ISOSWO Technical Advisory Committee
Meeting Notes
March 13, 2006

The entire discussion was to compile a summary of comments and questions from each participant's first review of the draft of proposed IAC 567-113 (Part I) released by DNR on or about March 2nd. The intent was to send the summary to DNR staff prior to a statewide ICN meeting scheduled for March 17th with enough lead time for DNR staff to prepare responses to at least some of the comments. Meeting ran from 1 p.m. to 4:30 p.m.

Summary of notes in annotation format begins on next page. Typos and grammatical edits are highlighted markouts within the text. All other comments and questions are indicated in margin notes. They all bear my initials [hm#] because I am the one compiling them (to the best of my ability). It is noteworthy that the vast majority of comments and questions in this markup were generally embraced by all of the meeting participants as meriting further discussion and consideration. In some cases, no one had a solution to recommend; in others, different participants favored different solutions. The concurrence, then, was on where the real issues lie more than in what the specific fixes may be. Everyone involved hopes that rigorous discussion in the ensuing months will lead to resolution of most of the issues identified herein, and that the eventual formal rulemaking will proceed more smoothly and the finished rule be stronger because of such rigorous review and debate.

Due to the short turnaround time, my transcriptions of these notes have not been reviewed by the meeting participants, the full technical committee, or the ISOSWO board, and do not represent official positions of any of the parties or individuals of those groups. These notes are intended to further the discussion at the Friday, March 17th ICN meeting, and in other discussions in the near future. Each of the participants is encouraged to further comment or question any part of the draft rule and these notes.

Respectfully submitted,

Hal Morton, Chair, ISOSWO Technical Advisory Committee

Draft 1

Draft

Rescind 567-Chapter 113 and adopt the following new chapter in lieu thereof as 567-Chapter 113:

Chapter 113
Sanitary Landfills for Municipal Solid Waste: Groundwater protection systems for the disposal of non-hazardous wastes.

567-113.1(455B, 455D) Purpose.

113.1(1) This chapter details the permitting, siting, design, operating, monitoring, corrective action, reporting, recordkeeping, closure, and post closure requirements for all sanitary landfills accepting municipal solid waste (MSW). The purpose of this chapter is to protect human health and the environment.

113.1(2) The purpose of this ~~part~~ chapter is to ~~establish~~ implement minimum national ~~criteria under~~ standards pursuant to the Resource Conservation and Recovery Act (RCRA or the Act), as amended, for all municipal solid waste landfill (MSWLF) units and under the Clean Water Act, as amended, for municipal solid waste landfills that are used to dispose of sewage sludge. These minimum national criteria ensure the protection of human health and the environment.[hm1]

113.1(3) Groundwater is a precious natural resource. The vast majority of citizens in Iowa depend on groundwater as a drinking water source. Agriculture, industry and commerce also depend heavily on groundwater. It is essential to health, welfare, and economic prosperity of all citizens in Iowa that groundwater is protected and that the prevention of groundwater contamination is of paramount importance. Therefore, the purpose of this chapter is to prevent groundwater contamination from MSW landfills to the maximum extent practical[hm2], and if necessary to restore the groundwater to a potable state, regardless of present condition, use, or characteristics.[hm3]

567-113.2(455B) Applicability and Compliance.

113.2(1) All sanitary landfills accepting municipal solid waste must comply with the provisions of this chapter.

113.2(2) These rules do not encompass the beneficial use of byproducts as alternative cover material. For rules pertaining to the beneficial use of byproducts as alternative cover material, see IAC 567—Chapter 108.

113.2(3) These rules do not encompass the management and disposal of special wastes. For rules pertaining to the management and disposal of special wastes, see IAC 567—Chapter 109.

113.2(4) These rules do not encompass the financial assurance requirements for MSW landfills. For rules pertaining to MSW landfill financial assurance, see IAC 567—Chapter 111.

113.2(5) ~~These Criteria do~~ This chapter does not apply to municipal solid waste landfill units that ~~do~~ did not receive waste after October 9, 1991.[hm4]

113.2(6) MSWLF units that ~~meet the conditions of §258.1(e)(3) and~~ receive waste after October 9, 1991 but stop receiving waste before ~~the~~ ~~date designated by the state pursuant to §258.1(e)(3)~~ October 9, 1994, are exempt from all the requirements of this part 258 chapter, except the final cover requirement specified in ~~§258.60(a)~~113.12(1) or (2). The final cover must be installed within one year after ~~the date designated by the state pursuant to §258.1(e)(3)~~ October 9, 1994. Owners or operators of MSWLF units described in this ~~paragraph~~ subrule that fail to complete cover installation within one-year after ~~the date designated by the state pursuant to §258.1(e)(3)~~ October 9, 1994 will be subject to all the requirements of this ~~part 258~~ chapter, unless otherwise specified.

113.2(7) Municipal solid waste landfill units failing to satisfy these criteria are considered open dumps for purposes of State solid waste management planning under RCRA. Municipal solid waste landfill units failing to satisfy these criteria constitute open dumps, which are prohibited under section 4005 of RCRA.

113.2(8) Municipal solid waste landfill units containing sewage sludge and failing to satisfy ~~these Criteria~~ this chapter violate sections 309 and 405(e) of the Clean Water Act.

113.2(9) ~~§ 258.3~~ *Consideration of other ~~Federal~~ laws.* ~~The owner or operator of a municipal solid waste landfill unit must comply with any other applicable Federal rules, laws, regulations, or other requirements.~~ The issuance of a MSW landfill permit by the Department in no way relieves the permit holder of the responsibility of complying with all other local, state, or federal statutes, ordinances, and rules and other applicable requirements.[hm5]

113.2(10) ~~§ 258.16~~ *Closure of existing municipal solid waste landfill units.*

a. Existing MSWLF units that cannot make the demonstration specified in ~~§258.10(a)~~113.6(2) "a", pertaining to airports, ~~§258.11(a)~~113.6(2) "b", pertaining to floodplains, or ~~§258.15(a)~~113.6(2) "f", pertaining to unstable areas, must close ~~by October 9, 1996,~~ in accordance with ~~§258.60 of this part~~ 113.12 and conduct post-closure activities in accordance with ~~§258.61 of this part~~ 113.13

b. Existing MSWLF units that do not comply with the leachate collection and liner requirements of 113.7(5) shall close[hm6] by October 1, 2007 in accordance with 113.12 and conduct post-closure activities in accordance with 113.13. If a new MSWLF unit is constructed, the construction of the new compliant MSWLF unit shall be completed by October 1, 2007, and at least 5-feet[hm7] of select MSW placed

over the liner before December 15, 2007[hm8]. No MSW shall be placed in a MSWLF unit that does not comply with the leachate collection and liner requirements of 113.7(5) after October 1, 2007[hm9].

567-113.3(455B, 455D) Definitions[hm10]**.** Unless otherwise noted, all terms contained in this part are defined by their plain meaning. This section contains definitions for terms that appear throughout this ~~part~~ chapter; additional definitions appear in the specific sections to which they apply. In addition to the definitions set out in Iowa Code section 455B.301, which shall be considered incorporated by reference in these rules, the following definitions shall apply:

"Active life" means the period of operation beginning with the initial receipt of solid waste and ending at completion of closure activities in accordance with ~~§258.60 of this part~~ 113.12.

"Active portion" means that part of a facility or unit that has received or is receiving wastes and that has not been closed in accordance with ~~§258.60 of this part~~ 113.12.

"*Aquifer"* means a saturated geologic formation or combination of formations, which has appreciably greater ability to transmit water than do adjacent formations. Typically, an aquifer is capable of yielding usable quantities of water to a well.

"Commercial solid waste" means all types of solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential and industrial wastes[hm11].

"Existing MSWLF unit" means any municipal solid waste landfill unit that is receiving has received solid waste as of the ~~appropriate dates specified in §258.1(e)~~ most recent permit renewal. ~~Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management.~~

"Facility" means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

"Household waste" means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses[hm12], ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas)[hm13].

"Industrial solid waste" means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under subtitle C of RCRA. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer~~/~~ and agricultural chemicals; food and related products~~/~~ and by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing~~/~~ and foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and

miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

"Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit[hm14], or a non-contiguous expansion of the waste boundaries that is still within the permitted area of an existing landfill.

"Municipal solid waste landfill (MSWLF) unit" means a discreet area of land or an excavation that receives household waste[hm15], and that is not a land application site, surface impoundment, injection well, or waste pile, as those terms are defined under 40 Code of Federal Regulations Part 257.2. A MSWLF unit also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous dry sludge, construction and demolition debris, and industrial solid waste. A MSWLF unit may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion. [hm16]A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

"New MSWLF unit" means any municipal solid waste landfill unit that has not received waste prior to ~~October 9, 1993, or prior to October 9, 1997 if the MSWLF unit meets the conditions of §258.1(f)(1)~~ the most recent permit renewal.

"Open burning" means the combustion of solid waste without:

(1) Control of combustion air to maintain adequate temperature for efficient combustion.

