved by the statute. Broen Memorial Home v. Minnesota Department of Human Services, 364 N.W.2d 436, 440 (Minn.App. 1985); Blocker Outdoor Advertising Company v. Minnesota Department of Transportation, 347 N.W.2d 88, 91 (Minn.App. 1984). The Supreme Court of Minnesota has further defined the burden by requiring that the agency "explain on what evidence it is relying and how the evidence connects rationally with the agency's choice of action to be taken." Manufactured Housing Institute v. Pettersen, 347 N.W.2d 238, 244 (Minn. 1984). In support of the adoption of the proposed rules, the MPCA has prepared a Statement of Need and Reasonableness (SONAR). The Agency has relied primarily on its SONAR as its affirmative presentation of need and reasonableness at the hearings. The Agency's comments made at the public hearings and in written comments following the hearing supplemented the Agency's presentation. This Report will not discuss each rule part, or each change proposed by the MPCA from the rules as published in the State Register. The Report will focus on those provisions that the Administrative Law Judge or members of the public questioned. Persons or groups who do not find their particular comments in this Report should know that the Administrative Law Judge has read and considered each and every suggestion. A part not commented on in this Report is hereby found to be needed and reasonable and does not exceed the statutory authority for the promulgation thereof. It is further found that on those parts not commented on, the MPCA has documented its need and reasonableness with an affirmative presentation of facts. Any change not commented upon is found not to constitute a substantial change.

Proposed Rule 7001.0040 - Application Deadlines.

12. Subpart 4 of proposed rule part 7001.0040 adds municipal solid waste combustor ash (MSW combustor ash) to the wastes for which a preliminary application for a land disposal facility must be completed at least 90 days prior to a detailed site investigation. No persons objected to this proposed addition. Subpart 4 is needed and reasonable, as proposed.

Proposed Rule 7001.3050 - Permit Requirements.

13. The MPCA proposes to allow facilities receiving up to five tons of MSW combustor ash for laboratory research to receive a "permit-by-rule." The requirements to obtain this "permit" are found in proposed rule part 7001.3050, subp. 3(H). The requestor must notify the Commissioner of the source and quantity of the ash, the proposed method for managing the ash, and a description of the research to be conducted. This notification is required before the ash may be received by the requestor. The MPCA proposes item H to allow the facility to conduct research without the administrative burden of a full permit application; while at the same time allowing the MPCA to keep track of the waste used in that research.

Rachel Lord, a member of the Steering Committee of Citizens' Coalition to Stop the Incinerator (CCSI), objected to allowing any use of MSW combustor ash without, at minimum, an abbreviated permit process. CCSI also asserted that five tons is too much ash to be allowed outside the disposal process, without close MPCA oversight. The MPCA responded to these objections by pointing out that the information required by Item H is similar to a streamlined permit process. The five ton MSW combustor ash level was chosen because it is the MPCA's best estimate of the amount of ash necessary to conduct anticipated experiments. There is no evidence in the record of any problems arising out of the use of MSW combustor ash in laboratory experimentation. The MPCA estimates the volume of five tons of MSW combustor ash to be approximately 6.7 cubic yards (roughly equivalent to 25 55-gallon drums). The MPCA has shown that allowing five tons of MSW combustor ash to be used for research without requiring a full permit is needed and reasonable.

Proposed Rule 7001.3480 - Final Application Information Requirements for Municipal Solid Waste Combustor Ash Land Disposal Facilities.

14. The requirements for the MSW combustor ash facility permit application are set forth in proposed rule 7001.3480. For the most part, these requirements generated no comments from interested persons. The landfill liner requirements of proposed rule 7035.2885, however, was the subject of a great deal of controversy. The landfill liner issue is discussed in greater detail at Findings 37 through 42, below. As part of its response to the landfill liner controversy in its post-hearing comment, the MPCA modified item C of proposed rule part 7001.3480 to include additional information requirements. The additional information would include a contingency action plan setting forth the steps the owner of the facility would take if the levels of water contamination (leachate) exceeded the levels allowed for the design of the landfill. The testing results and leachate analysis of the ash would also be required in the application. The application must also contain descriptions of any anticipated changes in the composition of the ash and an assessment of any trends in the leachate.

The usual practice of the industry regarding landfilled ash is to leave it indefinitely once it is placed in a facility. Tr. III, at 67. This remains true even if the leachate from the ash exceeds the levels set for the type of landfill containing the ash. Id. This practice caused many commentators to object to the availability of different liner systems for ash landfills because the level of contamination found in the leachate may change over time and exceed the level appropriate for the liner system chosen. (See Finding 31, below). The MPCA's response to these objections is to require the contingency action plan. No objections were received to the change proposed by the MPCA. The new language addresses concerns of commentators who questioned whether ash, once placed in a landfill, would remain in that particular type of facility even if the leachate levels were to exceed that landfill type's limitations. The MPCA has shown the rule part, as amended, is needed and reasonable. The change does not constitute a substantial change.

Proposed Rule 7035.0300 - Definitions.

15. Proposed rule 7035.0300 contains a number of subparts, most of which are definitions not at issue in this proceeding. Any definition not mentioned in this Report is found to be needed and reasonable.

Subpart 35. Energy Recovery Facility.

16. Proposed rule 7035.0300, subpart 35 amends the definition of "energy recovery facility." The proposed subpart is altered by changing "site" to "facility" in the interest of clarifying the terminology used in this rule. In addition, the MPCA added a sentence to the definition which states:

Energy recovery facilities include, but are not limited to, municipal solid waste combustors.

The intent of this additional sentence is to clarify that MSW combustors are included in the definition of energy recovery facilities. However, the new language places an open-ended list at the end of the actual definition. This language provides no notice to the affected public as to what facilities are energy recovery facilities. That failure of notice is a defect in the proposed rules. If the definition preceding this sentence is inadequate to include MSW combustors, the definition must be changed. However, if the definition is adequate and the MPCA merely wishes to explicitly include MSW combustors that can be achieved by the following language:

Municipal solid waste combustors are included in the definition of energy recovery facilities.

In the alternative, merely deleting the last sentence will also cure the defect in subpart 35. Since the addition is not essential information, deleting it would not adversely affect the proposed rules. With either change, the rule is needed and reasonable. Neither change constitutes a substantial change.

Proposed Rule 7035.0400 - General Requirements.

Proposed Rule 7035.0600 - Variances.

Proposed Rule 7035.0605 - Availability of References.

17. Proposed rule parts 7035.0400, 7035.0600, and 7035.0605 did not receive critical comments in the rulemaking process. Part 7035.0400 is

included in this rulemaking only to replace the term "utilized" with "used" and update the citations to include newly adopted rule parts. Part 7035.0600 expressly permits applications for a variance from these rules. The only change is to update the citations in the rule part. Citations are also updated in proposed rule 7035.0605, but the rule also incorporates a number of documents by reference. The incorporation of these documents is needed and reasonable to notify the affected public of the standards required by these rules. Those incorporated documents contain specifications with which owners and operators must comply; and they are readily available to the general public. Because of their length and technical nature it is appropriate to incorporate them by reference.

Proposed Rule 7035.0700 - Storage of Solid Waste at Individual Properties.

