CHAPTER 7080
MINNESOTA POLLUTION CONTROL AGENCY
INDIVIDUAL SEWAGE TREATMENT SYSTEMS

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7080.1050 PURPOSE AND INTENT.

The proper location, design, installation, use, and maintenance of an individual subsurface sewage treatment system (ISTS) protects the public health, safety, and general welfare by the discharge of adequately treated sewage to the groundwater In accordance with the authority granted in Minnesota Statutes, chapters 103F, 103G, 115, and 116, the Pollution Control Agency provides minimum environmental protection standards for ISTS as defined in this chapter These environmental protection standards shall be adopted countywide and administered and enforced by local units of government as directed by chapter 7082 and Minnesota Statutes, section 115 55

This chapter regulates all ISTS as defined in this chapter This chapter does not regulate systems that do not receive sewage as defined in this chapter. If systems receive both sewage and nonsewage, the requirements of this chapter apply, plus any additional requirements governing the nonsewage portion of the wastewater. Systems serving two or more dwellings, systems serving other establishments that serve over 20 persons, and systems receiving nonsewage are also regulated under Code of Federal Regulations, title 40, parts 144 and 146.

This chapter does not regulate systems that discharge to the ground surface or surface waters Those systems require a national pollution discharge elimination system permit

In addition, this chapter provides prescriptive design, construction, and operational standards to reasonably protect surface water and groundwater and promote public health, safety, and general welfare. This chapter also provides public health and environmental outcomes as a basis for a custom-designed system Technology and products employed in system design shall adequately protect the public health and the environment as determined by chapter 7083 and be approved for use by the local unit of government

In conjunction with these standards, the agency encourages the use of advanced treatment methods and waste reduction to further reduce the discharge of contaminants

Companion to this chapter are standards for midsized ISTS, chapter 7081, administrative requirements for local ordinances, permit, and inspection programs, chapter 7082, and certification and licensing requirements for those who design, install, inspect, manage, or maintain ISTS, chapter 7083

Statutory Authority: *MS s 115 03; 115 55*

History: *32 SR 1347*

7080.1100 DEFINITIONS.

Subpart 1 **Certain terms.** In addition to the definitions in chapters 7081, 7082, and 7083, which are incorporated in this part, and Minnesota Statutes, section 115.55, the following terms have the meanings given them For the purposes of this chapter, if a term used in this chapter is defined in chapter 7081, 7082, or 7083 it shall apply to other SSTS if referenced in later chapters For the purposes of these standards, certain terms or words used are interpreted as follows: the words "shall" and "must" are mandatory and the words "should" and "may" are permissive All distances specified in this chapter are horizontal distances unless otherwise specified.

Subp 2 **Absorption area.** "Absorption area" means the design parameter that is associated with the hydraulic acceptance of effluent The absorption area for mound systems is the original soil below a mound system that is designed to absorb sewage tank effluent The absorption area for trenches, seepage beds, and at-grade systems is the soil area in contact with the part of the distribution medium that is designed and loaded to allow absorption of sewage tank effluent This includes both bottom and sidewall soil contact areas

Subp 3 **Agency.** "Agency" means the Pollution Control Agency

Subp 4 **Alarm device.** "Alarm device" means a device that alerts a system operator or system owner of a component's status using a visual or audible device An alarm device can be either on site or remotely located

Subp 5 **Applicable requirements.** "Applicable requirements" means

A local ISTS ordinances that comply with parts 7080 2150, subpart 2, and 7081.0080, subparts 1 to 5, chapter 7082; and Minnesota Statutes, section 115 55, or

B in areas without complying ordinances to regulate ISTS, the requirements of this chapter

Subp 6 **At-grade system.** "At-grade system" means a pressurized soil treatment and dispersal system where sewage tank effluent is dosed to an absorption bed that is constructed directly on original soil at the ground surface and covered by loamy soil materials.

Subp 7 **Baffle.** "Baffle" means a device installed in a septic tank to retain solids and includes, but is not limited to, vented sanitary tees with submerged pipes and effluent screens

Subp. 8 **Bedrock.** "Bedrock" means geologic layers, of which greater than 50 percent by volume consist of unweathered in-place consolidated rock or rock fragments Bedrock also means weathered in-place rock which cannot be hand augered or penetrated with a knife blade in a soil pit.

Subp. 9 **Bedroom.** "Bedroom" means, for the sole purpose of estimating design flows from dwellings, an area that is.

A a room designed or used for sleeping, or

B a room or area of a dwelling that has a minimum floor area of 70 square feet with access gained from the living area or living area hallway Architectural features that affect the use as a bedroom under this item may be considered in making the bedroom determination

Subp 10. **Biochemical oxygen demand or BOD.** "Biochemical oxygen demand" or "BOD" means the measure of the amount of oxygen required by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period, commonly expressed in milligrams per liter (mg/L).

Subp. 11. **Building.** "Building" means any structure used or intended for supporting or sheltering any use or occupancy

Subp. 12 **Carbonaceous biochemical oxygen demand or $CBOD_5$.** "Carbonaceous biochemical oxygen demand" or "$CBOD_5$" means the measure of the amount of oxygen required by bacteria while stabilizing, digesting, or treating the organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification. CBOD is commonly expressed in milligrams per liter (mg/L).

Subp. 13. **Certificate of compliance.** "Certificate of compliance" means a document, written after a compliance inspection, certifying that a system is in compliance with applicable requirements at the time of the inspection.

Subp 14 **Certified statement.** "Certified statement" means a statement signed by a certified individual, apprentice, or qualified employee under chapter 7083 certifying that the licensed business or qualified employee completed work in accordance with applicable requirements

Subp 15 **Cesspool.** "Cesspool" means an underground pit, receptacle, or seepage tank that receives sewage directly from a building sewer and leaches sewage into the surrounding soil, bedrock, or other soil materials Cesspools include sewage tanks that were designed to be watertight, but subsequently leak below the designed operating depth

Subp 16 **Clean sand.** "Clean sand" means a soil fill material required to be used in mounds. The standards for clean sand are outlined in part 7080 2220, subpart 3, item C

Subp. 17 **Commissioner.** "Commissioner" means the commissioner of the Pollution Control Agency.

Subp. 18. **Compliance inspection.** "Compliance inspection" means an evaluation, investigation, inspection, or other such process for the purpose of issuing a certificate of compliance or notice of noncompliance

Subp. 19 **Distinct.** "Distinct" means a soil color that is not faint as described in subpart 29.

Subp. 20 **Distribution box.** "Distribution box" means a device intended to distribute sewage tank effluent concurrently and equally by gravity to multiple segments of a soil dispersal system.

Subp 21 **Distribution device.** "Distribution device" means a device used to receive and transfer effluent from supply pipes to distribution pipes or downslope supply pipes, or both. These devices include, but are not limited to, drop boxes, valve boxes, distribution boxes, or manifolds

Subp 22 **Distribution medium.** "Distribution medium" means the material used to provide void space in a dispersal component, through which effluent flows and is stored prior to infiltration Distribution media includes, but is not limited to, drainfield rock, polystyrene beads, chambers, and gravelless pipe

Subp 23 **Distribution pipes.** "Distribution pipes" means perforated pipes that distribute effluent within a distribution medium

Subp. 24. **Drop box.** "Drop box" means a distribution device used for the serial gravity application of sewage tank effluent to a soil dispersal system

Subp 25. **Dwelling.** "Dwelling" means any building with provision for living, sanitary, and sleeping facilities.

Subp. 26. **Effluent screen.** "Effluent screen" means a device installed on the outlet piping of a septic tank for the purpose of retaining solids of a specific size

Subp. 27. **EPA.** "EPA" means the United States Environmental Protection Agency

Subp. 28 **Existing systems.** "Existing systems" means systems that have been previously inspected and approved by the local unit of government during installation In addition, all operating systems installed before the adoption of a local permitting and inspection program are considered existing systems.

Subp 29 **Faint.** "Faint" means a soil color·

A. with the same hue as another soil color but that varies from the other color by two or less units of value and not more than one unit of chroma,

B that differs from another soil color by one hue and by one or less units of value and not more than one unit of chroma, or

C that differs from another soil color by two units of hue with the same value and chroma

Subp. 30 **Fecal coliform or FC.** "Fecal coliform" or "FC," for purposes of this chapter, means bacteria common to the digestive systems of humans that are cultured in standard tests Counts of these organisms are typically used to indicate potential contamination from sewage or to describe a level of disinfection, generally expressed in colonies per 100 mL

Subp 31 **Fine sand.** "Fine sand" means a sand soil texture, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in subpart 36, where more than 50 percent of the sand has a particle size range of 0 05 millimeters, sieve size 270, to 0 25 millimeters, sieve size 60

Subp 32 **Flood fringe.** "Flood fringe" means that portion of the floodplain outside the floodway. Flood fringe is synonymous with the term "floodway fringe" used in flood insurance studies

Subp 33 **Floodplain.** "Floodplain" means the area covered by a 100-year flood event along lakes, rivers, and streams as published in technical studies by local, state, and federal agencies, or in the absence of these studies, estimates of the 100-year flood boundaries and elevations as developed according to a local unit of government's floodplain or related land use regulations

Subp 34 **Floodway.** "Floodway" means the bed of a wetland or lake, the channel of a watercourse, and those portions of the adjoining floodplain that are reasonably required to carry the regional flood discharge

Subp 35 **Flow measurement.** "Flow measurement" means any method to accurately measure water or sewage flow, including, but not limited to, water meters, event counters, running time clocks, or electronically controlled dosing

Subp 36 **Geomorphic description.** "Geomorphic description" means the identification of the landscape, landform, and surface morphometry of the proposed area of the soil treatment and dispersal system as described in the Field Book for Describing and Sampling Soils. Version 2 0 (2002), developed by the National Soil Survey Center and Natural Resources Conservation Service of the United States Department of Agriculture The field book is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system

Subp 37 **Graywater.** "Graywater" means sewage that does not contain toilet wastes

Subp 38 **Graywater system.** "Graywater system" means a system that receives, treats, and disperses only graywater or other similar system as designated by the commissioner

Subp 39 **Hazardous waste.** "Hazardous waste" means any substance that, when discarded, meets the definition of hazardous waste in Minnesota Statutes, section 116 06, subdivision 11

Subp. 40 **Holding tank.** "Holding tank" means a tank for storage of sewage until it can be transported to a pomt of treatment and dispersal Holding tanks are considered a septic system tank under Minnesota Statutes, section 115 55

Subp 41. **Individual subsurface sewage treatment system or ISTS.** "Individual subsurface sewage treatment system" or "ISTS" means an individual sewage treatment system or part thereof, as set forth in Minnesota Statutes, sections 115 03 and 115 55, that employs sewage tanks or other treatment devices with final discharge into the soil below the natural soil elevation or elevated final grade that are designed to receive a sewage design flow of 5,000 gallons per day or less ISTS includes the holding tanks and privies that serve these same facilities ISTS does not include building sewers or other components regulated under chapter 4715 or collection systems

Subp. 42 **Inner wellhead management zone.** "Inner wellhead management zone" means the drinking water supply management area for a public water supply well that does not have a delineated wellhead protection area approved by the Department of Health under part 4720 5330

Subp. 43. **Invert.** "Invert" means the lowest point of a channel inside a pipe

Subp. 44 **Liquid capacity.** "Liquid capacity" means the liquid volume of a sewage tank below the invert of the outlet pipe or, for holding tanks and pump tanks, the liquid volume below the invert of the inlet

Subp. 45. **Lot.** "Lot" means a parcel of land in a plat recorded in the office of the county recorder or registrar of titles or a parcel of land created and conveyed, using a specific legal description, for a building site to be served by an ISTS

Subp 46. **Management plan.** "Management plan" means a plan that requires the periodic examination, adjustment, testing, and other operational requirements to meet system performance expectations, including a planned course of action in the event a system does not meet performance expectations

Subp 47 **Matrix.** "Matrix" means the majority of the color in a soil horizon, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in subpart 36.