(2) Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion.

(3) Control of the emission of the combustion products.

"Operator" means the person(s) responsible for the overall operation of a facility or part of a facility. For the purposes of this chapter, "operator" means a certified operator pursuant to 113.8(6).

"Owner" means the person(s) who owns a facility or part of a facility.

"Residential lead-based paint waste" means waste containing lead-based paint, which is generated as a result of activities such as abatement, rehabilitation, renovation and remodeling in homes and other residences[hm17]. The term residential lead-based paint waste includes, but is not limited to, lead-based paint debris, chips, dust, and sludges.

"Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a facility[hm18].

"Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

"Saturated zone" means that part of the earth's crust in which all voids are filled with water.

"Sludge" means any solid, semisolid, or liquid waste generated from a commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, or any other such waste having similar characteristics and effects exclusive of the treated effluent from a wastewater treatment plant.

"Stabilized sludge" means sludge that has been processed to a point where it has the ability to resist further change, produce minimal odor, and has achieved a substantial reduction in the pathogenic organism content. ~~(The department recognizes principles of stabilization other than conventional biological processes. Whether these procedures produce a stabilized sludge will be evaluated on an individual basis.)~~

"Uppermost aquifer" means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

"Waste management unit boundary" means a vertical surface located at the hydraulically downgradient limit of the unit[hm19]. This vertical surface extends down into the uppermost aquifer.

567-113.4(455B) Permits.

113.4(1) *Permit required.* A MSWLF unit shall not be constructed or operated without a permit from the Department.

113.4(2) *Construction and operation.* All MSWLF units shall be constructed and operated according to this chapter, any plans and specifications approved by the Department, and the conditions of the permit. Any approved plans and specifications shall constitute a condition of the permit.

113.4(3) *Transfer of title and permit.* If title to a MSWLF unit is transferred, then the Department shall transfer the permit within 60 days if the Department has found that the following requirements have been met:

a. The title transferee has applied in writing to the Department to request a transfer of the permit within 30 days of the transfer of the title.

b. The permitted facility is in compliance with Iowa Code chapters 455B and 455D, this chapter and the conditions of the permit.

113.4(4) *Permit conditions.* Any permit may be issued subject to conditions specified in writing by the Department that are necessary to ensure that the facility is constructed and operated in a safe and effective manner, and in compliance with Iowa Code chapters 455B and 455D, this chapter and the conditions of the permit.

113.4(5) *Effect of revocation.* If a MSWLF permit held by any public or private agency is revoked by the Department, then no new permit shall be issued to that agency for that MSWLF for a period of one year from the date of revocation. Such revocation shall not prohibit the issuance of a permit for the facility to another public or private agency.

113.4(6) *Inspection of site and operation.* The Department shall be notified when the construction of a new facility or MSWLF unit has been completed so that the Department may inspect the facility to determine if the project was constructed equal to or better than the design approved by the Department. The Department shall inspect and approve a new facility or MSWLF unit before MSW may be accepted. The Department may inspect a facility and its operations to determine if the facility is in compliance.

113.4(7) *Duration and renewal of permits.*

a. *Operating permits*. MSWLF permits shall be issued and may be renewed for a period no longer than five years, unless the MSWLF adopts RD&D provisions pursuant to sub-rule 113.4(10). MSWLF permits with RD&D provisions pursuant to sub-rule 113.4(10) shall be issued and may be renewed for a period no longer than three years.

b. *Closure permits*. MSWLF closure permits shall only be issued after a facility no longer accepts solid waste. Closure permits shall initially be issued for a period of 30 years. If the Department extends the postclosure period beyond 30 years, then the duration of the subsequent closure permit will be determined on a site-specific basis. A MSWLF requires a closure permit until the Department determines that postclosure operations are no longer necessary[hm20].

113.4(8) *Request for permit renewal.*

a. *Operating permits.* A request for an operating permit renewal shall be in writing and filed at least 90 days before the expiration of the current permit. If the renewal applicant is found not to be in compliance with this chapter or the permit requirements, then the applicant shall achieve compliance or be placed on a compliance schedule approved by the Department before the permit may be renewed.

b. *Closure permits*. A request for a closure permit renewal or termination shall be filed at least 180 days before the expiration of the current permit. If the Department finds that the MSW landfill has completed all required postclosure activities and no longer presents a significant risk to human health or the

environment, then the Department shall issue written notification that a closure permit is no longer required for the facility.

113.4(9) *Request for permit amendment.* Requests for permit amendments must be submitted in writing to the Department with supporting documentation and materials.

113.4(10) *RD&D permits.* The Department may issue a research, development and demonstration (RD&D) permit as follows. The Department may issue a RD&D permit that overrides the applicable portions of this chapter, as listed below, without issuing a variance. A permit amendment from the Department for leachate recirculation only does not require a RD&D permit.

a. The ~~Director of an approved State~~ Department[hm21] may issue a research, development, and demonstration (RD&D) permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative and new methods which vary from either or both of the following criteria provided that the MSWLF unit has a leachate collection system designed and constructed to maintain less than a 30-cm (i.e. 12 inch) depth of leachate on the liner:

(1) The run-on control systems in 113.7(8)"a"(3)[hm22] ~~§258.26(a)(1);~~ and

(2) The liquids restrictions in 113.8(1)"b"(3) ~~§258.28(a)~~.

b. The ~~Director of an approved State~~ Department may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative and new methods which vary from the final cover criteria of 113.12(1) ~~§258.60(a)(1), (a)(2)~~ and 113.12(2) ~~(b)(1)~~, provided the MSWLF unit owner/ or operator demonstrates that the infiltration of liquid through the alternative cover system will not cause contamination of groundwater or surface water, or cause leachate depth on the liner to exceed 30-cm.

c. Any permit issued under this section must include such terms and conditions at least as protective as the criteria for municipal solid waste landfills to assure protection of human health and the environment. Such permits shall:

(1) Provide for the construction and operation of such facilities as necessary, for not longer than three years, unless renewed as provided in paragraph "e" of this sub-rule ~~section~~;

(2) Provide that the MSWLF unit must receive only those types and quantities of municipal solid waste and non-hazardous wastes which the ~~State Director~~ Department deems appropriate for the purposes of determining the efficacy and performance capabilities of the technology or process;

(3) Include such requirements as necessary to protect human health and the environment, including such requirements as necessary for testing and providing information to the ~~State Director~~ Department with respect to the operation of the facility;

(4) Require the owner or operator of a MSWLF unit permitted under this section to submit an annual report to the ~~State Director~~ Department showing whether and to what extent the site is progressing in attaining project goals. The report will also include a summary of all monitoring and testing results, as well as any other operating information specified by the ~~State Director~~ Department in the permit; and

(5) Require compliance with all criteria in this ~~part~~ chapter, except as permitted under this section.

d. The ~~Director of an approved State~~ Department may order an immediate termination of all operations at the facility allowed under this section or other corrective measures at any time the ~~State Director~~ Department determines that the overall goals of the project are not being attained, including protection of human health or the environment.

e. Any permit issued under this section shall not exceed three years and each renewal of a permit may not exceed three years.

(1) The total term for a permit for a project including renewals may not exceed twelve years; and

(2) During permit renewal, the applicant shall provide a detailed assessment of the project showing the status with respect to achieving project goals, a list of problems and status with respect to problem resolutions, and ~~other~~ any other requirements that the ~~Director~~ Department determines necessary for permit renewal.

113.4(11) *Factors in permit issuance decisions*[hm23]. The Department may request that additional information be submitted for review to make a permit issuance decision. The Department may review and inspect the facility, its agents and operators, and compliance history. The Department may consider compliance with related requirements, such as financial assurance and comprehensive planning. The Department may review whether or not a good-faith effort to maintain compliance and protect human health and the environment is being made, and whether a compliance schedule is being followed. The Department may issue a permit on a trial basis.[hm24]

567-113.5(455B) Permit Application Requirements[hm25][hm26]**.**

113.5(1) Unless otherwise requested by the Department, a MSWLF permit applicant shall submit the following permit application information to the Department:

a. The name, address and telephone number of:

(1) Owner of the site where the facility will be located.

(2) Permit applicant.

(3) Official responsible for the facility.

(4) Certified operator (i.e. "operator") responsible for operation of the facility.

(5) Professional engineer (P.E.) licensed in the State of Iowa and retained for the design of the facility.

(6) Agency to be served by the facility, if any.

(7) Responsible official of agency to be served, if any.

b. An organizational chart.

c. A site exploration and characterization report for the facility that complies with the requirements of rule 113.6(4).

d. Plans and specifications for the facility, and quality control and assurance (QC&A) plans, that complies with the requirements of rule 113.7(6).

e. An operations plan for the facility, an emergency response and remedial action plan (ERRAP), and proof of MSWLF operator certification that complies with the requirements of rule 113.8[hm27].

f. An environmental monitoring plan[hm28] that complies with the requirements of rule 113.9.

g. The project goals and timelines, and other documentation as necessary to comply with 113.4(10) and other requirements of the Department if a RD&D permit is being requested or renewed.

h. Proof of financial assurance in compliance with IAC 567—Chapter 111.

i. A closure and postclosure plan that complies with the requirements of rules 113.12 and 113.13.