18. Prior to the disposal of MSW combustor ash at a landfill, ash may be temporarily stored at the facility which produces the ash under proposed rule 7035.0700, subp. 6. The rule part requires that fugitive dust emissions and the escape of contaminated liquids be minimized; liquids drained from the ash be reused, if feasible; storage of ash on-site be limited to a number of days of ash production; and ash stored be moved within a number of days of being generated. Two aspects of this subpart were disputed by commentators. The Project Environment Foundation (PEF) and CCSI suggested that the fifteen day on-site storage period be reduced to three days. Northern States Power Company (NSP) supported the fifteen day period originally proposed by the MPCA. In its post-hearing comment, the MPCA altered the storage period and maximum "age" of the ash stored on-site to five days. The Agency maintains that this period strikes a balance between ensuring prompt and proper disposal of ash and allowing combustors to operate without unnecessary shutdowns. Each shutdown imposes additional energy costs and decreased efficiency in combustion.

The MPCA estimates that ash contains approximately 20% moisture content upon production at the MSW combustor. MPCA Post-hearing Comment, at 5. At the anticipated rate of moisture loss from the MSW combustor ash (3% per day), it should remain suitably damp (5% moisture content) for transportation without releasing excessive dust after five days. Id. This would not be true after fifteen days. Id. Less than five days would impose too strict a schedule to correct problems in properly disposing of ash at facilities. The MPCA has shown that altering the period for on-site storage of MSW combustor ash to five days is needed and reasonable. The issue of changing the on-site storage time was fully discussed at the hearing and does not constitute a substantial change.

19. Rachel Lord of CCSI suggested that on-site storage be allowed only in a "completely enclosed structure" that is equipped with a leachate collection system. The MPCA declined to make that change, on the ground that the requirement would be unnecessary to ensure the prevention of dust emissions or liquid leaks. The designs for MSW combustors contained in the rulemaking record indicate that storage and loading of ash does take place in a building, where wind and rain do not affect the ash. However, the objections of CCSI are directed to the potential storage of ash in piles on vacant (and bare) ground at the combustor site. The MPCA has not shown that such storage is reasonable. At the landfill site, rules proposed in this proceeding require cover for all MSW combustor ash and require a leachate collection system. No less is required when the ash is awaiting disposal.

The proposed rule part as written is found to be inconsistent with the requirements that all MSW combustor ash be covered and that a leachate collection system be provided. It is therefore unreasonable. The MPCA can cure this defect in the proposed rules by adding the following language to subpart 6:

Ash stored at the facility must be kept in an enclosed structure equipped with a system to collect liquids which drain from the ash.

By adding this provision, the MPCA will ensure that on-site storage of ash does not become a source of pollution for surrounding areas. The change was suggested by a commentator and does not constitute a substantial change.

20. The MPCA also included language that allows the commissioner to approve the storage of more ash or for a longer period of time so long as the combustor owner or operator complies with the rules for solid waste storage facilities. This language permits anyone who can meet the landfill requirements proposed in these rules to store waste on-site so long as the appropriate limitations are met. The Agency intends to allow on-site treatment facilities to retain more ash, but not to permanently dispose of the ash on-site. Agency Staff's Comments, at 6. This option is needed and reasonable for those combustor operations which choose to conduct on-site treatment. Nevertheless, the proposed language is defective, since it states that the "commissioner may approve storage." The proposed language does not contain any standards to limit the commissioner's discretion in deciding whether to allow longer storage of ash. Substituting the following language cures the defect identified in this Finding:

The commissioner shall approve storage of a larger quantity of ash or storage for a longer period of time if the waste is kept in a container meeting the requirements of a solid waste storage facility under pt. 7035.2855.

The new language removes the commissioner's unbridled discretion while meeting the need to prevent contamination through inadequate storage facilities. The MPCA may choose to promulgate standards for the retention of ash in such on-site storage, but to do so as part of this proceeding would constitute a substantial change. The new language is needed and reasonable. The change does not constitute a substantial change.

Proposed Rule 7035.0800 - Collection and Transportation of Solid Waste.

21. Subpart 2 of proposed rule 7035.0800 is augmented in this rulemaking proceeding through the addition of a requirement that vehicles or containers of MSW combustor ash must be covered to prevent dust emissions and fluid leaks. No one disputed the need to prevent the escape of ash or contaminated liquids. PEF recommended that the proposed rules cross-reference the MPCA's authority to impose civil fines or administrative penalties. A number of commentators from Mankato strongly suggested that invoking criminal penalties is necessary to prevent the leakage of MSW combustor ash from trucks transporting that substance to disposal facilities. Those commentators testified that trucks containing MSW combustor ash routinely leak quantities of ash along the route from the combustor site to the disposal facility. The MPCA responded that other statutory provisions provide for criminal penalties,

and authority to enforce those laws lies with local law enforcement bodies. Therefore, MPCA believes it is not appropriate to cross reference these laws in the proposed rules as criminal enforcement is considered outside of MPCA's jurisdiction. The MPCA has shown that covering the ash is needed and reasonable to prevent leakage. Not including express criminal penalties for leaking ash during hauling does not render subpart 2 unreasonable. The authority of the MPCA to impose civil fines or administrative penalties for violations of these rules under Minn. Stat. § 115.071 is unaffected by the lack of a cross-reference in these rules. The proposed rule as written is found to be needed and reasonable.

Proposed Rule 7035.2555 - Location Standards.

22. Subpart 2 prohibits establishing a solid waste management facility within a shoreland governed by Minn. Rule chapters 6105 or 6120. The MPCA proposes to add wild and scenic rivers to the prohibited areas. No commentator objected to this proposed rule. However, PEF suggested that the prohibited zone be expanded to include any area within 2000 feet of a state park, recreation area, scientific area, natural area, or other dedicated area. PEF maintains that siting solid waste management facilities within 2000 feet of such resources is incompatible with the use of those resources. There are no facts in the record to support a 2000 foot prohibited zone around the resources identified by PEF. The proximity of those resources, as well as other factors, will be taken into account when the siting process is conducted. Creating a "laundry list" of disqualifying factors only serves to restrict the potential sites for a facility without determining whether the restriction is reasonable. Subpart 2 of 7035.2555 is needed and reasonable as proposed by the MPCA.

Proposed Rule 7035.2885 - Municipal Solid Waste Combustor Ash Land Disposal Facilities.

23. Proposed rule 7035.2885 comprises the core of the proposed rules. Due to the complexity of this rule part, each subpart will be discussed individually.

Subpart 2 - Exemptions.

24. Incinerator ash is pozzuolanic in nature. When allowed to dry, it forms a solid, similar to cement or concrete. Solid contaminants, such as lead or cadmium, are bound into the solid mass of ash and do not physically leave the ash. Incinerator ash which contains contaminants has the potential of spreading those contaminants to the environment, however, through leaching. Leaching occurs when water comes into contact with contaminants in the ash. Proposed rule 7035.2885, subp. 2 exempts from the most stringent requirements of this rule incinerator ash which does not contain high levels of contaminants. To determine whether ash qualifies for lesser disposal standards, the ash must be analyzed in accordance with EPA method 1312 (and EPA method 1311 if codisposed with acidic wastes) and the ash must be tested for furans and dioxins. If the ash tests at less than one-half the maximum leachable contaminant levels (MLCLs) for ash set in subpart 5 and does not exceed one microgram per kilogram (ug/kg) of dioxins or furans, the ash may be placed in a landfill meeting the requirements of Minn. Rule 7035.2815, subps. 6(D) and 7 (unburned MSW landfill).

The MPCA has recognized the distinctions between different types of ash in subpart 2. Incinerator ash is either bottom ash, which is removed from the grates upon which the MSW combustion is conducted, or fly ash trapped by the air pollution control equipment after combustion is completed. Of the two types of ash, fly ash contains the higher concentrations of contaminants and has the greater potential for leaching contaminants. SONAR, at 76. If combined ash (fly and bottom ash) is to be disposed of in an "exempt" facility, the fly ash must be tested alone and must meet the quality standards discussed in the foregoing paragraph. Requiring the separate testing of fly ash, rather than testing the combined ash, is grounded in the recognition that fly ash, even if combined with bottom ash, will not lose its greater capability to leach contaminants. For this reason, the MPCA proposes that only if the fly ash component of the ash being disposed falls within one half of the MLCLs set for MSW combustor ash will the ash qualify as "exempt."

