

CHAPTER 7041
MINNESOTA POLLUTION CONTROL AGENCY
SEWAGE SLUDGE MANAGEMENT

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7041.0100 DEFINITIONS.

Subpart 1. **Scope.** For the purpose of this chapter, the following terms have the meanings given them.

Subp. 2. **Agency.** "Agency" means the Minnesota Pollution Control Agency.

Subp. 3. **Agricultural land.** "Agricultural land" means land on which a food crop, feed crop, cover crop, or fiber crop is grown as well as land managed for the production of hay, pastureland for grazing of livestock, or rangeland.

Subp. 4. **Agronomic rate.** "Agronomic rate" means the sewage sludge application rate (dry weight basis) designed to:

A. provide the amount of nitrogen which can be utilized by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

B. minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the groundwater.

Subp. 5. **Annual pollutant loading rate.** "Annual pollutant loading rate" means the maximum amount of a pollutant that can be applied to a unit area of land during a 365-day period.

Subp. 6. **Apply sewage sludge or sewage sludge applied to the land.** "Apply sewage sludge" or "sewage sludge applied to the land" means applying sewage sludge by spraying or spreading sewage sludge on the surface of the land, injecting sewage sludge below the surface of the land or incorporating sewage sludge into the soil for beneficial use.

Subp. 7. **Available nitrogen.** "Available nitrogen" means nitrogen which is present in inorganic forms and the amount of organic nitrogen that can be mineralized to plant available forms.

Subp. 8. **Beneficial use.** "Beneficial use" means any application of sewage sludge to the land to improve soil physical and chemical properties by supplying nutrients, organic matter, and other components of this material.

Subp. 9. **Bulk sewage sludge.** "Bulk sewage sludge" means sewage sludge that is not sold or given away in a bag or other container for application to the land.

Subp. 10. **Cave.** "Cave" means any naturally formed, subterranean open area or chamber, or series of chambers.

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Subp. 11. **Commissioner.** "Commissioner" means the commissioner or other designated representative of the Minnesota Pollution Control Agency.

Subp. 12. **Cover crop.** "Cover crop" means a small grain or other close growing vegetation not grown for harvest such as vegetation growing on land set aside for conservation purposes.

Subp. 13. **Cropping year.** "Cropping year" means a year beginning on September 1 of the year prior to the growing season and ending August 31 the year the crop is harvested. For example, the 1994 cropping year began September 1, 1993, and ended August 31, 1994.

Subp. 14. **Cumulative pollutant loading rate.** "Cumulative pollutant loading rate" means the maximum amount of an inorganic pollutant that can be applied to an area of land.

Subp. 15. **Dewatered sewage sludge.** "Dewatered sewage sludge" means any sewage sludge with a total solids content of 20 percent or greater or which can be transported and handled as a solid material.

Subp. 16. **Domestic septage.** "Domestic septage" means either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Subp. 17. **Domestic sewage.** "Domestic sewage" means waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Subp. 18. **Dry weight basis.** "Dry weight basis" means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass, or essentially 100 percent solids content.

Subp. 19. **EPA.** "EPA" means the United States Environmental Protection Agency.

Subp. 20. **Exceptional quality sewage sludge.** "Exceptional quality sewage sludge" means sewage sludge which has been prepared to meet one of the Class A pathogen reduction requirements in part 7041.1300, subpart 2; the pollutant concentrations in part 7041.1100, subpart 4, item C; and one of the vector attraction reduction requirements in part 7041.1400, subpart 2, items A to H.

Subp. 21. **Feed crops.** "Feed crops" means crops produced primarily for consumption by animals.

Subp. 22. **Food crops.** "Food crops" means crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Subp. 23. **Forest.** "Forest" means a tract of land thick with trees and underbrush.

Subp. 24. **Groundwater.** "Groundwater" means water below the land surface in the saturated zone.

Subp. 25. **Highly permeable soils.** "Highly permeable soils" means soils whose soil leaching potentials are rated as severe, poor filter for soil pesticide loss, by the Natural Resources Conservation Service using the procedure found in part 620, Soil Interpretation Rating Guides of the United States Department of Agriculture-Natural Resources Conservation Service National Soil Survey Handbook.

Subp. 26. **Industrial wastewater.** "Industrial wastewater" means wastewater generated in a commercial or industrial process.

Subp. 27. **Land application site.** "Land application site" means an area of land which receives application of sewage sludge for beneficial use.

Subp. 28. **Long-term storage.** "Long-term storage" means the storage of dewatered bulk sewage sludge for a period greater than 30 days but not exceeding seven months at a land application site.

Subp. 29. **Material derived from sewage sludge.** "Material derived from sewage sludge" means sewage sludge received from a treatment works whose quality is changed either through treatment or mixing with a nonhazardous material prior to being applied to the land.

Subp. 30. **Mine.** "Mine" means an excavation for minerals.

Subp. 31. **NPDES permit.** "NPDES permit" means a national pollutant discharge elimination system permit issued by the agency that authorizes under certain conditions the discharge of pollutants to surface waters of the state. Combined NPDES/SDS permits issued by the agency will be considered NPDES permits under this chapter.

Subp. 32. **Natural Resources Conservation Service.** "Natural Resources Conservation Service" means the Natural Resources Conservation Service of the United States Department of Agriculture, formerly known as the Soil Conservation Service.

Subp. 33. **Other container.** "Other container" means either an open or closed receptacle. This includes, but is not limited to, a bucket, box, carton, or vehicle or trailer with a load capacity of one metric ton (2205 pounds) or less.

Subp. 34. **Pathogens.** "Pathogens" means organisms that are capable of producing an infection or disease in a susceptible host.

Subp. 35. **Perched water condition.** "Perched water condition" means the soil is saturated with water in one or more layers within 200 centimeters (78.7 inches) of the mineral soil surface and has one or more unsaturated layers, with an upper boundary above 200 centimeters (78.7 inches) in depth, below the saturated layer. The zone of saturation, i.e., the water table, is perched on top of a relatively impermeable layer. The Natural Resources Conservation Service also classifies this as "epi-saturation."

Subp. 36. **Permitting authority.** "Permitting authority" means either the EPA or a state with an EPA-approved sewage sludge management program.

Subp. 37. **Person.** "Person" has the meaning given it in Minnesota Statutes, section 116.06, subdivision 17.

Subp. 38. **Person who prepares sewage sludge.** "Person who prepares sewage sludge" means the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

Subp. 39. **pH.** "pH" means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25 degrees Celsius or measured at another temperature and then converted to an equivalent value at 25 degrees Celsius.

Subp. 40. **Pollutant.** "Pollutant" means an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, on the basis of information available to the administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions including malfunction in reproduction, or physical deformations in either organisms or offspring of the organisms.

Subp. 41. **Pollutant limit.** "Pollutant limit" means a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge, such as milligrams per kilogram of total solids, or the amount of a pollutant that can be applied to a unit area of land, such as pounds per acre.

Subp. 42. **Public contact site.** "Public contact site" means land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, and golf courses.

Subp. 43. **Quarry.** "Quarry" means a surficial mine used to obtain building stone, limestone, gravel, or sand.

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Subp. 44. **Realistic yield goal.** "Realistic yield goal" means the most recent five-year average of crop yields, excluding the worst year, or the most recent three- to five-year average yield increased by ten percent or if the crop has never been grown, the realistic yield goal based on soil productivity and level of management as determined by the county Natural Resources Conservation Service, county extension agent, or a crop consultant.

Subp. 45. **Reclamation site.** "Reclamation site" means drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Subp. 46. **Residential development.** "Residential development" means ten or more places of habitation concentrated within ten acres of land. The term also includes schools, churches, hospitals, nursing homes, businesses, offices, and apartment buildings or complexes having ten or more living units.

Subp. 47. **SDS permit.** "SDS permit" means a state disposal system permit issued by the agency that authorizes under certain conditions the subsurface disposal or on-land disposal of pollutants and the operation of a disposal system.

Subp. 48. **Seasonal high water table.** "Seasonal high water table" means the highest level the water table reaches during a given year. Methods of determining the seasonal high water table are given in part 7041.3400, subpart 3.

Subp. 49. **Sewage sludge.** "Sewage sludge" means solid, semisolid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. Sewage sludge that is acceptable and beneficial for recycling on land as a soil conditioner and nutrient source is also known as biosolids.

Subp. 50. **Short-term storage.** "Short-term storage" means the storage of dewatered bulk sewage sludge for a period of less than 30 days at a land application site.

Subp. 51. **Sinkhole.** "Sinkhole" means a closed depression in an area of Karst topography that is formed either by solution of surficial limestone or by collapse of underlying caves.

Subp. 52. **Soil horizon.** "Soil horizon" means a layer of soil that is approximately parallel to the soil surface and has some set of properties that have been produced by soil-forming processes, and has some properties that are not like those of the layers above and beneath it. These properties include color, structure, texture, consistency, and bulk density.

Subp. 53. **Soil texture.** "Soil texture" means the relative portion of the soil separates sand, silt, and clay. It can be measured using methods described in part 7041.3400, subpart 1. Coarse texture is United States Department of Agriculture textural classifications sand, loamy sand, and sandy loam. Medium texture is United States Department of Agriculture classifications loam, silt, silt loam, and sandy clay loam. Fine texture is United States Department of Agriculture classifications clay loam, silty clay loam, sandy clay, silty clay, and clay.

Subp. 54. **Specific oxygen uptake rate (SOUR).** "Specific oxygen uptake rate (SOUR)" means the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in the sewage sludge.