113.5(2) *Incomplete permit applications.* If the Department finds the permit application information to be incomplete, it shall notify the applicant of that fact and of the specific deficiencies. If the applicant fails to correct the noted deficiencies within 30 days, the Department may reject the application and return the application materials to the applicant. The applicant may reapply without prejudice.

567-113.6(455B) Siting & Location Requirements for New[hm29] **MSW Landfills.**

113.6(1) *Local siting approval.* The Department will not consider a permit application for a new MSWLF unless local siting approval pursuant to Iowa Code 455B.305A has been obtained.

113.6(2) *Location restrictions.* All MSWLFs shall comply with the following location restrictions.

a. *Airports.* For purposes of this paragraph ~~section~~:

"Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

"Bird hazard" means an increase in the likelihood of bird-aircraft collisions that may cause damage to the aircraft or injury to its occupants.

(1) A prohibition on locating a new MSWLF near certain airports was enacted in Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Ford Act), Pub. L. 106–181 (49 U.S.C. 44718 note). Section 503 prohibits the "construction or establishment" of new MSWLFs after April 5, 2000 within six miles of certain smaller public airports. The Federal Aviation Administration (FAA) administers the Ford Act and has issued guidance in FAA Advisory Circular 150/5200–34, dated August 26, 2000. For further information, please contact the FAA.

(2) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that are located within 10,000 feet (3,048 meters) of any airport runway end used by turbojet aircraft or within 5,000 feet (1,524 meters) of any airport runway end used by only piston-type aircraft must demonstrate to the Federal Aviation Administration (FAA) that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft. The owner or operator must place the demonstration ~~in paragraph (a)~~ of this ~~section~~ requirement in the operating record, and notify the ~~State Director~~ Department that it has been placed in the operating record, and submit to the Department a copy of the demonstration approved by the FAA.

(3) Owners or operators proposing to site new MSWLF units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the Federal Aviation Administration (FAA). A copy of these notifications shall be submitted to the Department.

b. *Floodplains.* For purposes of this paragraph ~~section~~:

"Floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

"100-year flood" means a flood that has a 1-percent or greater chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in 100 years on the average over a significantly long period.

"*Washout*" means the carrying away of solid waste by waters of the base flood.

Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year floodplains must demonstrate to the Department that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the operating record, ~~and~~ notify the ~~State Director~~ Department that it has been placed in the operating record, and submit a copy of the demonstration to the Department.

c. *Wetlands.* For purposes of this paragraph ~~section~~:

"Wetlands" means those areas that are ~~defined in 40 CFR 232.2(r). Note: In 40 CFR 232.2(r), *Wetlands* means those areas that are~~ inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

New MSWLF units and lateral expansions shall not be located in wetlands, unless the owner or operator can make the following demonstrations to the ~~Director of an approved State~~ Department:

(1) Where applicable under section 404 of the Clean Water Act or applicable State wetlands laws, the presumption that practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;
(2) The construction and operation of the MSWLF unit will not:

1. Cause or contribute to violations of any applicable State water quality standard,

2. Violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act,

3. Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, and

4. Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary.

(3) The MSWLF unit will not cause or contribute to significant degradation of wetlands. The owner or operator must demonstrate the integrity of the MSWLF unit and its ability to protect ecological resources by addressing the following factors:

1. Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the MSWLF unit;

2. Erosion, stability, and migration potential of dredged and fill materials used to support the MSWLF unit;

3. The volume and chemical nature of the waste managed in the MSWLF unit;

4. Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;

5. The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and

6. Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

(4) To the extent required under section 404 of the Clean Water Act or applicable State wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent practicable as required by ~~paragraph (a)(1) of this section~~ subparagraph 113.6(2)“c”(1), then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

(5) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

d. *Fault areas.* For the purposes of this ~~section~~ sub-rule:

“Fault” means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

“Displacement” means the relative movement of any two sides of a fault measured in any direction.

"Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

New MSWLF units and lateral expansions shall not be located within 200 feet (60 meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the ~~Director of an approved State~~ Department that an alternative setback distance of less than 200 feet (60 meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.

e. *Seismic impact zones.* For the purposes of this ~~section~~ sub-rule:

"Seismic impact zone" means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 250 years.

"Maximum horizontal acceleration in lithified earth material" means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

"Lithified earth material" means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface.

New MSWLF units and lateral expansions shall not be located in seismic impact zones, unless the owner or operator demonstrates to the ~~Director of an approved State/Tribe~~ Department that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The owner or operator must place the demonstration in the operating record, and notify the ~~State Director~~ Department that it has been placed in the operating record, and submit a copy of the demonstration to the Department.

f. *Unstable areas.* For purposes of this section:

"Unstable area" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and Karst terranes.

"Structural components" means liners, leachate collection systems, final covers, run-on systems, run-off systems, and any other component used in the construction and operation of the MSWLF that is necessary for protection of human health and the environment.

"Poor foundation conditions" means those areas where features exist which indicate that a natural or ~~man-induced~~ human-induced event may result in inadequate foundation support for the structural components of an MSWLF unit.

"Areas susceptible to mass movement" means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the MSWLF unit, because of natural or ~~man-induced~~ human-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluction, block sliding, and rock fall.

"Karst terranes" means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terranes include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must demonstrate to the Department that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. The owner or operator must place the demonstration in the operating record, ~~and~~ notify the ~~State Director~~ Department that it has been placed in the operating record, and submit a copy of the demonstration to the Department. The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable:

(1) On-site or local soil conditions that may result in significant differential settling;

(2) On-site or local geologic or geomorphologic features; and

(3) On-site or local human-made features or events (both surface and subsurface).

g. *Threatened or endangered flora and fauna.*

[NOTE: DERIVED FROM 101.8(1) "i" (7). DELETE THAT RULE AS PART OF THIS RULEMAKING.]

(1) All MSWLFs and lateral expansions shall prepare a comprehensive listing of plant and animal species. In preparing the listing, the permit applicant shall contact the Department's Iowa natural areas inventory with a request to search its records to determine the presence of, or habitat for, any threatened or endangered species or communities of flora or fauna on the proposed site. In the event that the

Department's Iowa natural areas inventory does not contain records of threatened or endangered species or communities but their presence is suspected, then the permit applicant shall conduct a site survey.

(2) Should any threatened or endangered species be identified pursuant to paragraph 113.6(2)"g"(1), the permit applicant shall demonstrate to the Department that the MSWLF unit will not cause or contribute to significant degradation of the threatened or endangered species or communities.

h. *Cultural resources.*
[NOTE: DERIVED FROM 101.8(1) "i" (7). DELETE THAT RULE AS PART OF THIS RULEMAKING.]

(1) All MSWLFs and lateral expansions shall prepare a comprehensive listing of, and assessment of the impact on, any archaeologically, historically, or architecturally significant properties on the proposed site. To assess the impact, the permit applicant shall consult with the historic preservation bureau of the Iowa State historical society.

(2) Should any significant cultural resources be identified pursuant to paragraph 113.6(2)"h"(1), the permit applicant shall demonstrate to the Department that the MSWLF unit will not cause or contribute to significant degradation of those cultural resources.

i. *Separation from groundwater.* The base of a MSWLF unit shall be at least 5-feet above the high water table.[hm30][hm31][hm32]

j. *Wells*[hm33]. A MSWLF unit shall not be within 1,000 feet of any well in existence at the time of receipt of the permit application that is being used or could be used for human or livestock consumption. Groundwater monitoring wells are exempt from this requirement. The Department may also exempt extraction wells utilized as part of a remediation system from this requirement. A new MSWLF unit shall not be within 1,000 feet[hm34] of an agricultural drainage well.

k. *Community water systems.* A MSWLF unit shall not be within one mile of the source of any community water system that is down gradient from the MSWLF unit and is in existence at the time of receipt of the permit application ~~that is down gradient from the MSWLF unit~~.

l. *Property line setback.* A MSWLF unit shall be at least 50 feet from the adjacent property line.

m. *Housing and sensitive populations.* A MSWLF unit shall not be within 500 feet of an occupied residence, recreational area, child care facility, educational facility, or health care facility in existence at the time of receipt of the permit application, unless there is a written agreement with the owner of such facility and appropriate screening [hm35]of the

MSWLF unit is utilized. [hm36]The written agreement shall be filed with the county recorder for abstract of title purposes, and a copy submitted to the Department.