By allowing codisposal of ash with unburned MSW, the MPCA is attempting to balance the concerns related to the potential hazard of the ash with the need for economic incentives which can be derived from lower disposal standards. At a minimum, lower standards can be justified only if the ash does not leach contaminants in excess of hazardous waste limits (HWLs). The MPCA has set the limits for pollutants in leachate (MLCLs) at levels which range from 12 to 60 percent of the various HWLs. The leachate level of the ash is determined, for the purpose of initial disposal, by testing the waste to be codisposed. The need to test "exempt" MSW combustor ash illustrates a critical problem in attempting to protect the environment while still providing for economical ash disposal. The levels of contaminants contained in the ash is not consistent with the levels of the same contaminants found in the leachate from that ash. For example, the lowest level of lead contaminant in fly ash in Minnesota is produced by the Hennepin County MSW combustor. Yet, test results show that facility generates the highest level of lead in its leachate. PEF Final Comments, Appendix A, Table 3. Indeed, a close comparison of the totals for lead in leachate from Minnesota generators shows that similar contaminants tested at similar alkalinity can result in lead levels in leachate ranging from 0.025 mg/L (milligrams per liter) to 3.6 mg/L. PEF Final Comments, Appendix A, Table 3. As a result of this inability to accurately predict levels of contaminant in leachate by comparing the same contaminants in the ash, the only method to determine the appropriate disposal of ash is to test the leachate.

25. The testing proposed by the MPCA is, by its nature, prospective. Ash is subjected to tests which are designed to compress many years of natural leaching into a much shorter period. To reflect the interaction of "exempt" ash with uncombusted MSW (or other wastes), the MPCA proposes that ash be tested using a procedure known as the Toxic Characteristic Leachate Procedure (TCLP), otherwise known as EPA Method 1311; and that the results of that test be no more than twice the MLCL for each contaminant. The MPCA asserts that doubling the limit on this test is necessary because Method 1311 uses a very acidic leaching fluid (pH 2 to 5) while landfills with MSW are usually between pH 6 to 7 (less acidic to neutral). The acidic nature of Method 1311 causes leaching which would not normally occur in a landfill. This factor is the MPCA's basis for doubling the test limit.

In conjunction with Method 1311, the proposed rule also requires the leachate from "exempt" ash to test less than one-half the MLCL for each

contaminant using the Synthetic Precipitation Leach Test for Soils, also known as EPA Method 1312. The MPCA maintains that this test most closely simulates the conditions in a landfill and most accurately reflects the leachate which will be produced by disposed ash. However, the MPCA acknowledges that the situation reflected by Method 1312 is disposal of ash in a monofill, not codisposal. The interplay between the results of Methods 1311 and 1312 is clearly intended to predict whether codisposal of "exempt" ash will result in leachates migrating outside the barriers of the landfill in amounts exceeding the MLCLs.

26. Mr. Byron Richards of Richards Asphalt Company (Richards) maintains a garbage burning plant in Savage, Minnesota. Richards does not own its own landfill for MSW combustor ash. Richards testified that there are no Minnesota facilities which will accept its ash. Tr. III, at 115. Ash from Richards' facility is shipped to Wisconsin for disposal. At present, Richards' combined ash does not meet the standards proposed for codisposal. Tr. III, at 115. Bottom ash from Richards' facility either meets or is close to the standards proposed. Tr. III, at 116. Richards may alter the waste combusted, treat the ash produced, or codispose only the bottom ash produced if this provision is adopted by the MPCA. The benefits derived from allowing codisposal are reduced cost to the generator and increased availability of disposal sites in Minnesota. There is no information in the record, however, of the disposal costs of "exempt" ash, nor the cost savings if codisposal is authorized.

27. More troubling, however, is the lack of information as to what contaminants could be leached and how much leachate would be produced if codisposal of ash is authorized. One of the benefits of ash monofilling is the limited amount and duration of the ash's exposure to water at a pH likely to cause metals to leach. As a result, long-term leaching of contaminants is less likely to occur, and the amount of leachate can be kept to a minimum, after the disposal phase receives its final cover. The situation is clearly different when ash is codisposed with unburned MSW. Unburned MSW holds water that is more acidic, thereby promoting the leaching of metals. The organic content of the waste increases the contamination of water in the waste. Lastly, the higher water content will generate more leachate over a longer period of time. Neither of the two tests required for codisposal (Methods 1311 and 1312) reflect an environment similar to the conditions within a landfill containing MSW combustor ash combined with unburned MSW.

As discussed in Finding 25, the standard for acidic leaching (as measured by Method 1311) is twice the MLCL for ash leachate. The MPCA has attempted to justify this standard on the ground that the test is more "aggressive" than conditions in a codisposal landfill. In comparison with a landfill environment, Method 1311 does use a more acidic leaching fluid, mixes more thoroughly, and puts more contaminant in contact with the leaching fluid. However, the MPCA cannot accurately compare the testing environment to an actual landfill environment, and as a result, the MPCA cannot accurately predict the level of contaminants in leachate when it leaves a given landfill. Thus, it is possible, under the rules as proposed, to dispose of "exempt" waste in MSW landfills even though the "exempt" waste has higher leachate levels than would be allowed under the proposed rules for MSW combustor ash landfills. This result is unreasonable. Setting the testing standard at less than half the levels of Method 1312 is irrelevant to the

issue of codisposal of exempt ash because Method 1312 reflects monofill conditions, not codisposal conditions. The problem with Method 1312 is not overprediction or underprediction of contaminants in monofills, since those trends have been noted and allowances made in the rule standards to account for variance of test results from actual leachate produced; rather, the problem is that the test cannot predict the level of contaminants in ash leachate from MSW waste and combustor ash once they have been combined and disposed.

MPCA is required to support its proposed rules with specific facts showing the need for and reasonableness of the rules. MPCA is not required to choose the best regulation presented in the rulemaking process, but only support the regulations it has chosen by an affirmative presentation of fact. Manufactured Housing Institute v. Pettersen, 347 N.W.2d 238, 246 (Minn. 1984). MPCA has not introduced any facts to support its contention that codisposed "exempt" MSW combustor ash will leach only one half the contaminant levels generated by Method 1311.

Because there is a lack of knowledge as to what leachate contamination levels will occur from codisposal, and because there is the potential for MSW facilities to exceed the limits imposed on MSW combustor ash facilities when ash is codisposed, the proposed rule which authorizes codisposal is unreasonable as written. The MPCA may cure this defect by changing the Method 1311 standard to a standard which would equal the MLCL for contaminants applied to MSW combustor ash facilities. In the alternative, the MPCA may cure this defect by deleting the option of codisposal. Either of the two suggested changes will remove the uncertainty that leachate from codisposal could exceed applicable MLCLs. Since the MPCA proposed this exemption to accommodate small ash producers and intended this accommodation to have no adverse environmental effect, neither change would constitute a substantial change from the rules as proposed. This issue was thoroughly discussed at the rulemaking proceeding and is consistent with the MPCA's statutory mandate to protect the environment.

