7035.2885 MUNICIPAL SOLID WASTE COMBUSTOR ASH LAND DISPOSAL FACILITIES.

Subpart 1. **Scope.** The requirements of subparts 2 to 18 apply to landowners and owners and operators of facilities that dispose of municipal solid waste combustor ash in or on the land, except as provided in subpart 2.

Subp. 2. **Exemptions.** None.

Subp. 3. **Acceptable wastes.** Only municipal solid waste combustor ash and other wastes, excluding municipal solid waste, approved by the commissioner according to the procedures in this subpart may be disposed of in a waste combustor ash land disposal facility.

The owner or operator must submit requests for approval to codispose of other wastes to the commissioner in writing. Requests must state the physical and chemical characteristics of the waste, including results of EPA Method 1311 leach test, EPA Method 1312 leach test, and total composition analysis. The waste must be analyzed for total composition for the parameters in part 7035.2910, subpart 4, item A, tables (1) and (2). Leach test samples must be analyzed for all parameters detected by total composition analysis. The request must also include an assessment of the potential for the waste to affect the leaching potential of waste combustor ash and other wastes previously approved for codisposal. The commissioner shall approve a waste for codisposal in a municipal solid waste combustor ash disposal facility only if the commissioner determines that codisposal of that waste will not significantly increase the movement of leachate generated at the facility, which contaminates outside the codisposal ash phase by leakage, leaching, or fugitive dust emissions.

Subp. 4. **Limitation of leachable contaminants.** After January 1, 1993, the owner or operator of a waste combustor ash land disposal facility may not dispose of ash which exceeds the maximum leachable contaminant levels of subpart 5, unless the facility design either meets or exceeds the requirements of subparts 10, item C, subitem (3); and 11, item O or P, or if the facility is a type II cell which meets or exceeds the requirements in part 7035.2915 and is approved prior to or during the nine-month period immediately following adoption of parts 7001.0040 to 7035.2915, whichever applies. Compliance with this subpart must be based on results of testing ash using EPA Method 1312 as required by part 7035.2910, except as provided by items B to D. Alternatively, the commissioner may approve treatment within the land disposal facility if treatment reduces contaminant mobility so that any pollutants detected in leachate will not exceed the maximum leachable contaminant levels of subpart 5. A request for approval of an in-place treatment method

must include results of a pilot scale demonstration of the effectiveness of the treatment method.

A. For the purpose of this subpart, "results" means the upper 80 percent confidence limit of a rolling data set consisting of results of EPA Method 1312, or actual leachate according to items B and C, calculated as follows:

(1) the rolling data set must consist of results of the specified test for the preceding 12 months, or the time period since a change was made in waste combusted, waste combustor operations, or ash processing which significantly alters ash quality, whichever time period is shorter;

(2) if data from only one quarter are used to calculate results, the owner or operator must calculate the upper 80 percent confidence limit for the data using equations for random sampling shown in Table 9-1 of EPA SW-846. Part 7035.0605 incorporates this document by reference and establishes its availability; and

(3) if data from two or more quarters are used to calculate results, the owner or operator must calculate the upper 80 percent confidence limit for the data using equations for stratified random sampling shown in Table 9-1 of EPA SW-846, using each quarter as a stratum. The fraction of the population represented by each stratum (W_k) must be selected based on the number of quarters of data to be used and the relative amounts of ash produced during each quarter.

B. The owner or operator may calculate results as required by item A using actual leachate analyses rather than EPA Method 1312 analyses for ash from a given waste combustor for one or more quarters if the following conditions are all true:

(1) the leachate analyzed was from a land disposal facility phase which was filled to one-half or more of the phase capacity, where a phase is an area of a land disposal facility which is served by a leachate collection system which may be sampled independently;

(2) ash from the waste combustor makes up 90 percent or more of the waste in the phase;

(3) ash generated by the waste combustor during the quarter was disposed in the phase;

(4) the leachate analyzed was collected during the quarter;

(5) samples used to calculate results for consecutive quarters were collected at least 60 days apart; and

(6) the leachate samples were collected according to a water quality and leachate monitoring protocol approved by the commissioner as part of the operations manual required under parts 7001.3480, item G; and 7035.2815, subpart 14, item G.