Subp. 55. **Surface waters.** "Surface waters" means waters of the state including streams, lakes, ponds, marshes, watercourses, waterways, springs, reservoirs, and all other bodies or accumulations of water, natural or artificial, public or private, which are contained within, flow through, or border upon the state.

Subp. 56. **Total solids.** "Total solids" means the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Subp. 57. **Treatment works.** "Treatment works" means either a federally owned, publicly owned, or privately owned device or system used to treat, recycle, or reclaim either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature. This includes a septage treatment or septage storage facility which receives domestic septage from multiple sources. For the purpose of this chapter, a treatment works does not include septic tanks unless they are part of a wastewater treatment facility operated by a municipality or sanitary district which is required by the agency to have a NPDES or SDS permit.

Subp. 58. **Type IV certified operator or inspector.** "Type IV certified operator or inspector" means a person certified according to chapter 7048 for the land application of sewage sludge or the inspection of sewage sludge land application sites.

Subp. 59. **Unstabilized solids.** "Unstabilized solids" means organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Subp. 60. **Vector attraction.** "Vector attraction" means the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Subp. 61. **Volatile solids.** "Volatile solids" means the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Subp. 62. **Wetland.** "Wetland" means those areas that are inundated or saturated by surface water or groundwater 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. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must:

- A. have a predominance of hydric soils;
- B. be inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and
- C. under normal circumstances, support a prevalence of such vegetation.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0200 PURPOSE AND POLICY.

The purpose of this chapter is to establish requirements for the storage and land application of sewage sludge that protect public health and the environment. The policy of the agency is to encourage the beneficial use of sewage sludge as a fertilizer or soil conditioner.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0300 APPLICABILITY AND EXCLUSIONS.

Subpart 1. **Applicability.** Except as provided in subpart 2, item I, the requirements of this chapter apply to any person who prepares sewage sludge that is applied to the land, to any person who applies sewage sludge to the land, to sewage sludge applied to the land (including sewage sludge remaining in a treatment works that is a wastewater treatment pond when the pond is emptied or ceases to be used to receive wastewater), and the land on which sewage sludge is applied.

Subp. 2. **Exclusions.** This chapter does not establish requirements for:

- A. processes used to treat domestic sewage or for processes used to treat sewage sludge such as thickening, stabilization, and dewatering prior to final application to the

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land, except as provided in parts 7041.1300 and 7041.1400. Treatment processes do not include storage;

B. the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage;

C. the use or disposal of sewage sludge determined to be hazardous according to Code of Federal Regulation, title 40, part 261;

D. the use or disposal of sewage sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis);

E. the use or disposal of ash generated during the firing of sewage sludge in a sewage sludge incinerator;

F. the use or disposal of grit, for example, sand, gravel, cinders, or other materials with a high specific gravity, or screenings, for example, relatively large materials such as rags, generated during preliminary treatment of domestic sewage in a treatment works;

G. the use or disposal of sludge generated during the treatment of either surface water or groundwater used for drinking water;

H. a material derived from exceptional quality sewage sludge; and

I. the land application or storage of domestic, commercial, industrial septage, a mixture of domestic septage and commercial septage, or a mixture of domestic septage and industrial septage unless the domestic septage or mixture is generated or stored at a treatment works, in which case it is subject to the requirements of this chapter.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0400 EXCEPTIONAL QUALITY SEWAGE SLUDGE.

Subpart 1. **Conditions.** The conditions in subpart 2 for exceptional quality sewage sludge do not apply until they are included in a permit or approved management plan as required in part 7041.0600.

Subp. 2. **General requirements and management practices.** The general requirements in part 7041.1000 and the management practices in part 7041.1200 do not apply to exceptional quality sewage sludge which is applied to the land, except as follows:

A. the management practices in part 7041.1200, subpart 2, item B, for liquid bulk sewage sludge applied to frozen or snow covered ground apply to liquid bulk exceptional quality sewage sludge; and

B. the total nitrogen, phosphorus, and potassium content must be supplied by the person who prepares the sewage sludge to the person who applies or distributes the sewage sludge for that person's use in recommending application rates.

Subp. 3. **Storage.** The requirements in part 7041.1200, subpart 8, items D and E, apply to the storage of dewatered bulk exceptional quality sewage sludge on agricultural land, forest, or a reclamation site and the storage must not exceed seven months. Persons who prepare sewage sludge shall inform in writing persons who receive the bulk exceptional quality sewage sludge of these storage requirements.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0500 BASIC PROVISIONS.

Subpart 1. **Responsibility.** Persons who prepare sewage sludge are responsible for ensuring that the applicable requirements in this chapter are met when the sewage sludge is prepared, distributed, or applied to the land.

Subp. 2. **Direct enforceability.** No person shall use or dispose of sewage sludge through any practice for which requirements are established in this chapter except in accordance with such requirements.

Subp. 3. **Additional or more stringent requirements.** When necessary to protect the public health or the environment from a potentially adverse effect of a pollutant in sewage sludge, the commissioner may include in a permit or site approval additional or more stringent requirements than established in this chapter.

Subp. 4. **Variance.** Any person may apply for a variance from requirements of this chapter in accordance with chapter 7000, Minnesota Statutes, section 116.07, subdivision 5, and other applicable statutes and rules; however, the agency shall not grant a variance from any federal requirement.

Subp. 5. [Repealed, L 2012 c 272 s 98]

Subp. 6. [Repealed, L 2012 c 272 s 98]

Subp. 7. [Repealed, L 2012 c 272 s 98]

Statutory Authority: *MS s 116.07*

History: *21 SR 1642; L 2012 c 272 s 98*

7041.0600 REQUIREMENT TO OBTAIN PERMITS AND SITE APPROVAL.

Subpart 1. **Permits for inclusion of the sewage sludge requirements.** A NPDES or SDS permit which includes sewage sludge requirements must be applied for and obtained from the agency by persons specified in items A to C. Persons who do not have a permit must apply for and obtain a permit before land applying or distributing sewage sludge for application to the land. Permit application requirements are set out in part 7041.0700.

A. Persons who prepare sewage sludge in Minnesota. For persons who have NPDES or SDS permits issued by the agency, the requirements for sewage sludge shall be incorporated into those permits when they are reissued unless the requirements are included in a separate permit or modification of a permit at the request of a permittee. Information required in part 7041.0700 shall be submitted with an application to obtain, renew, or modify a permit.

B. Persons who prepare sewage sludge in another state which is applied to the land or distributed for application to the land in Minnesota, unless the person who prepares the sewage sludge produces exceptional quality sewage sludge or sewage sludge that is sold or given away in a bag or other container and has a permit issued by another state or EPA which includes the requirements for its preparation.

If a permit from the agency is not required, the person who prepares the sewage sludge must obtain written approval of a management plan from the commissioner before the sewage sludge is distributed or applied to the land. The plan must include the information in part 7041.0700, item I. An approved management plan shall be enforceable to the same extent and the same manner as a permit.

C. Persons who prepare sewage sludge which is applied to the land or distributed for application to the land in Minnesota who propose methods to utilize sewage sludge which are not addressed by this chapter.

Subp. 2. **Permits for sewage sludge storage.** Persons who store bulk sewage sludge or construct storage for bulk sewage sludge at locations other than at a permitted wastewater treatment facility must apply for and obtain a NPDES or SDS permit from the agency prior to storage or construction. Persons who have permits may apply to have their permits modified to include conditions for storage or construction of storage. Permit application requirements are set out in part 7041.0700. A permit is not required for:

A. short-term or approved long-term storage of dewatered bulk sewage sludge at a land application site; or

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B. storage of dewatered bulk exceptional quality sewage sludge when:

- (1) the storage meets the requirements in part 7041.0400, subpart 3;
- (2) the storage is at a facility permitted under Minnesota Statutes, section 18C.305, for fertilizer;
- (3) the storage is located at public contact sites, plant nurseries, turf farms, or other locations where it is used for landscaping or horticultural purposes; or
- (4) it is stored by persons using it for landscaping or horticultural purposes.

Subp. 3. **Site approval.** Persons who prepare bulk sewage sludge must obtain approval of the sites on which bulk sewage sludge is applied before it is applied unless it is exceptional quality sewage sludge. Application procedures are set out in part 7041.0800.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0700 APPLICATION REQUIREMENTS FOR NPDES AND SDS PERMITS.

The agency's procedural and permitting rules, chapters 7000 and 7001, apply to all permits required by this chapter. In addition to information required by part 7001.1050, permit applications must include the information listed in items A to L, except that items I and J need only be included when applicable, on a form provided by the commissioner. Information in item I is required when exceptional quality sewage sludge or sewage sludge which is sold or given away in a bag or other container is prepared. Item J is required when the application is for storage or construction of a storage facility for bulk sewage sludge.

A. A description of the process used to meet Class A or Class B pathogen and vector attraction reduction requirements, including any information needed to make these determinations including temperatures, retention times, salmonella, virus, and viable helminth data, volatile solids reduction calculations and management practices.

B. Sewage sludge chemical characteristics determined from a sample or samples taken within one year of application submittal, analyzed, at a minimum, for the parameters listed in part 7041.1500, subpart 2, items A to E, unless the sewage sludge is generated from septic tanks in which case an analysis is not necessarily required. The commissioner shall determine and notify the permit applicant if an analysis is required to protect human health or the environment after review of the permit application. In order to make this determination, the permit application must include information on the size and location of the septic tanks and a description of any commercial (such as a restaurant) or industrial discharges to the treatment works.