Subp 48 **Medium sand.** "Medium sand" means a sand soil texture, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in subpart 36, that ranges in size between 0.25 millimeters, sieve size 60, and 0 5 millimeters, sieve size 35

Subp 49. **Mottles.** "Mottles" means the minority of the variegated colors in a soil horizon, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in subpart 36

Subp. 50. **Mound system.** "Mound system" means a soil treatment and dispersal system designed and installed such that all of the infiltrative surface is installed above grade, using clean sand between the bottom of the infiltrative surface and the original ground elevation, utilizing pressure distribution and capped with suitable soil material to stabilize the surface and encourage vegetative growth

Subp. 51. **New construction.** "New construction" means installing or constructing a new ISTS or altering, extending, or adding capacity to a system that has been issued an initial certificate of compliance

Subp. 52. **Notice of noncompliance.** "Notice of noncompliance" means a document written and signed by a certified inspector after a compliance inspection that gives notice that an ISTS is not in compliance as specified under part 7080 1500.

Subp 53 **Ordinary high water level.** "Ordinary high water level" of surface water has the meaning given in Minnesota Statutes, section 103G.005, subdivision 14

Subp 54 **Original soil.** "Original soil" means naturally occurring soil that has not been cut, filled, moved, smeared, compacted, altered, or manipulated to the degree that the loading rate must be reduced from that associated with natural soil conditions

Subp. 55 **Other pit.** "Other pit" means any pit or other device designed to leach sewage effluent that is greater than 30 inches in height or has a bottom area loading rate of sewage greater than two gallons per square feet per day

Subp 56 **Owner.** "Owner" means any person having possession of, control over, or title to property with an ISTS

Subp. 57 **Parent material.** "Parent material" means the unconsolidated and chemically weathered geologic mineral or organic matter from which soils are developed by soil forming processes.

Subp 58 **Percolation rate.** "Percolation rate" means the rate of a drop of water infiltrating into a test hole as specified in part 7080 1720, subpart 6, item B.

Subp 59 **Periodically saturated soil.** "Periodically saturated soil" means the highest elevation in the soil that is in a reduced chemical state due to soil pores filled or nearly filled with water causing anaerobic conditions Periodically saturated soil is determined by the presence of redoximorphic features in conjunction with other established indicators as specified in part 7080.1720, subpart 5, items E and F, or determined by other scientifically established technical methods or empirical field measurements acceptable to the permitting authority in consultation with the commissioner.

Subp. 60 **Plastic limit.** "Plastic limit" means a soil moisture content above which manipulation will cause compaction or smearing The plastic limit can be measured by American Society for Testing and Materials, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils, ASTM D4318 (2005) The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change

Subp 61 **Pressure distribution.** "Pressure distribution" means a network of distribution pipes in which effluent is forced through orifices under pressure

Subp 62 **Privy.** "Privy" means an aboveground structure with an underground cavity meeting the requirements of part 7080 2280 that is used for the storage or treatment and dispersal of toilet wastes, excluding water for flushing and graywater. A privy also means a nondwelling structure containing a toilet waste treatment device

Subp. 63 **Public waters.** "Public waters" means any public waters or wetlands defined in Minnesota Statutes, section 103G 005, subdivision 15, or identified as public waters or wetlands by the inventory prepared according to Minnesota Statutes, section 103G 201

Subp 64 **Pump tank.** "Pump tank" means a tank or separate compartment following the sewage tank that serves as a reservoir for a pump. A separate tank used as a pump tank is considered a septic system tank under Minnesota Statutes, section 115.55, subdivision 1, paragraph (o).

Subp 65 **Redoximorphic features.** "Redoximorphic features" means:

A a color pattern in soil, formed by oxidation and reduction of iron or manganese in saturated soil coupled with their removal, translocation, or accrual, which results in the loss (depletion) or gain (concentration) of mineral compounds compared to the matrix color; or

B a soil matrix color controlled by the presence of ferrous iron.

Redoximorphic features are described in part 7080 1720, subpart 5, item E

Subp 66 **Replacement.** "Replacement" means the removal or discontinued use of any major portion of an ISTS and reinstallation of that portion of the system, such as reinstallation of a new sewage tank, holding tank, dosing chamber, privy, or soil dispersal system

Subp 67 **Seepage bed.** "Seepage bed" means a soil treatment and dispersal system, the absorption width of which is greater than three feet but no greater than 25 feet

Subp 68 **Seepage pit.** "Seepage pit" means an underground pit that receives sewage tank effluent and from which the liquid seeps into the surrounding soil and that meets the design requirements in part 7080.2550

Subp 69 **Septage.** "Septage" means solids and liquids removed from an SSTS and includes solids and liquids from cesspools, seepage pits, other pits, or similar systems or devices that receive sewage. Septage also includes solids and liquids that are removed from portable, incinerating, composting, holding, or other toilets Waste from Type III marine sanitation devices, as defined in Code of Federal Regulations, title 33, section 159 3, and material that has come into contact with untreated sewage within the past 12 months is also considered septage

Subp. 70. **Septic tank.** "Septic tank" means any watertight, covered receptacle that is designed and constructed to receive the discharge of sewage from a building sewer or preceding tank, stores liquids for a detention period that provides separation of solids from liquid and digestion of organic matter, and allows the effluent to discharge to a succeeding tank, treatment device, or soil dispersal system

Subp. 71 **Serial distribution.** "Serial distribution" means distribution of sewage tank effluent by gravity flow that progressively loads one section of a soil treatment and dispersal system to a predetermined level before overflowing to the succeeding section and does not place a dynamic head on the lower section of the soil treatment and dispersal system. The distribution medium is allowed to serve as a conveyance medium to the next section.

Subp. 72 **Setback.** "Setback" means a separation distance measured horizontally

Subp. 73. **Sewage.** "Sewage" means waste produced by toilets, bathing, laundry, or culinary operations or the floor drains associated with these sources, and includes household cleaners, medications, and other constituents in sewage restricted to amounts normally used for domestic purposes.

Subp 74. **Sewage tank.** "Sewage tank" means a receptacle used in the containment or treatment of sewage and includes, but is not limited to, septic tanks, aerobic tanks, pump tanks, and holding tanks. Requirements for sewage tanks are described in parts 7080.1900 to 7080.2030 Sewage tanks are considered a septic system tank in Minnesota Statutes, section 115 55, subdivision 1, paragraph (o)

Subp 75. **Sewage tank effluent.** "Sewage tank effluent" means the liquid that flows from a septic tank or other treatment device.

Subp. 76 **Site.** "Site" means the area required for the proper location of the ISTS.

Subp. 77 **Slope.** "Slope" means the vertical rise or fall divided by the horizontal distance, expressed as a percentage

Subp 78 **Soil dispersal area.** "Soil dispersal area" means the area required for the soil dispersal system, including spacing between individual units or zones

Subp. 79. **Soil dispersal system.** "Soil dispersal system" means a system where sewage effluent is dispersed into the soil for treatment by absorption and filtration and includes, but is not limited to, trenches, seepage beds, at-grade systems, mound systems, and drip dispersal systems.

Subp 80 **Soil texture.** "Soil texture" means the soil particle size classification and particle size distribution as specified in the Field Book for Describing and Sampling Soils, incorporated by reference in subpart 36.

Subp 81. **Subsoil.** "Subsoil" means a soil layer that has a moist color value of 3.5 or greater and has undergone weathering and soil formation processes

Subp 82. **Subsurface sewage treatment system or SSTS.** "Subsurface sewage treatment system" or "SSTS" is either an individual subsurface sewage treatment system as defined in subpart 41 or a midsized subsurface sewage treatment system as defined in part 7081 0020, subpart 4, as applicable

Subp 83 **Supply pipe.** "Supply pipe" means a nonperforated pipe, the purpose of which is to transport sewage tank effluent.

Subp 84 **Systems in shoreland areas or wellhead protection areas or systems serving food, beverage, or lodging establishments or SWF.** "Systems in shoreland areas or wellhead protection areas or systems serving food, beverage, or lodging establishments" or "SWF" means the following three categories of systems

A SSTS constructed in shoreland areas where land adjacent to public waters has been designated and delineated as shoreland by local ordinance as approved by the Department of Natural Resources,

B SSTS constructed in wellhead protection areas regulated under Minnesota Statutes, chapter 103I; and

C. SSTS serving food, beverage, and lodging establishments that are required to obtain a license under Minnesota Statutes, section 157.16, subdivision 1, including manufactured home parks and recreational camping areas licensed accordmg to Minnesota Statutes, chapter 327

Subp 85 **Toilet waste.** "Toilet waste" means waste commonly disposed of in toilets, including fecal matter, urine, toilet paper, and water used for flushing

Subp 86 **Toilet waste treatment devices.** "Toilet waste treatment devices" means other toilet waste apparatuses including incinerating, composting, biological, chemical, recirculating, or holding toilets or portable restrooms

Subp. 87 **Topsoil.** "Topsoil" means the natural, in-place organically enriched soil layer with a color value of less than 3 5

Subp. 88 **Topsoil borrow.** "Topsoil borrow" means a loamy soil material having

A less than five percent material larger than two millimeters, No 10 sieve,

B no material larger than 2 5 centimeters,

C a moist color value of less than 3 5, and

D adequate nutrients and pH to sustain healthy plant growth

Subp 89. **Trench.** "Trench" means a soil treatment and dispersal system, the absorption width of which is 36 inches or less.

Subp. 90. **Valve box.** "Valve box" means a watertight structure designed for alternate distribution of sewage tank effluent to segments of a soil treatment system.

Subp 91 **Vertical separation.** "Vertical separation" means the vertical measurement of unsaturated soil or sand between the bottom of the distribution medium and the periodically saturated soil level or bedrock

Subp 92 **Watertight.** "Watertight" means constructed so that no liquid can get into or out of a device except through designed inlets and outlets

Subp 93 **Wellhead protection area.** "Wellhead protection area" means the surface and subsurface area surroundmg a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field as regulated under chapter 4720 For the purposes of this chapter, wellhead protection area is that area bounded by the drinking water supply management area as regulated under chapter 4720

Statutory Authority: *MS s 115.03, 115 55*

History: *32 SR 1347*

7080.1200 ADMINISTRATION OF DESIGN STANDARDS.

Subpart 1 **Administrative scope.** ISTS must be designed, constructed, and operated according to this chapter, except as modified through a local ordinance m comphance with

chapter 7082 and Mmnesota Statutes, section 115.55. ISTS must be designed, installed, inspected, pumped, serviced, and operated by licensed businesses meeting the qualifications in parts 7083.0070 to 7083 2040. ISTS must conform to all applicable state laws and rules.

Subp 2 **Federal regulation.** SSTS that are designed to receive sewage or nonsewage from a two-family dwelling or greater or receive sewage or nonsewage from another establishment that serves more than 20 persons per day, are regulated under Code of Federal Regulations, title 40, parts 144 and 146.

Subp 3. **Variance procedures.** The standards in this chapter are provided to be incorporated into a local ordinance according to chapter 7082 and Mmnesota Statutes, section 115 55 Variance requests to the standards made by an owner or owner's agent must be issued or denied by the local unit of government Local units of government shall not issue variances for part 7080 2150, subpart 2, items A to D

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1500 COMPLIANCE CRITERIA.

Subpart 1 **Treatment required.** Sewage discharged from a dwelling that is not served by a system issued a permit containing effluent and discharge limits or specific monitoring requirements by the agency must be treated according to applicable requirements

Subp. 2 **Primitive structures.** Graywater from structures without plumbing that originated from hand-carried water must not be discharged directly to surface waters, drainageways, or poorly drained soils, in a manner or volume harmful to the environment or public health, or in a manner that creates a public health nuisance as determined by the local unit of government

Subp 3 **Compliance criteria for new construction.** An ISTS regulated under a current construction permit is considered compliant if it meets the applicable requirements of parts 7080 2150 to 7080 2400

Subp. 4 **Compliance criteria for existing systems.** To be in compliance, an existing ISTS must meet the provisions of this subpart

A The ISTS must be protective of public health and safety A system that is not protective is considered an imminent threat to public health or safety At a minimum, a system that is an imminent threat to public health or safety is a system with a discharge of sewage or sewage effluent to the ground surface, drainage systems, ditches, or storm water drains or directly to surface water, systems that cause a reoccurring sewage backup mto a dwelling or other establishment; systems with electrical hazards, or sewage tanks with unsecured, damaged, or weak maintenance hole covers A determination of protectiveness for other conditions must be made by a qualified employee inspector or licensed inspection business.

