July 16, 2003

To Whom It May Concern:

The draft MSW landfill expansion and liner guidance has been completed. The Iowa Department of Natural Resources (IDNR) intends to issue the final guidance document in the Fall of 2003, and formalize its content in rulemaking revisions to IAC 567—Chapter 113 by more closely mirroring language in 40 CFR part 258 (i.e. the RCRA Subtitle D standards for MSW landfills).

It is important to note that this guidance is being released in draft form to provide a comment period to our stakeholders. Please review this guidance document in conjunction with IAC 567—Chapter 113, Iowa Code, and the minimum federal standards found in 40 CFR part 258 for MSW landfills.

Written comments will be accepted until August 29th, 2003. Please submit your written comments on signed and dated letterhead if you are representing an association, business, government agency, or other professional entity. If you are submitting comments as an individual, please include your return mailing address and date and sign your written comments. Comments should be mailed to the following address:

Iowa Department of Natural Resources
Energy & Waste Management Bureau
Attn: Jeff Myrom
502 East 9th St.
Des Moines, IA 50319

Thank you for your time and consideration in reviewing this draft guidance.

Sincerely,

Jeff Myrom, Executive Officer
Energy & Waste Management Bureau

IOWA DEPARTMENT OF NATURAL RESOURCES
WASTE MANAGEMENT ASSISTANCE DIVISION

DRAFT GUIDANCE STATEMENT

TOPIC: MSW Landfill Expansion and Liner Guidance.

Policy Number: **Replaces Number:**

Date: July 1, 2003 **Effective Date:**

Preparer: Jeff Myrom **Reviewer: Jon Tack, Nina Koger, Jane Mild**

Approval: Bureau Chief: **Date:**

Division Administrator: **Date:**

Applicable Code of Iowa or Administrative Code: 455B.301(18), 455B.301(19), 455B.304(1), 455E.4, 455E.5(1), 455E.5(6). IAC 567—Chapter 113.

Attachments:

BACKGROUND

On October 20, 1997, Iowa received RCRA Subtitle D, final full program determination of adequacy from the U.S. Environmental Protection Agency (EPA) for its municipal solid waste (MSW) landfill permit program.[1] Iowa had previously submitted an application for full MSW landfill permit program approval on September 30, 1993, but was denied because its rules did not satisfy 40 CFR part 258. Thus, the landfill rules were revised, effective November 13, 1996, to satisfy RCRA Subtitle D requirements and allow Iowa to become a fully approved state.

As a fully approved state, Iowa must have enforceable standards technically comparable to 40 CFR part 258, which establishes "…minimum national criteria under the Resource Conservation and Recovery Act (RCRA or the Act), as amended, for all municipal solid waste landfill (MSWLF) units…". The same regulations also state that: "These minimum national criteria ensure the protection of human health and the environment."[2] Moreover, MSWLF units that fail to satisfy 40 CFR part 258 are prohibited under section 4005 of RCRA.[3]

The Federal standards for landfill liners in new MSWLF units and lateral expansions are found in 40 CFR 258.40. Those regulations allow for either a composite liner with a leachate collection system designed and constructed to maintain less than a 30-centimeter depth of

[1] See Federal Register, v. 62, n. 160, August 19, 1997, p. 44127-44128.
[2] See 40 CFR 258.1(a).
[3] See 40 CFR 258.1(g) and (h).

leachate over the liner[4], or what Iowa has termed an "alternative liner system" with a point of compliance. An excerpt of the Federal composite liner requirements is given below.

> …*composite liner* means a system consisting of two components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec. FML components consisting of high density polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component.[5]

The Federal requirements for an approved alternative liner system design are as follows.

> In accordance with a [alternative liner system] design approved by the Director of an approved State… The [alternative liner system] design must ensure that the concentration values listed in Table 1 of this section will not be exceeded in the uppermost aquifer at the relevant point of compliance…
> The relevant point of compliance specified by the Director of an approved State shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the MSWLF unit.[6]

ISSUE

Iowa is a RCRA Subtitle D authorized state and must have regulatory standards technically comparable to the minimum requirements set out in Federal regulations. Iowa's current administrative rules for municipal solid waste landfills[7] are technically comparable to Subtitle D regulations, however, the rules could be improved by more closely mirroring the Federal standards from which they are derived and clearly defining conditions under which a landfill expansion may be considered by the Department.