C. A description of how and when representative samples of sewage sludge applied to the land will be taken.

D. Information necessary to evaluate the laboratory quality assurance and quality control procedures including analytical methods, detection limits, and holding times of the laboratory doing the analysis in item B and the sampling techniques, preservation method, and shipping technique used by the preparer.

E. Any groundwater monitoring data, with a description of the well locations and approximate depth to groundwater for land application sites if this data is not already on file at the agency.

F. A description of the applicant's sewage sludge use, disposal, or distribution practices.

G. The location to which sewage sludge is transferred and the names of applicators, contractors, or distributors who will use or dispose of the sewage sludge, if applicable.

H. Annual sewage sludge production.

I. A management plan that describes how the person who prepares the sewage sludge will ensure that the proposed distribution or land application of the sewage sludge

meets the requirements of this chapter. The following items shall be included or addressed in the plan:

- (1) a copy of any permits issued to the applicant which contain conditions for the treatment of sewage sludge which are not issued by the agency;
- (2) a certification statement appropriate to the type of sewage sludge prepared as required in part 7041.1600;
- (3) a copy of the analysis of the sewage sludge as required by part 7041.1500;
- (4) the proposed method of use and distribution of the sewage sludge;
- (5) a copy of any labels or information sheets to be supplied to users or distributors of the sewage sludge, if applicable;
- (6) the quantity of sewage sludge to be transported and the transportation schedule; and
- (7) what information will be submitted on the annual report and when the annual report will be submitted.

J. Information describing storage or construction of storage which includes:

- (1) the location on a topographic map depicting the area one mile beyond the proposed location;
- (2) the size of the storage facility or area;
- (3) the type of sewage sludge to be stored;
- (4) operating conditions for receiving and removing sewage sludge and handling spills if liquid sewage sludge is stored;
- (5) the type of storage structure or impermeable pad if proposed; and
- (6) the plans and specifications for constructed storage facilities.

K. Any information required to determine the appropriate standards for permitting under this chapter.

L. Any other information the commissioner may request and reasonably require to assess the sewage sludge land application practices, to determine whether to issue a permit, or to ascertain appropriate permit requirements such as detailed product description and proposed distribution.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0800 APPLICATION AND APPROVAL PROCEDURE FOR LAND APPLICATION SITES.

Subpart 1. **Site application.** Persons who are required by part 7041.0600, subpart 3, to obtain a site approval from the commissioner must apply for the approval as provided in this part. Applications for approvals must be completed and signed by a Type IV certified operator or inspector. An approval is only valid for the conditions stated in the approval, including management practices and acreage authorized. If a change in acreage is proposed, a new application must be submitted and approval obtained. If a change in management practices included in the site approval is proposed, the change shall be authorized by the commissioner through a letter to the person who applies for the change before the person initiates the change.

The application must include a copy of the notification described in subpart 6 and the specific information given in subparts 2 to 5 submitted on a site application form obtained from or approved by the commissioner.

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Subp. 2. **Site characterization.** Site applications must contain site characterization that includes the following:

A. a copy of Natural Resources Conservation Service soil survey maps from the official soil survey, if available, or comparable soil maps prepared by a soil scientist with mapping experience, delineating the boundaries of the specific land application site, and:

- (1) the depth, spacing, and location of tile lines;
- (2) the location of tile inlets; and
- (3) a list of soil types on the site that are highly permeable;

B. a legal description of the land application site, including township, range, section, quarter section, township or city name, and county;

C. the following characteristics of the soil determined from samples obtained within six months of site application submittal using collection and analysis procedures in parts 7041.3300 and 7041.3400:

- (1) United States Department of Agriculture textural classification;
- (2) percentage of organic matter;
- (3) extractable phosphorus in parts per million;
- (4) exchangeable potassium in parts per million;
- (5) water pH; and
- (6) soluble salts expressed in millimhos per centimeter;

D. the approvable acreage of the land application site;

E. the name and address of the landowner and a copy or description of any contracts or agreements the landowner has with persons other than the applicant for the land application of bulk sewage sludge or other waste products such as industrial sludge, wastewater, and animal manure, at the land application site; and

F. the name and address of any renter, lessee, or occupier of the land application site.

Subp. 3. **Site management.** Applications must include site management, including:

A. a description of the proposed method or methods of bulk sewage sludge application;

B. a description of the crops to be grown and realistic yield goals or dominant vegetation at the site and the intended use of the crops or vegetation;

C. the maximum available nitrogen application rate, in pounds of nitrogen per acre and the agronomic rate in dry tons of bulk sewage sludge solids per acre per cropping year; and

D. a description of how public access to the site is proposed to be controlled if necessary.

Subp. 4. **Application requirements for long-term storage of dewatered bulk sewage sludge at the site at which the bulk sewage sludge is applied.** Applications must include the following information if approval of long-term storage at the land application site is requested:

A. a description of the necessity for storage at the land application site;

B. the location of the storage area delineated on maps submitted according to subpart 2, item A;

C. the dimensions of the bulk sewage sludge storage area;

D. the quantity of bulk sewage sludge to be stored;

E. boring logs from at least two soil borings taken to a depth of ten feet at the perimeter of the proposed storage area. The boring logs must include:

- (1) texture and thickness of each soil horizon encountered;

(2) color and presence or absence of mottling for each soil horizon encountered;

(3) depth to seasonal high water table, if encountered; and

(4) depth to bedrock, if encountered;

F. the expected duration of storage before land application; and

G. the description of precautions or practices to minimize or prevent drainage, runoff, or nuisance conditions at the storage area.

Subp. 5. **Modification of management practices.** If any modification of the suitable soil conditions, slopes, or separation distances in part 7041.1200, subpart 3, are requested for nonagricultural uses, the site application must indicate what the nonagricultural use is; which conditions, slopes, or separation distances should be modified; and what environmental benefits will result from bulk sewage sludge application under the proposed conditions.

Subp. 6. **Approval procedure; public notification.** Persons who prepare bulk sewage sludge shall provide notice by mail of the proposed land application site on the same date to the commissioner, the owner and occupier of the site, the city or township and county official of the area where the land application site is located, and any person known by the preparer to be interested in the approval of the site. The notice must include:

A. that the purpose is to notify local officials of the intent to apply to the commissioner for approval of the site for the beneficial use of sewage sludge;

B. site ownership and location and the name of the lessee, renter, or occupier of the site if applicable;

C. the preparer's name and how the preparer can be reached for more information;

D. a general site management and conditions information sheet prepared or approved by the commissioner;

E. that a Type IV operator or inspector certified by the commissioner in handling sewage sludge has reviewed the sites for compliance with this chapter;

F. that application is being mailed on the same date to the commissioner for a final determination on site suitability and site management for those sites;

G. that if there are comments or questions regarding approval of the sites, the agency's Water Quality Division must be contacted within 30 days of the date the notification was sent;

H. that the commissioner will approve or deny the application in writing after the 30-day comment period; and

I. that the commissioner reviews land application reports submitted annually by the preparer of sewage sludge.

Subp. 7. **Review.** Applications shall be reviewed for completeness by the commissioner. If the application is incomplete, the commissioner shall promptly advise the applicant of the incompleteness. Further processing of the application shall be suspended until the applicant has supplied the necessary information to the commissioner.

Subp. 8. **Approval or denial.** Notice of approval or denial and reasons for a denial shall be issued by the commissioner to the persons listed in subpart 6 no sooner than 30 days from the date the notification of the land application site was sent to those persons.

Subp. 9. **Final determination.** The commissioner shall attempt to resolve all comments prior to a final determination concerning the application. If the comments have been resolved, the commissioner shall issue or deny the approval. If all comments cannot be resolved, the application shall be presented to the agency board, which shall issue or deny the approval.

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Subp. 10. **Enforcement.** A site approval issued to the person who prepares sewage sludge under this part shall be enforceable to the same extent and in the same manner as a permit.

Subp. 11. **Revocation of site approvals.** A site approval may be revoked in accordance with the requirements of part 7001.0170.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.0900 STORAGE CONSTRUCTION REQUIREMENTS.

The minimum construction requirements in items A and B apply to storage facilities required to be permitted under part 7041.0600, subpart 2.

A. Any basin, tank, pit, or lagoon used to store liquid sewage sludge must not seep at a rate greater than 500 gallons per acre per day.

B. Any area used to store dewatered sewage sludge must be paved with asphalt, concrete, or other material meeting the seepage requirement in item A to a depth sufficient to bear the weight of unloading and loading trucks and equipment without cracking. The pad must be sloped and curbed to collect all runoff water. Runoff water must be routed to a wastewater treatment facility or used in a manner approved by the commissioner.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1000 GENERAL REQUIREMENTS.

Subpart 1. **Cumulative pollutant loading rates.** No person shall apply bulk sewage sludge to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in part 7041.1100, subpart 4, item B, have been reached.

Subp. 2. **Notice and necessary information for compliance.** Notice and necessary information needed to comply with the requirements of this chapter must be given or obtained by preparers, appliers, and users of bulk sewage sludge according to items A to D.

A. Preparers of bulk sewage sludge must provide written notification of the concentration of total nitrogen (as N on a dry weight basis) and available nitrogen (in pounds per wet ton or pounds per 1,000 gallons, whichever is appropriate) to appliers of bulk sewage sludge.

B. Before bulk sewage sludge subject to the cumulative pollutant loading rates in part 7041.1100, subpart 4, item B, is applied to the land, the person who proposes to apply the bulk sewage sludge must contact the permitting authority for the state in which the bulk sewage sludge will be applied to determine whether cumulative pollutant loading rates have been reached. If bulk sewage sludge which has pollutant concentrations greater than those listed in part 7041.1100, subpart 4, item C, has been applied since July 20, 1993, and the cumulative amount is not known, no additional bulk sewage sludge may be applied to that land.