C. If results of testing leachate as required by subpart 16, item B, exceed the maximum leachable contaminant levels of subpart 5, all new portions of the land disposal facility which accept ash from the same waste combustor or waste combustors must comply with the final cover requirements of subpart 10, item C, subitem (3), and the liner requirements of subpart 11, item O. If results of testing leachate as required by subpart 16, item B, exceed the maximum concentration of contaminants for characteristic of extraction procedure (EP) toxicity established in part 7045.0131, subpart 8, all new portions of the land disposal facility which accept ash from the same waste combustor or waste combustors must comply with the final cover requirements of subpart 10, item C, subitem (3), and the liner requirements of subpart 11, item P. For the purpose of this item, "results" means the upper 80 percent confidence limit of a rolling data set consisting of results of leachate testing for the preceding 12 months. The upper 80 percent confidence limit must be calculated using the equations presented in subpart 3, item A, subitems (1) to (3). The commissioner may approve an exemption from this part if the owner or operator demonstrates that the leachate produced in a new portion of the facility may reasonably be expected to not exceed the limits cited in this subpart, based on changes made such as pretreatment of ash prior to disposal.

D. If an owner or operator demonstrates an inability to meet the requirements of this subpart, the commissioner may grant an extension of up to two years if the commissioner determines that the owner or operator has attempted to meet the requirements of this part, and the agency, through no fault of the owner or operator, has not taken final action on applications for permits or other agency approvals needed to comply with this part.

E. A municipal solid waste combustor ash land disposal facility which accepts ash from a waste combustor which has not completed four or more quarters of ash testing according to part 7035.2910, must place the ash over a liner that complies at a minimum with the design requirements of subpart 11, item P, unless:

(1) the waste combustor ash will be treated before disposal to reduce the leaching potential to such a degree that the treated ash will not exceed the maximum leachable contaminant levels established in subpart 5; or

(2) the owner or operator demonstrates, based on ash testing data from a similar waste combustor, where similarity is based on design, operation, and characteristics of waste combusted, that the ash which has not been tested is not likely to exceed the maximum leachable contaminant levels of subpart 5, and the ash is placed over a liner which complies with the design requirements of subpart 11, item L or N, whichever applies to the type of ash to be disposed of. If this subitem applies, the ash must be considered in storage and the commissioner shall not approve disposal of the ash until four quarters of ash and leachate testing have been completed. If results of ash or leachate testing for the

four quarters exceed the maximum leachable contaminant levels, the ash must be removed from the land disposal facility. For the purpose of this subitem, results must be calculated according to subpart 4, item A, subitems (1) to (3).

Subp. 5. **Maximum leachable contaminant levels.** The maximum leachable contaminant levels are as follows:

Substance	Maximum leachable contaminant level (µg/l)
Arsenic	750
Barium	30,000
Boron	9,000
Cadmium	60
Chromium	1,500
Copper	15,000
Lead	300
Manganese	9,000
Mercury	30
Nickel	2,100
Selenium	300
Silver	300
Tin	60,000
Zinc	21,000

Subp. 6. **Location.** The owner or operator must locate a waste combustor ash land disposal facility according to parts 7035.2555 and 7035.2815, subpart 2.

Subp. 7. **Hydrogeologic evaluations.** The owner or operator must complete a hydrogeologic evaluation of the site according to part 7035.2815, subpart 3.

Subp. 8. **Groundwater performance standards.** The owner or operator must design, construct, operate, and maintain the facility to achieve compliance with part 7035.2815, subpart 4.