28. PEF and Dr. Denison objected to the use of sampling and testing to determine the appropriate disposal of ash. They maintain that the variability of ash from quarter to quarter, or even from batch to batch, will nullify the testing program's goal of directing particular ash to the most appropriate type of landfill. PEF and Dr. Denison also argue that the grab sample method proposed by the MPCA does not require sufficient numbers of samples to render the sampling method statistically valid. The proposed rule required two samples to perform the testing. The commentators pointed out that the EPA proposed a requirement that 14 samples be analyzed for each sampling event. PEF Post-hearing Comment, at 15.

In response to the commentators' suggestion, the MPCA proposed an amendment to proposed subpart 2(B)(4)(a) to require at least twelve analyses to calculate results for Methods 1311 and 1312. The new language would also require eight analyses to calculate results for dioxin and furan in combined ash or fly ash. Only four analyses would be required to calculate results for dioxin or furan in bottom ash. The Agency suggests that twelve analyses are needed to ensure that ash, which contains varying levels of contaminant from one batch to the next is appropriate for the disposal method chosen. Fewer tests are needed for dioxins and furans due to the reduced variability of those contaminants. Additionally, the test for dioxins and furans is more

expensive than Methods 1311 and 1312. While twelve tests are fewer than the fourteen recommended by the EPA, the difference is not critical to adequate identification of the contaminants in ash generated by an MSW combustor.

Dr. Denison introduced detailed analyses of contaminant levels found in ash and comparisons between those results and the levels predicted by the testing. He indicated that the actual levels were often double the predicted levels. Based on these results, Dr. Denison argued that testing is not an appropriate method for determining disposal options. The amount of contaminant is not critical to the disposal option, however. The appropriate disposal option is determined by the toxicity and amount of leachate. As discussed in Finding 24, above, there is no apparent correlation between the level of contaminant in the ash and the toxicity of the leachate. Testing is needed and reasonable to indicate which disposal option provides adequate environmental protection without requiring unnecessary expenditures. The MPCA has adequately balanced the need for identification of the waste with the cost of testing. The Agency's proposed change which increases the number of required samples insures statistical validity. The change is not a substantial change.

Subpart 3 - Acceptable Wastes.

29. Generally, MSW combustor ash is required to be disposed of in landfills containing only MSW combustor ash. This practice is known as monofilling. Subpart 3 establishes the method by which an owner or operator of a MSW combustor ash facility can obtain approval from the MPCA to accept for disposal at its facility wastes other than MSW combustor ash. The request for codisposal of non-ash waste in an ash landfill must be accompanied by the results of a variety of tests, and an assessment of the interaction between the ash and non-ash waste. PEF vigorously objected to the provision allowing codisposal of wastes. They maintain that codisposal will increase the volume and toxicity of leachates in the landfill. NSP and the Minnesota Resource Recovery Association (MRRRA) support codisposal as a waste management option, particularly for combustor ash generators who wish to dispose of lime scrubber "bags".

As part of a program to reduce air emissions from some MSW combustors, combustor ash generators (such as NSP) have installed "baghouses" which are designed to trap airborne emissions resulting from the combustion process. The baghouses have fiberglass filters, known as "bags." These bags, once used, exceed hazardous waste limits for many contaminants, due to the embedded fly ash they contain. Combustor ash generators seek to dispose of these bags together with the ash. PEF and Dr. Denison maintain that the lime contained in the bags will increase the pH in ash landfills to the point where cadmium and lead will leach. NSP asserts that the pH of the bags falls within the "window" of alkalinity (pH 8 to 10) where lead and cadmium do not readily leach.

Similar to the discussion in the foregoing finding, the critical issue is whether codisposal will increase the level of contaminants in leachate. The MPCA has recognized this issue by requiring the facility operator to obtain approval for codisposal from the Commissioner. The proposed language of subpart 3 relating to this issue reads as follows:

The commissioner shall determine whether a waste is acceptable for codisposal based on the potential for the waste to increase the quantity or toxicity of leachate generated at the facility, to cause failure of engineered systems such as the liner and leachate collection system, or to increase the potential for fugitive dust emissions.

The foregoing language directs the commissioner's inquiry toward four concerns regarding codisposal when approval is requested. However, no limitation is put upon the commissioner's discretion to grant or deny approval once those factors are considered. This lack of any limit on discretion constitutes a defect in the proposed rules. See Anderson v. Commissioner of Highways, 126 N.W.2d 778, 780 (Minn. 1964). To establish a limitation on discretion and thereby cure the defect in this subpart the MPCA must add language that specifies some standards and criteria such as the following:

The commissioner shall approve a waste for codisposal in an MSW combustor ash facility only if the commissioner determines that codisposal of that waste will not significantly increase the movement of contaminants outside the codisposal ash phase by leakage, leaching, or fugitive dust emissions.

The recommended standard does not contain precise limits on wastes or by-products of wastes. The MPCA cannot set such limits in this rulemaking, since that would constitute a substantial change. With the recommended addition, the subpart is needed and reasonable to permit wastes with similar properties to be disposed of in an economical fashion. The recommended language cures the defect in the proposed subpart and does not constitute a substantial change.

Subpart 4 - Limitation of Leachable Contaminants.

30. Subpart 4 requires that ash disposed in MSW combustor ash facilities must not exceed the MLCLs set in subpart 5, unless the most stringent design of landfill is used for ash disposal. Compliance is determined by Method 1312 testing or actual leachate analysis (if certain conditions are met). Ash which exceeds the Method 1312 testing standards can be treated in the disposal facility if the commissioner is satisfied that the treatment method will reduce the leachate to within the MLCLs. The testing results are obtained through a "rolling data set" which averages individual test results. The upper 80 percent confidence limit is the figure used as the "results" of testing. This method "smoothes out" variable results and permits the tester to assign a degree of confidence that the actual content of the substance being tested falls within a relatively limited range of results. The 80 percent confidence interval is taken from EPA document SW-846 "Test Methods for Evaluating Solid Waste," third edition. See SONAR, at 40. No commentator showed that ash has characteristics which require a different sampling method. Adopting the EPA method for sampling is needed and reasonable.

The MPCA changed the initial language of item E to clarify that untested ash subject to being moved is ash from a combustor that has not completed four quarters of testing. Exhibit 14. This change is intended to provide an adequate database upon which to base a reasonable estimate of the ash's characteristics. Four quarters of testing is an adequate period to determine

the likelihood that ash is appropriately disposed. The item is needed and reasonable, and does not constitute a substantial change.

31. The Administrative Law Judge pointed out that subpart 4(E)(2) vests the Commissioner with discretion to order removal of the ash within four quarters of its placement in the landfill if testing shows the liner to be an inappropriate option for the level of contaminants in the leachate. The MPCA responded to this comment by altering the proposed rule to require the facility operator to move the ash in the event that contaminants exceed the liner limits. The change removes unbridled discretion from the Commissioner and clearly informs facility operators of the results of improper disposal of untested ash. Subpart 4(E)(2), as amended, is needed and reasonable. The change removes a defect from the proposed rules and does not constitute a substantial change.

Subpart 5 - Maximum Leachable Contaminant Levels.