B The ISTS must be protective of groundwater A system that is not protective is considered a system failing to protect groundwater At a mmimum, a system that is failing to protect groundwater is a system that is a seepage pit, cesspool, drywell, leaching pit, or other pit; a system with less than the required vertical separation distance described in items D and E; and a system not abandoned in accordance with part 7080 2500. A determination of the threat to groundwater quality for other conditions must be made by a qualified employee or licensed inspection business

C. The ISTS must be operated, meet performance standards, and be managed accordmg to its operatmg permit

D ISTS built after March 31, 1996, or m an SWF area as defined under part 7080 1100, subpart 84, shall have a three-foot vertical separation or a vertical separation based on applicable requirements The local ordmance must not allow more than a 15 percent reduction in the vertical separation distance to account for settling of sand or soil, normal variation of measurements, and interpretations of the limiting layer conditions.

E ISTS built before April 1, 1996, in areas that are not SWF areas as defined under part 7080 1100, subpart 84, must have at least two feet of vertical separation

F. The vertical separation measurement for items D and E shall be measured outside the area of system influence in an area of similar soil.

Subp 5. **Compliance criteria for systems with a flow of greater than 2,500 gallons per day.** In addition to the requirements under subpart 4, systems designed under part 7080 2150, subpart 4, item A or B, must demonstrate that the additional nutrient reduction component required under those items is in place and functioning

Subp 6 **Compliance criteria for systems receiving replacement components.** Components of an existing system that result in the system being in noncompliance must be repaired or replaced according to part 7082 0100, subpart 1 The repaired or replacement components must meet technical standards and criteria for new construction according to local ordinance The remaining components of the existing system must result in the system being in compliance with subpart 4

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1550 ACCEPTABLE AND PROHIBITED DISCHARGES.

Subpart 1 **Sewage.** This chapter provides design standards for ISTS that exclusively receive sewage. If ISTS receive both sewage and nonsewage, the requirements of this chapter and requirements governing the nonsewage portion of the waste apply

Subp 2 **System influent.** Footing or roof drainage and chemically treated hot tub and pool water must not be discharged into any part of a system Products containing hazardous chemicals and hazardous waste must not be discharged to a system other than in normal amounts of household products and cleaners designed for household use Substances not intended for use in household cleaning, including but not limited to solvents, pesticides, flammables, photo finishing chemicals, paint, and dry-cleaning chemicals must not be discharged to the system. Other unused products or substances, or unused medicines, must not be discharged to the system solely as a method of disposal Floor drains from garages serving dwellings must not be connected to the system.

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1670 REQUIREMENTS TO CONDUCT WORK.

Systems must be designed, installed, inspected, operated, and maintained by appropriately licensed businesses and certified individuals according to part 7083.0700 and any other applicable state requirements

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1700 DESIGN PHASE I; SITE EVALUATION.

Site evaluations consisting of preliminary and field evaluations according to parts 7080 1710 and 7080.1720 must be conducted for all proposed sites for ISTS The site evaluation is considered the first phase of an ISTS design.

Statutory Authority: *MS s 115.03, 115 55*

History: *32 SR 1347*

7080.1710 PRELIMINARY EVALUATION.

A preliminary evaluation shall consist of the determination, location, or existence of the following items

A. design flow for the dwelling, dwellings, or other establishments;

B. proposed or existing

(1) water supply wells within 100 feet of the proposed ISTS,

(2) noncommunity transient public water supply wells within 200 feet of the proposed ISTS if alternative local standards are in effect,

(3) a community or noncommumty nontransient water supply in a drinking water supply management area if alternative local standards are in effect;

(4) existing and proposed buildings or improvements on the lot; and

(5) buried water supply pipes within 50 feet of the proposed system,

C easements on the lot,

D the ordinary high water level of public waters, if adjacent to the lot,

E floodplain designation and flooding elevation from pubhshed data or data that is acceptable to and approved by the local unit of government or the Department of Natural Resources, if applicable,

F. property lines,

G. all required setbacks from the system;

H the soil characteristics at the proposed soil treatment and dispersal areas as obtained from the soil survey report, if available, including the soil map, map units, landscape position, parent material, flooding potential, slope range, periodically saturated soil level, depth to bedrock, texture, color, depth to redoximorphic features, and structure and consistence of soil horizons,

I a township, range, and section number and other unique property identifiers as required by local government and lot dimensions;

J. names of property owners, and

K the inner wellhead management zone or wellhead protection area of a public water supply, if applicable

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1720 FIELD EVALUATION.

Subpart 1 **Scope.** A field evaluation consists of the items described in subparts 2 to 7.

Subp 2 **Lot lines.** Lot lines shall be established to the satisfaction of the property owner or the property owner's agent Lot improvements, required setbacks, and easements must be identified

Subp 3. **Surface features.** The following surface features must be described

A the percent and direction of the slope at the proposed system location,

B vegetation types,

C any evidence of cut or filled areas or disturbed or compacted soil;

D. the flooding or run-on potential, and

E a geomorphic description.

Subp 4 **Soil observations.** A minimum of three soil observations are required for the initial and replacement soil treatment area and at least one soil observation must be performed in the portion of the soil treatment area anticipated to have the most limiting conditions The total number of soil observations required is based on the judgment of the certified individual or the local unit of government Soil observations must comply with the following requirements

A the soil observations must be conducted within or on the borders of the proposed site,

B the soil observations must be performed in an exposed pit or by hand augering or probing The use of flight augers is not allowed,

C the soil observation method must allow observation of the different soil horizons that constitute the soil profile and, if determining the loading rate by part 7080.2150, subpart 3, item E, Table IX, must be observed by a soil pit,

D underground utilities must be located before soil observations are undertaken,

E required safety precautions must be taken before entering soil pits,

F soil observations must be conducted prior to any required percolation tests to determine whether the soils are suitable to warrant percolation tests and, if suitable, at what depth percolation tests shall be conducted, and

G the minimum depth of the soil observations must be to the periodically saturated layer, to the bedrock, or three feet below the proposed depth of the system, whichever is less.

Subp. 5 **Soil descriptions.** Each soil profile observed at the proposed soil treatment area must be evaluated under adequate light conditions with the soil in a moist unfrozen state for the characteristics in items A to H.

A the depth of each soil horizon measured from the ground surface Soil horizons are differentiated by changes in texture, color, redoximorphic features, bedrock, structure, consistence, and any other characteristic that affects water movement or treatment of effluent,

B a description of all soil colors for each horizon according to the Munsell Soil Color Charts, Revised Edition, Munsell Color Corporation (1992), or equivalent The color charts are incorporated by reference, are available through the Minitex interlibrary loan system, and are not subject to frequent change,

C. a description of the soil texture, structure, and consistence using the United States Department of Agriculture (USDA) soil classification system as specified in the Field Book for Describing and Sampling Soils, which is incorporated by reference under part 7080 1100, subpart 36;

D depth to the bedrock;

E depth to the periodically saturated soil for new construction or replacement as determmed by redoximorphic features and other mdicators, as determined m subitems (1) to (3)

(1) in subsoil and parent material, redoximorphic features include·

(a) distinct redoximorphic iron accumulations or distinct redoximorphic iron depletions,

(b) a gleyed or depleted soil matrix or redoximorphic mottles having a color chroma of two or less or a depleted matrix or redoximorphic mottles having a color hue of 5Y and a chroma of three or less, or

(c) faint redoximorphic concentrations or faint redoximorphic depletions in subsoil or parent material with a hue of 7.5YR or redder,

(2) in lower topsoil layers that are deeper than 12 inches from the surface and are immediately followed in depth by a periodically saturated horizon, redoximorphic features include

(a) soil colors with a redoximorphic chroma of two or less, or

(b) redoximorphic accumulations or depletions,

(3) in the upper 12 inches of the topsoil layer immediately followed by a periodically saturated horizon, the depth of seasonal saturation is determined by indicators in units (a) to (e)

(a) soil colors with a chroma of zero,

(b) organic soil textures or mineral soil textures with an organic modifier,

(c) dominance of hydrophytic vegetation,

(d) the soil treatment area at or near the elevation of the ordinary high water level of a surface water or in a concave hill slope position, or

(e) the soil expressing indicators of seasonal saturation as determined in Field Indicators of Hydric Soils in the United States A Guide for Identifying and Delineating Hydric Soils, USDA Natural Resource Conservation Service (2006) The field indicators are incorporated by reference, are available through the Minitex interlibrary loan system, and are subject to frequent change,

F depth to the periodically saturated soil for all existing systems, determined by redoximorphic features in item E, except subitems (2), unit (a), and (3), units (a), (c), and (d), as measured outside the area of system influence in an area of similar soil,

G depth of standing water in the soil observation excavation, measured from the soil surface, if observed, and

H any other soil characteristic that needs to be described to design a system, such as hardpans or restrictive layers These other characteristics must be classified according to the Field Book for Describing and Sampling Soils, which is incorporated by reference under part 7080 1100, subpart 36.

Subp 6 **Determination of loading rate and absorption area size.** The effluent loading and absorption area size must be determined by either item A or B as required by the local unit of government.

A the loading rate based on an examination of soil texture, structure, and consistence in soil pits using the United States Department of Agriculture (USDA) soil classification system as specified in the Field Book for Describing and Sampling Soils, which is incorporated by reference under part 7080 1100, subpart 36, or

B the loading rate based on the percolation procedure described in subitems (1) to (8) or other equivalent procedure as approved by the local unit of government

(1) each test hole must be six to eight inches in diameter, have vertical sides, and be located in the soil absorption area For mounds and at-grade systems, the bottom of each test hole must be in the upper 12 inches of the original soil For trenches and seepage beds, the bottom of each test hole shall be at the depth of the absorption area,

(2) soil texture descriptions for percolation test holes must note the depths from the ground surface where texture changes occur,

(3) the bottom and sides of the hole must be carefully scratched to remove any smearing and to provide a natural soil surface into which water penetrates The scarification must not result in the hole having a diameter of greater than eight inches,

(4) all loose material must be removed from the bottom of the test hole and two inches of one-fourth to three-fourths inch gravel or clean sand must be added to protect the bottom from scouring,

(5) the hole must be carefully filled with clear water to a minimum depth of 12 inches from the bottom of the test hole and maintained for no less than four hours for saturation to occur The soil must then be allowed to swell for at least 16, but no more than 30, hours. In sandy soils, the saturation and swelling procedure is not required and the test is allowed to proceed if the initial filling of the hole with 12 inches of water seeps away in less than ten minutes,

(6) in sandy soils, water depth must be adjusted to eight inches over the soil at the bottom of the test hole From a fixed reference point, the drop in water level must be measured in inches to the nearest 1/16 inch at approximately ten-minute intervals A measurement is also allowed to be made by determining the time it takes for the water level to drop one inch from an eight-inch reference point If eight inches of water seeps away in less than ten minutes, a shorter interval between measurements must be used, but

water depth must not exceed eight inches The test must continue until three consecutive percolation rate measurements do not vary by more than ten percent In other soils, the water depth must be adjusted to eight inches over the soil at the bottom of the test hole From a fixed reference point, the drop in water level must be measured in inches to the nearest 1/16 inch at approximately 30-minute intervals and refilled between measurements to maintain an eight-inch starting head If water seeps away in less than 30 minutes, a shorter time interval between measurements must be used, but water depth must not exceed eight inches The test must continue until three consecutive percolation rate measurements do not vary by more than ten percent The percolation rate is also allowed to be determined by observing the time it takes the water level to drop one inch from an eight-inch reference point if a constant water depth of at least eight inches has been maintained for at least four hours prior to the measurement;

(7) the time interval must be divided in minutes by the drop in water level in inches to obtain the percolation rate in minutes per inch The percolation rates that are within the ten percent provision determined for each test hole must be averaged to determine the final percolation rate for that hole. The slowest final percolation rate for all holes within the soil dispersal area must be used for design; and

(8) a percolation test must not be run where frost exists within 12 inches of the bottom of the percolation test hole.