Furthermore, guidance (with subsequent rulemaking) is needed to address landfills with significant remaining disposal airspace over an area not technically comparable to Subtitle D standards[8] for liners. Such inadequately lined landfills may be disposing of waste over an area with some compacted soils, no compacted soils, without any leachate collection system, or with a retrofitted collection system that captures some of the leachate. As presently permitted, some Iowa landfills could dispose of waste over an area not technically comparable to Subtitle D standards for the next 30 to 100-years.

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[4] See 40 CFR 258.40(a)(2).
[5] See 40 CFR 258.40(a)(2)(b).
[6] See 40 CFR 258.40(a)(1) and 40 CFR 258.40(d). The term "alternative liner system" was inserted into the excerpted text to aid with comprehension for readers familiar with Iowa rules, however, this terminology does not actually appear in the Federal rules.
[7] See IAC 567—Chapter 113.
[8] The terminology "technically comparable to Subtitle D standards" means either a composite liner or alternative liner system with a point of compliance pursuant to 40 CFR 258.40.

Due to the importance of protecting Iowa's groundwater and planning for the essential public service of solid waste disposal, the Department was asked to issue this guidance describing some of the changes the Department intends to make to the administrative code for municipal solid waste landfills.

DISCUSSION

Iowa's administrative rules for composite liners are found in IAC 567—Chapter 113.26(1) "d" (1), which reads:

> Municipal solid waste landfills (MSWLFs) shall have a composite liner system consisting of two components. The upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil as specified in subparagraph 113.26(1) "d" (2).

The reference given at the end of the excerpt above means that the lower compacted soil layer must have a coefficient of permeability equal to or less than 1×10^{-7} cm/sec and must be installed in lifts not exceeding 8-inches in thickness to satisfy rule requirements. Furthermore, IAC 567—Chapter 113.26(1) "d" (1) requires that:

> FML components consisting of high-density polyethylene (HDPE) shall be at least 60-mil thick. The FML must be installed in direct and uniform contact with the compacted soil component. The requirements for MSWLF facilities under this subparagraph were effective November 13, 1996, and apply to liner and cover systems that had not been installed by that date.

Note that Iowa's rules closely mirror Federal regulations for composite liners. However, the last sentence is particularly important, as Iowa exempts (by administrative rule) airspace permitted previous to November 13, 1996, from the standards technically comparable to Federal RCRA Subtitle D composite liner requirements at least two-years later than Federal regulations allow.[9]

The Department may also approve alternative liner systems pursuant to IAC 567—Chapter 113.26(1) "e" (1), which reads in part:

> The department may approve an alternative to the liner system specified in subparagraph 113.26(1) "d" (1) provided that the alternative liner system design has included certification by a professional engineer registered in Iowa stating that the proposed alternative liner system will ensure that the contaminant concentration values listed in federal regulation under 40 CFR 258, Subpart D, Table 1, will not be exceeded in the uppermost aquifer at the designated monitoring points of compliance as specified by the department. This point of compliance shall be no more than 150 meters from the waste management boundary.

[9] 40 CFR part 258 took effect on 10/9/1991, 4/9/1994, or 10/9/1994 depending on local circumstances. See 40 CFR 258.1 for details.

Although RCRA Subtitle D standards are closely mirrored in Iowa's administrative code, IAC 567—Chapter 113.26(1) "d" (2) does not clarify that the point of compliance must be located on land owned by the owner of the MSWLF unit, which is required by Federal regulations.[10]

While 40 CFR part 258 sets the minimum national standards for landfills, state requirements can provide greater levels of protection for human health and the environment. Iowa's Groundwater Protection Act sets the policy of the state as "…to prevent further contamination of groundwater from any source to the maximum extent practical."[11] Landfills with liners technically comparable to Subtitle D standards provide the maximum practical protection to Iowa's groundwater.

Furthermore, Iowa Code 455B.301 directs the Environmental Protection Commission to "…establish rules for the proper administration of this part 1 of division IV which shall reflect and accommodate as far as is reasonably possible the current and generally accepted methods and techniques for treatment and disposition of solid waste…". Landfills with liners technically comparable to Subtitle D standards are the current and generally accepted method for disposing of solid waste.

Therefore, it is the Department's intent that all landfills should transition to liners technically comparable to Subtitle D standards or close as soon as practical. The Department's position is that ten-years is a realistic timeline for this transition. The transition deadline will apply to all MSW landfills, regardless or remaining airspace, previous expansion approvals or exemptions.