113.6(3) *Soil and hydrogeologic investigations.* All MSWLFs shall conduct a soil and hydrogeologic investigation in accordance with this sub-rule. The purpose of this investigation is to obtain data to determine potential routes of contaminant migration via groundwater. Such information is vital for completion of the site exploration and characterization report[hm37], and the hydrologic monitoring system plan and design. These rules set forth the minimum requirements for soil and hydrogeologic investigations and shall be complied with unless the Department issues written approval for alternative hydrogeologic investigation requirements[hm38] due to specific site conditions.

a. *Pre-investigation meeting.* Prior to beginning site work for the soil and hydrogeologic investigation, a potential applicant for a new MSWLF unit shall schedule a meeting with the Department's landfill permitting staff. The purpose of the meeting is to help ensure that the planned soil and hydrogeologic investigation will provide sufficient data for the site exploration and characterization report, and for the hydrologic monitoring system plan and design.

b. *Number of borings.*

(1) A sufficient number of borings shall be made to accurately identify the stratigraphic and hydrogeologic conditions at the site.

(2) Excluding existing MSWLF unit areas, a minimum of four borings per acre[hm39] is required for new MSWLF units.

(3) The Department may issue written permission for fewer borings at an existing facility, or portion thereof, if justified by previous borings and analysis.

(4) The Department may require a greater number of borings at a site, or portion thereof, due to complex hydrogeology or potential movement of contaminants.

c. *Depth of borings*[hm40].

(1) All borings shall be a minimum of 25 feet deep and at least 10 feet below the water table.

(2) At a minimum, half of all borings shall extend 20 feet into the uppermost aquifer, 50 feet below the water table, or 10 feet into bedrock.

(3) At a minimum, one boring shall extend 10 feet into bedrock or 100 feet below the lowest ground surface elevation.

(4) All borings shall be of sufficient depth [hm41]to correlate ~~stratum~~ strata between borings.

d. *Boring method and soil samples.*

(1) In fine-grained soils, continuous samples shall be collected to a depth of 25 feet.

(2) When the boring depth is greater than 25 feet in fine-grained soils, or when boring in coarse-grained soils, samples shall be collected from each major soil stratum encountered and at 5-foot maximum intervals.

(3) At least one sample[hm42] shall be collected from the uppermost stratum below the proposed waste disposal area[hm43].

(4) Boring logs shall be as detailed as possible in describing each stratum. Major ~~stratum~~ strata shall be described down to the lowest soil classification.

(5) Samples shall be clearly marked, preserved and transported in accordance with standard laboratory procedures.

(6) The permit applicant shall keep and preserve samples until at least 30-days after the permit is issued.

e. *Completion or plugging borings.*

(1) Borings may be completed to piezometers or monitoring wells. However, the conversion of such borings does not guarantee that more piezometers or monitoring wells will not be required in the Department-approved hydrologic monitoring system plan and design.

(2) Borings not converted to piezometers or monitoring wells shall be plugged and properly sealed so as not to create pathways for sub-surface or surface pollution migration. Borings converted to piezometers or monitoring wells may still need to be partially plugged depending on the depth of the boring. Plugging shall be pursuant to paragraph 113.10(2)“d”.

f. *Soil and hydrogeologic investigation description and analysis.* A soil and hydrogeologic investigation description and analysis shall be completed and maintained[hm44] which, at a minimum, contains the following:

(1) The boring logs from subparagraph 113.6(3)“d”(4).

(2) A description of the properties of each soil and bedrock stratum, including:

1. Soil texture and classification.

2. Particle size distribution.

3. Mineral composition, cementation, and soil structure[hm45].

4. Permeability, including horizontal and vertical permeability, and porosity.

5. Geologic structure, including strike, dip, folding, faulting and jointing.

6. Previous activities and infrastructure at the site that could affect geology and hydrogeology, such as but not limited to mining, quarry operations, borrow pits, waste disposal, storage tanks, pipelines, utilities and tile lines.

7. Lenses and other discontinuous units, voids, solution openings, layering, fractures, other heterogeneity, and the scale or frequency of the heterogeneity.

8. Correlation and continuity of ~~stratum~~ strata between borings.

(3) Descriptions of the geologic units within the saturated zone, including their:

1. Thickness.

2. Hydraulic properties.

3. Concentrations of chemical constituents listed in Appendix I[hm46] present in the hydrologic units[hm47] and the source of those constituents if known[hm48].

4. Role and effect of each as an aquifer, aquitard, or perched saturated zone.

5. ~~The a~~Actual or potential use of the aquifers as water supplies.

(4) Plan view maps, and a series of cross sections spaced no more than 500 feet apart with two oriented perpendicular and two oriented parallel to the predominant directions of groundwater flow through the MSWLF unit, showing:

1. The extent of soil and bedrock strata.

2. The position of the water table.

3. The position of the uppermost aquifer.

4. Measured values of hydraulic head.

5. Equipotential lines and inferred groundwater streamlines of the water table, and the uppermost aquifer if different from the water table.

6. Location of soil and bedrock borings.

7. Location of piezometers and monitoring points, if any.

(5) A description and evaluation of horizontal and vertical groundwater flow which specifically addresses the following and their significance to the movement of pollutants carried by groundwater:

1. Local, intermediate and regional groundwater systems.

2. Groundwater recharge and discharge areas within and immediately surrounding the facility, including interactions with perennial and intermittent surface waters and how the facility affects recharge rates.

3. Existing and proposed groundwater and surface water withdrawals.

4. The effects of heterogeneity, fractures or directional differences in permeability on groundwater movement.

5. Directions of groundwater movement, including vertical components of flow, specific discharge rates and average linear velocities within the hydrologic strata.

6. Seasonal or other temporal fluctuations in hydraulic head.

7. The effect of existing and proposed MSWLF units.

(6) An analysis of potential impacts on groundwater and surface water quality, and water users, in the event of a theoretical release at the most downgradient portion of each MSWLF unit.[hm49] This analysis shall include:

1. Assumptions and approximations utilized, and why they were utilized.

2. A thorough description of models used and each model's capabilities and limitations, including the reliability and accuracy of the models in actual field tests.

3. Projected paths and rates of movement of contaminants found in leachate[hm50] at 1, 5, 10 and 30-year time intervals from the beginning of the theoretical release.

(7) Recommendations for the location of the proposed MSWLF unit and conceptual design based on the hydrogeologic information contained in this report.

g. HOLD FOR FORMATTING THEN DELETE

113.6(4) *Site exploration and characterization report*[hm51]. All MSWLFs shall maintain a site exploration and characterization report[hm52]. At a minimum, the site exploration and characterization report shall detail compliance with the requirements of rule 113.6 and shall contain the following components.

a. A title page and index.

b. A legal description of the site[hm53].

c. Proof of the applicant's ownership of the site and legal entitlement to use the site as a MSWLF. If the applicant does not own the site, then proof of legal entitlement to the site, such as but not limited to a lease, must be submitted. Such legal entitlement must include the following:

(1) Provisions that allow continued disposal operations until closure of the facility.

(2) Provisions for the performance of facility closure operations.

(3) Provisions for postclosure care for at least a 30-year period after facility closure.

d. Proof of the applicant's local siting approval pursuant to Iowa Code 455B.305A, if applicable.

e. Scaled maps or[hm54] aerial photographs locating the boundaries of the facility[hm55] and identifying:

(1) North and other principal compass points[hm56].

(2) Section lines and other legal boundaries.

(3) Zoning and land use within 0.5 miles[hm57].

(4) Haul routes to and from the facility[hm58], including load limits or other restrictions on those routes.

(5) Topography within 0.5 miles[hm59].

(6) Applicable setback distances and location requirements pursuant to rule 113.6, including:

1. Airports within 6-miles[hm60].

2. Floodplains within or adjacent to the facility[hm61][hm62].

3. Wetlands within or adjacent to the facility[hm63][hm64].

4. Fault areas within 200 feet[hm65].

5. Seismic impact zones within or adjacent to the facility[hm66].

6. Unstable areas within or adjacent to the facility[hm67].

7. Location of threatened or endangered species within or adjacent to the facility[hm68].

8. Location of cultural resources within or adjacent to the facility[hm69].

9. Groundwater elevations within the facility[hm70].

10. Wells within 1,000 feet[hm71].

11. Community water systems within 1-mile[hm72].

12. Boundaries of the MSWLF units and the facility property line[hm73].

13. Housing and sensitive populations within 500 feet[hm74].

(7) HOLD FOR FORMATTING THEN DELETE

f. The aircraft bird hazard demonstration pursuant to paragraph 113.6(2)“a”, if applicable.

g. The floodplain demonstration pursuant to paragraph 113.6(2)“b”, if applicable.

h. The wetlands demonstration pursuant to paragraph 113.6(2)“c”, if applicable.

i. The fault area demonstration pursuant to paragraph 113.6(2)“d”, if applicable.

j. The seismic impact zone demonstration pursuant to paragraph 113.6(2)“e”, if applicable.

k. The unstable area demonstration pursuant to paragraph 113.6(2)“f”, if applicable.

l. The threatened or endangered flora and fauna demonstration pursuant to paragraph 113.6(2)“g”, if applicable.

m. The cultural resources demonstration pursuant to 113.6(2)“h”, if applicable.

n. Copies of written agreements with surrounding property owners pursuant to paragraph 113.6(2)“m”, if applicable.

o. The soil and hydrogeologic investigation description and analysis pursuant to paragraph 113.6(3)“f”.