Subp. 9. **General design requirements.** A waste combustor ash land disposal facility must meet the design requirements of part 7035.2815, subpart 5, items A, B, D, E, F, and G in addition to the following general design requirements:

A. The fill area at a waste combustor ash land disposal facility must be located at least 200 feet from the nearest property line, unless a shorter distance is approved by the

commissioner as sufficient for performing facility monitoring, performing any necessary remedial activities, and minimizing deposition of dust on adjacent property, based on filling procedures, facility design, facility geographic location, existing land restrictions and results of monitoring dust emissions at the facility or a similar existing facility.

B. The facility design must include:

(1) cover systems according to subpart 10;

(2) a liner system according to subpart 11;

(3) a leachate collection and treatment system according to subpart 13; and

(4) a water monitoring system according to subpart 16.

Subp. 10. **Cover system.** The owner or operator must design and maintain a cover system capable of minimizing infiltration of precipitation into the fill areas, preventing surface water ponding on fill areas, preventing erosion of surface and side slopes, minimizing the creation and movement of dust, retaining slope stability, reducing effects of freeze-thaw and other weather conditions, maintaining vegetative growth while minimizing root penetration of the low permeability cover layer, discouraging vector and burrowing animal intrusion into the site, and attenuating contaminants contained in leachate. A complete cover system must consist of intermittent, intermediate, and final covers as outlined in items A to C.

A. The owner or operator must place intermittent cover on all exposed ash according to the approved operation and maintenance manual for the site and subitems (1) to (4). In all cases, intermittent cover placement must be adequate to prevent fugitive dust emissions.

(1) The owner or operator of a facility which disposes of bottom ash or combined ash must place intermittent cover frequently enough so that the bottom ash or combined ash is not left uncovered for more than 48 hours. The percent moisture of exposed ash must not be less than ten percent at any time. In the active work area, newly delivered waste combustor ash may be used to cover previously placed ash.

(2) The owner or operator of a facility which disposes of fly ash must cover the fly ash immediately after it is placed and compacted. Fly ash must be treated to minimize emission of fugitive dust before it is placed in the land disposal facility.

(3) The commissioner may approve less frequent cover placement based on a demonstration by the owner or operator that the alternative frequency would not increase the potential for damage to human health or the environment. The commissioner, in approving the proposed alternative cover system, must consider the characteristics of the proposed cover material, the characteristics of the waste, the design and operation of the facility,

moisture content of the ash, screening or other engineered methods for preventing dust production, and season of the year.

(4) The cover materials used and cover depth must be sufficient to cover the ash completely.

B. The owner or operator must place intermediate cover on all filled surfaces of the facility where no additional ash will be deposited within 30 days. The intermediate cover must be at least six inches deep if soil or similar material is used, cover the ash completely, and be graded to prevent surface water ponding.

C. The owner or operator must place final cover according to the requirements of subitems (1) to (3) and part 7035.2815, subpart 6, item D, subitems (1), (2), and (6) to (9). A final cover system must consist of at least three layers: a barrier layer, a drainage layer, and a top layer.

(1) If the final cover uses a barrier layer constructed of soils or similar materials, the barrier layer must be at least 24 inches thick. The barrier layer must have a maximum permeability no greater than $1x10^{-6}$ centimeters per second. At least the top six inches after compaction of a barrier layer must not contain waste products which could contaminate water collected by the drainage layer. The drainage layer must be at least six inches thick and have an in-place permeability no less than $1x10^{-2}$ centimeters per second. The top layer must be at least 42 inches thick, of which at least the top six inches is topsoil, and of sufficient depth to contain the vegetative roots and protect the barrier layer from freezing. The top layer must have an available water-holding capacity that will promote vegetative growth. An alternative cover system may be approved by the commissioner if the owner or operator demonstrates that the barrier layer will be at least 24 inches thick, constructed of soils or similar materials, and have a maximum permeability no greater than $1x10^{-7}$ centimeters per second. The top layer of the alternative cover system must be at least 18 inches thick.