Subp. 7. **Site protection.** The proposed soil treatment and dispersal area site shall be protected from disturbance, compaction, or other damage by staking, fencing, posting, or other effective method

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1730 PHASE I; SITE EVALUATION REPORTING.

A written report on the site evaluation must be prepared and include the following:

A. preliminary and field evaluation results from parts 7080 1710 and 7080.1720,

B dates of preliminary and field evaluations,

C a map drawn to scale or dimension with a north arrow, and including:

(1) horizontal and vertical reference points of the proposed soil treatment and dispersal areas, soil observations, percolation tests, and pertinent distance from the proposed ISTS to all required setbacks, lot improvements, easements, ordinary high water mark of public waters, property lines, and direction and percent slope,

(2) the location of any unsuitable, disturbed, or compacted areas, and

(3) the access route for system maintenance,

D the estimated depth of periodically saturated soil layer, bedrock, or flood elevation, if appropriate,

E the proposed elevation of the bottom of the soil treatment and dispersal system,

F. anticipated construction-related issues;

G the name, address, telephone number, and certified statement of the individual conducting the site evaluation;

H an assessment of how known or reasonably foreseeable land use changes are expected to affect system performance, including, but not limited to, changes in drainage patterns, increased impervious surfaces, and proximity of new water supply wells,

I a narrative explaining any difficulties encountered during the site evaluation, including but not limited to identifying and interpreting soil and landform features and how the difficulties were resolved, and

J a notation of any differences between observed soil characteristics and those identified in the soil survey report

Statutory Authority: *MS s 115 03; 115 55*

History: *32 SR 1347*

7080.1750 DESIGN PHASE II.

Subpart 1 **System design.** Completion of tasks outlined in parts 7080.1850 to 7080 2430 is considered the second phase of ISTS design.

Subp 2. **Compliance.** Designs for new construction or replacement ISTS must comply with applicable requirements and any other applicable codes, rules, and laws

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1850 SEWAGE FLOW DETERMINATION FOR DWELLINGS.

Subpart 1 **System sizing.** If construction of additional dwellings or bedrooms, the installation of water-using devices, or other factors likely to affect the operation of the ISTS can be reasonably anticipated, the system must be designed to accommodate these factors

Subp. 2 **Design flow.** The estimated design flow for any dwelling must provide for at least two bedrooms For multiple or multifamily dwellings, the design flow consists of the sum of the design flows for each individual unit

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1860 DESIGN FLOW (GALLONS PER DAY).

TABLE IV

Number of bedrooms	Classification of dwelling			
	I	II	III	IV
	Gallons per day			
2 or less	300	225	180	*
3	450	300	218	*
4	600	375	256	*
5	750	450	294	*
6	900	525	332	*

* Flows for Classification IV dwellings are 60 percent of the values as determined for Classification I, II, or III systems

For more than six bedrooms, the design flow is determined by the following formulas

Classification I Classification I dwellings are those with more than 800 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, or where more than two of the following water-use appliances are installed or anticipated. clothes washing machine, dishwasher, water conditioning unit, bathtub greater than 40 gallons, garbage disposal, or self-cleaning humidifier in furnace The design flow for Classification I dwellings is determined by multiplying 150 gallons by the number of bedrooms

Classification II Classification II dwellings are those with 500 to 800 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, and where no more than two of the water-use appliances listed in Classification I are installed or anticipated The design flow for Classification II dwellings is determined by adding one to the number of bedrooms and multiplying this result by 75 gallons.

Classification III. Classification III dwellings are those with less than 500 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, and where no more than two of the water-use appliances listed in Classification I are installed or anticipated. The design flow for Classification III dwellings is determined by adding one to the number of bedrooms, multiplying this result by 38 gallons, then adding 66 gallons

Classification IV: Classification IV dwellings are dwellings designed under part 7080 2240

Statutory Authority: *MS s 115 03, 115.55*

History: *32 SR 1347*

7080.1880 SEWAGE FLOW DETERMINATION FOR OTHER ESTABLISHMENTS.

Design sewage flow and waste concentration levels for other establishments with a flow of 5,000 gallons per day or less shall be determined by part 7081 0130

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1885 OTHER FLOW CONSIDERATIONS.

If the system is served by a sewage collection system, part 7081 0140 applies

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1900 SEWAGE TANKS; GENERAL.

Sewage tanks serving ISTS must meet or exceed the applicable requirements of parts 7080 1910 to 7080.2030 unless otherwise approved by a licensed professional engineer and approved by the local unit of government

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1910 TANK STRENGTH.

Subpart 1. **Requirements.** Tanks, fittings, risers, and apertures must:

A be capable of supporting long-term vertical loads for the conditions in which the tank will be placed These loads include, but are not limited to, saturated soil load, based on 130 pounds per cubic foot,

B. be capable of withstanding a lateral load for the conditions the tank will be placed,

C. with proper maintenance and venting, not be subject to failure due to corrosion and degradation from sewage or sewage gases, including risers and maintenance hole covers, and

D be structurally capable of withstanding exposure and stresses from freezing conditions

Subp 2 **Poured-in-place concrete tanks.** Poured-in-place concrete tanks must be designed to meet each requirement of subpart 1 and be designed by a Minnesota licensed professional engineer

Statutory Authority: *MS s 115.03; 115.55*

History: *32 SR 1347*

7080.1920 SEPTIC TANK DESIGN.

Septic tanks must

A have a liquid depth of at least 30 inches Any liquid depth that is greater than 84 inches must not be used when calculating the septic tank liquid capacity,

B. have a minimum of six feet between the inlet and outlet of the tank, rather than between compartments, or have a minimum of six feet from the inlet of the first tank to the outlet of the last tank in series;

C if site conditions warrant, the inlet and outlet are allowed to be located on walls that are not opposite each other along the axis of maximum dimension, however, the requirements of item B must be met,

D have an inlet invert at least two inches above the outlet invert, and

E have a reserve or storage space between the liquid surface and the top of the inlet and outlet baffles of not less than eight inches or 100 gallons, whichever is greater

Statutory Authority: *MS s 115 03; 115.55*

History: *32 SR 1347*

7080.1930 SEPTIC TANK CAPACITY.

Subpart 1 **Dwellings.** The liquid capacity of septic tanks must be at least as large as the liquid capacities given in Table V

TABLE V

Number of bedrooms	Septic tank liquid minimum capacities (gallons)
3 or less	1,000
4 or 5	1,500
6 or 7	2,000
8 or 9	2,500

Where more than nine bedrooms are present, the septic tank capacity must be calculated by the following formula. 2,500 + ([# of bedrooms - 9] x 250)

Subp 2 **Garbage disposals.** If a garbage disposal unit or other appliance with garbage grinding capability is anticipated or installed in a dwelling, the septic tank capacity must be at least 50 percent greater than that required in subpart 1 and must include either multiple compartments or multiple tanks. In addition, an effluent screen with an alarm must be employed.

Subp 3 **Sewage pumping.** If sewage is pumped from a sewage ejector or grinder pump from a dwelling to a septic tank, the septic tank capacity must be at least 50 percent greater than that required in subpart 1 and must include either multiple compartments or multiple tanks In addition, an effluent screen with an alarm must be employed.

Subp 4. **Sewage pumping and garbage disposals.** If conditions in both subparts 2 and 3 apply to a dwelling, the mitigative requirements of either subpart 2 or 3 apply; the requirements of both subparts 2 and 3 need not be additive.

Subp 5 **Systems serving multiple dwellings.** For systems serving multiple dwellings with a common septic tank, the liquid capacity must be determined by adding the capacities for each dwelling as determined in this part

Subp 6 **Prior to other treatment devices.** Septic tank liquid capacity prior to other treatment devices must accord with manufacturer's requirements, accepted engineering principles, or as identified in the product registration recommended standards and criteria

Subp. 7 **Septic tank capacity for other establishments.** Septic tank liquid capacity for other establishments shall be determined by part 7081.0240, subpart 2

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.1940 MULTIPLE TANKS.

A If more than one septic tank is used to obtain the required liquid capacity as determined in part 7080 1930, septic tanks must be connected in series or employ multiple collection systems

B. If tanks are connected in series, each tank or compartment must contain at least 25 percent of the required total liquid capacity For new construction, the first tank must be equal to or larger than any subsequent tank in the series.

Statutory Authority: *MS s 115.03; 115 55*

History: *32 SR 1347*

7080.1950 COMPARTMENTALIZATION OF SINGLE TANKS.

If septic tanks are compartmentalized, items A to E apply

A. When septic tanks are divided into compartments, the volume of the first compartment must be equal to or larger than any succeeding compartments Each compartment must contain at least 25 percent of the total required liquid capacity and have an inside horizontal dimension of at least 24 inches.

B Flow between compartments can be achieved by an unbaffled transfer hole with a minimum size of 50 square inches located in the clarified liquid zone or a minimum 12-square-inch transfer hole located above the clarified liquid zone that is baffled according to part 7080 1960 The final compartment of a tank that employs a transfer hole in the clarified zone shall not be used as a pump tank

C Septic tanks must have at least a two-inch drop between the invert of the inlet to the invert of the outlet No liquid level drop is required between the compartments

D Adequate venting must be provided between compartments by baffles or by an opening of at least 12 square inches near the top of the compartment wall

E All compartmental walls must be designed to withstand the weight of the effluent against an empty compartment

Statutory Authority: *MS s 115 03; 115 55*

History: *32 SR 1347*

7080.1960 SEPTIC TANK BAFFLES.

All septic tanks must be baffled according to items A to G. Effluent screens are allowed to be substituted for outlet baffles

A Baffles must be installed at each inlet and outlet of septic tanks. Outlet baffles are required on compartment walls if the transfer hole is at the liquid level

B Baffles must be resistant to corrosion or decay Inlet baffles must not restrict the movement of solids.

C Baffles must be integrally cast with the tank or affixed at the top and bottom with connectors that are not subject to corrosion or decay Baffles for fiberglass-reinforced polyester tanks are allowed to be either resin bonded or secured with suitable structural

adhesive Sanitary tees used as baffles must be affixed to the inlet or outlet pipes with a permanent waterproof adhesive

D The inlet baffle must extend at least six inches, but not more than 20 percent of the total liquid depth, below the liquid surface and at least six inches above the liquid surface

E The outlet baffle and any baffles between compartments must extend below the liquid surface a distance equal to 40 percent of the liquid depth, except that the penetration of the indicated baffles or sanitary tees for horizontal cylindrical tanks must be 35 percent of the total liquid depth They must also extend above the liquid surface as required in item D These baffles must extend at least six inches above the liquid surface.

F There must be at least one inch between the underside of the top of the tank and the highest point of the inlet and outlet baffles

G. The nearest point on the inlet baffles other than sanitary tees must be no less than six inches and no more than 12 inches from the end of the inlet pipe The nearest point on the outlet baffle, other than sanitary tees, must not be closer than six inches and no more than 12 inches from the beginning of the outlet pipe to the baffle Sanitary tees used as inlet or outlet baffles must be at least four inches in diameter.

Statutory Authority: *MS s 115.03, 115.55*

History: *32 SR 1347*

7080.1970 SEPTIC TANK ACCESS.

A Septic tanks shall have a minimum of two maintenance holes with a minimum diameter of 20 inches (least dimension) One maintenance hole must be over the outlet device (baffle or screen) Another maintenance hole must be near the center of the tank, to facilitate pumping without interference For a compartmented tank, this hole must be centered over the first compartment. The tank must also have an inspection pipe with a minimum diameter of six inches over the inlet baffle Enough maintenance holes must be provided so access can be gained within six feet of all walls for solids removal of each compartment.