In summary, Iowa is a RCRA Subtitle D authorized state and must have standards technically comparable to the minimum requirements set out in Federal regulations. While Iowa's current administrative rule is technically comparable to Subtitle D regulations, the rules could be improved in specific areas to more clearly mirror the Federal regulations in 40 CFR part 258. Above and beyond the minimum requirements of 40 CFR part 258, Iowa's Groundwater Protection Act (455E) sets maximum practical groundwater protection as the policy of the state. Liners technically comparable to Subtitle D standards offer the maximum practical protection. Therefore, it is the Department's intent to more closely mirror language in 40 CFR part 258 and require all landfills to transition to a disposal area technically comparable to those standards as soon as practicable in the upcoming administrative rules revision for landfills.

As an aside to the regulatory requirements, it should be noted that many solid waste professionals believe landfills will transition from their current "dry-tomb theory" management and design, where the addition of liquids and infiltration of precipitation is minimized, to bioreactor designs where liquid addition is not prohibited but managed. Current research indicates that bioreactor landfills can safely and effectively degrade solid waste much more rapidly than "dry tomb" landfills, when the addition of liquids, and sometimes air, is carefully managed and monitored.

[10] See 40 CFR 258.40(d).
[11] See Iowa Code Chapter 455E.5(1).

Since bioreactor technology involves the managed and monitored addition of liquids, the focus of landfill design and leachate management will shift from a combination cover-liner liquids barrier system to a design with greater emphasis on the liquids barrier integrity of the liner. The Department is amenable to permitting bioreactor technology pursuant to EPA's Research, Development, and Demonstration Permit rulemaking.[12] Therefore, emerging bioreactor technology may be an incentive for landfills to transition to liners technically comparable to Subtitle D standards.

GUIDANCE

Vertical Expansions:[13]

A landfill that does not have a liner technically comparable to Subtitle D standards may be granted a vertical expansion (VE) of its permitted disposal airspace if all of the following conditions are met. In all of these cases the VE shall be for the minimum amount of time necessary to alleviate the situation.

- The solid waste agency is facing an immediate shortage of disposal airspace, which it took all reasonable steps to avoid, and needs more time to construct a disposal cell with a liner technically comparable to Subtitle D standards or arrange for an alternate disposal method to avoid a disposal crisis.
- Reshaping the final contours of the landfill will significantly reduce the infiltration of precipitation and significantly reduce leakage to groundwater at a site where groundwater contamination is occurring.

Horizontal Expansions:

A landfill that does not have a liner technically comparable to Subtitle D standards may be granted a horizontal expansion of its permitted disposal airspace if the horizontal expansion will utilize a liner technically comparable to Subtitle D standards. The horizontal expansion may abut a disposal area that does not have a liner technically comparable to Subtitle D standards if a drainage layer is constructed directing the majority of leachate toward the liner technically comparable to Subtitle D standards.

Piggyback Expansions:

A landfill that does not have a liner technically comparable to Subtitle D standards may be granted a combination vertical-horizontal (i.e. piggyback) expansion of its permitted disposal airspace if one or more of the following conditions are met. In all of these cases the vertical expansion (VE) over the inadequately lined area shall be for the minimum amount of time necessary to alleviate the situation.

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[12] See Federal Register, v. 67, n. 111, June 10, 2002, p. 39662-39668.

[13] The Department intends to define 'vertical expansion' as a disposal airspace increase, above previously placed waste, greater than or equal to 5% of the previously permitted disposal cell's airspace. The Department may approve a single increase less than 5% of the previously permitted disposal cell's airspace as an amendment to the final contours, rather than a vertical expansion, if the amendment reduces infiltration and leakage to groundwater.

- The solid waste agency is facing an immediate shortage of disposal airspace, which it took all reasonable steps to avoid, and needs more time to construct a disposal cell with a liner technically comparable to Subtitle D standards or arrange for an alternate disposal method to avoid a disposal crisis.
- Reshaping the final contours of the landfill will significantly reduce the infiltration of precipitation and significantly reduce leakage to groundwater at a site where groundwater contamination is occurring.
- The horizontal expansion utilizes a liner technically comparable to Subtitle D standards.
- A drainage layer is constructed directing a majority of the leachate toward the liner technically comparable to Subtitle D standards.

Remaining Disposal Airspace:

The Department recommends that all landfills with remaining disposal airspace over a liner not technically comparable to Subtitle D standards reshape their final contours and modify their fill progression to satisfy the following objectives:

- Allow construction of a drainage layer to direct a majority of the leachate toward a liner technically comparable to Subtitle D standards if an abutting horizontal expansion or piggyback is being considered.
- Minimize the infiltration of precipitation and leakage to groundwater in the inadequately lined area.
- Maximize disposal airspace over a future liner technically comparable to Subtitle D standards.
- Transition to a disposal area with a liner technically comparable to Subtitle D standards or close within the next ten years.