C. The person who prepares bulk sewage sludge, or an applier under contract to the preparer to do so, is responsible for notifying and providing the necessary information for compliance with this chapter to the users of bulk sewage sludge by specifying appropriate agronomic application rates, site restrictions, and other management practices.

D. A person who prepares sewage sludge must give notice and necessary information to comply with this chapter to other persons who prepare sewage sludge or derive a material from the sewage sludge.

Subp. 3. **Sewage sludge applied to land in another state.** Any person who prepares bulk sewage sludge in Minnesota that is applied to land in another state is responsible for providing written notice to the permitting authority for the state in which the bulk sewage

sludge is proposed to be applied prior to the initial application of bulk sewage sludge. The notice must include:

- A. the legal description of each land application site;
- B. the approximate time period bulk sewage sludge will be applied to the site;
- C. the concentration of the pollutants listed in part 7041.1100, subpart 4, item C, for the bulk sewage sludge which will be applied to the land; and
- D. the name, address, telephone number, and national pollutant discharge elimination system permit number, if appropriate, for the person who prepares the bulk sewage sludge.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1100 POLLUTANT LIMITS.

Subpart 1. **Ceiling concentrations.** Bulk sewage sludge or sewage sludge sold or given away in a bag or other container must not be applied to the land if the concentration of any pollutant in the sewage sludge exceeds the ceiling concentration for the pollutant in subpart 4, item A.

Subp. 2. **Cumulative loading rates.** If bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site, either the cumulative loading rate for each pollutant must not exceed the cumulative pollutant loading rate for each pollutant in subpart 4, item B, or the bulk sewage sludge must be exceptional quality sewage sludge.

Subp. 3. **Pollutant concentrations.** The conditions in items A and B apply to pollutant concentrations in bulk sewage sludge and sewage sludge sold or given away in a bag or other container.

A. If bulk sewage sludge is applied to a lawn or a home garden, the concentration of each pollutant in the sewage sludge must not exceed the concentration for the pollutant in subpart 4, item C.

B. If sewage sludge is sold or given away in a bag or other container for application to the land, either:

(1) the concentration of each pollutant in the sewage sludge must not exceed the concentration for the pollutant in subpart 4, item C; or

(2) the product of the concentration of each pollutant in the sewage sludge and the annual whole sludge application rate for the sewage sludge must not cause the annual pollutant loading rate for the pollutant in subpart 4, item D, to be exceeded. The procedure used to determine the annual whole sludge application rate is outlined in part 7041.3100.

Subp. 4. **Pollutant concentrations and loading rates.** Pollutant concentrations and loading rates are given in items A to D.

A. Ceiling concentrations.

Pollutant	Ceiling Concentration (mg/kg)¹
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420

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Selenium	100
Zinc	7500

¹Dry weight basis

B. Cumulative pollutant loading rates.

Pollutant	Rate (kg/ha)	Rate (lbs/ac)
Arsenic	41	37
Cadmium	39	35
Copper	1500	1339
Lead	300	268
Mercury	17	15
Nickel	420	375
Selenium	100	89
Zinc	2800	2500

C. Pollutant concentrations.

Pollutant	Monthly Average Concentrations (mg/kg) ¹
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2800

¹On a dry weight basis, the arithmetic mean of all measurements taken during the month.

D. Annual pollutant loading rates per 365-day period.

Pollutant	Rate (kg/ha)	Rate (lb/ac)
Arsenic	2.0	1.8
Cadmium	1.9	1.7
Copper	75.0	67.0
Lead	15.0	13.0
Mercury	0.85	0.76
Nickel	21.0	19.0

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Selenium	5.0	4.5
Zinc	140.0	125.0

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1200 MANAGEMENT PRACTICES AND LIMITATIONS.

Subpart 1. **Endangered species.** Bulk sewage sludge must not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act of 1973, United States Code, title 16, section 1533, as amended, or its designated critical habitat.

Subp. 2. **Frozen or flooded ground.**

A. Bulk sewage sludge must not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen, or snow covered so that the bulk sewage sludge enters a wetland or other surface waters.

B. In addition to the requirements in subpart 3, item B, land application of dewatered or liquid bulk sewage sludge to frozen or snow covered ground is restricted to land with zero to two percent slopes. The application of liquid bulk sewage sludge is also restricted to a 15,000 gallon per acre hydraulic loading rate for the period when the ground is frozen or snow covered and must take place no closer than 600 feet from downgradient surface waters listed in subpart 3, item B.

C. Bulk sewage sludge must be injected or incorporated within 48 hours of surface application on ground which is subject to flooding unless specified otherwise in a site approval.

Subp. 3. **Suitable soil conditions, slopes, and separation distances.** The suitable soil conditions in item A and the suitable slopes and separation distances in item B must be met when bulk sewage sludge is applied to agricultural land application sites. These conditions and limitations must also be met when bulk sewage sludge is applied to nonagricultural sites such as reclamation, forest, or public contact sites unless approved by the commissioner under the requirements of part 7041.0800, subpart 5. Bulk sewage sludge must not be applied to agricultural land, forest, a public contact site, or a reclamation site that is 33 feet or less from surface waters or wetlands unless specified otherwise in a permit.

A. Suitable soil conditions are as follows:

(1) the soil texture, United States Department of Agriculture classification, at the zone of sewage sludge application must be fine sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, sandy clay, silty clay loam, silty clay, or clay;

(2) the pH of the soil must be 5.5 or greater;

(3) bulk sewage sludge application to a site must be suspended when the soil extractable phosphorus content determined by the Brays P-1 test exceeds 200 parts per million (400 pounds per acre) in the surface six inches of soil unless it is demonstrated through a management plan approved by the commissioner that all resource management system level erosion control practices as determined necessary by the Natural Resources Conservation Service are in place and maintained;

(4) bulk sewage sludge application to a site must be suspended when the electrical conductivity of the saturation extract of the soil exceeds four millimhos per centimeter as determined by the soluble salt test;

(5) soil samples must be collected and analyzed for parameters in part 7041.0800, subpart 2, item C, at a minimum of once in the three-year time period prior to the land application of bulk sewage sludge unless stipulated otherwise in a site approval;

(6) liquid bulk sewage sludge must not be applied to soils with surface permeabilities of less than 0.2 inch per hour unless the sewage sludge is injected or incorporated within 48 hours of surface application; and

(7) organic soils or peat soils must not be used for bulk sewage sludge application unless subsurface drainage is provided by a system designed according to or equivalent to Natural Resources Conservation Service engineering criteria.

B. Suitable slopes and separation distances must be as described in this item. If applied through irrigation equipment, aerosol drift shall not be in contact with the feature specified.

BULK SEWAGE SLUDGE APPLIED TO THE LAND
SUITABLE SLOPES AND SEPARATION DISTANCES

Criteria	Surface Applied	Incorporation within 48 hrs.	Injection
Depth to bedrock	3 ¹ ft.	3 ¹ ft.	3 ¹ ft.
Depth to seasonal high water table ² or drain tile ³	3 ¹ ft.	3 ¹ ft.	3 ¹ ft.
Allowable slopes	0% to 6%	0% to 12%	0% to 12%
Distance to wells			
Private supply	200 ft.	200 ft.	200 ft.
Public supply	1000 ft.	1000 ft.	1000 ft.
Irrigation	50 ft.	25 ft.	25 ft.
Distance to residences ⁴	200 ft.	200 ft.	100 ft.
Distance to residential development ⁴	600 ft.	600 ft.	300 ft.
Distance to public contact site	600 ft.	600 ft.	300 ft.
Down gradient ⁵ lakes, rivers, streams, type 3, 4, and 5 wetlands, intermittent streams ⁶ , or tile inlets connected to these surface waters, and sinkholes			
Slope 0% to 6%	200 ft.	50 ft.	50 ft.
Slope >6 to 12%	N/A	100 ft.	100 ft.
Grassed Waterways ⁷			
Slope 0% to 6%	100 ft.	33 ft.	33 ft.
Slope 6% to 12%	N/A	33 ft.	33 ft.

¹The depth is calculated from the zone of sewage sludge application and the separation distance for highly permeable soils is 5 feet.

²For the purpose of this item, a perched water condition shall not be considered a seasonal high water table.

³The depth to subsurface drainage tiles shall be considered the depth to the seasonal high water table for sites with tile drainage systems that are designed according to or equivalent to Natural Resources Conservation Service engineering standards and criteria.

⁴Separation distances may be reduced with written permission from all persons responsible for residential developments and places of recreation and all persons inhabiting within the otherwise protected distance.

⁵If downgradient surface water does not receive runoff because the site is bermed, separation distances can be reduced to 33 feet.

⁶For the purpose of this item, intermittent stream means a drainage channel with definable banks that provides for runoff flow to any of the surface waters listed in this item during snow melt or rainfall events.

⁷Separation distances are from the centerline of grassed waterways. For grassed waterways which are wider than these separation distances, application is allowed to the edge of the grass strip. Grassed waterways are natural or constructed, typically broad and shallow, and seeded to grass as protection against erosion.

Subp. 4. Agronomic rates.

A. Bulk sewage sludge must be applied to agricultural land, forest, a public contact site, or a reclamation site at an application rate that is equal to or less than the agronomic rate, unless, in the case of a reclamation site, otherwise specified by the commissioner.