32. The standard by which ash is measured to determine appropriate disposal methods is the maximum leachable contaminant level (MLCL). Subpart 5 sets the MLCLs for fourteen elements, including cadmium, lead, mercury, and zinc. The MPCA arrived at these levels by balancing the need to protect ground water from contamination by leachates with the likelihood that the liner system will contain or attenuate most of the leachate produced. In arriving at its proposed MLCLs, the MPCA has assumed that less than one percent of the leachate produced will escape the containment layers of the landfill; that the leachate which escapes will dilute in the groundwater; and a safety margin must be included to reflect the differences between Methods 1311 and 1312 and conditions in actual landfills. See SONAR, at 51. The MPCA also considered the routes by which leachate could come in contact with the environment and what standard would apply at each contact. See SONAR, Table 3, at 53. The MPCA concluded that the unit from which the MLCL should be calculated is the Recommended Allowable Limit (RAL), where an RAL is appropriate. The RALs were set by the Minnesota Department of Health (MDOH), most recently in 1991, to provide a standard which drinking water from private wells must meet for the safety of persons consuming that water. See SONAR, at 54. The MPCA used RALs from previous years where the Agency believed that the earlier standard more accurately reflected achievable standards. In the case of arsenic, for example, the Agency used the 1988 limit, since the new limit is below the level of arsenic found in ambient groundwater. See SONAR, at 55. The Agency is aware that MDOH intends to alter the RALs for eight of the elements and the MPCA has used those new RALs for those eight elements.

Another factor with an impact on the ultimate standard chosen as a MLCL is the amount of dilution which will occur when the contaminant reaches groundwater. The MPCA concluded that a dilution factor of 1.5 is appropriate. The 1.5 factor is a conservative number, based on scenarios including calculations of 30 inches of rainfall per year, total failure of cover and liner in keeping rainwater from reaching the ash, and zero percent liner efficiency. NSP objected to the scenarios used by the MPCA as being too conservative and particularly objected to the zero percent liner efficiency figure. NSP maintains that liners always have some level of efficiency, even if the synthetic layer is punctured. However, the MPCA's assumption of zero percent efficiency is not directed at operating landfills. Rather, the scenario reflects the situation at landfills when the twenty years of monitoring have expired. At that stage, leachate is no longer collected.

Without collection, the MPCA is entitled to assume that the liner is ineffective since the accumulated leachate that is not removed for treatment is likely to contaminate groundwater.

The last factor considered in setting the MLCLs is the attenuation of contaminants in the clay liner of the landfill. This process bonds the contaminant to the clay, reducing the level of contaminant remaining in the leachate. The MPCA has chosen a single attenuation factor to apply to each MLCL set in this subpart, to avoid the problem of altering the factor for differing types of clay and differing rates of attenuation for each element. The factor chosen by the MPCA for attenuation is 40, based on the standard of removing 97.5 percent of contaminants through bonding with the clay liner. This standard is considered "adequate for some parameters, and very conservative for others" by the MPCA. SONAR, at 62. The formula to determine the MLCLs is the dilution factor (1.5) times the attenuation factor (40) multiplied by the percentage of the RALs in comparison to the groundwater performance standards (25% or .25). The number which results from the formula (15) is multiplied by the RALs to arrive at the MLCLs. Thus the MLCL is fifteen times higher than the RAL for the same element. However, under proposed subpart 8, each facility must meet the groundwater performance standards which are four times lower than the RALs. The distance between the leachate collection system (where the MLCL is measured) and the performance boundary (where the groundwater standard is measured) makes the proposed requirement needed and reasonable.

Subpart 6 - Location.

Subpart 7 - Hydrogeologic Evaluations.

Subpart 8 - Groundwater Performance Standards.

33. The standards proposed by the MPCA in subparts 6, 7 and 8 are the same requirements presently established for location, hydrogeologic evaluation, and groundwater performance for MSW land disposal facilities found in MPCA Solid Waste Rules. The problems to be prevented and factors which exacerbate or ameliorate those problems are identical for both MSW land disposal facilities and MSW combustor ash facilities. The MPCA has shown that cross-referencing the appropriate standard in this portion of the rules is needed and reasonable.

Subpart 9 - General Design Requirements.

34. Proposed subpart 9 sets design requirements which must be met by all MSW combustor ash facilities. The requirements consist of the same requirements found in MPCA Solid Waste Rules for MSW land disposal facilities, except for landfill specifications for cover, liner, leachate collection, and monitoring. Items A and B of subpart 9 replace their counterparts in the MSW land disposal facility design requirements. Item A sets a 200 foot setback limit from the property line wherein waste cannot be disposed. A lesser limit may be approved if the commissioner finds that the lesser limit provides adequate protection against contamination. CCSI objected to the 200 foot limit and suggested that 500 feet are required to protect adjacent areas from dust emissions. Mike Cousino, Public Works Director of Olmstead County, Minnesota, graphically demonstrated that a 500 foot limit from the property line would severely restrict the space available for fill storage. The persons advocating the 500 foot limit maintain that computer models of dust

emissions show excessive levels of dioxin at 1536 feet, arsenic and lead from fly ash at 552 feet, cadmium and mercury at 224 feet, and arsenic and dioxins from combined ash at 224 feet. PEF Final Comments, at 34. The MPCA responded that the model cited by these commentators was of a fly ash facility, not a facility for combined or bottom ash. Since fly ash facilities require immediate cover, the model is misleading. The MPCA's reasons for the 200 foot limit are tied to the moisture content, characteristics of the ash, and frequency of cover required at these facilities. In the event that dust emissions do exceed an applicable limit, the MPCA is authorized to take adverse action against the owner and operator of the offending facility. Since periodic cover is required, its impact on dust emissions is an appropriate consideration in setting the distance between the ash and the property line. The MPCA has shown that a 200 foot setback requirement is needed and reasonable.

Item B of proposed subpart 9 requires a cover system, liner system, leachate collection and treatment system, and a water monitoring system of each facility. The specifications of each system are located in succeeding subparts. Each system will be discussed individually.

Subpart 10 - Cover System.

35. Proposed subpart 10 requires three types of cover for ash disposed in an ash facility. Intermittent cover must be placed on bottom or combined ash within 48 hours of placement and the ash left exposed must have a moisture content of not less than ten percent. For fly ash, the Intermittent cover must be placed immediately. Any facility which proposes to cover its ash less frequently must obtain approval from the commissioner and show that the change will not harm health or the environment. Intermediate cover is required when ash disposal is not ongoing. The MPCA has set a benchmark requiring intermediate cover when 30 days will pass without the facility accepting new ash for disposal in the open phase of the ash cell. Final cover is required when the phase reaches capacity or no further ash will be disposed in that phase. The design of final cover required under this subpart is a barrier layer, a drainage layer, and a top layer. The cover requirements are all intended to minimize fugitive dust emissions. Final cover has the additional goal of limiting contact between the ash and precipitation or run-off. To that end, the MPCA requires the three layers of final cover to stop liquids from entering the ash (barrier layer), remove liquids before they come in contact with the ash (drainage layer), and provide natural protection to the surface of the phase (top layer).

36. The specifications required of the final cover vary depending upon the materials used and the MLCLs obtained from the ash. Where soil is used as a barrier layer, that layer must be at least 24 inches thick, and the top layer must be at least 42 inches thick. An alternative method may be used, if the alternative meets a permeability standard of no greater than 1×10^{-7} centimeters per second. In no event can the barrier be less than 24 inches thick or the top layer less than 18 inches thick. When a synthetic membrane is used as the barrier layer, the membrane must be at least 30 mils (30/1000 of an inch) thick and a top layer of at least 18 inches must be placed over the ash. In all cases, the drainage layer is to be no less than 6 inches thick.

Each of these options (soil or synthetic membrane) presuppose the MLCLs are not exceeded. Where MLCLs are exceeded within the four quarters of testing required under proposed subpart 4, the barrier layer must, at a minimum, contain 24 inches of compacted soil overlain by a 30 mil synthetic membrane. In addition, those phases which exceed MLCL limits must have a top layer at least 42 inches thick.