B. All maintenance hole risers must extend through the tank cover above final grade.

C Covers for maintenance holes must

(1) be secured by being locked, being bolted or screwed, having a weight of at least 95 pounds, or other methods approved by the local unit of government Covers shall also be leak resistant; and be designed so the cover cannot be slid or flipped, which could allow unauthorized access to the tank,

(2) have a written and graphic label warning of the hazardous conditions inside the tank;

(3) be capable of withstanding a load that the cover is anticipated to receive; and

(4) be made of a material suitable for outdoor use and resistant to ultraviolet degradation

Statutory Authority: *MS s 115.03, 115 55*

History: *32 SR 1347*

7080.1980 TANK CONSTRUCTION.

A. All precast reinforced concrete sewage tanks must be constructed to meet the requirements of this chapter. Information on best practices for tank construction is found in the National Precast Concrete Association's best practices manual, Precast Concrete On-site Wastewater Tanks (2005) This manual is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change If a conflict exists between the manual and this chapter, this chapter applies

B All fiberglass-reinforced polyester and polyethylene tanks must be constructed to meet the requirements of this chapter Information on best practices for these tanks is found in the International Association of Plumbing and Mechanical Officials (IAPMO), Material and Property Standard for Prefabricated Septic Tanks, Standard PS 1-2006 (2006) This standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change. If conflicts exist between the standard and this chapter, this chapter applies.

Statutory Authority: *MS s 115.03, 115 55*

History: *32 SR 1347*

7080.1990 TANK STORAGE, TRANSPORT, AND USE.

Subpart 1. **Precast reinforced concrete tanks.** Precast reinforced concrete tanks must

A have a method to lift the tank for an ultimate load that is four times the working load,

B undergo proper curing to achieve a compressive strength of 4,000 pounds per square inch before transport, placement, or use; and

C. have no pipe penetration points or openings in the exterior walls or tank bottom below the tank liquid level, unless designed for a specific operational purpose and approved by the local unit of government.

Subp. 2 **Other tanks.** Fiberglass-reinforced polyester or polyethylene tanks must be protected against deterioration during storage.

Statutory Authority: *MS s 115 03; 115 55*

History: *32 SR 1347*

7080.2000 LOCATION AND INSTALLATION OF TANKS.

A Sewage tanks must not be placed in areas that prohibit the removal of solids and liquids from the tank according to part 7080 2450

B. Sewage tanks must be set back as specified in Table VII in part 7080 2150, subpart 2, item F.

C. The top of sewage tanks must not be buried deeper than four feet from final grade for new dwellings, unless a local ordinance allows for burial at a greater depth, not to exceed the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the insulation on the top of the tank is six inches.

D. Sewage tanks must not be placed in floodways, drainageways, or swales. Upslope drainage must be diverted away from the location of all tanks. A tank's final cover must be crowned or sloped to shed surface water

E Sewage tanks must not be placed in areas subject to vehicular traffic unless engineered for the anticipated load

F Sewage tanks must be placed on firm and evenly compacted soil and with the soil level in all directions The bottom shall be excavated in a manner so the vertical load is borne by the tank walls and not the tank bottom If the bottom of the tank excavation contains rocks, bedding material must be used according to manufacturer's instructions The soil beneath the tank must be capable of bearing the weight of the tank and its contents

G. Sewage tanks and risers must be installed according to manufacturer's requirements and in a structurally sound and watertight fashion

H If the top of a sewage tank is to be less than two feet from final grade, the lid of the tank must be insulated to an R-value of ten. Maintenance hole covers must be insulated to an R-value of ten All insulating materials must be resistant to water absorption

I Sewage tanks placed below the level of the periodically saturated soil must employ a method to protect against flotation under periodic saturated soil conditions when the tank is empty.

J. Connections between the concrete tank and the building sewer or supply pipe must meet the requirements of American Society for Testing and Materials, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals, ASTM C923 (2002), or equivalent The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change

K Joints of concrete tanks, concrete tank lids, and concrete risers must be sealed using a bonding compound that meets American Society for Testing and Materials, Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants, ASTM C990 (2003) The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2010 TANK ASSESSMENT.

Subpart 1 **General.**

A All sewage tanks must be watertight, including at all tank and riser joints, riser connections, and pipe connections

B An assessment of all models of sewage tanks to be used must be conducted to determine

(1) the structural integrity of the tank design, and

(2) the adequacy of the manufacturing process of watertightness

C Sewage tanks, including riser joints, riser connections, and pipe connections must be designed, manufactured, and installed to be watertight under normal use.

Subp 2. **Structural integrity of design test.** The structural integrity of each model of tank manufactured and all poured-in-place tanks must be verified by calculation, proof testing, or a licensed professional engineer to determine the horizontal and vertical loads that the tank can withstand when empty Tanks must be reverified for structural integrity if the design, materials, or construction methods are modified A licensed professional engineer shall certify in writing if different manufactured models are similar enough so that the structural integrity information for one model is valid for other models Verifications must be submitted to the commissioner The commissioner shall maintain and make available the verifications upon request.

Subp 3 **Watertightness test.**

A At least one tank per year, per model must be tested for watertightness. All poured-in-place tanks shall be tested for watertightness. Records of testing must be maintained by the manufacturer for three years and must be available to the commissioner and local unit of government if requested. Tanks must be tested and meet or exceed the applicable requirements of subitem (1), (2), or (3)

(1) when empty, a tank must maintain a vacuum of at least two inches of mercury for five minutes, without loss of pressure,

(2) concrete tanks must hold water for one hour, without loss, after the tank has been filled with water to the top of the tank, let stand for 24 hours, and then refilled to the same level; or

(3) fiberglass-reinforced polyester or polyethylene sewage tanks must hold water without loss for one hour after being filled.

B Sewage tanks that do not pass the tests listed in item A must not be used until repaired and retested. The repair and retest procedure must be repeated until the tank passes the test or the tank must not be used

Statutory Authority: *MS s 115.03, 115.55*

History: *32 SR 1347*

7080.2020 TANK IDENTIFICATION.

A Sewage tanks must be marked near the outlet with

(1) the manufacturer's name,

(2) model number,

(3) liquid capacity,

(4) date of manufacture, and

(5) maximum depth of burial

B The tank manufacturer or manufacturer's agent shall provide the information in item A to the installer in writing.

C The tank inlet or outlet must be clearly marked.

D The installer shall submit the information in item A with the as-built drawing

Statutory Authority: *MS s 115 03, 115.55*

History: *32 SR 1347*

7080.2030 EFFECTIVE DATE.

Sewage tanks must meet the requirements of parts 7080 1910 to 7080.2020 within three years of February 4, 2008 Tanks produced and installed within this three-year period must meet the requirements of Minnesota Rules 2005, part 7080.0130.

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2050 DISTRIBUTION OF EFFLUENT.

Subpart 1. **General.** Distribution of effluent for ISTS must meet or exceed the requirements of this part

Subp 2. **Supply pipes.**

A The supply pipe extending from the septic tank to the undisturbed soil beyond the tank excavation must meet the strength requirements of American Society for Testing and Materials (ASTM), Schedule 40 Pipe, contained in Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120, ASTM D1785 (2006) The schedule is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change

B. Supply pipes must.

(1) be made from materials resistant to breakdown from sewage and soil,

(2) be watertight, including all joints,

(3) be durable throughout the design life;

(4) not deflect, buckle, crush, or longitudinally bend,

(5) be resistant to pressures, fatigue, and strain for the application,

(6) be installed according to American Society of Testing and Materials, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications, ASTM D2321 (2005) The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change,

(7) be designed, installed, and protected to minimize the danger of freezing in the pipe,

(8) not be closer than six inches from final grade Pipes susceptible to freezing shall be insulated, and

(9) be set back from water supply wells and water service pipes according to chapters 4715 and 4725.

C The minimum slope for gravity supply pipes is one percent (1/8 inch per linear foot). There is no maximum slope Pipe restraints must be used for slopes greater than 20 percent or where fluid velocities in the pipe exceed 15 feet per second For pressure systems, a minimum slope of one percent for drainback or other frost protection measures must be employed.

D Access to each supply pipe must be provided for cleanout The access point must be accessible from final grade

Subp 3. **Gravity distribution.**

A Serial distribution must be used to distribute effluent to individual trenches in a soil treatment and dispersal system If the necessary elevation differences between trenches for serial distribution cannot be achieved by natural topography or by varying the excavation depths, parallel distribution must be used Serial distribution must not create a pressure head on trenches at lower elevations

B If drop boxes are used for serial distribution, subitems (1) to (6) apply

(1) The drop box must be watertight and constructed of durable materials not subject to corrosion or decay

(2) The invert of the inlet supply pipe must be at least one inch higher than the invert of the outlet supply pipe to the next drop box.

(3) The invert of the outlet supply pipe to the next drop box must be no greater than two inches higher than the crown of the distribution pipe serving the trench in which the box is located.

(4) When sewage tank effluent is delivered to the drop box by a pump, the pump discharge must be directed against a wall or side of the box on which there is no outlet or directed against a deflection wall, baffle, or other energy dissipater The discharge rate into the drop box must not result in surfacing of sewage from the drop box. The supply pipe must drain after the pump shuts off.

(5) The drop box must be covered by a minimum of six inches of soil If the top of the box is deeper than six inches, access must be provided above, at, or within six inches of finished grade

(6) The drop box must be placed on firm and settled soil

C If valve boxes are used, all requirements of item B apply to valve boxes.

D Distribution boxes must meet the standards in subitems (1) to (6)

(1) The box must be watertight and constructed of durable materials not subject to corrosion or decay

(2) The distribution box must be covered by a minimum of six mches of soil If the top of the box is deeper than six inches, access must be provided above, at, or within six mches of the finished grade

(3) The inverts of all outlets must be set and maintained at the same elevation

(4) The inlet invert must be either at least one inch above the outlet invert or sloped such that an equivalent elevation above the outlet invert is obtained within the last eight feet of the inlet pipe

(5) Each trench line must be connected separately to the distribution box and must not be subdivided. Distribution boxes must not be connected to one another if each box has distribution pipes.

(6) When sewage tank effluent is delivered by pump, a baffle wall must be installed in the distribution box or the pump discharge must be directed against a wall, baffle, side of the box on which there is no outlet, or directed against a deflection wall, baffle, or other energy dissipater. The baffle must be secured to the box and extend at least one inch above the crown of the inlet pipe The discharge rate into the drop box must not result in surfacing of sewage from the drop box. Pressure must not build up in the box during pump discharge

E Nonpressurized distribution pipes must meet the requirements of subitems (1) to (4) and subpart 2, item B, subitems (1) and (3) to (5)

(1) Distribution pipes used for gravity distribution must be at least four inches in diameter

(2) Distribution pipes used for gravity distribution must have at least one row of holes of no less than one-half inch in diameter spaced no more than 40 inches apart

(3) Distribution pipes for gravity distribution must be laid level or on a uniform slope oriented away from the distribution device of no more than four inches per 100 feet.

(4) Distribution pipes for gravity distribution in seepage beds must be uniformly spaced no more than five feet apart and not more than 30 inches from the side walls of the seepage bed

Subp. 4. **Pressure distribution.**

A. Pressure distribution must pressurize the entire distribution system and must be used for

(1) mound systems,

(2) at-grade systems,

(3) all seepage beds placed in soils with a texture group of 1 through 5 in Table IX in part 7080.2150, subpart 3, item E,

(4) all seepage beds with a width greater than 12 feet;

(5) all trench systems if the trenches are at the same elevation and placed in soils with a texture group of 1 through 5 in Table IX in part 7080 2150, subpart 3, item E,

(6) systems receiving treatment level A or B effluent, as determined in part 7083 4030, Table III, and

(7) all systems where the distribution network is installed above the original grade

B Pressurized distribution pipes must conform to the requirements of subpart 2, item B, subitems (1) and (3) to (5).

C. Pressure distribution pipes and associated fittings must be properly joined together. The pipe and connections must be able to withstand a pressure of at least 40 pounds per square inch

D The distribution network must be designed so there is less than a ten percent variance in flow for all perforations

E Perforations must be no smaller than one-eighth inch diameter and no larger than one-quarter inch diameter The number of perforations, perforation spacing, and pipe size for pressure distribution must be in accordance with Table VI The friction loss in any individual perforated lateral must not exceed 20 percent of the average pressure head on the perforations.