567-113.7(455B) MSWLF Unit Design and Construction Standards. All MSWLF units shall be designed and constructed in accordance with this rule.

113.7(1) *Pre-design meeting with the Department.* A potential applicant for a new MSWLF unit shall schedule a pre-design meeting with the Department’s landfill permitting staff prior to beginning work on the plans and specifications of a modified or new MSWLF. The purpose of this meeting is to help minimize the need for revisions upon submittal of the official designs and specifications.
[hm75]

113.7(2) *Plans and specifications.*

a. Unless otherwise requested by the Department, initially one copy of plans, specifications and supporting documents shall be sent to the Department for review. Upon written Department approval, the documents shall be submitted in triplicate to the Department for proper distribution.

b. All new MSWLF units shall be constructed in compliance with the rules and regulations in effect at the time of construction. Previous Department approvals [hm76]of plans and specifications are ~~superceded~~ superseded by the promulgation of new rules and regulations and shall be submitted to the Department again for approval prior to construction and operation.[hm77]

113.7(3) *General site design and construction requirements.* A MSWLF shall have the following:

a. All-weather access roads to the facility.

b. A secure perimeter fence with lockable gate(s) to help prevent unauthorized access and control blowing litter.

c. A sign at the entrance to the facility specifying:

(1) Name and permit number of the facility

.

(2) Days and hours that the facility is open to the public or a statement that the facility is not open to the public.

(3) Materials that are and are not accepted, or the statement “All materials must have prior approval.”[hm78]

(4) Telephone number of the official responsible for operation of the facility and the emergency contact person(s).

d. All-weather access roads within the facility[hm79][hm80].

e. Signs or pavement-markings clearly indicating safe and proper on-site traffic patterns.

f. Adequate queuing distance for vehicles entering and exiting the property such that lines of vehicles will not extend onto public streets, unless approved in writing by the appropriate local government authority and a copy of such approval is submitted to the Department.

g. A scale certified by the Iowa Department of Agriculture and Land Stewardship.

h. At least a 25-foot wide fire lane around the outside of the active portion and within the perimeter fence.[hm81]

113.7(4) *MSWLF unit subgrade.* The subgrade for a new MSWLF unit shall be constructed as follows:

a. All trees, stumps, roots, boulders, debris, and other material capable of deteriorating in-situ material strength or creating a preferential pathway for contaminants shall be completely removed prior to construction of the MSWLF unit.

b. The material beneath the MSWLF unit shall have sufficient strength to support the weight of the unit during all phases of construction and operation. The loads and loading rate shall not cause or contribute to failure of the liner and leachate collection system[hm82].

c. The total settlement or swell of the MSWLF unit's subgrade shall not cause or contribute to failure of the liner and leachate collection system.

d. If the in-situ material of the MSWLF unit's subgrade can not meet the requirements of paragraphs 113.7(4) "b" and "c", then such material shall be removed and replaced with material capable of compliance.

e. All materials used for the MSWLF unit's subgrade shall be compacted to maximize strength and density properties, and to comply with the requirements of paragraphs 113.7(4) "b" and "c".[hm83]

f. The subgrade of a MSWLF unit shall be constructed and graded to provide a smooth working surface on which to construct the liner.

g. The subgrade of a MSWLF unit shall not be constructed in or with frozen soil.

113.7(5) *MSWLF unit liners and leachate collection systems.* The liner and leachate collection system for a new MSWLF unit shall be constructed in accordance with the requirements of this subrule. All active portions must have a composite liner or an alternative liner approved by the Department. All MSWLF units must have a functioning leachate collection system during their active life.

a. *Liner systems.* All MSWLF units shall have a liner system that complies with either the composite liner requirements of 113.7(5)"a"(1) or an alternative liner system that complies with the requirements of 113.7(5)"a"(2). Liners utilizing compacted soil must place the compacted soil in lifts no thicker than 6-inches[hm84].

(1) *Composite liner systems*[hm85].

1. ~~For purposes of this section,~~ A composite liner ~~means a system consisting~~ consists of two components, an upper flexible membrane liner (FML) and a lower compacted soil liner.

2. The ~~the~~ upper component must consist of a minimum 30-mil flexible membrane liner (FML). 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[hm86] with the lower compacted soil component.

3. The ~~and the~~ lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second (cm/sec). The compacted soil must be placed in lifts no thicker than 6-inches.

4. The composite liner must slope toward the leachate collection pipes at a slope greater than 2%[hm87]. The side slopes of the composite liner shall not exceed a slope of 25%.

5.[hm88]

(2) *Alternative liner systems*.

1. The design must ensure that the concentration values listed in Table 1 of ~~this section~~ rule 113.7 will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified ~~by the Director of an approved State under paragraph (d)~~ pursuant to subparagraph 113.7(5)"a"(2)"2" ~~of this section~~. Alternative liners utilizing compacted soil must place the compacted soil in lifts no thicker than 6-inches.

2. The relevant point of compliance specified by the ~~Director of an approved State~~ Department shall be no more than 150 meters (i.e. 492 feet) from the waste management unit boundary and shall be located on land owned by the

owner of the MSWLF unit. The relevant point of compliance specified by the Department shall be at least 50 feet from the property line of the facility. In determining the relevant point of compliance ~~State Director~~ the Department shall consider at least the following factors[hm89]:

i. The hydrogeologic characteristics of the facility and surrounding land. The point of compliance shall be at a location where hydrogeologic contamination from the MSWLF unit could be detected.

ii. The volume and physical and chemical characteristics of the leachate. The point of compliance shall be at a distance capable of detecting a release from the MSWLF unit given the volume and strength of leachate typically produced by a MSWLF unit at the facility.

iii. The quantity, quality, and direction, of flow of ground water. The location of the point of compliance must ensure that a release can be detected given local groundwater conditions. This includes the utilization of a relevant up-gradient well capable of yielding reliable background monitoring parameters.

iv. The proximity and withdrawal rate of the groundwater users. The location of the point of compliance shall allow sufficient time for corrective action to prevent a release from contaminating nearby groundwater withdrawals. The closer in proximity and higher in rate the withdrawals, the closer the point of compliance should be placed to the MSWLF unit.

v. The availability of alternative drinking water supplies. The more important the uppermost aquifer is regarding drinking water supplies, the closer the point of compliance should be placed to the MSWLF unit.

vi. The existing quality of the groundwater, including other sources of contamination and their cumulative impacts on the ground water, and whether the ground water is currently used or reasonably expected to be used for drinking water.

vii. Public health, safety, and welfare effects. The impact of the distance of the relevant point of compliance from the MSWLF unit shall be considered. Factors such as the distance to the nearest groundwater user or potentially affected surface water, the response time to contain a contamination plume, and the risk that the point of compliance may not accurately reflect the true plume conditions, must be considered.

viii. Practicable capability of the owner or operator. The owner or operator must demonstrate[hm90] the ability to technically and financially provide corrective action for a plume extending to the point of compliance.

3. When approving a an alternative liner[hm91] design ~~that complies with paragraph (a)(1) of this section~~, the ~~Director of an approved State~~ Department shall consider at least the following factors:

   i. The hydrogeologic characteristics of the facility and surrounding land.

   ii. The climatic factors of the area.

   iii. The volume and physical and chemical characteristics of the leachate.

   iv. The sensitivities and limitations of the modeling demonstrating the applicable point of compliance.

   v. The ability of the agency and its agents to construct the alternative liner as designed and demonstrate such construction through a detailed and documented quality control and assurance (QC&A) program.

   vi. The comparative performance of the alternative liner design to a composite liner[hm92] [hm93]regarding permeance and leakage to groundwater.

4. The alternative liner must slope toward the leachate collection pipes at a slope greater than 2%.[hm94] The side slopes of the alternative liner shall not exceed a slope of 25%.

5. A monitoring well shall be placed at the relevant point of compliance required by subparagraph 113.7(5)“a”(2)“2”. If groundwater-testing results at that monitoring well exceed the concentration values listed in Table 1 of rule 113.7 then the MSWLF unit(s) utilizing that point of compliance shall close[hm95][hm96] pursuant to 113.12 unless the owner or operator can demonstrate to the satisfaction of the Department, within a Department approved time period, that the contaminants are not originating from the MSWLF unit(s).[hm97]

Table 1

Chemical	MCL (mg/l)
Arsenic	0.05
Barium	1.0
Benzene	0.005
Cadmium	0.01
Carbon tetrachloride	0.005
Chromium (hexavalent)	0.05
2,4-Dichlorophenoxy acetic acid	0.1
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
Endrin	0.0002
Fluoride	4
Lindane	0.004

Lead	0.05
Mercury	0.002
Methoxychlor	0.1
Nitrate	10
Selenium	0.01
Silver	0.05
Toxaphene	0.005
1,1,1-Trichloromethane	0.2
Trichloroethylene	0.005
2,4,5-Trichlorophenoxy acetic acid	0.01
Vinyl Chloride	0.002

[hm98]

b. *Leachate collection system.* All MSWLF units shall have a leachate collection system that complies with the following requirements.