The varying specifications for cover requirements are needed and reasonable to reduce the amount of precipitation and runoff which comes into contact with ash. The barriers will reduce the volume of leachate produced by each filled phase. Mankato Citizens Concerned with Preserving Environmental Quality, Inc. (MCCPEQ) objected to the standard requiring only a depth of 18 inches in the top layer, because they believe that the top layer would not be effective to prevent puncture of the barrier layer by plants or animals. However, with a drainage layer of 6 inches added to the top layer, there is a full two feet of protection for the barrier layer. In addition, the facility operator is obligated to maintain the vegetation on the top layer to "minimize root penetration of the low permeability cover layer ..." and discourage "burrowing animal intrusion into the site" Proposed rule 7035.2885, subp. 10. The rule as proposed meets the concerns of MCCPEQ, while not adding unnecessary safeguards.

Subpart 11 - Liners.

37. The issue of liners for ash phases was discussed in great detail by commentators and agency staff in this rulemaking. The purpose of lining ash phases is to trap, remove, and attenuate leachates from the ash. Leachates are trapped in a landfill when they seep to the lowest level in the phase, only to come in contact with a low permeability barrier. Removal of leachates is accomplished through a drainage layer installed above the low permeability barrier together with a piping or pumping system which removes the leachate from the phase. If leachate is not removed or trapped, it leaks past the low permeability barrier. If an additional layer of an absorbent substance underlays the low permeability barrier, the contaminants in the leachate can be attenuated. This system then, would act as a treatment process for the contaminated water.

Consistent with the explanation in the preceding paragraph, the MPCA is proposing a system of five different types of liner. The different liners are identified in items L through P of proposed subpart 11. Each liner will be identified by its item designation. The SONAR contains a depiction of each design labelled A through E. SONAR, at 73. Design A corresponds to liner L, design B to liner M, and so forth. Each liner type has, at a minimum, a drainage layer, a low permeability barrier, and a clay barrier. This composite liner system is designed to trap, remove, and attenuate leachates.

Under the proposed system, three factors determine the appropriate liner to be used for disposal of the ash. The first factor is whether the ash is being disposed of before or after January 1, 1993. This date is proposed to allow facilities to prepare the most stringent design (liner P) for accepting ash. There are presently no liner P phases operating in Minnesota. The second factor determining disposal is whether the MLCLs are exceeded by the ash. If the levels are exceeded, a "double" liner (e.g. liners O or P) is required for disposal of the ash. The third factor is whether the hazardous

waste limits are exceeded by the ash. If the ash is properly classified as hazardous waste, only the most stringent liner system (liner P) may be used for disposal.

The MPCA's proposal has been termed a "testing based" approach to ash disposal, due to the critical role played by the results of the tests (Methods 1311 and 1312) applied to the ash, in deciding the proper treatment option. The actual working of the MPCA's system is somewhat more complicated since the type of ash and date of disposal are also included in the formula. The proposed rule, in pertinent part, reads as follows:

	Bottom Ash	Combined	Fly Ash
Before January 1, 1993:			
(1) Leach results < MLCL	L	M	N
(2) MLCL < Leach results < EP	L	M	P
(3) Leach results > EP	L	M	P
After January 1, 1993:			
(1) Leach results < MLCL	L	M	N
(2) MLCL < Leach results < EP	O	O	P
(3) Leach results > EP	P	P	P

Proposed rule 7035.2885, subp. 11.

A key is provided in that subpart which identifies the letter as the item for each different liner system. Essentially, the difference can be characterized as two different liner systems, one requiring single liners (L, M and N) and the other requiring double liners (O and P). The difference between the two types can be dramatic in terms of overall cost. Glen Anderson, Registered Professional Engineer, representing the City of Fergus Falls, the Pope and Douglas County Solid Waste Boards, and the City of Red Wing, testified that adding a second liner raised the cost of each phase by twenty-five to fifty per cent, depending upon the depth of the ash disposed in the phase. Transcript III, at 66. However, the estimated increase in the cost per ton of ash incurred if all ash was disposed in double lined phases rather than a single composite liner is \$3.78. PEF Final Comment, at 15 (referencing Attachment IV, at 9). Mr. Anderson believes that figure is low. However, the cost per ton estimate was not rebutted by any evidence introduced into rulemaking record. Since a ton of ash is derived from approximately four tons of waste, PEF estimated the increased amount paid by waste disposers to have the waste burned (the "tipping fee") to be \$0.95 per ton. PEF Final Comment, Attachment IV, at 10. This amount is not excessive in comparison to the potential for severe groundwater contamination which could occur from inadequate ash disposal. However, even though the cost of disposal using double liners is not excessive, this factor does not demonstrate that the rule which allows single liner landfills in some circumstances is unreasonable. The controlling factor is environmental protection, not cost.

38. The MPCA based its assignment of ash to landfill type upon the testing of bottom ash, combined ash, and fly ash. Depending upon the results of the testing, progressively more stringent liner designs must be used for ash disposal. However, for MSW combustor ash facilities, the MPCA has treated combined ash as a separate waste, entitled to its own standard for disposal. All of the information in the record demonstrates that bottom ash and fly ash are two distinct wastes, with different levels of toxicity and different

physical characteristics. The mixing of the two wastes to form combined ash is done to ease problems in handling fly ash. Tr. III, 12.

The MPCA has set out the advantages and disadvantages for combined disposal and separate disposal of bottom ash and fly ash. SONAR, Appendix II. Briefly stated, the benefits of combining ash are:

- 1) reduction of fugitive dust emissions;
- 2) theoretical reduction of pH;
- 3) single source of ash, one truck for transportation; and
- 4) combined ash tests below hazardous waste limits.

SONAR, Appendix II.

The MPCA also asserted that the ash would have a single destination, thus further simplifying ash management. However, that simplicity is more than offset by the possibility that the ash must be moved due to variations in the leachate from the ash.

A summary of the MPCA's rationale for keeping fly and bottom ash separate is as follows:

- 1) the smaller volume and higher level of contaminants in fly ash permits more economical use of extensive containment methods;
- 2) the higher potential for compaction reduces water content and, as a result, lowers leachate volume;
- 3) with fly ash testing above hazardous waste limits, keeping fly ash separate can reduce long term costs in treatment by reducing the volume of ash which must be treated; and
- 4) the potential for reuse of the metals in fly ash is retained.

SONAR, Appendix II.

The MPCA concluded that combined ash can be managed in an environmentally safe manner; that handling combined ash is operationally more efficient; that treatment prior to disposal is preferred (but insufficient information is available to require pretreatment); and, since reuse of metals is not a proven technology, requiring separation of ash is not reasonable. SONAR, Appendix II. The Administrative Law Judge agrees with all of these conclusions. The MPCA indicated at the hearing that the proposed system "should not prohibit combining bottom and fly ash, but where possible should at least allow, if not encourage, their separate management." Tr. I, at 31.

39. The system of disposal options proposed by the MPCA, however, is not consistent with the Agency's goal of encouraging separate management or the rationales offered for separate or combined bottom and fly ash disposal. By allowing the testing of combined ash rather than requiring the testing of the components individually, the MPCA is virtually ensuring lower toxicity test results, thus making more likely that combined ash will be disposed in less stringently designed landfills. The MPCA has not shown that there is any less toxicity in the ash occurring as a result the combining of bottom ash with fly ash. In fact, there is a possibility that increased pH due to the lime content in fly ash could actually cause an increase in lead and cadmium leaching. Mixing bottom ash with fly ash from electrostatic precipitators could possibly reduce leaching by neutralizing its acidity, but the MPCA describes this benefit as "theoretical." SONAR, Appendix II, at 2.