B. Bulk sewage sludge application rates, combined with other known sources of nitrogen such as manure, carry-over nitrogen from previous sewage sludge applications, or fertilizer, must supply no more available nitrogen than the rates as described in subitems (1) to (5).

(1) The maximum available nitrogen application rates calculated by methods provided by the commissioner which are based on realistic yield goals, soil organic matter content, and previously grown crops.

(2) For alfalfa and clovers which do not have recommended nitrogen application rates either:

(a) the maximum available nitrogen application rate must not exceed 200 pounds per acre for alfalfa and 100 pounds per acre for clover, alfalfa grass, and clover grass mixtures; or

(b) the maximum available nitrogen application rates may be calculated based on realistic yield goals and measured yields in tons per acre multiplied by 50 pounds of nitrogen per ton.

(3) For soybeans, the maximum available nitrogen application rate shall be calculated by multiplying the realistic yield goal in bushels per acre times 3.5 pounds of nitrogen per bushel.

(4) The maximum available nitrogen application rate for cover crops must not exceed 50 pounds per acre per year.

(5) The available nitrogen applied after the second cutting of a hay crop must be no more than 50 percent of the maximum available nitrogen application rate for the current cropping year.

C. Bulk sewage sludge must not be applied to the land during the months of June, July, and August unless a crop is growing on the land or a crop is seeded within fourteen days following the bulk sewage sludge application.

D. Bulk sewage sludge must not be applied to fallow land, which is land that is uncropped and kept cultivated throughout a growing season and has a vegetative cover of less than 25 percent. Any land that is uncropped and cultivated during the months of September through May where a crop will be grown the following growing season is not considered fallow land.

E. The calculation of available and carry-over nitrogen in sewage sludge must be performed as described in part 7041.3000.

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Subp. 5. **Highly permeable soils.** In addition to those specified in subparts 3 and 4, the separation distances in item A and agronomic management practices in items B and C must be met when bulk sewage sludge is applied to highly permeable soils.

A. The minimum separation distance between the zone of bulk sewage sludge application and the seasonal high water table and bedrock is five feet.

B. Bulk sewage sludge must not be applied to the land during the months of June, July, August, or September unless a crop is growing on the land or a crop is seeded within 14 days following the bulk sewage sludge application.

C. Bulk sewage sludge applied in October shall be surface applied or applied with a nitrification stabilizer which extends the time the nitrogen component remains in the soil in the ammoniacle form.

Subp. 6. **Prohibited sites and other limits.** The prohibited sites and other limits in items A to G apply to bulk sewage sludge applied to the land.

A. Bulk sewage sludge must not be applied on areas ponded with water or sewage sludge.

B. Bulk sewage sludge must not be applied or run onto adjoining property, roads, and the shoulders and drainage ditches alongside a road.

C. The boundary of a land application site must be identified prior to and during application with the use of conspicuous flags placed to achieve a clear and positive identification of the suitable site boundary unless apparent boundaries, such as fence rows, roads, tree lines, type of vegetation, or steep slopes, exist.

D. Bulk sewage sludge must not be applied on any land without the permission of the owner.

E. Bulk sewage sludge must be applied to land in such a manner as to provide uniform application.

F. Bulk sewage sludge must not be disposed of or placed into any cave, or sink-hole. Except as part of a reclamation project, sewage sludge must not be disposed of or placed on any mine or quarry.

G. Daily surface applications of liquid sewage sludge must not exceed the following: coarse-textured soils, 25,000 gallons per acre; medium-textured soils, 15,000 gallons per acre; or fine-textured soils, 10,000 gallons per acre.

Subp. 7. **Short-term storage.** Items A to C apply to the short-term storage of dewatered bulk sewage sludge.

A. The short-term storage of bulk sewage sludge shall not exceed 30 days.

B. Separation distances for short-term bulk sewage sludge storage areas shall be those provided in subpart 3, item B, except that short-term storage of bulk sewage sludge shall not occur within 100 feet of any adjoining property without the written permission of the owner or within 100 feet of any road or drainage ditch.

C. Short-term storage of bulk sewage sludge shall not take place on land with a slope greater than two percent unless measures are taken to control water runoff or the bulk sewage sludge is being spread concurrent with the unloading of bulk sewage sludge delivery trucks and will not be stockpiled overnight.

Subp. 8. **Long-term storage.** Items A to G apply to the long-term storage of dewatered bulk sewage sludge.

A. Long-term storage of bulk sewage sludge is only allowed at land application sites where the stored bulk sewage sludge is to be applied. Long-term storage of bulk sewage sludge that is intended for application at several land application sites is allowed provided that all sites are owned by the same person and all sites are within a one-half mile radius.

B. Long-term storage of bulk sewage sludge for land application areas of 40 acres or less shall not take place within 400 feet from any residence. This separation distance shall increase 100 feet for every additional ten acres of land application area, or portion thereof, up to a maximum of 1,000 feet. Separation distances may be reduced if written permission is obtained from all persons residing within the otherwise protected distance.

C. Long-term storage of bulk sewage sludge shall not take place within 1,000 feet of any residential development or public contact site.

D. Long-term storage of bulk sewage sludge shall not take place within 1,000 feet of any downgradient surface waters and wetlands listed in subpart 3, item B, tile inlets, or sinkholes unless measures are taken to control runoff in which case the separation distance may be reduced to 200 feet.

E. Long-term storage of bulk sewage sludge shall not be allowed on land with greater than a two percent slope.

F. Long-term bulk sewage sludge storage areas shall be located in areas where the texture of all the horizons in the soil profile to a depth of five feet is sandy loam or finer unless an impervious pad with a drainage collection system is constructed.

G. Long-term bulk sewage sludge storage shall not take place on the same area for two or more consecutive years unless an impervious pad with a drainage collection system is constructed.

Subp. 9. **Labeling.** A label must be affixed to the bag or other container in which sewage sludge is sold or given away for application to the land or an information sheet must be provided to the person who receives sewage sludge in an other container. The label or information sheet must contain the following information:

A. the name and address of the person who prepared the sewage sludge that is sold or given away in a bag or other container;

B. a statement that application of the sewage sludge to the land is prohibited except according to the instructions on the label or information sheet; and

C. the annual whole sludge application rate for the sewage sludge that does not cause any of the annual pollutant loading rates in part 7041.1100, subpart 4, item D, to be exceeded.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1300 OPERATIONAL STANDARDS; PATHOGEN REDUCTION.

Subpart 1. **General.** Bulk sewage sludge must meet the requirements of Class A pathogen reduction or Class B pathogen reduction and the site restrictions in subpart 3, item D, when it is applied to agricultural land, forest, a public contact site, or a reclamation site. Bulk sewage sludge applied to a lawn or home garden and sewage sludge sold or given away in a bag or other container must meet Class A pathogen reduction requirements.

Subp. 2. **Pathogens in sewage sludge; Class A.** To be classified Class A with respect to pathogen reduction, the requirements in items A and B must be met.

A. One of the Class A pathogen requirements in items C to H must be met either prior to or at the same time the vector attraction reduction requirements in part 7041.1400, subpart 2, are met except when the vector attraction reduction requirements in part 7041.1400, subpart 2, item F, G, or H, are met.

B. Either the density of fecal coliform in the sewage sludge must be less than 1,000 most probable number per gram of total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the sewage sludge must be less than three most probable number per four grams of total solids (dry weight basis) at the time the sewage sludge is applied to the land, at the time the sewage sludge is prepared for sale or giveaway in a bag or other container for application to the land, or at the time the sewage sludge or material derived

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from sewage sludge is prepared to meet the requirements of exceptional quality sewage sludge.

C. Class A, Alternative 1. (Not applicable for composting.) The temperature of the sewage sludge shall be maintained at a specific value for a period of time.

(1) When the percent solids of the sewage sludge is seven percent or higher, the temperature of the sewage sludge shall be 50 degrees Celsius or higher, the time period shall be 20 minutes or longer, and the temperature and time period shall be determined using the equation in this unit, except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid.

$$D = \frac{131,700,000}{10^{0.1400t}}$$

Where,

D=time in days.

t=temperature in degrees Celsius.

(2) When the percent solids of the sewage sludge is seven percent or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the temperature of the sewage sludge shall be 50 degrees Celsius or higher, the time period shall be 15 seconds or longer, and the temperature and time period shall be determined using the equation in subitem (1).

(3) When the percent solids of the sewage sludge is less than seven percent and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period shall be determined using the equation in subitem (1).

(4) When the percent solids of the sewage sludge is less than seven percent, the temperature of the sewage sludge is 50 degrees Celsius or higher, and the time period is 30 minutes or longer, the temperature and time period shall be determined using the equation in this unit.

$$D = \frac{50,070,000}{10^{0.1400t}}$$

Where,

D=time in days.

t=temperature in degrees Celsius.

D. Class A, Alternative 2. The pH of the sewage sludge shall be raised to above 12 and shall remain above 12 for 72 hours.

(1) The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

(2) At the end of the 72-hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50 percent.

E. Class A, Alternative 3. The sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses and helminth ova.

(1) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is less than one plaque-forming unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses until the next monitoring episode for the sewage sludge.

(2) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is equal to or greater than one plaque-forming unit per four grams of total solids

(dry weight basis), the sewage sludge is Class A with respect to enteric viruses when the density of enteric viruses in the sewage sludge after pathogen treatment is less than one plaque-forming unit per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the enteric virus density requirement are documented.

(3) After the enteric virus reduction in subitem (2) is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to enteric viruses when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in subitem (2).