(2) If the final cover uses a synthetic membrane as the barrier layer, the membrane must be at least 30/1000 of an inch thick and meet the physical property standards for the material type developed by National Sanitation Foundation, Standard Number 54, Flexible Membrane Liners, May 1990, Ann Arbor, Michigan. Part 7035.0605 incorporates this document by reference and establishes its availability. The drainage layer must be at least six inches thick and have an in-place permeability no less than $1x10^{-2}$ centimeters per second. The top layer must be at least 18 inches thick, of which at least the top six inches is topsoil, and of sufficient depth to contain the vegetative roots. The top layer must have an available water-holding capacity that will promote vegetative growth.

(3) According to subpart 4, if results of testing the specific combined, bottom, or fly ash which is placed in the land disposal facility phase to be covered or results

of analysis of actual leachate from the phase exceed the maximum leachable contaminant levels established under subpart 5, the final cover system must consist of:

(a) a barrier layer consisting of at least 24 inches of compacted soils or similar materials with a permeability no greater than $1x10^{-6}$ centimeters per second, overlain by a synthetic membrane liner which is at least 30/1000 of an inch thick and meets the physical property standards developed by the National Sanitation Foundation, Standard Number 54, Flexible Membrane Liners, May 1990, Ann Arbor, Michigan;

(b) a drainage layer consisting of at least six inches with a permeability no less than $1x10^{-2}$ centimeters per second; and

(c) a top layer which is at least 42 inches thick, of which the top six inches is topsoil, and of sufficient depth to contain the vegetative roots and protect the barrier layer from freezing. The top layer must have an available water-holding capacity that will promote vegetative growth.

Subp. 11. **Liners.** All waste combustor ash land disposal facilities must be lined. A liner installed at a waste combustor ash land disposal facility after April 27, 1992, unless otherwise allowed by part 7035.2915, subpart 4, must meet the requirements of items A to K and part 7035.2815, subpart 7, items B, C, F, G, I, K, L, M, and N. In addition, waste combustor ash land disposal facilities must comply with the design standards of item L, M, N, O, or P, based on the requirements identified in Table 1.

Table 1: Identification of Applicable Liner Design Standards

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

*Leach results must be taken from fly ash only.

Key: Leach results must be determined according to subpart 4.

MLCL means the maximum leachable contaminant levels established in subpart 5.

EP means the maximum concentration of contaminants for the toxicity characteristic established in part 7045.0131, subpart 8, as tested according to subpart 4.

A. If a waste combustor ash land disposal facility is constructed adjacent to a mixed municipal solid waste land disposal facility, the waste combustor ash land disposal facility must be separated from the mixed municipal solid waste land disposal facility adequately to prevent leachate from the mixed municipal solid waste land disposal facility from entering the waste combustor ash land disposal facility.

B. The liner system must consist of at least the following (listed in order, starting from the lowest layer):

(1) a smooth, stable subgrade for placement of the barrier layer by means of the placement of protective material over the existing subgrade, the removal of abrasive objects, organic matter, and vegetation in the subgrade, and regrading;

(2) where required by items O and P, a secondary liner and leachate collection and leak detection system;

(3) a barrier layer capable of containing leachate generated at the facility and surface water that has come in contact with waste; and

(4) a drainage layer above the barrier layer to rapidly convey surface water and leachate from the fill area, and to protect the barrier layer from puncture or other disturbances that might disrupt the integrity of the barrier layer.

C. The liner system must minimize the amount of leachate leaving the fill site to the soil and groundwater below the site.

D. The liner system must be compatible with waste combustor ash and waste combustor ash leachate.

E. Synthetic membranes used as part of the liner system must meet the specifications of the National Sanitation Foundation, Standard Number 54, Flexible Membrane Liners, May 1990, Ann Arbor, Michigan. Part 7035.0605 incorporates this document by reference and establishes its availability.

F. The owner or operator must construct the facility in accordance with subpart 14 and certify construction in accordance with part 7035.2610.