No real reduction in toxicity occurs in the process of combining ash. The only "reduction" that occurs is due to dilution when the more contaminated ash leachate is combined with the less contaminated ash leachate. Examined another way, MSW combustor operators are encouraged to combine ash appropriate for a single liner landfill with ash which exceeds the hazardous waste limits to bring the resulting combined ash within the limits which qualify it for single liner landfill disposal. Encouraging dilution is not consistent with the MPCA's approach to hazardous waste regulation. Further, the MPCA has taken the opposite approach to ash disposal within these very rules. Proposed rule 7035.2665, subp. 2(B) requires separate testing of fly ash when combined ash is codisposed in an MSW facility. Under subpart 2(B), the fly ash alone must meet the requirements for codisposal. Determining the appropriate disposal option by measuring each component individually has already been shown to be needed and reasonable.

The only support made in this rulemaking for encouraging combined ash disposal is that combined ash is easier to handle than fly ash. This ease of handling appears to be the motivating factor behind the proposed rule which allows the less stringent disposal option for combined ash. Furthermore, there will not necessarily be any significant cost savings over time resulting from disposal of combined ash in less stringently designed landfills. While fly ash alone would require a landfill design equivalent to that for a hazardous waste facility (Liner P), bottom ash alone is likely to require the least stringent liner design (Liner L). The larger percentage of ash is bottom ash in all combustors except refuse derived fuel combustors. Only ash which does not exceed the MLCLs can be disposed of in less stringently designed landfills. Mr. Anderson's estimated a 25% to 50% increase in costs for more stringent designs over the least stringent design suggests that the most cost effective approach is to reduce the volume of ash which is at risk of requiring disposal in the most expensive option. An additional benefit to this approach is that the most contaminated ash is placed in a facility which emulates hazardous waste containment (Liner P). This will reduce the potential for contamination of groundwater.

The foregoing analysis does not mean that combined ash should be totally prohibited. It is reasonable to allow ash to be combined to facilitate handling. The foregoing analysis simply finds that the MPCA has not designed a system of ash disposal to accomplish its stated goals. The disposal of combined ash should remain an option for MSW combustor ash facility operators. The choice of a liner, however, must be made based on the individual testing results of bottom ash and fly ash, not combined ash. Requiring facility operators to select a disposal option based on individual testing results removes any incentive to combine ash before testing with a goal of qualifying the diluted ash for the least environmentally protective disposal option. Instead, facility operators should be allowed to combine ash to reduce fugitive dust emissions thus making transportation of the ash easier. The cost of space in the more stringently designed landfills will act as an incentive to ensure that the facility operator adds only the amount of bottom ash needed to achieve those goals.

The Judge finds that the proposed rule which does not require the separate testing of fly ash and bottom ash to determine the choice of liner is unreasonable as it is inconsistent with the Agency's own SONAR and its approach to hazardous waste regulation. It does not encourage the separate disposal of fly ash and bottom ash, but encourages combining ash which is inconsistent with the Agency's own stated goals.

40. To cure the defect in subpart 11, the Administrative Law Judge suggests that the MPCA alter table 1 of that subpart. That table presently reads as follows:

	Bottom Ash	Combined	Fly Ash
Before January 1, 1993:			
(1) Leach results < MLCL	L	M	N
(2) MLCL < Leach results < EP	L	M	P
(3) Leach results > EP	L	M	P
After January 1, 1993:			
(1) Leach results < MLCL	L	M	N
(2) MLCL < Leach results < EP	O	O	P
(3) Leach results > EP	P	P	P

Correcting the defect can be accomplished by altering proposed rule 7035.2885, subp. 11, table 1 to read as follows:

	Bottom Ash	Combined	Fly Ash
Before January 1, 1993:			
(1) Leach results < MLCL	L	N*	N
(2) MLCL < Leach results < EP	M	N*	P
(3) Leach results > EP	P	P*	P
After January 1, 1993:			
(1) Leach results < MLCL	L	N*	N
(2) MLCL < Leach results < EP	O	P*	P
(3) Leach results > EP	P	P*	P

* Leach results must be taken from fly ash only.

The lesser requirements before January 1, 1993 are needed and reasonable to provide disposal during the transition from the adoption of these rules to the time when more stringently designed landfills can be constructed. Liner N is appropriate for fly ash and combined ash which is below the MLCLs since fly ash tends to leach more easily. Liner N provides three feet of clay to attenuate metals which escape the drainage and synthetic barrier layers. The recommended changes render the liner requirements needed and reasonable to encourage separate management of MSW combustor ash, protect the quality of groundwater, and meet the needs of combustor operators in handling ash for disposal. The changes are consistent with the comments discussed in the rulemaking hearings and written comments submitted during the comment period. The changes do not constitute substantial changes.

41. Dr. Denison proposed that the MPCA mandate a single design for all ash disposal facilities. That design would require, from the top down, a leachate collection system, a single synthetic liner, a second leachate collection system, and a composite liner composed of the synthetic liner underlain by three feet of compacted clay. Exhibit 16, Attachment IV. This design is nearly identical to Liner O. As discussed in the foregoing paragraph, the liner system proposed by the MPCA is unreasonable, because the system as proposed is inconsistent with the MPCA's stated goals. However, the design suggested by Dr. Denison is not appropriate for the same reasons. Were the MPCA to adopt any single design for the disposal of ash, the Agency would

remove all incentive to manage bottom ash and fly ash separately. In addition, it would provide no incentive to combustor ash generators to reduce the toxicity of their ash.

42. NSP recommended a change to the liner requirements to permit an alternative design for double liner landfills. NSP's alternative design would place a clay liner between the first and second synthetic liners and leachate collectors. PEF maintained that the NSP design would eliminate the "leak detection" function of the second liner by preventing the migration of leachates to the second liner until after the operator was no longer monitoring the facility. The MPCA declined to adopt NSP's suggestion. NSP has not shown that an alternative design is required in the proposed rules. Declining to adopt NSP's language does not constitute a defect in the proposed rules.

Proposed Rule 7035.2910 - Municipal Waste Combustor Ash Testing Requirements.

43. Since ash disposal is an ongoing process, the MPCA has proposed testing on a quarterly basis. For those contaminants which do not exceed the detection limits set in subpart 4(B)(table 1) for eight or more sampling events, the MPCA has proposed that testing be performed annually. The Agency asserts that there is no valid reason for facility operators to incur the cost of frequent testing for any contaminant which does not occur in significant quantity over a period of time. The annual testing is intended to prevent disposal of ash when the characteristics of that ash has changed because of long term changes in the waste stream. Several commentators expressed concern that the infrequent testing would allow disposal of ash into landfills which do not have liners commensurate with the leaching potential of the contaminants in the ash. These commentators suggested that, because of the variability of the ash, quarterly testing should be required for all ash. However, due to the change recommended in this Report with respect to the method of choosing a liner, the variability of contaminants in the ash is no longer a critical factor. Since the altered liner system encourages separate disposal of bottom ash and fly ash, and requires most fly ash and combined ash to be disposed of in the most stringent liner design, the impact of contaminant variability is reduced. The MPCA has shown that reducing the cost of testing for contaminants which do not exceed quarterly limits for eight testing episodes is needed and reasonable.

Due to the defect found in Finding 39 and the recommended changes made to determine what liner is appropriate, the MPCA must also make changes in proposed rule 7035.2910, subpart 5. These changes will conform the requirement of testing fly ash separately to permit disposal of combined ash, with the testing procedures required under subpart 5. The first change is the deletion of "Unless bottom ash and fly ash are mixed as part of an internal mechanical process" in the first sentence of subpart 5. If the MPCA wishes to retain testing of combined ash in addition to fly ash, the Agency can retain the second sentence of subpart 5 by altering the wording as follows:

In cases where bottom and fly ash are mixed, collect and analyze samples of combined ash according to item B, and fly ash samples according to item A.