(1) The leachate collection system shall be designed and constructed to function for the entire active life of the facility and the post-closure period.

(2) The leachate collection system shall be of a structural strength capable of supporting waste and equipment loads throughout the active life of the facility and the post-closure period.

(3) The leachate collection system shall be designed and constructed to minimize leachate head over the liner at all times. A MSWLF unit shall have a leachate collection system that ~~is designed and constructed to~~ always ~~maintain~~ maintains less than a 30 cm centimeter (cm; i.e. 12-inch) depth of leachate over the liner. The leachate collection system shall have a method for accurately measuring the leachate head on the liner at the system's lowest point(s) within the MSWLF unit. Furthermore, leachate piezometers shall be installed to measure leachate directly on the liner. Leachate head measurements from clean-out lines or manholes are not acceptable. The horizontal locations of the piezometers shall be at least 20-feet away from collection lines to reduce the potential of measuring localized draw down effects.[hm99]

(4) If the leachate collection system is not designed and constructed factoring in leachate recirculation or bioreactor operations, the Department may prohibit such activities within the MSWLF unit. For bioreactor operation modeling, the Department recommends that the addition of liquids up to a maximum of forty-five percent waste moisture content be modeled.

(5) The collection pipes shall be of a length and cross sectional area that allows for annual[hm100] cleaning and inspection through the entire length of all collection pipes. The collection pipes shall not be designed or constructed with sharp bends that prevent cleaning or inspection along any section of the collection pipe or that may cause the collection pipe to be damaged during cleaning or inspection.

(6) The collection pipes shall allow for constant open channel flow to active leachate collection points where the leachate is transferred directly to a sanitary sewer or storage structures for later processing.

(7) Leachate collection system designs shall attempt to minimize the potential for clogging due to mass loading. Leachate collection system designs with more, closely spaced pipes with shorter pipe-runs are preferable to designs with fewer, further spaced pipes with longer pipe-runs.

(8) The leachate collection system shall consist of four components as follows.[hm101] No component[hm102] of the leachate collection system shall have a hydraulic conductivity of less than $1x10^{-2}$ cm/sec. Components of the leachate collection system shall have a minimal carbonate content. The leachate collection system shall be at least 1-foot thick over the liner[hm103] and designed and constructed as follows:

1. A geotextile cushion over the FML, if the liner utilizes an FML. The geotextile's mass shall be determined based on the allowable pressure on the geomembrane.

2. Collection pipe(s) at least 4-inches in diameter at the base of the liner slope(s), surrounded by the high hydraulic-conductivity material listed in subparagraph 113.7(5)"b"(8)"3" below. The collection pipe shall have slots or holes large enough to minimize the potential for clogging from fines conveyed by incoming leachate.

3. One of the following high hydraulic-conductivity materials:

   i. High hydraulic-conductivity material (e.g. gravel) of uniform size, at least forty millimeters (mm) in size, and free of fines.[hm104] The high hydraulic-conductivity material shall be at least 6-inches in depth[hm105] and provide at least 2-inches of cover over the top of the collection pipes. The high hydraulic-conductivity material shall be surrounded by a geotextile listed in subparagraph 113.7(5)"b"(8)"4" below. Or;

   ii. A geosynthetic drainage media (e.g. geonet) with a triplanar structure[hm106] and a minimum thickness of 300 millimeters (mm) [hm107]or greater sized in accordance with appropriate design calculations. The geonet shall be covered on both sides with the geotextiles specified in 113.7(5)"b"(8)"1" and 113.7(5) "b"(8)"4".The following values shall be utilized as minimum standards in the drainage design calculations:

      - A minimum design load on the MSWLF unit subgrade of 10,000 pounds per square foot (psf) or the calculated total load. In performing the calculation of total load, the Department encourages

the consideration of the potential for vertical expansions over the MSWLF unit.

- A geotextile intrusion reduction factor (RFin) of 1.2.[hm108]
- A creep deformation of core or geotextile into the drainage channel reduction factor (RFcr) of 2.0.
  [hm109]
- A chemical clogging into the drainage core reduction factor (RFcc) of 2.0.
  [hm110]
- A biological clogging in the drainage core reduction factor (RFbc) of 2.0.
  [hm111]
- An overall design drainage factor of 2.0.[hm112]

4. Geotextile designed to prevent the coarse granular material listed in subparagraph 113.7(5)“b”(8)“5” below from filtering into the high hydraulic conductivity material. However, the geotextile shall not filter out fines being transmitted through the coarse granular material.

5. Coarse granular (e.g. coarse sand) top layer at least 6-inches thick to separate waste from the geotextile listed in subparagraph 113.7(5)“b”(8)“4”. The coarse granular layer shall have a fines content of less than 1% passing a #200 sieve. The purpose of the coarse granular layer is not to filter out fines. The purpose of the coarse granular layer is to separate the waste from the liner and the rest of the leachate collection system while readily transmitting leachate.

(9) The use of manholes within the MSWLF unit[hm113] shall be avoided. If manholes must be used within the MSWLF unit, then their design shall attempt to minimize the potential for stressing or penetrating the liner due to friction on the manhole exterior from waste settlement.

(10) Leachate collection systems shall be designed and constructed so that they do not penetrate the liner.

(11) The leachate drainage and collection system within the MSWLF unit shall not be used for the purpose of storing leachate. If leachate is to be stored, it shall be in designated storage structures outside of the MSWLF unit.

(12) All of the facility’s leachate storage and management structures outside of the MSWLF unit (e.g. tanks, holding ponds, pipes, sumps, manholes, lift stations) and operations shall have containment structures or countermeasures adequate to prevent seepage to groundwater or surface water. The containment structures and countermeasures for leachate storage shall be at

least as protective of groundwater at the MSWLF unit's liner on a performance basis.[hm114]

(13) The leachate storage structures shall be able to store at least 7-days of accumulated leachate at the maximum generation rate used in designing the leachate collection system. Such minimum storage capacity may be constructed in phases over time so long as the 7-day accumulation capacity is maintained. The storage facility shall also have the ability to load tanker trucks in case sanitary sewer service is unavailable for longer than 7-days.

(14) The leachate collection system shall be equipped with valves so that leachate can be controlled during maintenance.

(15) The leachate collection system shall be accessible for maintenance at all times and under all weather conditions.

c. HOLD FOR FORMATTING

113.7(6) *Quality Control and Assurance Programs.* All MSWLF units shall be constructed under the supervision of a strict quality control and assurance (QC&A) program to ensure MSWLF units are constructed as good or better than the requirements of rule 113.7 and the approved plans and specifications. At a minimum, such a QC&A program shall consist of the following.

a. The owner or operator shall designate a quality control and assurance (QC&A) officer. The QC&A officer shall be a professional engineer (P.E.) registered in Iowa. The QC&A officer shall not be an employee of the facility[hm115]. The owner or operator shall notify the Department of the designated QC&A officer and provide the Department with that person's contact information.

b. The QC&A officer shall supervise and be responsible for all inspections, testing, documentation and other activities necessary to ensure compliance with rule 113.7, and the approved plans and specifications. The QC&A officer may delegate another person or persons who are not employees of the facility[hm116] to supervise or implement an aspect of the QC&A program. However, the QC&A officer still assumes full responsibility for construction of the MSWLF in compliance with rule 113.7, and the approved plans and specifications.

c. At a minimum, the QC&A officer shall supervise, inspect, test and document compliance with rule 113.7, and the approved plans and specifications, for the following aspects of construction.

(1) The MSWLF unit's subgrade.

(2) The liner system, as applicable below:

i. For composite liners, the lower compacted soil liner and each 6-inch lift thereof, and the flexible membrane liner (FML). For the compacted soil portion, a minimum of one field density test per 6-inch lift per acre shall be performed to verify that the correct density, as correlated to permeability by a laboratory analysis, has been achieved. A double-ring infiltrometer test shall be utilized as a final QC&A test of the compacted soil portion.[hm117][hm118] Electrical resistivity testing is required for the FML. Destructive testing of the FML shall be minimized and preferably kept to side slopes when continuous seams are utilized. Patches over FML destructive testing areas shall be checked with electrical resistivity testing. Special attention shall be given to the inspection of extrusion welds at "T" and "Y"-like joints of the FML.

ii. For alternative liners, each component of the liner system as determined by the Department. For the compacted soil portion, a minimum of one field density test per 6-inch lift per acre shall be performed to verify that the correct density, as correlated to permeability by a laboratory analysis, has been achieved. A double-ring infiltrometer test for the compacted soil portion[hm119][hm120] shall be utilized as a final QC&A test of that component.

(3) The leachate collection, conveyance and storage systems.

(4) Any other aspect of construction as required by the Department.

d. A sampling and testing program shall be designed and implemented by the QC&A officer as part of the QC&A program.

(1) The goal of the sampling and testing program is to verify full compliance with the requirements of rule 113.7, and the approved plans and specifications.

(2) The sampling and testing program shall be designed by QC&A officer and approved by the Department prior to construction of the MSWLF unit.