G. The owner or operator must design, construct, and maintain synthetic membranes in direct continuous contact with the soil layers beneath them to the greatest extent feasible.

H. Drainage layers must consist of at least 12 inches of suitable soil or an equivalent synthetic material. Drainage layers must not contain sharp stones or other sharp objects which may puncture the synthetic membrane, and must be resistant to clogging.

I. The owner or operator must design the liner and leachate collection system to minimize the number of places where the liner is penetrated.

J. When calculating efficiency as required for compliance with items L to P, the owner or operator must consider the liner thickness, the liner slope, the saturated hydraulic conductivity of the liner and drainage layer, the drainage layer thickness, the permeability of the drainage layer and liner, the porosity of the drainage layer, the flow distance to collection pipes, and the amount of leachate to be generated and collected based on annual infiltration and groundwater inflow.

K. In the engineering report required in part 7001.3480, item E, the owner or operator must discuss the design of the liner system and address at least the following:

(1) the source and quantity of natural soils capable of meeting the requirements of this subpart;

(2) the likelihood and consequences of failures caused by puncture, tear, creep, freeze-thaw, thermal stress, abrasion, swelling, extraction, oxidative degradation, exposure to ultraviolet radiation, acidic and alkaline conditions, concentration of ions, organic constituents, pressure, and the presence of gases, rodents, microbes, and root penetration;

(3) the composition of the drainage layer and liner including the soil gradations, percent fines, mineral composition, and solubility under acidic to alkaline conditions; and

(4) the calculations and assumptions used in choosing the particular design proposed for the facility.

L. The liner of an ash land disposal facility, required by table 1 to meet the requirements of this item, must comply with subitems (1) to (3).

(1) The barrier layer must be a composite liner which includes a synthetic membrane which is at least 60/1000 of an inch thick placed over a layer of recompacted clay or other natural material with a permeability of no more than $1x10^{-7}$ centimeters per second which is at least one foot thick.

(2) The liner system must be designed to have a leachate collection efficiency of at least 95 percent of the precipitation falling on the fill area before final cover placement.

(3) The liner system in combination with the cover system must achieve an overall site efficiency of at least 98.5 percent collection or rejection of the precipitation that falls on the disposal area.

M. The liner of an ash land disposal facility, required by table 1 to meet the requirements of this item, must comply with subitems (1) to (3).

(1) The barrier layer must be a composite liner which includes a synthetic membrane which is at least 60/1000 of an inch thick placed over a layer of recompacted clay or other natural material with a permeability of no more than $1x10^{-7}$ centimeters per second which is at least two feet thick.

(2) The liner system must be designed to have a leachate collection efficiency of at least 95 percent of the precipitation falling on the fill area before final cover placement.

(3) The liner system in combination with the cover system must achieve an overall site efficiency of at least 98.5 percent collection or rejection of the precipitation that falls on the disposal area.

N. The liner of an ash land disposal facility, required by table 1 to meet the requirements of this item, which accepts ash which does not exceed the maximum leachable contaminant levels of subpart 5 must comply with subitems (1) to (3).

(1) The barrier layer must be a composite liner which includes a synthetic membrane which is at least 60/1000 of an inch thick placed over a layer of recompacted clay or other natural material with a permeability of no more than $1x10^{-7}$ centimeters per second which is at least three feet thick.

(2) The liner system must be designed to have a leachate collection efficiency of at least 98 percent of the precipitation falling on the fill area before final cover placement.

(3) The liner system in combination with the cover system must achieve an overall site efficiency of at least 99.5 percent collection or rejection of the precipitation that falls on the disposal area.

O. As provided by subpart 4, after January 1, 1993, the liner of a bottom ash or combined ash land disposal facility that accepts ash which exceeds the maximum leachable contaminant levels of subpart 5 must comply with subitems (1) to (3).