TABLE VI

MAXIMUM NUMBER OF PERFORATIONS PER LATERAL

1/4 inch holes

	Pipe diameter in inches				
	1	1.25	1 5	2	3
Perforation spacing in feet					
2	10	13	18	30	60
2.5	8	12	16	28	54
3	8	12	16	25	52

3/16 inch holes

	Pipe diameter in inches				
	1	1 25	1.5	2	3
Perforation spacing in feet					
2	12	18	26	46	87
2.5	12	17	24	40	80
3	12	16	22	37	75

1/8 inch holes

	Pipe diameter in inches				
	1	1.25	1 5	2	3
Perforation spacing in feet					
2	21	33	44	74	149
2.5	20	30	41	69	135
3	20	29	38	64	128

F Perforation holes must be drilled straight into the pipe and not at an angle Pressurized distribution laterals must be installed level Perforation holes must be free of burrs Holes must be spaced no more than three feet apart A method to introduce air into the pipe after dosing must be provided. The pipes must completely dram after the pump turns off

G Pressure distribution laterals must be spaced no further than 36 inches apart in seepage beds and mound absorption beds, and no further than 24 inches from the outside edge of the bed

H. Pressure distribution laterals must be connected to a header or manifold pipe that is of a diameter such that the friction loss in the header or manifold will be no greater than five percent of the average head at the perforations. The header or manifold pipe must be connected to the supply pipe from the pump

I. Perforated laterals must not be installed closer than 12 inches from the edges of the absorption bed and perforated laterals must terminate no closer than 12 inches from the ends of the absorption bed

J Pressure distribution pipe cleanouts must be provided to check the system for proper operation and cleaning of plugged perforations Cleanouts must be accessible from final grade

Statutory Authority: *MS s 115 03; 115.55*

History: *32 SR 1347*

7080.2100 DOSING OF EFFLUENT.

Subpart 1 **General.** When pumping or dosing is necessary, it must comply with this part

Subp. 2 **Pump tanks.**

A Pump tanks shall meet or exceed the requirements of parts 7080 1910, 7080 1970, and 7080 1980 to 7080 2020. All dosing chambers must be vented

B The pump, pump controls, and pump discharge line must be installed to allow access for servicing or replacement without entering the pump tank.

C The pump tank must either include an alternating two-pump system or have a minimum total capacity of 500 gallons for design flow values of 600 gallons per day or less or 100 percent of the design flow for design flow values of greater than 600 gallons per day.

D. An ISTS with a pump must employ an alarm device to warn of failure.

E The inlet of pumps must be elevated at least four inches from the bottom of the pump tank or protected in some other manner to prevent the pump from drawing excessive settled solids

F Electrical installations must comply with applicable laws and ordinances including the most current codes, rules, and regulations of public authorities having jurisdiction and with part 1315 0200, which incorporates the National Electrical Code.

Subp. 3 **Pumps for gravity distribution.** If a pump is used to lift effluent into a gravity distribution system, items A to C apply

A The pump must discharge at least ten gallons per minute but no more than 45 gallons per minute.

B. The pump must be constructed and fitted with sound, durable, and corrosion-resistant materials

C The pump must have sufficient dynamic head for both the elevation difference and friction loss

Subp 4. **Pumps for pressure distribution.** Pumps for pressure distribution must meet the requirements in items A to D.

A Pumps must be constructed and fitted with sound, durable, and corrosion-resistant materials

B The pump discharge capacity must be based on the perforation discharges for a minimum average head of 1 0 foot for 1/4 inch and 3/16 inch perforations and 2.0 feet for 1/8 inch perforations for dwellings The minimum average head must be 2 0 feet for all other establishments Perforation discharge is determined by the following formula:

$$Q = 19.65\ cd^2h^{1/2}$$

where. Q = discharge in gallons per minute

c = 0 60 = coefficient of discharge

d = perforation diameter in inches

h = head in feet

C The pump discharge head must be at least five feet greater than the head required to overcome pipe friction losses and the elevation difference between the pump and the distribution device.

D The quantity of effluent delivered for each pump cycle must be no greater than 25 percent of the design flow and at least five times the volume of the supply and distribution pipes.

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2150 TREATMENT AND DISPERSAL.

Subpart 1 **General.** Treatment and dispersal of all sewage for new construction or replacement ISTS must be in compliance with this part and parts 7080 2200 to 7080 2400 as adopted into local ordinances

Subp. 2. **General technical requirements for all systems.** All new construction or replacement ISTS must be designed to meet or exceed the provisions in items A to F

A. All treatment and dispersal methods must be designed to conform to all applicable federal, state, and local regulations

B Treatment and dispersal processes must prevent sewage or sewage effluent contact with humans, insects, or vermin.

C. Treatment and dispersal of sewage or sewage effluent must be in a safe manner that adequately protects from physical injury or harm

D An unsaturated zone in the soil must be maintained between the bottom of the soil treatment and dispersal system and the periodically saturated soil or bedrock during loading of effluent

E. Soil treatment and dispersal systems must not be designed in floodways Soil treatment and dispersal systems installed m flood fringes must meet the requirements in part 7080 2270 All soil treatment systems located in areas subject to excessive run-on must have a diversion constructed upslope from the system.

F ISTS components must be set back in accordance with Table VII

TABLE VII

MINIMUM SETBACK DISTANCES (FEET)

Feature	Sewage tank, holding tank, or sealed privy	Absorption area or unsealed privy	Building sewer or supply pipes
Water supply wells	*	*	*
Buried water lines	*	*	*
Buildings**	10	20	
Property lines***	10	10	
Ordinary high water level of public waters	****	****	

* Setbacks from buried water lines and water supply wells are governed by chapters 4715 and 4725, respectively

** For structures other than buildings, these setbacks are allowed to be reduced if necessary due to site conditions, but no component of an ISTS is allowed to be located under or within the structure or other impermeable surface.

*** Infringement on property line setbacks must be made through accepted local procedures

**** Setbacks from lakes, rivers, and streams are governed by chapters 6105 and 6120

Subp 3 **Other technical requirements for systems.** Items A to J are required for specific designs as determined in parts 7080 2200 to 7080 2400

A Employ components registered under parts 7083 4070 and 7083.4080 that are installed, used, and operated according to the conditions placed on registration

B Employ structural components and joint sealants that meet or exceed the system's expected design life.

C For acceptable treatment of septic tank effluent by soil, the soil treatment and dispersal systems must meet the requirements of subitems (1) and (2).

(1) A minimum three-foot vertical soil treatment and dispersal zone shall be designed below the distribution media that meets the criteria in units (a) to (c)

(a) the zone must be above the periodically saturated soil and bedrock The zone must be continuous and not be interrupted by seasonal zones of saturation,

(b) any soil layers with a texture group of 1 or 4 in Table IX in item E must not be credited as part of the necessary three-foot zone, and

(c) the entire treatment zone depth must be within seven feet from final grade.

(2) The distribution system or media must not place a hydraulic head greater than 30 inches above the bottom of the bottom absorption area.

D. The system's absorption area must be original soil

E. The system's absorption area must be sized according to Table IX

TABLE IX

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA FOR TRENCHES AND SEEPAGE BEDS FOR EFFLUENT TREATMENT LEVEL C AND ABSORPTION RATIOS FOR DETERMINING MOUND ABSORPTION AREAS USING DETAILED SOIL DESCRIPTIONS

Texture	Texture group	Structure	Grade	Consistence	Soil loading rate (gpd/ft^2)	Mound absorption ratio
Course sand*	1	single grain		loose	0.00	1
		single grain		weakly cemented-friable	0 00	2
		single grain		cemented-firm	0 00	0
Medium sand*	2	single grain		loose	1.20	1
		single grain		weakly cemented-friable	0 60	2
		single grain		cemented-firm	0 00	0
Fine sand	3	single grain		loose	0 60	2

		single grain		weakly cemented-friable	0 24	5
		single grain		cemented-firm	0.00	0
Coarse and medium loamy sand*	4	single gram		loose	1.20	1
		single grain		weakly cemented-friable	0.60	2
		single grain		cemented-firm	0 00	0
Fine and very fine loamy sand	5	single grain		loose	0 60	2
		single grain		weakly cemented-friable	0.24	5.0
		single grain		cemented-firm	0.00	0
Coarse and medium sandy loam	6	pris, blk, gr	weak	v friable, friable	0 45	2 6
		pris, blk, gr	weak	firm	0 24	5 0
		pris, blk, gr	mod or strong	v friable, friable	0 78	1 3
		pris, blk, gr	mod or strong	firm	0 45	2 6
		platy	weak	v. friable, friable	0 45	2 6
		platy	weak	firm	0.24	5 0
		platy	mod or strong	v. friable, friable	0 45	2 6
		platy	mod or strong	firm	0 00	0.0
		massive		v. friable, friable	0 24	5 0
		massive		firm	0.00	0.0
Fine and v fine sandy loam	7	pris, blk, gr	weak	v friable, friable	0.24	5 0
		pris, blk, gr	weak	firm	0 24	5 0
		pris, blk, gr	mod or strong	v friable, friable	0 60	2.0

		pris, blk, gr	mod or strong	firm	0.24	5.0
		platy	weak	v. friable, friable	0 24	5.0
		platy	weak	firm	0.00	0 0
		platy	mod or strong	v. friable, friable	0.00	0.0
		platy	mod or strong	firm	0.00	0.0
		massive		v. friable, friable	0.24	5.0
		massive		firm	0.00	0 0
Loam	8	pris, blk, gr	weak	v friable, friable	0 45	2.6
		pris, blk, gr	weak	firm	0.24	5 0
		pris, blk, gr	mod or strong	v. friable, friable	0.60	2.0
		pris, blk, gr	mod or strong	firm	0.24	5 0
		platy	weak	v friable, friable	0 24	5.0
		platy	weak	firm	0 00	0.0
		platy	mod or strong	v friable, friable	0.00	0 0
		platy	mod or strong	firm	0 00	0.0
		massive		v friable, friable	0.24	5.0
		massive		firm	0.00	0 0
Silt loam	9	pris, blk, gr	weak	v. friable, friable	0 45	2.6
		pris, blk, gr	weak	firm	0.24	5.0
		pris, blk, gr	mod or strong	v. friable, friable	0 50	2.4
		pris, blk, gr	mod or strong	firm	0 24	5 0
		platy	weak	v friable, friable	0.24	5.0
		platy	weak	firm	0 00	0.0
		platy	mod or strong	v. friable, friable	0.00	0 0

		platy	mod or strong	firm	0 00	0 0
		massive		v friable, friable	0 24	5.0
		massive		firm	0.00	0.0
Clay loam, silty clay loam, sandy clay loam	10	pris, blk, gr	weak	v. friable or friable	0.24	5 0
		pris, blk, gr	weak	firm	0 00	0 00
		pris, blk, gr	mod or strong	v friable or friable	0.45	2.6
		pris, blk, gr	mod or strong	firm	0 24	5 0
		platy	weak	v friable or friable	0.00	0 00
		platy	weak	firm	0 00	0 00
		platy	mod or strong	v friable or friable	0 00	0 00
		platy	mod or strong	firm	0.00	0.00
		massive		v. friable or friable	0 00	0 00
		massive		firm	0 00	0 00
Clay, silty clay, sandy clay	11	pris, blk, gr	weak	v. friable, friable	0.00	0.00
		pris, blk, gr	weak	firm	0 00	0 00
		pris, blk, gr	mod or strong	v. friable, or friable	0.24	5.0
		pris, blk, gr	mod or strong	firm	0 00	0 00
		platy	weak	v friable, friable	0 00	0 00
		platy	weak	firm	0.00	0.00
		platy	mod or strong	v friable, friable	0 00	0 00
		platy	mod or strong	firm	0.00	0 00
		massive		v. friable, friable	0 00	0 00
		massive		firm	0.00	0 00

All very firm consistence has a loading rate of 0 0.