(4) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is less than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova until the next monitoring episode for the sewage sludge.

(5) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is equal to or greater than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova when the density of viable helminth ova in the sewage sludge after pathogen treatment is less than one per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the viable helminth ova density requirement are documented.

(6) After the viable helminth ova reduction in subitem (5) is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to viable helminth ova when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in subitem (5).

F. Class A, Alternative 4.

(1) The density of enteric viruses in the sewage sludge shall be less than one plaque-forming unit per four grams of total solids (dry weight basis) at the time the sewage sludge is applied to the land, at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land, or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements of exceptional quality sewage sludge, unless otherwise specified by the permitting authority.

(2) The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is applied to the land; at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land, or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements of exceptional quality sewage sludge, unless otherwise specified by the permitting authority.

G. Class A, Alternative 5. Sewage sludge shall be treated in one of the processes to further reduce pathogens in subitems (1) to (7).

(1) Composting. Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge is maintained at 55 degrees Celsius or higher for three days. Using the windrow composting method, the temperature of the sewage sludge is maintained at 55 degrees or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees or higher, there shall be a minimum of five turnings of the windrow.

(2) Heat drying. Sewage sludge is dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge to 10 percent or lower. Either the temperature of the sewage sludge particles exceeds 80 degrees Celsius or the wet bulb temperature of the gas in contact with the sewage sludge.

(3) Heat treatment. Liquid sewage sludge is heated to a temperature of 180 degrees Celsius or higher for 30 minutes.

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(4) Thermophilic aerobic digestion. Liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage sludge is ten days at 55 to 60 degrees Celsius.

(5) Beta ray irradiation. Sewage sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).

(6) Gamma ray irradiation. Sewage sludge is irradiated with gamma rays from certain isotopes, such as Cobalt 60 and Cesium 137, at room temperature (ca. 20 degrees Celsius).

(7) Pasteurization. The temperature of the sewage sludge is maintained at 70 degrees Celsius or higher for 30 minutes or longer.

H. Class A, Alternative 6. Sewage sludge that is applied to the land shall be treated in a process that is equivalent to a process to further reduce pathogens in item G, as determined by the permitting authority.

Subp. 3. **Sewage sludge; Class B.** The requirements in item A, B, or C must be met for sewage sludge to be classified as Class B with respect to pathogen reduction and when Class B sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site, the site restrictions in item D must also be met.

A. Class B, Alternative 1.

(1) Seven representative samples of the sewage sludge that is applied to the land shall be collected.

(2) The geometric mean of the density of fecal coliform in the samples collected in subitem (1) shall be less than either 2,000,000 most probable number per gram of total solids (dry weight basis) or 2,000,000 colony forming units per gram of total solids (dry weight basis).

B. Class B, Alternative 2. Sewage sludge shall be treated in one of the Processes to Significantly Reduce Pathogens in subitems (1) to (5).

(1) Aerobic digestion. Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

(2) Air drying. Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

(3) Anaerobic digestion. Sewage sludge is treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.

(4) Composting. Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40 degrees Celsius or higher and remains at 40 degrees Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55 degrees Celsius.

(5) Lime stabilization. Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 after two hours of contact.

C. Class B, Alternative 3. Sewage sludge shall be treated in a process that is equivalent to a process to significantly reduce pathogens, as determined by the permitting authority.

D. Site Restrictions.

MINIMUM DURATION BETWEEN APPLICATION AND HARVEST/GRAZING/PUBLIC ACCESS FOR CLASS B SEWAGE SLUDGE APPLIED TO THE LAND

Criteria	Surface Applied or Incorporated	Injected
Food crops whose harvested part may touch the soil/sludge mixture (melons, squash, tomatoes, etc.)	14 mos.	14 mos.
Food crops whose harvested parts grow in the soil (potatoes, carrots, etc.)	20/38 mos. ¹	38 mos.
Feed, other food crops (field corn, sweet corn, etc.) hay, or fiber crop	30 days	30 days
Grazing of animals	30 days	30 days
Public access to the land		
- High potential ²	1 year	1 year
- Low potential ³	30 days	30 days

¹The 20-month duration between application and harvesting applies when the sewage sludge that is surface applied stays on the soil surface for four months or longer prior to incorporation into the soil. The 38-month duration is in effect when the sewage sludge remains on the soil surface for less than four months prior to incorporation.

²This includes, but is not limited to, a public contact site and reclamation site located in populated areas, for example, a construction site located in a city, turf farms, and plant nurseries.

³Land the public uses infrequently which includes, but is not limited to, agricultural land, forest, and a reclamation site located in an unpopulated area.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1400 OPERATIONAL STANDARDS; VECTOR ATTRACTION REDUCTION.

Subpart 1. **Agricultural and other lands.** One of the vector attraction reduction requirements in subpart 2 must be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

Subp. 2. **Home use and land application.** One of the vector attraction reduction requirements in items A to H must be met when bulk sewage sludge is applied to a lawn or a home garden or when sewage sludge is sold or given away in a bag or other container for application to the land.

A. The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent.

B. When the 38 percent volatile solids reduction requirement in item A cannot be calculated for an anaerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. When at the end of the 40 days the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 17 percent, vector attraction reduction is achieved.

C. When the 38 percent volatile solids reduction requirement in item A cannot be calculated for an aerobically digested sewage sludge, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge that has a

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percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. When at the end of the 30 days the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 15 percent, vector attraction reduction is achieved.

D. The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.

E. Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of the sewage sludge shall be higher than 45 degrees Celsius.

F. The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.

G. The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials at the time the sewage sludge is applied to the land, at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to the land, or at the time the sewage sludge is prepared to meet the requirements of exceptional quality sewage sludge.

H. The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials, at the time the sewage sludge is applied to the land, at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to the land, or at the time the sewage sludge is prepared to meet the requirements of exceptional quality sewage sludge.

I. Sewage sludge shall be injected below the surface of the land.

(1) No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected.

(2) When the sewage sludge that is injected below the surface of the land is Class A with respect to pathogens, the sewage sludge shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.

J. Sewage sludge applied to the land surface shall be incorporated into the soil within six hours after application to the land unless specified otherwise by the permitting authority. When sewage sludge that is incorporated into the soil is Class A with respect to pathogens, the sewage sludge shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1500 MONITORING REQUIREMENTS.

Subpart 1. **Sampling of sewage sludge.** Representative samples of sewage sludge that is applied to the land must be collected and analyzed by the person who prepares the sewage sludge. The following minimum requirements apply for the sampling of parameters except pathogens and pathogen indicator organisms:

A. in the case of digesters and liquid storage tanks, a representative sample must be composed of at least four grab samples composited over a 24-hour period; and

B. in the case of lagoons, stockpiles, drying beds, and compost piles, a representative sample must be composed of at least ten grab samples composited from the sewage sludge prior to land application.

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Subp. 2. **Analysis.** Sewage sludge must be analyzed according to the analytical procedures in part 7041.3200 or other EPA approved methods for the parameters in items A to F. All analytical values, except pH and total solids, must be recorded on a dry weight basis:

- A. percentage of total solids;
- B. volatile solids as percentage of total solids;
- C. pH;
- D. major plant nutrients, including the percentages of kjeldahl nitrogen, ammonia nitrogen, phosphorus, and potassium;
- E. concentration of metals in milligrams per kilogram of zinc, copper, lead, nickel, cadmium, mercury, arsenic, molybdenum, and selenium; and
- F. polychlorinated biphenyls (PCBs) if the sewage sludge is being removed from a wastewater treatment pond described in part 7041.0300, subpart 1.

Subp. 3. **Additional analysis or parameters.** If the commissioner concludes that additional analysis or monitoring for additional parameters is needed to protect the public health or the environment, the commissioner shall require this analysis based on considerations about the sewage sludge in question, including the age of the sewage sludge, the size of the treatment facility, the processes used to treat the sewage sludge, the methods of land application, and the characteristics of industrial discharges to the sewer system.

Subp. 4. **Frequency of monitoring.** The minimum monitoring frequency for the parameters listed in subpart 2, the pathogen or indicator organism density requirements in part 7041.1300, subparts 2 and 3, and the vector attraction reduction requirements in part 7041.1400, subpart 2, items A to D and F to H, shall be the frequency in this item.

MINIMUM SAMPLING FREQUENCIES

Sewage Sludge Applied ¹ (metric tons/ 365-day period)	Sewage Sludge Applied ¹ (tons/365-day period)	Frequency (times/ 365-day period)
>0 but <290	>0 but <320	1
≥290 but <1,500	≥320 but <1,650	4
≥1,500 but <15,000	≥1,650 but <16,500	6
≥15,000	≥16,500	12

¹Either the amount of bulk sewage sludge applied to the land or the amount of sewage sludge received by a person who prepares sewage sludge that is sold or given away in a bag or other container for application to the land (dry weight basis).

Subp. 5. **Greater frequency of sewage sludge monitoring and analysis.** Parameters exceeding concentrations in subpart 6, based on the average of all analyses made during the previous cropping year, must be analyzed for at least two times the minimum frequency given in subpart 4.

Subp. 6. **Greater frequency of sewage sludge sampling and analysis.**

GREATER FREQUENCY OF SAMPLING

Concentration Expressed in
Milligrams/Kilogram of Dry Weight

Parameter	2X Frequency
Arsenic	38
Cadmium	43
Copper	2150
Lead	420

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Mercury	28
Molybdenum	38
Nickel	210
Selenium	50
Zinc	3750

Subp. 7. **Reduction in monitoring frequency.** After the sewage sludge has been monitored for two years at the frequency in subparts 4 and 6, the commissioner may reduce the frequency of monitoring for the parameters listed in subpart 2 and the pathogen density in part 7041.1300, subpart 2, item E, but in no case shall the frequency of monitoring be less than once per year when sewage sludge is applied to the land.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1600 RECORD KEEPING.