(1) The liner must be a double liner which includes at a minimum, from top to bottom:

(a) a drainage layer which complies with item H;

(b) a synthetic membrane which is at least 60/1000 of an inch thick;

(c) a secondary drainage layer which complies with item H;

(d) a synthetic membrane which is at least 30/1000 of an inch thick; and

(e) a compacted clay layer which is at least two feet thick with a permeability no greater than $1x10^{-7}$ centimeters per second.

(2) The liner system must be designed to have a leachate collection efficiency of at least 98.5 percent of the precipitation falling on the fill area before final cover placement.

(3) The liner system in combination with the cover system must achieve an overall site efficiency of at least 99.8 percent collection or rejection of the precipitation that falls on the disposal area.

P. The liner of a waste combustor ash land disposal facility that accepts fly ash which exceeds the maximum leachable contaminant levels of subpart 5, or bottom or combined ash which exceeds the maximum concentration of contaminants for characteristic of extraction procedure (EP) toxicity established in part 7045.0131, subpart 8, must comply with subitems (1) to (3).

(1) The liner must be a double liner which includes at a minimum, from top to bottom:

(a) a drainage layer which complies with item H;

(b) a synthetic membrane which is at least 60/1000 of an inch thick;

(c) a secondary drainage layer which complies with item H;

(d) a synthetic membrane which is at least 30/1000 of an inch thick; and

(e) a compacted clay layer which is at least three feet thick with a permeability no greater than $1x10^{-7}$ centimeters per second.

(2) The liner system must be designed to have a leachate collection efficiency of at least 99 percent of the precipitation falling on the fill area before final cover placement.

(3) The liner system in combination with the cover system must achieve an overall site efficiency of at least 99.9 percent collection or rejection of the precipitation that falls on the disposal area.

Subp. 12. **Cover and liner materials evaluation.** The owner or operator must evaluate soils intended for use as cover or liner material as appropriate for the properties shown in part 7035.2815, subpart 8.

Subp. 13. **Leachate detection, collection, and treatment.** The facility must include a leachate detection, collection, and on-site or off-site treatment system designed in accordance with the requirements of part 7035.2815, subpart 9.

Subp. 14. **Construction requirements.** The owner or operator must follow the construction requirements of items A to C and part 7035.2815, subpart 12. The

owner or operator must incorporate all applicable construction requirements into project specifications for all major design features.

A. Clay barrier layers must be compacted in lifts which are not deeper than the feet on the equipment used to compact the liner, or six inches after compaction, whichever is less.

B. Clay barrier layers must be bladed and rolled smooth after the final lift is compacted.

C. An on-site inspector qualified by training and experience must be present during construction of liner systems and final cover.

Subp. 15. **Operation and maintenance requirements.** The owner or operator must operate the facility according to items A to V.

A. A waste combustor ash land disposal facility must be operated by a certified operator, as defined in parts 7048.0100 to 7048.1300. A certified operator must be present during the time that the facility is open to accept ash.

B. Ash must be spread and compacted in layers which are one foot or less in depth before compaction.

C. Appropriate compacting equipment must be used to achieve compaction adequate to prevent settlement.

D. To determine compliance with subpart 10, item A, subitem (1), the moisture content of ash in areas where intermittent cover has not been placed must be tested. The sampling procedures of subitems (1) to (4) must be followed.

(1) Ash moisture content must be tested at least monthly.

(2) Ash moisture content at six or more locations on the exposed ash surface must be tested using random methods to select the horizontal location of moisture testing samples.

(3) If the moisture content of ash samples is not analyzed immediately, samples must be protected from changes in composition due to exposure to precipitation, wind, sun, absorbent materials, and extremes of temperature.

(4) Testing must be performed by persons qualified by training and experience.

E. Ash must be placed and compacted at a moderate slope to promote drainage off the fill area while achieving good compaction.

F. Ash must be covered in accordance with the approved intermittent cover system required in subpart 10, item A.

G. When no ash will be placed on a fill area for 30 days or more, intermediate cover, as defined in subpart 10, item B, must be placed over the ash.