(3) The sampling and testing program shall detail how each stage of construction will be verified for full compliance with the requirements of rule 113.7, and the approved plans and specifications.

(4) The sampling and testing program shall be based on statistically significant sampling techniques and establish criteria for the acceptance or rejection of materials and constructed components of the MSWLF unit.

(5) The sampling and testing program shall detail what will occur to remedy and verify any material or constructed component that is not in compliance with the requirements of rule 113.7, and the approved plans and specifications.

e. The QC&A officer shall document the QC&A program. Upon completion of the MSWLF unit construction, the QC&A officer shall submit a final report to the Department that verifies compliance with the requirements of rule 113.7 and the approved plans and specifications. A copy of the final report shall also be maintained[hm121] by the facility in the operating record. At a minimum, the final report shall include the following.

(1) A title page and index.

(2) The name and permit number of the facility.

(3) Contact information for the QC&A officer and persons delegated by the QC&A officer to supervise or implement an aspect of the QC&A program.

(4) Contact information for all construction contractors.

(5) A copy of the Department approved plans and specifications.

(6) Copies of daily reports containing the following information.

1. The date.

2. Summary of weather conditions.

3. Summary of locations on the facility where construction was occurring.

4. Summary of equipment, materials and personnel utilized in construction.

5. Summary of meetings held regarding the construction of the MSWLF unit.

6. Summary of construction progress.

7. Photographs of the construction progress, with descriptions of the time, subject matter and location of each photograph.

8. Details of sampling and testing program for that day. At a minimum this shall include details of where sampling and testing occurred, the methods utilized, personnel involved and test results.

9. Details of how any material or constructed component that was found not to be in compliance via the sampling and testing program was remedied.

(7) A copy of detailed as-built drawings with supporting documentation and photographic evidence. This shall also include a narrative explanation of changes from the original Department approved plans and specifications.

(8) A signed and sealed certification statement by the QC&A officer that the MSWLF unit was constructed as good as or better than the requirements of 113.7, and the approved plans and specifications.

f. HOLD FOR FORMATTING

113.7(7) *Vertical and horizontal expansions of MSWLF units.* All vertical and horizontal expansions of disposal airspace over existing and new MSWLF units shall comply with the following requirements.

[hm122]

a. Horizontal expansions shall, at a minimum, comply with the following requirements:

(1) Horizontal expansions are new MSWLF units and, at a minimum, shall be designed and constructed in accordance with subrules 113.7(4), (5) and (6).

(2) If a horizontal expansion abuts a MSWLF unit that does not comply with subrules 113.7(4), (5) and (6), then the abutment of the two MSWLF units shall be designed and constructed such that leachate from the expansion drains to the new MSWLF unit that complies with subrules 113.7(4), (5) and (6). Such a horizontal expansion must also comply with the following:

1. The abutment shall have a 20% minimum[hm123] slope.

2. The abutment shall have a barrier consisting of at least 2-feet of soil compacted to a permeability no greater than $1x10^{-7}$ cm/sec.

3. The abutment shall have at least 12-inches of coarse drainage material with a permeability of at least $1x10^{-2}$ cm/sec over the compacted soil that directs leachate to the new MSWLF unit that is in compliance with subrules 113.7(4), (5) and (6). The coarse drainage material shall have a fines content of less than 1% passing a #200 sieve. Terracing and letdown collection pipes may be required depending on the size of the side-slope being abutted.

(3) The slope stability of the horizontal expansion between the existing and new MSWLF unit shall be analyzed. The interface between two MSWLF units shall not cause a slope failure of either of the MSWLF units.

(4) A horizontal expansion may include a vertical elevation increase of the old MSWLF unit, pursuant to 113.7(7)“b”, if approved by the Department.

b. Vertical expansions shall, at a minimum, comply with the following requirements:

(1) A vertical expansion of a MSWLF unit shall not be allowed if the MSWLF does not comply with subrules 113.7(4), (5) and (6).

(2) An analysis shall be completed of the structural impacts of the proposed

vertical expansion on the liner and leachate collection system. The vertical expansion shall not contribute to the structural failure of the liner and leachate collection system.

(3) An analysis shall be completed of the impact of the proposed vertical expansion on leachate generation. The vertical expansion shall not overload the leachate collection system or contribute to excess head on the liner.

(4) An analysis shall be completed of the affect of the proposed vertical expansion on run-on, run-off and discharges into waters of the state. The vertical expansion shall not cause a violation of subrule 113.7(8).

(5) The proposed vertical expansion shall be in compliance with the final slopes required at closure pursuant to 113.12(1)“e”.

(6) An analysis shall be completed of the potential impact of the proposed vertical expansion on litter generation. Landfill management strategies may need to be amended to help prevent increased litter.

(7) An analysis shall be completed of the impact of the proposed vertical expansion on lines-of-sight and any visual buffering utilized by the landfill.

c. HOLD FOR FORMATTING

113.7(8) ~~§ 258.26~~ *Run-on/ and run-off control systems*.

a. Owners or operators of all MSWLF units must design, construct, and maintain the following. The run-on and run-off control systems shall be certified by a professional engineer registered in Iowa, or another professional certified in erosion control or stormwater management.

(1) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 25-year storm;

(2) A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

b. The run-on and run-off control system required in paragraph 113.7(8) “a” must account for:

(1) The final contours of the MSWLF unit and the planned drainage pattern.

(2) The need for temporary structures due to fill progression and site development.

(3) The drainage pattern of the surrounding area and the possible implications for compliance with paragraph 113.10(1) “a”.

c. Run-off from the active portion of the landfill unit must be handled in accordance with ~~§258.27(a) of this part~~ paragraph 113.10(1) “a”.

113.7(9) *MSWLF unit buffer*. The use of visual buffer to block lines-of-sight to the active portion is strongly encouraged. Natural buffer (e.g. trees, vegetated earthen berms) outside of a MSWLF unit is preferable when feasible. For maximum effectiveness, natural buffer may need to be constructed or planted years before a new MSWLF unit is constructed.

[hm1]Since both paragraphs describe purpose, they should probably be combined.
[hm2]This is not objectively definable.
[hm3]This appears to be tougher than the purpose of the UST rules. Should be consistent across different rule chapters.
[hm4]Which rules will apply to these landfills?
[hm5]Need to ensure permittees do not become unwitting victims of bad advice by DNR. (AQ rules may have another way of addressing this issue.)
[hm6]Does this mean "stop receiving waste", or "capped, vegetated, etc."?
[hm7]Does this include side slopes?
[hm8]The time frame may be too short to achieve 5" of select MSW. Other states have allowed the 5' to include the leachate collection layer. Maybe a performance std would be better – requiring frost protection for the liner. (Such protection could include temporary placement of material other than select MSW).
[hm9]Can be construed to prohibit future cells & expansions after 2007. Need to include a clause clarifying "…if a new MSWLF unit is constructed […to provide compliance with these requirements by the effective date of October1, 2007…]
[hm10]DNR has previously tried to move all solid waste definitions to Ch. 100. Will these move to 100 when the rule is promulgated? If the intent is to make 113 "stand-alone", there are other definitions now in 100 that may need to be inserted here.
[hm11]Does this include schools/institutions? If not, where do they fit?
[hm12]Do dormitories fit here, or are they considered institutional?
[hm13]See comment @ "residential lead-based paint waste".
[hm14]This term is new to Iowa Code. It is unclear whether it means cell, waste boundary, landfill footprint, permitted boundary or property line. Usage throughout this draft appears inconsistent (varying between the concepts listed above).
[hm15]Should "household waste" be the sole determining factor? Do we need a definition of "municipal solid waste"?
[hm16]Does this mean there are 3 types of units? Do they deserve separate definitions? Very confusing considering the ambiguity noted in comment 14 above.
[hm17]Is this phrase completely analogous with the term "households" in the "household waste" definition?
[hm18]Does this mean permitted cells? Fill area? Property boundary?
[hm19]It would be more straightforward to substitute "waste boundary".
[hm20]Double check that DNR has the statutory authority to make this determination.
[hm21]Usage of "Department" and "Director" should be consistent with other solid waste chapters. Double check.
[hm22]This subsection doesn't exist. What is correct citation?
[hm23]This section should be more directly tied to 133.4(3)
[hm24]This provides very open-ended discretion to DNR – is there a concern of potential political considerations?
[hm25]Does this pertain only to applications for new permits, or also to permit renewals &/or permit modifications? Some subsections below clearly apply to new permits apps, others are only appropriate for already existing facilities. If this section applies to all kinds of modifications (and even renewals), then this section seems like bureaucratic overkill. Could also subject previously approved elements to second-guessing, and could unnecessarily increase review burden on DNR staff. Probably need separate sections for renewals and modifications.
[hm26]Should promote electronic submittal wherever feasible.
[hm27]This should be combined with 113.5(1)a.(4) above.
[hm28]Need a definition.
[hm29]Delete this word. 113.6(1) and (2) make the correct distinction between "new" and "all."
[hm30]This could lead to desiccation of clay underlying plastic in composite liner design.
[hm31]Does this allow for engineering approaches to lower the groundwater level? If so, how?
[hm32]Need to specifcy demonstration method.
[hm33]Does this pertain to permit renewals? Could provide a "backdoor" approach for NIMBYs to close an existing landfill.
[hm34]From where? If the ag well is up gradient, 1000 ft would be unnecessary.
[hm35]Who decides what is appropriate? Shouldn't an agreement with the neighbor be sufficient?