TABLE IXa

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA FOR TRENCHES AND SEEPAGE BEDS FOR EFFLUENT TREATMENT LEVEL C AND ABSORPTION RATIOS FOR DETERMINING MOUND ABSORPTION AREAS USING PERCOLATION TESTS

Percolation rate (minutes per inch)	Gallons per day per square foot of trench bottom	Mound absorption ratio
Faster than 0 1*	0 0	1
0 1 to 5*	1 20	1
0 1 to 5 (soil texture groups 3 & 5)	0 6	2
6 to 15	0 78	1 3
16 to 30	0 6	2
31 to 45	0.5	2 4
46 to 60	0 45	2.6
61 to 120	0 24	5 0
Slower than 120	0 0	

*See part 7080 2260 for requirements for these soils

F If drainfield rock medium is employed, a durable, nonwoven geotextile fabric must be used to cover the distribution rock medium The fabric must be of sufficient strength to undergo installation without rupture. The fabric must permit passage of water without passage of overlying soil material into the rock medium

G All excavation into the absorption area, or surface preparation of the upper 12 inches of absorption area, must be in a manner to expose the original soil structure in an unsmeared and uncompacted condition. Excavation is only allowed when the soil moisture content is at or less than the plastic limit and is not frozen or freezing

H Excavation equipment or other vehicles must not be driven on the excavated or prepared absorption area Foot traffic on these areas must be minimized and not cause compaction The exposed areas must be immediately covered with media or the designed coverage materials If the areas are exposed to direct rainfall, they must be allowed to dry and must be re-prepared according to item G.

I A minimum of six inches of topsoil borrow shall be placed over the system

J A close-growing, vigorous vegetative cover must be established over the soil treatment and dispersal system and other vegetatively disturbed areas The sodding, seeding, or other vegetation establishment shall begin immediately after the placement of the topsoil borrow The soil treatment and dispersal system must be protected from erosion and excessive frost until a vegetative cover is established The vegetative cover established must not interfere with the hydraulic performance of the system and shall provide adequate frost and erosion protection Trees, shrubs, deep-rooted plants, or hydrophytic plants must not be planted on the system

Subp 4 **Systems with a design flow greater than 2,500 gallons per day.** At a minimum, systems designed under this chapter with a design flow of greater than 2,500 gallons per day, which impact water quality of an aquifer, as defined in part 4725.0100, subpart 21,

must employ best management practices for nitrogen reduction developed by the commissioner to mitigate water quality impacts to groundwater

Statutory Authority: *MS s 115.03; 115.55*

History: *32 SR 1347*

7080.2200 TYPE I SYSTEMS.

Systems designed according to parts 7080.2200 to 7080.2240 are considered Type I systems

Statutory Authority: *MS s 115.03, 115.55*

History: *32 SR 1347*

7080.2210 TRENCHES AND SEEPAGE BEDS.

Subpart 1 **Characteristics.** To qualify as a trench or seepage bed system, the system must meet or exceed the requirements of items A to E

A employ flow values in parts 7080.1850 to 7080.1885;

B meet or exceed applicable technical requirements of parts 7080.1900 to 7080.2030, 7080.2050, and 7080.2100,

C. provide flow measurement if a pump is to be employed;

D meet or exceed the requirements of part 7080.2150, subparts 2 and 3, and

E meet the requirements of subparts 2 to 4

Subp. 2 **Seepage beds.** Seepage bed placement must be limited to areas having natural slopes of less than six percent. Seepage beds and trenches must not be placed in soils with a texture group of 10 and 11 on Table IX in part 7080.2150, subpart 3, item E Seepage beds must not be located in floodplains

Subp. 3 **Sizing of trenches and seepage beds.**

A The trench bottom absorption area is calculated by dividing the design flow by the appropriate soil loading rate in Table IX or IXa in part 7080.2150, subpart 3, item E If gravity distribution is used in seepage beds, the seepage bed absorption area is calculated by dividing the design flow by the soil loading rate in Table IX or IXa in part 7080.2150, subpart 3, item E, multiplied by 1.5 If pressure distribution is used in seepage beds, the seepage bed absorption area is determined by dividing the design flow by the soil loading rate in Table IX or IXa in part 7080.2150, subpart 3, item E

B The minimum sidewall absorption is six inches The bottom absorption area is allowed to be reduced, for trenches only, by the following.

Sidewall absorption - inches	Bottom area reduction
12 to 17	20%
18 to 23	34%
24	40%

Subp. 4 **Design and construction of trenches and seepage beds.**

A Trenches must be no more than 36 inches wide. Any excavation wider than 36 inches shall be considered a seepage bed A seepage bed must not be wider than 12 feet if gravity distribution is used and 25 feet if pressure distribution is used Natural, undisturbed soil must exist between multiple trenches and seepage beds Multiple seepage beds must be spaced at one-half the bed width. Multiple units must be designed based on contour loadmg rates as described in part 7080.2220, subpart 3, item B.

B. A vertical inspection pipe at least four inches in diameter must be installed and secured in the distribution medium of every trench or seepage bed. The inspection pipe must be located at an end opposite from where the sewage tank effluent enters the

medium The inspection pipe must have three-eighths inch or larger perforations spaced vertically no more than six inches apart At least two perforations must be located in the distribution medium. Perforations must not be located above the geotextile cover or wrap The inspection pipe must extend to the bottom of the distribution medium, be secured, and be capped flush with or above finished grade

C The top and bottom of the distribution medium must be level along the contour. Sidewalls must be as vertical as practical and not intentionally sloped

D. The minimum depth of soil cover, including topsoil borrow, over the distribution medium is 12 inches

E Trenches or seepage beds must be backfilled and crowned above finished grade to allow for settling The top six inches of the backfill must have the same texture as the adjacent soil

Statutory Authority: *MS s 115 03; 115.55*

History: *32 SR 1347*

7080.2220 MOUNDS.

Subpart 1. **Mound system requirements.** To qualify as a mound system, the system must meet or exceed the following requirements.

A employ flow values in parts 7080.1850 to 7080 1885,

B meet or exceed applicable technical requirements of parts 7080.1900 to 7080 2030, 7080 2050, and 7080 2100,

C meet or exceed the requirements of part 7080 2150, subparts 2 and 3,

D employ flow measurement, and

E meet the requirements of subparts 2 and 3.

Subp 2. **Location of mounds.**

A The upper 12 inches of the original soil mound absorption area must have a mound absorption ratio of greater than zero under part 7080 2150, subpart 3, item E, Table IX or IXa. The upper 12 inches of the absorption area must also be above the periodically saturated soil or bedrock

B Setbacks must be according to Table VII in part 7080.2150, subpart 2, item F Setbacks must be measured from the original soil absorption area

C On slopes of one percent or greater and where the original soil mound absorption is 5 0 or greater in Table IX or IXa in part 7080.2150, subpart 3, item E, mounds must not be located where the ground surface contour lines that lie directly below the long axis of the distribution media bed represent a swale or draw, unless the contour lines have a radius of curvature greater than 100 feet Mounds must never be located in swales or draws where the radius of curvature of the contour lines is less than 50 feet

Subp 3 **Mound design and construction.**

A The mound distribution media bed area consists of bottom area only and must be calculated by dividing the design flow by 1 2 gallons per square foot per day

B The mound distribution media bed area must be as long and narrow as practical Mound distribution media beds must be no wider than ten feet Mound distribution bed widths must be determined by the contour loading rate, which is the relationship between the vertical and horizontal water movement based on the following soil conditions

(1) the permeability difference between the original soil mound absorption area and slower permeability horizons below the original soil mound absorption area;

(2) the depth between the original soil mound absorption area and the change in permeability described in subitem (1); and

(3) the land slope

C Clean sand must be used to elevate the mound distribution media bed and must consist of sound, durable material that conforms to the following requirements:

Sieve Size	Percent Passing
No 4	95-100
No 8	80-100
No 10	0-100
No 40	0-100
No 60	0-40
No 200	0-5

Clean sand must also contain less than three percent deleterious substances and be free of organic impurities

D The original soil mound absorption area is determined by multiplying the original soil mound absorption length by the original soil mound absorption width. The original soil mound absorption width is calculated by multiplying the mound distribution media bed width by the mound absorption ratio. The mound absorption ratio of the upper 12 inches of soil in the proposed original soil mound absorption area shall be determined according to Table IX or IXa in part 7080 2150, subpart 3, item E

E The required original soil absorption width for mounds constructed on slopes from zero to one percent must be centered under the mound distribution media bed width The required original mound soil absorption width constructed on slopes greater than one percent must be measured downslope from the upslope edge of the mound distribution media bed width and measured in the direction of the original land slope and perpendicular to the original contours

F The side slopes on the mound must not be steeper than three horizontal units to one vertical unit and shall extend beyond the required original soil absorption area, if necessary.

G Distribution of effluent over the mound distribution media bed must be by level perforated pipe under pressure according to parts 7080.2050 and 7080 2100

H The supply pipe from the pump to the original soil absorption area must be installed before surface preparation of the original mound soil absorption area The trench excavated for the supply pipe must be carefully backfilled and compacted to prevent seepage of effluent

I Vegetation in excess of two inches in length and dead organic debris including leaf mats must be removed from the original soil mound absorption area Trees must be cut nearly flush with the ground and stumps must not be removed.

J. The original soil mound absorption area must be roughened by backhoe teeth, moldboard, or chisel plow The soil must be roughened to a depth of eight inches. Discing is allowed if the upper eight inches of soil has a texture of sandy loam or coarser. If plowed, furrows must be thrown uphill and there must not be a dead furrow in the original soil mound absorption area A rubber-tired tractor is allowed for plowing or discing. Rototilling or pulverizing the soil is not allowed The original soil must not be excavated or moved more than one foot from its original location during soil surface preparation

K Prior to placement of six inches of clean sand, vehicles must not be driven on the original soil mound absorption area before or after the surface preparation is completed. The clean sand must immediately be placed on the prepared surface

L. The clean sand must be placed by using a construction technique that minimizes compaction If the clean sand is driven on for construction, a crawler or track-type

tractor must be used At least six inches of sand must be kept beneath equipment to minimize compaction of the prepared surface.

M A minimum of 12 inches of clean sand must be placed in contact with the bottom area of the mound distribution media bed and must be uniformly tapered to cover the entire original soil absorption area Other sandy materials are allowed to be used outside of this area to complete construction of the mound.

N. The top of the clean sand layer upon which the mound distribution media bed is placed must be level in all directions.

O. A vertical inspection pipe at least four inches in diameter must be installed and secured at the distribution medium and sand interface. The inspection pipe must have three-eighths inch or larger perforations spaced vertically no more than six inches apart At least two perforations must be located in the distribution medium Perforations must not be located above the permeable synthetic fabric, if used The inspection pipe must extend to the bottom of the distribution medium, be secured, and be capped, flush with or above finished grade.

P On slopes of one percent or greater, the upslope edge of the mound absorption bed must be placed on the contour

Q. The sidewalls of the mound absorption bed must be as vertical as practical and not intentionally sloped

R The top of the mound distribution media bed must be level in all directions.

S A minimum of six inches of sandy to loamy soil material must be placed on the top of the mound absorption bed and sloped upwards toward the center of the mound a minimum of ten horizontal units to one vertical unit

T Construction vehicles must not be allowed on the distribution media until backfill is placed as described in item S

U A minimum of six inches of topsoil borrow must be placed over the entire mound.

Statutory Authority: *MS s 115.03; 115 55*

History: *32 SR 1347*

7080.2230 AT-GRADE SYSTEMS.

Subpart 1 **At-grade system.** To qualify as an at-grade system, the system must meet or exceed the following requirements·

A. employ flow values in parts 7080 1850 to 7080 1885,

B meet or exceed applicable technical requirements of parts 7080.1900 to 7080 2030, 7080 2050, and 7080 2100,

C meet or exceed the requirements of part 7080 2150, subparts 2 and 3,

D. employ flow measurement, and

E meet the requirements of subparts 2 and 3.

Subp 2. **Location of at-grade systems.**

A The upper 12 inches of the absorption area must be original soil with a loadmg rate of 0 45 gallons per day per square foot or greater as shown in Table IX or IXa in part 7080 2150, subpart 3, item E.

B At-grade systems must not be installed in areas with slopes greater than 25 percent

C Setbacks must be accordmg to part 7080 2150, subpart 2, item F Setbacks must be measured from the absorption area.