H. Each fill phase must be covered when it reaches final permitted waste elevations, according to subpart 10, item C, as soon as possible, considering limitations such as weather conditions.

I. Each fill phase must be outlined with grade stakes or another marking method before placing waste in the phase.

J. Resource recovery operations, including but not limited to ferrous metal recovery, must be confined to designated areas approved in the facility permit. Storage areas must be kept as small as practical; they must not interfere with normal disposal operations.

K. The facility must be inspected according to the schedule identified in the facility's operations manual and approved by the commissioner for at least the following items: dust emissions, uncontrolled vegetative growth, soil erosion on slopes and completed areas, vandalism on the monitoring systems, rodents and burrowing animals, malfunctions in the leachate detection and collection systems, and settlement in completed areas.

L. Leachate must be sampled and analyzed according to subpart 16.

M. The leachate collection system must be cleaned annually.

N. The amount of leachate collected must be monitored and recorded.

O. Corrective actions must be performed to repair any conditions not in compliance with parts 7035.2525 to 7035.2885.

P. Groundwater must be sampled and analyzed according to subpart 16.

Q. During wet weather conditions liners, covers, and other design features that might be disrupted by additional loads in a saturated condition must be protected.

R. The fill area must be surveyed annually before November 1 by a land surveyor registered in Minnesota. An updated existing conditions plan must be submitted with the annual report required in part 7035.2585. The plan must show the elevations of completed fill areas, areas partially filled, and all design features that changed in elevation due to facility operations or settlement. The remaining fill capacity must be calculated and its location shown on the plan.

S. All fill areas must be marked with permanent markers which clearly show the location of disposed ash.

T. The liner must be protected from freezing. At least three feet of ash or other approved material must be placed above the sand blanket on all lined areas by December 1 of each year to protect the liner from freezing. No disposal may take place after December

1 in areas which have not met this requirement without first testing the liner integrity and receiving approval from the commissioner for the disposal.

U. All closure costs expended under part 7035.2625, all postclosure care cost expenditures made under part 7035.2645, and all corrective action expenditures made under part 7035.2615 must be recorded in the operating record.

V. The sequence and direction of below-grade operations must be conducted to prevent surface water from entering the fill area.

Subp. 16. **Groundwater, surface water, and leachate sampling and analysis.** The owner or operator must design, install, and maintain a water monitoring system in compliance with part 7035.2815, subpart 10. The owner or operator must collect and analyze groundwater samples, leachate samples and, where required in permits, orders, or stipulation agreements, surface water samples, according to part 7035.2815, subpart 14, items A, B, and D to Q.

Until the commissioner has established facility-specific monitoring requirements as required by part 7035.2815, subpart 14, item B, the owner or operator must comply with the monitoring requirements of items A and B.

A. Groundwater quality monitoring points at the facility must be sampled at least three times per year at the times specified in the facility permit. For one of the three sampling events, the owner or operator must provide the field measurements, laboratory analysis, and field and laboratory observations listed in subitems (1) and (2). For the other two sampling events, the owner or operator must provide only the measurements and observations listed in subitem (1) for all groundwater monitoring points. Where existing monitoring points may be unsuitable for sampling some or all of the listed substances, the commissioner may make appropriate changes in the monitoring requirements.

(1) Routine list of groundwater parameters:

(a) Alkalinity, total as $CaCO_3$

(b) Aluminum, dissolved

(c) Ammonia Nitrogen

(d) Arsenic, dissolved

(e) Cadmium, dissolved

(f) Calcium, dissolved

(g) Chloride

(h) Copper, dissolved

(i) Dissolved Solids, total

(j) Iron, dissolved

(k) Lead, dissolved

(l) Magnesium, dissolved

(m) Manganese, dissolved

(n) Mercury, dissolved

(o) Nickel, dissolved

(p) Nitrate + Nitrite, as N

(q) Potassium, dissolved

(r) Selenium, dissolved

(s) Sodium, dissolved

(t) Sulfate

(u) Suspended Solids, total

(v) Zinc, dissolved

(w) Appearance (a)

(x) pH (b)

(y) Specific Conductance (b)

(z) Temperature (b)

(aa) Water Elevation (c)

In subitems (a) to (aa), (a) means visual observation, in field and laboratory, noting conditions such as the following, if present: color, cloudiness, floating films, other liquid or gas phases, odor; (b) means two measurements: in the field, immediately after obtaining the sample, and in the laboratory; (c) means as measured in the field before pumping or bailing, to the nearest 0.01 foot.