[hm36]If this section applies to permit renewals or modifications, this provision could provide a backdoor for a neighbor to close an existing landfill.
[hm37]Actually, this info shall be submitted within the site E&C report.
[hm38]Add this phrase for clarity.
[hm39]Where did this number come from? Seems excessive for geologically uniform settings.
[hm40]When do these go into effect? Do they apply to renewals? To modifications? Some concern that required depths are larger than necessary for some sites.
[hm41]Who decides?
[hm42]Clarify type of sample intended.
[hm43]This should apply to each boring.
[hm44]What does this mean? Is there an ongoing, open-ended responsibility implied here, or does this mean "keep a file copy"?
[hm45]Does this include plasticity or capacity to shrink and swell?
[hm46]Long list = expensive lab cost, especially if it applies to each sample and/or each geologic &/or soil unit.
[hm47]What does this mean? How does it correlate to geologic units in (3) above?
[hm48]If this section pertains to permit renewals &/or modifications &/or expansions, the permit application could kick an existing landfill into corrective action even if contamination has not yet reached an established point of compliance, or if pre-existing contamination or elevated background levels of Apx. I constituents upgradient of the existing fill were not identified prior to construction of existing fill (that predated such regulatory requirement).
[hm49]What is real intent? Does this mean impact on the zone of influence?
[hm50]Which constituents does DNR consider "default". For new sites, defaults will be needed. For existing sites, who determines which constituents to use in the model?
[hm51]Many of the requirements in this section clearly pertain to new sites, but many should not be required for renewals or modifications.
[hm52]Does this imply an ongoing responsibility? Normally a "report" does not evolve.
[hm53]Which boundaries should be used – property lines, permitted boundary lines, unit lines, cell lines, facility lines…?
[hm54]Maps and aerials should both be required. Both should indicate property boundaries and proposed permitted boundaries, if different. What about unit, cell or facility boundaries?
[hm55]"Facility" boundaries may or may not match property boundaries. Several of the requirements in 113.6(4) use the "facility" and "property" interchangeably and should be clarified.
[hm56]A north arrow is sufficient. If you want specific other compass points, then list the ones you want. Does this mean true north or magnetic north?
[hm57]Of which boundaries?
[hm58]How far out should these go – 0.5 miles? To the first major arterials or state highways? Again, from which boundaries?
[hm59]From which boundaries?
[hm60]From which boundaries? 6 mi. is fed std for new landfills, but 5 is fed std for existing. Again a question about whether this section pertains to new permits, renewals, modifications, or some combination thereof.
[hm61]Floodplain outside property boundary is irrelevant.
[hm62]"Facility" or "property"?
[hm63]Wetlands outside property boundary are irrelevant and difficult to prove without trespassing.
[hm64]Of which boundaries?
[hm65]Of which boundaries?
[hm66]Which boundaries? How far does "adjacent" extend?
[hm67]Which boundaries? How far does "adjacent" extend?
[hm68]Which boundaries? How far does "adjacent" extend? Endangered species outside property boundary are irrelevant and difficult to prove without trespassing.
[hm69]Which boundaries? How far does "adjacent" extend?
[hm70]Which boundaries?
[hm71]Of which boundaries?
[hm72]Of which boundaries?

[hm73]Should also include the proposed permitted boundary. "Facility property line" may be ambiguous. We need property line, proposed permitted boundary, and unit or cell or facility boundaries.
[hm74]Of which boundaries? Define "sensitive populations. Does "housing" correspond to the usage in the definition of "household waste"?
[hm75]DNR should provide applicant with a written summary of the meeting to reduce later confusion.
[hm76]Need clarification on timeframe implied here. DNR approvals should be good for the ensuing construction season at least, regardless of rule changes.
[hm77]Shouldn't these changes in standards be addressed through the permit renewal process? Re-submitting the entire volume of plans and reports is a significant endeavor, and should not be required speculatively.
[hm78]How specific does this need to be? If "liquids and hazardous waste" is what is needed, just say that.
[hm79]Presumably this means roads intended for public use.
[hm80]Which boundaries does this mean?
[hm81]Where did this requirement come from? What exactly does it mean? Paved or non-vegetated gravel road? What kind of weed control is permissible? Why the active portion? What about the visual screening and neighbor agreements?
[hm82]Should also include failure of the ground water diversion system, if applicable.
[hm83]This paragraph appears to be a subset of paragraph d. above. In situ subgrade that meets the requirements of 113.7(4)"b" and "c" would not need to be compacted.
[hm84]Append: …when compacted.
[hm85]Point of compliance modeling and monitoring should be required for all MSWLF units regardless of liner design. Specifically, items 1, 2, 3 and 5 in 113.7(5)a.(2) below should be included here. Without these requirements, it will never be possible to confirm that composite liners perform as presumed.
[hm86]Has this been defined in practical terms? Need to address the reality of wrinkles, surface and irregularities in the substrate (clay). How much is allowable? Is that during installation, or up until all is covered with MSW?
[hm87]Should allow different gradients based on the leachate system design. The lesser slopes should only be allowed in higher conductivity systems.
[hm88]Either include paragraph like (2)5. below, or else place that requirement above both subsections (1) and (2).
[hm89]General feeling that the black text in this section is too prescriptive. It should be more performance based to accommodate improvements in modeling technology and to better allow for site specific data, where it is available.
[hm90]What is the demonstration? FAI and C/PC Accounts are not available for corrective action.
[hm91]Items 1,2,3 and 5 in this subsection should pertain to any liner design, not just alternative liners.
[hm92]If we truly want Best Available Design, this comparison should be required for all MSWLF unit submittals, not just for alternative liners.
[hm93]There is no default performance value for a composite liner.
[hm94]Should allow different gradients based on the leachate system design. The lesser slopes should only be allowed in higher conductivity systems.
[hm95]Assessment and corrective action should be allowed before requiring closure.
[hm96]If the contamination source is realistically presumed to be an old closed fill area, should an adjacent new cell be closed?
[hm97]Are the levels in Table 1 intended as absolute levels, or are they maximum elevations above background as demonstrated by upgradient wells and by pre-construction testing of the POC well?
[hm98]Double check MCLs.
[hm99]Sumps with collection pipes ARE the lowest points in landfills. 20 ft away will not be the lowest parts of the liner. Extra wells are an unnecessary extra expense. This requirement appears to be based on outdated piezometer technology.
[hm100]This is excessive and not based on performance. Should either be required on same schedule as permit renewals, or better yet, based on performance (if leachate volume collected declines significantly, or if chemical content changes significantly.
[hm101]General feeling that this section should define performance standards, and should not prescribe specific design.
[hm102]The pipe walls are sure to have lower hydraulic conductivity!

[hm103]If the geonet is going to be required, and if the 40 mm river gravel is packing for collection pipes only, then this minimum thickness should be approx. 6". General concern that this paragraph doesn't work very well.
[hm104]Looks great on paper, but unrealistic. 4 cm clean river gravel is not readily available statewide and is extremely expensive.
[hm105]This may work in pipe trenches, but not as a 6" layer across the floor.
[hm106]Triplanar is a sole-source patented material. Better to go with minimum std of biplanar to foster competition. Leave the decision to upgrade to triplanar be a result of modeling and value engineering.
[hm107]Surely this means 300 mil (30 cm is about a foot). Even so, there is only one manufacturer of 300mil geonet. Better to go with 200 mil as the minimum standard.
[hm108]Where did this factor come from?
[hm109]Where did this factor come from?
[hm110]Where did this factor come from?
[hm111]Where did this factor come from?
[hm112]Where did this factor come from?
[hm113]What does unit mean?
[hm114]Lagoons are designed to store leachate, not to keep hydraulic head less than 1 ft.
[hm115]Append: …or of the construction contractor.
[hm116]Append: …or of the construction contractor.
[hm117]This is a destructive type test, and is not very practical for a final test application. Should be required on a test pad prior to construction.
[hm118]Include ASTM reference.
[hm119]This is a destructive type test, and is not very practical for a final test application. Should be required on a test pad prior to construction.
[hm120]Include ASTM reference.
[hm121]Does this imply an ongoing requirement? Is this a plan that is expected to change, or is the report supposed to be kept on file.
[hm122]This section should be placed before the QA&C section, so that the QA&C requirements pertain to expansions as well. These expansions should also be subject to performance modeling, similar to the standards for alternative liners, (and that should be required for composite liners).
[hm123]Probably need a maximum slope, too.

ISOSWO Technical Committee
3-13-06 Meeting Participants

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(joining for last 15 minutes:)

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