Subpart 1. **General requirements.** A record keeping system must be initiated and maintained by the person who prepares sewage sludge. Records required to be kept by an applier who is different than the preparer must be supplied to the preparer for record keeping purposes.

Subp. 2. **Exceptional quality sewage sludge.** The preparer of exceptional quality sewage sludge applied to the land either in bulk or sold or given away in a bag or other container must develop and retain the following information for five years:

A. the concentration of each parameter listed in part 7041.1500, subpart 2, items A to E;

B. the following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in Minnesota Rules, part 7041.1300, subpart 2, and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Minnesota Rules, part 7041.1400, subpart 2, items A to H] has been prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.";

C. a description of how the Class A pathogen requirements in part 7041.1300, subpart 2, are met;

D. a description of how one of the vector attraction reduction requirements in part 7041.1400, subpart 2, items A to H, is met;

E. a copy of written information required to be given as required in part 7041.0400, subpart 3; and

F. the quantity of exceptional quality sewage sludge provided to distributors or users if supplied in bulk and the quantity sold or given away in a bag or other container per 365-day period.

Subp. 3. **Other Class A and Class B bulk sewage sludge.** The preparer of other Class A and Class B bulk sewage sludge that is applied to the land must develop and retain the information in items A to G and subpart 5 for five years and the information in items H to N indefinitely.

A. The concentration of each parameter listed in part 7041.1500, subpart 2, items A to E.

B. The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in Minnesota Rules, part 7041.1300, subpart 2, [insert if Class A requirements are met] or Minnesota Rules, part 7041.1300, subpart 3, [insert if Class B requirements are met] and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Minnesota Rules, part 7041.1400, subpart 2, items A to H, if one of those requirements is met] has been prepared under my direction and supervision according to the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements [and vector attraction reduction requirements, if applicable] have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

C. A description of how the Class A or Class B pathogen requirement is met.

D. A description of how one of the vector attraction reduction requirements in part 7041.1400, subpart 2, items A to J, is met.

E. A record of soil test data as required by part 7041.0800, site approvals, or permits.

F. The maximum available nitrogen application rate based on the realistic yield goal and vegetation grown on the site during the cropping year.

G. The known amount of available nitrogen applied during the cropping year from all sources expressed in terms of pounds per acre.

H. The location of the land application and stockpile sites on a United States Geological Survey quadrangle or soil survey map.

I. The legal description of the land application site and the number of acres to which bulk sewage sludge was applied.

J. The amount of bulk sewage sludge applied that cropping year and cumulatively expressed in terms of tons of sewage sludge solids per acre.

K. The amount of arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc applied that cropping year and cumulatively expressed in terms of pounds per acre.

L. The date bulk sewage sludge is applied to each site.

M. The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the requirements to obtain information in Minnesota Rules, part 7041.1000, subpart 2, item B, has been prepared for each site on which bulk sewage sludge is applied under my direction and supervision according to the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the requirements to obtain information have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."

N. A description of how the requirements to obtain information in part 7041.1000, subpart 2, item B, are met.

Subp. 4. **Class A sewage sludge not meeting pollutant concentrations.** The person who prepares Class A sewage sludge which does not meet the pollutant concentrations in part 7041.1100, subpart 4, item C, and is sold or given away in a bag or other container for application to the land, must develop and retain the following information for five years:

A. the annual whole sludge application rate for the sewage sludge that does not cause the annual pollutant loading rates in part 7041.1100, subpart 4, item D, to be exceeded;

B. the concentration of each parameter listed in part 7041.1500, subpart 2, items A to E, in the sewage sludge;

C. the following certification statement:

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"I certify, under penalty of law, that the information used to determine compliance with the labeling requirements in Minnesota Rules, part 7041.1200, subpart 9, the Class A pathogen requirement in Minnesota Rules, part 7041.1300, subpart 2, and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Minnesota Rules, part 7041.1400, subpart 2, items A to H] has been prepared under my direction and supervision according to the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practice, pathogen requirement, and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.";

D. a description of how the Class A pathogen requirements in part 7041.1300, subpart 2, are met; and

E. a description of how one of the vector attraction reduction requirements in part 7041.1400, subpart 2, items A to H, is met.

Subp. 5. **Appliers of bulk sewage sludge.** The applier of bulk sewage sludge must provide the preparer with the information in items A and B.

A. The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in Minnesota Rules, part 7041.1200, the site restrictions in Minnesota Rules, part 7041.1300, subpart 3, item D [insert if Class B sewage sludge is applied to the land], and the vector attraction reduction requirement in [insert Minnesota Rules, part 7041.1400, subpart 2, item I or J, if met] for each site on which bulk sewage sludge is applied has been prepared under my direction and supervision according to the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices and site restrictions have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

B. A description of how the management practices, site restrictions, and vector attraction reduction requirements, if options in part 7041.1400, subpart 2, item I or J, are met for each site on which bulk sewage sludge was applied.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1700 REPORTING.

Subpart 1. **Annual reporting requirements.**

A. The information in part 7041.1600 must be recorded, as applicable, by the person who prepares the sewage sludge on a form provided or approved by the commissioner and submitted annually to the agency no later than December 31 following the end of the cropping year unless specified otherwise in a permit or approved management plan if applicable. If bulk sewage sludge is applied, the form must be prepared by or under the supervision of a Type IV certified operator or inspector employed by the person who prepares the bulk sewage sludge.

B. If bulk sewage sludge is applied on a site in Minnesota, the legal description of the site and the information in part 7041.1600, subpart 3, items M and N, do not have to be reported.

C. For the purpose of annual reports, the month instead of the date referenced in part 7041.1600, subpart 3, item L, shall be reported on the form provided or approved by the commissioner.

Subp. 2. **Special reporting requirements.** The preparer of bulk sewage sludge which is not exceptional quality sewage sludge must notify the agency, in writing, when 90 percent

or more of any of the cumulative pollutant loading rates in part 7041.1100, subpart 4, item B, has been reached for a site.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.1800 PROVISIONS FOR SEWAGE SLUDGE FROM SEPTIC TANKS.

Subpart 1. **General.** The requirements in subparts 2 to 4 for application at agronomic rates, pathogen and vector attraction reduction, monitoring, record keeping, and reporting, unless specified otherwise in a permit, shall be met by persons who prepare the sewage sludge from septic tanks which is referred to in this part as septage.

Subp. 2. **Agronomic rates.** The agronomic application rate for septage applied to agricultural land, forest, or a reclamation site for a cropping year must be calculated using the equation in this subpart unless specified otherwise by the commissioner. The commissioner may specify the rate based on an actual nitrogen analysis.

$$AR = \frac{N}{0.0026}$$

Where,

AR = Application rate in gallons per acre for the cropping year.

N = The maximum available nitrogen application rate in pounds per acre per cropping year required by the crop based on realistic yield goals or nitrogen uptake by vegetation grown on the land minus the amount supplied by other sources such as manure or fertilizer.

Subp. 3. **Pathogen and vector attraction reduction.** To meet pathogen and vector attraction reduction requirements, the site restrictions in part 7041.1300, subpart 3, item D, must be met and either:

A. the pH of the septage must be raised to 12 or higher for 30 minutes by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes;

B. the septage is injected and no significant amount of the septage is present on the land surface within one hour after it is injected; or

C. the septage is incorporated below the surface of the land within six hours after application unless specified otherwise by the permitting authority.

Subp. 4. **Monitoring, record keeping, and reporting.** The permittee must obtain and keep on record for five years, the information required to be in compliance with this chapter including:

A. the following certification statement for all septage applied to the land:

"I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen and vector attraction reduction requirements in subpart 2, item A, B, or C [insert either subpart 3, item A, B, or C] the management practices in part 7041.1200, and the site restrictions in part 7041.1300, subpart 3, item D, has been prepared under my direction and supervision according to the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen and vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.";

B. a description of how the pathogen and vector attraction reduction requirements are met. If alkali addition is used, records must indicate each container of septage applied is monitored for compliance with subpart 3, item A;

C. a description of how management practices and site restrictions are met;

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- D. a record of soil test data as required by part 7041.0800, site approvals, or permits;
- E. the maximum available nitrogen application rate based on the realistic yield goal of the crop or vegetation grown on the site during the cropping year;
- F. the amount of septage in gallons per acre applied that cropping year;
- G. the legal description of the land application site;
- H. the number of acres used;
- I. the date septage is applied to the land; and
- J. any other analysis or information required by the commissioner.

The information in items A to J must be recorded by the permittee on a form provided or approved by the commissioner and submitted annually to the agency no later than December 31 following the end of the cropping year.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.3000 CALCULATION OF AVAILABLE AND CARRY-OVER NITROGEN.

Subpart 1. **Available nitrogen.** The formulas in this subpart shall be used for the calculation of available nitrogen for the cropping year sewage sludge is applied to the land unless it has been demonstrated to the satisfaction of the commissioner with data from laboratory and/or field tests that another calculation based on sewage sludge or site-specific mineralization rates is more appropriate.