(2) Extended list of groundwater parameters:

(a) Barium, dissolved

(b) Boron

(c) Chromium, total dissolved

(d) Silver, dissolved

(e) Tin, dissolved

(f) Other parameters listed in item B required by the commissioner based on their detection in leachate

B. Leachate monitoring points at the facility must be sampled at least quarterly at the times specified in the facility permit. For one of the sampling events the owner or operator must provide the field measurements, laboratory analysis, and field and laboratory observations listed in subitems (1) and (2). For at least two years, and thereafter at least every other year or on a schedule determined by the commissioner based on results of previous analyses, the owner or operator must analyze leachate samples from one of the quarterly sampling events for the parameters listed in subitem (3). For the other sampling events, the owner or operator must provide only the measurements and observations listed in subitem (1).

(1) Routine list of leachate parameters:

(a) Alkalinity, total as $CaCO_3$

(b) Aluminum, total

(c) Ammonia Nitrogen

(d) Arsenic, total

(e) Boron

(f) Barium, total

(g) Biological Oxygen Demand (BOD)

(h) Cadmium, total

(i) Calcium, total

(j) Chloride

(k) Chromium, total

(l) Chemical Oxygen Demand (COD)

(m) Copper, total

(n) Dissolved solids, total

(o) Iron, total

(p) Lead, total

(q) Magnesium, total

(r) Manganese, total

(s) Mercury, total

(t) Nickel, total

(u) Nitrate + Nitrite, as N

(v) Potassium, total

(w) Selenium, total

(x) Silver, total

(y) Sodium, total

(z) Sulfate

(aa) Suspended Solids, total

(bb) Tin, total

(cc) Zinc, total

(dd) Appearance (a)

(ee) pH (b)

(ff) Specific Conductance (b)

(gg) Temperature (b)

In subitems (a) to (gg), (a) means visual observation, in field and laboratory, noting conditions such as the following, if present: color, cloudiness, floating films, other liquid or gas phases, odor; (b) means two measurements: in the field, immediately after obtaining the sample, and in the laboratory.

(2) Extended leachate sampling parameters:

(a) Benzo(a)pyrene

(b) Benzo(b)fluoranthene

(c) Benzo(k)fluoranthene

(d) Benzo(g,h,i)perylene

(e) Chrysene

(f) Hexachlorobenzene

(g) Indeno(1,2,3-cd)pyrene

(h) Pyrene

(i) Pentachlorophenol

(j) Acetone

(k) Vinyl Chloride

(3) Dioxins and Furans:

(a) 2,3,7,8-TCDD

(b) Tetrachlorodibenzodioxin

(c) Pentachlorodibenzodioxin

(d) Hexachlorodibenzodioxin

(e) Heptachlorodibenzodioxin

(f) Tetrachlorodibenzofuran

(g) Pentachlorodibenzofuran

(h) Hexachlorodibenzofuran

(i) Heptachlorodibenzofuran

Subp. 17. **Contingency action.** The owner or operator must implement actions necessary to repair site features or to control, recover, or treat polluted ground or surface waters and explosive or toxic gases according to part 7035.2815, subpart 15.

Subp. 18. **Closure and postclosure care.** The owner or operator must comply with the closure and postclosure care requirements of part 7035.2815, subpart 16.

Statutory Authority: *MS s 115A.97*

History: *16 SR 2321*

Published Electronically: *October 4, 2013*