If the MPCA does not want combined ash sampled, it must instead require separate bottom ash and fly ash sampling. In that instance, item B must be

deleted. Either one or the other of these two changes is acceptable. Either change is needed so that the reader can determine what disposal option is minimally required. Neither change constitutes a substantial change.

Proposed Rule 7035.2915 - Requirements for Temporary Program Type I and II Storage Facilities.

44. Under Minn. Stat. § 115A.97, a temporary program for storage of MSW combustor ash was established by the MPCA. This program resulted in two types of storage. Type I storage consists of a liner over soil and, according to the MPCA, was never intended for disposal of MSW combustor ash. SONAR, at 123. Thus, proposed subpart 3 requires that all Type I facilities be closed within 18 months of the adoption of these rules and that all ash and contaminated soil be removed from the site. The time delay is intended to allow new disposal facilities to be constructed. No commentator objected to this subpart. Closing Type I facilities has been shown to be needed and reasonable.

Type II facilities were used by the MPCA as testing grounds for differing types of single or composite liner designs. The designs range from four feet of compacted clay to composite liners of synthetic and clay with a leachate collection system. In subpart 4, the Agency proposes to classify these facilities as MSW combustor ash land disposal facilities. Existing Type II facilities would be exempted from the liner and cover requirements, but new construction must meet the requirements of these rules. Several commentators objected to the retention of Type II facilities, since none of them meet the liner requirements of proposed rule 7035.2885, subp. 11. However, the MPCA has monitored these facilities and has not detected significant levels of leachate. SONAR, at 125. The Agency estimates that the cost of moving the ash, and the probability that fugitive dust emissions will occur if the ash is moved are negative factors which outweigh the minimal benefit to be achieved by moving ash into a more stringently designed facility, especially when one takes into consideration the fact that the present disposal facility is not leaking. The MPCA has retained the authority to reclassify the facility, should the situation change. The MPCA has shown subpart 4 to be needed and reasonable.

Reduction of Toxicity.

45. Many commentators suggested that the MPCA is not following its statutory mandate under Minn. Stat. § 115A.97, subd. 1, which provides that:

Mixed municipal solid waste incinerators be planned and managed to achieve to the maximum extent feasible and prudent ... reduction of the toxicity of incinerator ash; reduction of the quantity of incinerator ash; and reduction of the quantity of waste processing residuals that require disposal.

Minn. Stat. § 115A.97, subd. 3, expressly requires that rules adopted regarding incinerator ash must be "designed to meet the goals in subdivision 1." MCCPEQ made a number of suggestions which would reduce toxicity of the ash produced in MSW incineration. The most direct suggestions to reduce contaminants in MSW is presorting to remove "recyclables, non combustibles and

a specific list of heavy metal bearing waste." MCCPEQ Post-hearing Comment, at 5. MCCPEQ and PEF argued that the proposed rules do not address the issue of reduction of toxicity in MSW combustor ash and, therefore, the rules conflict with the Agency's statutory mandate. The MPCA responded that these rules are only directed toward disposal of ash already produced, not the waste stream prior to incineration. Proposed rule 7035.2910, subp. 5 encourages treatment of ash by requiring testing after treatment. This procedure provides an incentive to the facility operator to treat the ash so that it might qualify for a less stringent liner requirement. The MPCA has met the statutory requirements of Minn. Stat. § 115A.97, subd. 3, so far as that statute applies to ash disposal.

Particular Non-ash Waste.

46. Several commentators differed over the proper disposal of scrubber bags, used to remove fly ash from MSW combustor emissions. Such items are industrial in nature, and usually exceed the MSW combustor waste contaminant levels. Scrubber bags usually qualify as hazardous waste. The MPCA has banned hazardous waste from being burned in MSW combustors, but indicated at the Mankato hearing that the Agency had no objection to codisposal of such items in MSW ash facilities, so long as the bags did not unduly increase the toxicity of the leachate produced. NSP indicated that it intended to burn the bags in its incinerators, thus rendering the bags "ash" and then dispose of the resulting material at MSW combustor ash facilities. Since there is essentially no combustible material in the bags, the result of burning them is to increase the levels of contaminants in bottom ash, without achieving any benefit through the reduction of the waste to be disposed of in MSW combustor ash facilities. Burning the bags is an inappropriate treatment of that waste.

However, including scrubber bags in the wastes allowed to be disposed of in MSW combustor landfills for fly ash exceeding the MLCLs does not violate any of the statutory goals cited above. The effect of disposing these wastes at ash disposal facilities with the most stringently designed liner is to place a waste with similar characteristics of fly ash in a landfill containing fly ash or combined ash. The toxicity of the ash is not likely to increase, since the contaminants are identical. Some commentators questioned whether the lime used in scrubber bags would increase the pH inside the landfill to the level where lead and cadmium readily leach. The MPCA has the option of requiring treatment in later rulemaking if this problem arises. For the present, such scrubber bags would be placed in a landfill which meets requirements similar for those at hazardous waste facilities. Including scrubber bags reduces the amount of waste which must be disposed of outside of MSW combustor ash facilities while providing containment equivalent to hazardous waste facilities. This practice has been shown to be needed and reasonable.

Based upon the foregoing Findings of Fact, the Administrative Law Judge makes the following:

CONCLUSIONS

1. The Minnesota Pollution Control Agency (MPCA) gave proper notice of this rulemaking hearing.
2. The MPCA has substantially fulfilled the procedural requirements of

Minn. Stat. §§ 14.14, subds. 1, 1a and 14.14, subd. 2, and all other procedural requirements of law or rule so as to allow it to adopt the proposed rules.

3. The MPCA has demonstrated its statutory authority to adopt the proposed rules, and has fulfilled all other substantive requirements of law or rule within the meaning of Minn. Stat. §§ 14.05, subd. 1, 14.15, subd. 3 and 14.50 (i) and (ii), except as indicated at Findings 16, 20, and 29.

4. The MPCA has demonstrated the need for and reasonableness of the proposed rules by an affirmative presentation of facts in the record within the meaning of Minn. Stat. §§ 14.14, subd. 2 and 14.50 (iii), except as indicated at Findings 19, 27, 39, and 43.

5. The additions and amendments to the proposed rules which were suggested by the MPCA after publication of the proposed rules in the State Register do not result in rules which are substantially different from the proposed rules as published in the State Register within the meaning of Minn. Stat. § 14.15, subd. 3, and Minn. Rule 1400.1000, subp. 1 and 1400.1100.

6. The Administrative Law Judge has suggested action to correct the defects cited at Conclusions 3 and 4 as noted at Findings 16, 19, 20, 27, 29, 39, and 43.

7. Due to Conclusions 3, 4 and 6, this Report has been submitted to the Chief Administrative Law Judge for his approval pursuant to Minn. Stat. § 14.15, subd. 3.

8. Any Findings which might properly be termed Conclusions and any Conclusions which might properly be termed Findings are hereby adopted as such.

9. A finding or conclusion of need and reasonableness in regard to any particular rule subsection does not preclude and should not discourage the MPCA from further modification of the proposed rules based upon an examination of the public comments, provided that no substantial change is made from the proposed rules as originally published, and provided that the rule finally adopted is based upon facts appearing in this rule hearing record.

Based upon the foregoing Conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS HEREBY RECOMMENDED that the proposed rules be adopted except where specifically otherwise noted above.

Dated this 7th day of October, 1991.

Phyllis A. Reha

PHYLLIS A. REHA
Administrative Law Judge

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