POUNDS OF AVAILABLE NITROGEN PER TON OF SEWAGE SLUDGE SOLIDS

Type of Stabilization	Application Method	Formula
Digested		
Anaerobic	Surface	(% organic-N x 4) + (%NH ₃ -N x 10)
Anaerobic	Incorporated ¹ or injected	(% organic-N x 4) + (%NH ₃ -N x 20)
Aerobic	Surface	(% organic-N x 6) + (%NH ₃ -N x 10)
Aerobic	Incorporated ¹ or injected	(% organic-N x 6) + (%NH ₃ -N x 20)
Stabilized primary and waste activated	Surface	(% organic-N x 8) + (%NH ₃ -N x 10)
	Incorporated ¹ or injected	(% organic-N x 8) + (%NH ₃ -N x 20)
Composted	Surface	(% organic-N x 2) + (%NH ₃ -N x 10)
	Incorporated ¹	(% organic-N x 2) + (%NH ₃ -N x 20)

¹Incorporated within 48 hours

Subp. 2. **First year carry-over nitrogen.** First year carry-over nitrogen from the initial application of sewage sludge shall be calculated using the formulas in this subpart.

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FIRST YEAR CARRY-OVER NITROGEN FROM INITIAL SEWAGE SLUDGE APPLICATION

Type of Stabilization	Pounds per Acre
Anaerobically digested	(% organic-N) x (1.6) x (tons per acre applied)
Aerobically digested	(% organic-N) x (2.1) x (tons per acre applied)
Stabilized primary and waste activated	(% organic-N) x (2.4) x (tons per acre applied)
Composted	(% organic-N) x (0.9) x (tons per acre applied)

Subp. 3. **Second year carry-over nitrogen.** Second year carry-over nitrogen from the initial application of sewage sludge must be calculated for aerobically digested and stabilized primary and waste activated sewage sludge if the initial application provided greater than or equal to 100 pounds of available nitrogen per acre. The following formula shall be used:

Second year carry-over nitrogen = (% organic-N) x (1.0) x (tons/acre applied).

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.3100 PROCEDURE TO DETERMINE ANNUAL WHOLE SLUDGE APPLICATION RATE (AWSAR).

A. This part contains the procedure used to determine the AWSAR for a sewage sludge that does not cause the annual pollutant loading rates in part 7041.1100, subpart 4, item D, to be exceeded. The relationship between the annual pollutant loading rate (APLR) for a pollutant and the AWSAR for a sewage sludge is shown in the equation in this subpart.

$$APLR = C \times AWSAR \times 0.001$$

Where,

APLR = Annual pollutant loading rate in kilograms per hectare per 365-day period.

C = Pollutant concentration in milligrams, per kilogram of total solids (dry weight basis).

AWSAR = Annual whole sludge application rate in metric tons per hectare per 365-day period (dry weight basis).

0.001 = A conversion factor.

B. To determine the AWSAR, the equation in subpart one is rearranged as follows:

$$AWSAR = \frac{APLR}{C \times 0.001}$$

The procedure used to determine the AWSAR is described in subitems (1) to (4).

(1) Analyze a sample of the sewage sludge to determine the concentration for each of the pollutants listed in part 7041.1100, subpart 4, item D, in the sewage sludge.

(2) Using the pollutant concentrations from subpart 1 and the APLRs from part 7041.1100, subpart 4, item D, calculate an AWSAR for each pollutant using the equation in this subpart.

(3) The AWSAR for the sewage sludge is the lowest AWSAR calculated in this subpart.

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(4) To convert the AWSAR to pounds per acre, multiply the AWSAR (in Kg/ha) by .892.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.3200 ANALYTICAL PROCEDURES FOR DETERMINING CONSTITUENTS IN SEWAGE SLUDGE SAMPLES.

The documents in items A to I are incorporated by reference and are available through the Minitex interlibrary loan system. They are not subject to frequent change.

A. Analytical Procedures for Determining Organic Priority Pollutants in Municipal Sludge, issued by the United States Environmental Protection Agency as EPA 600/2-80-030 (1980), also available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB 80-198401), 1-800-553-6847.

B. Method Development for Determination of Polychlorinated Hydrocarbons in Municipal Sludge, issued by the United States Environmental Protection Agency as EPA 600/2-80-029 (1980), also available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB 80-200793), 1-800-553-6847.

C. Enteric Viruses, ASTM Designation: D 4994-89, "Standard Practice for Recovery of Viruses From Wastewater Sludges," 1992 Annual Book of ASTM Standards: Section 11 -- Water and Environmental Technology, ASTM, 1916 Race Street, Philadelphia, Pennsylvania 19103-1187.

D. Fecal Coliform, Part 9221E or Part 9222D, "Standard Methods for the Examination of Water and Wastewater," 18th Edition, 1992, American Public Health Association, 1015 15th Street NW, Washington, DC 20005.

E. Helminth Ova, Yanko, W.S., "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges," EPA 600/1-87-014, 1987, National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB 88-154273/AS).

F. Inorganic pollutants, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Second Edition (1982) with Updates I (April 1984) and II (April 1985) and Third Edition (November 1986) with Revision I (December 1987). Second Edition and Updates I and II are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (PB 87-120-291). Third Edition and Revision I are available from Superintendent of Documents, Government Printing Office, 941 North Capitol Street NE, Washington, DC 20002 (Document Number 955-001-00000-1).

G. Salmonella sp. bacteria, Part 9260D, "Standard Methods for the Examination of Water and Wastewater," 18th Edition, 1992, American Public Health Association, 1015 15th Street NW, Washington, DC 20005; Kenner, B.A. and H.P. Clark, "Detection and enumeration of Salmonella and Pseudomonas aeruginosa," Journal of the Water Pollution Control Federation, Vol. 46, No. 9, September 1974, pp. 2163-2171, Water Environment Federation, 601 Wythe Street, Alexandria, Virginia 22314.

H. Specific oxygen uptake rate, Part 2710B, "Standard Methods for the Examination of Water and Wastewater," 18th Edition, 1992, American Public Health Association, 1015 15th Street NW, Washington, DC 20005.

I. Total fixed, volatile solids, Part 2540G, "Standard Methods for the Examination of Water and Wastewater," 18th Edition, 1992, American Public Health Association, 1015 15th Street NW, Washington, DC 20005.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.3300 COLLECTION OF SOIL SAMPLES.

At a minimum, one soil sample shall represent an area of no more than 40 acres. Additional soil samples may be required if there are areas differing greatly in previous fertilization, liming, cropping history, land management, or soil texture. The soil must be sampled to a depth of six to nine inches from at least 15 to 20 random locations in the sampling area. The samples must be composited, thoroughly mixed, and subsampled for analysis. Approximately one pint of soil is necessary for analysis.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*

7041.3400 ANALYSIS OF SOILS.

Subpart 1. **Analytical methods.** Acceptable analytical methods for United States Department of Agriculture textural classification, organic matter, extractable phosphorus, exchangeable potassium, pH, and soluble salts are found in one or more of the publications in items A to C which are incorporated by reference. These documents are not subject to frequent change and are available through the Minitex interlibrary loan system or the addresses given.

A. Recommended Chemical Soil Test Procedures for the North Central Region, issued by the North Dakota Agricultural Experiment Station, North Dakota State University as North Central Regional Publication No. 221 (Revised) October 1988.

B. Methods of Soil Analysis, Chemical and Microbiological Properties edited by Alan Page et al., issued by the American Society of Agronomy as Agronomy Monograph No. 9 (Madison, Wisconsin, Part 2, second edition, 1982).

C. Procedures for Collecting Soil Samples and Methods of Analysis for Soil Survey, issued by the Natural Resources Conservation Service as Soil Survey Investigations Report 1 (revised) (Washington, D.C., United States Government Printing Office, 1984).

Subp. 2. **Soil permeability.** The documents in items A and B are incorporated by reference for determining soil permeability measurements for different soil types and soil horizons when the information is not available from the Natural Resources Conservation Service. These references are not subject to frequent change and are available through the Minitex interlibrary loan system or addresses given.

A. Determination by direct measurements in the field as outlined in chapter 29, Hydraulic Conductivity of Saturated Soils: Field Methods, in Methods of Soil Analysis, Physical and Mineralogical Methods, edited by Klute, issued by the American Society of Agronomy, 677 South Segoe Road, Madison, Wisconsin 53711, as Agronomy Monograph No. 9, Part 1, (Madison, Wisconsin, second edition 1986).

B. Determination in the laboratory using undisturbed soil samples as outlined in chapter 28, Hydraulic Conductivity and Diffusivity: Laboratory Methods in Methods of Soil Analysis, edited by Klute, issued by the American Society of Agronomy, 677 South Segoe Road, Madison, Wisconsin 53711, as Agronomy Monograph No. 9, Part 1, (Madison, Wisconsin, second edition 1986).

Subp. 3. **Seasonal high water table.** The documents in items A and B are incorporated by reference for determining the depth to and type of seasonal high water table for different soil types when the information is not available from the Natural Resources Conservation Service. These references are not subject to frequent change and are available through the Minitex interlibrary loan system or addresses given.

A. Determination of the depth of soil having mottles with a chroma of two or less as discussed on pages 15 to 17 of Keys to Soil Taxonomy, Sixth Edition (1994), issued by the Natural Resources Conservation Service (Washington D.C., United States Government Printing Office).

B. Measurement of water levels at monthly intervals over the course of one year in piezometers. The highest water level measurement obtained is acceptable as the seasonal

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high water table. Piezometers must be installed according to the Minnesota Department of Health Well Code, chapter 4725, available from Office of State Register, Minnesota Bookstore, 117 University Avenue, Saint Paul, Minnesota 55155.

Statutory Authority: *MS s 116.07*

History: *21 SR 1642*