Subp 3 **Design and construction of at-grade systems.**

A The at-grade bed absorption width must be determined according to part 7080 2220, subpart 3, item B, and must not exceed a width of 15 feet The at-grade bed absorption width for slopes of one percent or greater does not include any width of the media necessary to support the upslope side of the pipe

B The at-grade absorption length must be calculated by dividing the design flow by the soil loading rate found in Table IX or IXa in part 7080.2150, subpart 3, item E, for the upper 12 inches of soil and dividing by the absorption bed width

C At-grade systems must employ pressurized distribution by meetmg or exceeding the applicable requirements of parts 7080.2050 and 7080 2100 At-grade systems located on slopes of one percent or greater require only one distribution pipe located on the upslope edge of the distribution media, with the absorption bed width bemg measured from the distribution pipe to the downslope edge of the media Multiple distribution pipes are allowed to be used to provide even distribution, if necessary, based on site conditions

D The upslope edge of an at-grade absorption bed must be installed along the natural contour

E At-grade materials must be placed by using construction techniques that minimize compaction

F Six inches of loamy or sandy cover material must be installed over the distribution media Cover must extend at least five feet from the ends of the rock bed and be sloped to divert surface water. Side slopes must not be steeper than four horizontal units to one vertical unit Six inches of topsoil borrow must be placed on the cover material

G. One vertical inspection pipe of at least four inches in diameter must be installed along the downslope portion of the absorption bed The inspection pipes must have three-eighths mch or larger perforations spaced vertically no more than six inches apart Perforations must not exist above the distribution medium The inspection pipes must extend to the absorption bed/soil interface and must be secured and capped flush with or above finished grade.

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2240 GRAYWATER SYSTEMS.

Subpart 1 **General.** To qualify as a graywater system, the system must meet or exceed the following requirements

A employ 60 percent of the flow values in parts 7080.1850 to 7080 1885,

B meet or exceed applicable technical requirements of parts 7080 1900 to 7080 2030, 7080.2050, and 7080.2100, except as modified in this part,

C provide flow measurement if a pump is to be employed;

D. meet or exceed the requirements of parts 7080 2210 to 7080 2230,

E meet or exceed requirements of part 7080 2150, subparts 2 and 3, and

F meet the requirements of subparts 2 and 3

Subp 2 **Toilet waste.** Toilet waste must not be discharged to a graywater system

Subp. 3. **Sewage tank.** The liquid capacity of a graywater septic tank serving a dwelling must be based on the number of bedrooms existmg and anticipated in the dwelling served and shall be at least as large as the capacities given in Table X

TABLE X

Number of bedrooms (gallons)	Tank liquid capacity
3 or less	750

4 or 5	1,000
6 or 7	1,250
8 or 9	1,500

For ten or more bedrooms, the graywater septic tank shall be sized as: (1,500 + ((# of bedrooms - 9) x 150))

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2250 TYPE II SYSTEMS.

Systems designed according to parts 7080 2260 to 7080 2290 are considered Type II systems

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2260 RAPIDLY PERMEABLE SOILS.

Subpart 1 **General.** A system must be designed under this part if the soil in the proposed absorption area, or within three vertical feet of the absorption area, has a soil texture group of 1 or 4 in Table IX in part 7080 2150, subpart 3, item E. The system must meet or exceed the following requirements:

A employ the design flow values in parts 7080 1850 to 7080 1880,

B. meet or exceed applicable technical requirements of parts 7080 1900 to 7080 2030, 7080 2050, and 7080.2100, except as modified in this part;

C provide flow measurement if a pump is to be employed,

D meet or exceed the requirements of parts 7080 2210 to 7080 2230,

E meet or exceed requirements of part 7080 2150, subparts 2 and 3, except as modified in this part, and

F meet the requirements of subparts 2 and 3

Subp 2. **Contact with soil.** The distribution media must not be in contact with soils with a texture group of 1 as listed in Table IX in part 7080 2150, subpart 3, item E

Subp 3 **Treatment techniques.** If the distribution media is in contact with soil with soil texture groups 2 through 5 in Table IX in part 7080 2150, subpart 3, item E, pressure distribution must be used as specified in part 7080 2050, subpart 4

Statutory Authority: *MS s 115 03, 115.55*

History: *32 SR 1347*

7080.2270 FLOODPLAIN AREAS.

Subpart 1 **General.** ISTS must be designed under this part if the system is proposed to be located in a floodplain A system located in a floodplain must meet or exceed the following requirements

A employ flow values in parts 7080 1850 to 7080 1885,

B meet or exceed applicable technical requirements of parts 7080 1900 to 7080 2030, 7080 2050, and 7080 2100, except as modified in this part;

C provide flow measurement if a pump is to be employed,

D meet or exceed the requirements of parts 7080 2210 to 7080.2230;

E. meet or exceed requirements of part 7080 2150, subparts 2 and 3, except as modified in this subpart, and

F meet the requirements of subparts 2 to 11

Subp 2 **State and local requirements.** The allowed use of systems in floodplains must be according to state and local floodplain requirements

Subp. 3. **Location of system.** An ISTS must not be located in a floodway and, whenever possible, placement within any part of the floodplain should be avoided If no alternative exists, a system is allowed to be placed within the flood fringe if the requirements in subparts 4 to 11 are met.

Subp 4 **Openings.** There must be no inspection pipe or other installed opening from the distribution media to the soil surface.

Subp 5 **Highest ground.** An ISTS must be located on the highest feasible area of the lot and must have location preference over all other improvements except the water supply well If the ten-year flood data are available, the bottom of the distribution media must be at least as high as the elevation of the ten-year flood

Subp. 6. **Pump.** If a pump is used to distribute effluent to the soil treatment and dispersal system, provisions shall be made to prevent the pump from operating when inundated with floodwaters

Subp 7. **Raising elevation.** When it is necessary to raise the elevation of the soil treatment system to meet the vertical separation distance requirements, a mound system as specified in part 7080 2220 is allowed to be used with the following additional requirements.

A. the elevation of the bottom of the mound bed absorption area must be at least one-half foot above the ten-year flood elevation if ten-year flood data are available;

B. inspection pipes must not be installed unless the top of the mound is above the 100-year flood elevation, and

C the placement of clean sand and other fill must be done according to any community-adopted floodplain management ordmance

Subp 8. **Inundation of top.** When the top of a sewage tank is inundated, the dwelling must cease discharging sewage into it

Subp 9 **Backflow.** Backflow prevention of liquid into the building when the system is inundated must be provided. If a holding tank is used, the system must be designed to permit rapid diversion of sewage into the holding tank when the system is inundated

Subp 10 **Holding tank.** If a holding tank is used to serve a dwelling, the holding tank's liquid capacity must equal 100 gallons times the number of bedrooms times the number of days between the ten-year stage on the rising limb of the 100-year flood hydrograph and the ten-year stage on the falling limb of the hydrograph, or 1,000 gallons, whichever is greater The holding tank must be accessible for removal of tank contents under flooded conditions

Subp 11 **Water level above top.** Whenever the water level has risen above the top of a sewage tank, the tank must be pumped to remove all solids and liquids after the flood has receded and before use of the system is resumed

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2280 PRIVIES.

A To qualify as a privy, the system must

(1) meet or exceed the requirements of part 7080 2150, subpart 2,

(2) have soil beneath the bottom of the pit that meets or exceeds the requirements of part 7080 2150, subpart 3, item C, employ a watertight tank meeting applicable requirements of parts 7080.1900 to 7080 2030, or employ a toilet treatment device, and

(3) meet the requirements of items B to E

B Pits or vaults must have sufficient capacity for the dwelling they serve, but must have at least 25 cubic feet of capacity.

C The sides of the pit must be curbed to prevent cave-in.

D The privy must be easily maintained and insect proof The door and seat must be self-closing. All exterior openings, including vent openings, shall be screened

E Privies must be adequately vented

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2290 HOLDING TANKS.

A. To qualify as a holding tank, the system must

(1) meet or exceed applicable requirements of parts 7080 1900 to 7080.2030,

(2) meet or exceed the applicable requirements of part 7080 2150, subpart 2,

(3) meet or exceed the requirements of part 7080 2150, subpart 3, item B; and

(4) meet the requirements of items B to F

B All tanks used as holding tanks must be tested for watertightness as specified in part 7080 2010, subpart 3.

C. A cleanout pipe of at least six inches in diameter must extend to the ground surface and be provided with seals to prevent odor emissions and exclude insects and vermin A maintenance hole of at least 20 inches in least dimension must extend through the cover to a point within 12 inches, but no closer than six inches, below finished grade If the maintenance hole is covered with less than six inches of soil, the cover must be secured according to part 7080 1970, item C

D For a dwelling, the minimum size is 1,000 gallons or 400 gallons times the number of bedrooms, whichever is greater For other establishments, the minimum capacity shall be at least five times the design flow Tank sizing for floodplain areas must be calculated according to part 7080 2270, subpart 10.

E Holding tanks must be located in an area readily accessible to the pump truck under all weather conditions and where accidental spillage during pumping will not create a nuisance and must meet the setback requirements as specified in Table VII in part 7080.2150, subpart 2, item F.

F Holding tanks must have an alarm device to minimize the chance of accidental sewage overflows unless regularly scheduled pumping is used An alarm device shall identify when the holding tank is at 75 percent capacity.

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2300 TYPE III SYSTEMS.

A system designed according to this part is considered a Type III system The system must:

A employ design flow values in parts 7080 1850 to 7080 1885,

B meet or exceed applicable technical requirements of part 7080 2050, subpart 4, item A;

C provide flow measurement,

D meet or exceed the requirements of part 7080.2150, subpart 2; and

E. meet or exceed the requirements of part 7080.2150, subpart 3, items A, B, C, G, I, and J

If the site cannot accommodate a soil treatment and dispersal system sized in accordance with Table IX or IXa in part 7080.2150, subpart 3, item E, a smaller soil treatment and dispersal system is allowed to be constructed if it employs flow restriction devices that

do not allow loadings in excess of those in Table IX or IXa of part 7080 2150, subpart 3, item E.

Statutory Authority: *MS s 115.03; 115 55*

History: *32 SR 1347*

7080.2350 TYPE IV SYSTEMS.

Subpart 1 **General.** A system designed according to this part is considered a Type IV system The system must

A employ design flow values in parts 7080 1850 to 7080 1885,

B. meet or exceed applicable technical requirements of parts 7080 1900 to 7080.2030, 7080 2050, and 7080 2100,

C meet or exceed the requirements of part 7080 2150, subpart 2,

D meet or exceed the requirements of part 7080.2150, subpart 3, items A and B, and

E. meet or exceed the requirements of Table XI in subpart 2 and Table XII or XIIa in subpart 3

Subp. 2. **Table XI.**

TABLE XI

TREATMENT COMPONENT PERFORMANCE LEVELS AND METHOD OF DISTRIBUTION BY TEXTURE GROUP[1]

Vertical separation (inches)	Soil group found in Table XII		
	1-5	6-9	10-11
12 to 17	Treatment Level A Pressure Distribution Timed Dosing	Treatment Level A Pressure Distribution Timed Dosing	Treatment Level A Pressure Distribution Timed Dosing
18 to 23	Treatment Level B Pressure Distribution Timed Dosing	Treatment Level B Pressure Distribution Timed Dosmg	Treatment Level B Pressure Distribution
24 to 36	Treatment Level B Pressure Distribution Timed Dosing	Treatment Level B Pressure Distribution	Treatment Level B Pressure Distribution

[1]The treatment component performance levels correspond with those established for treatment components under the product testing requirements in Table III in part 7083 4030

Subp 3 **Tables XII and XIIa.** The system's absorption area must be sized according to Table XII or Table XIIa

TABLE XII

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA FOR TRENCHES AND SEEPAGE BEDS FOR EFFLUENT MEETING TREATMENT LEVELS A AND B AND ABSORPTION RATIOS FOR DETERMINING MOUND ABSORPTION AREAS USING DETAILED SOIL DESCRIPTIONS

Texture	**Texture group**	**Structure**	**Grade**	**Consistence**	**Soil loading rate (gpd/ft^2)**	**Mound absorption ratio**
Coarse sand*	1	single grain		loose	0.00	1
		single grain		weakly cemented-friable	0.00	2
		single grain		cemented-firm	0.00	0
Medium sand*	2	single grain		loose	1.6	1
		single grain		weakly cemented-friable	0.78	2
		single grain		cemented-firm	0.00	0
Fine sand	3	single grain		loose	1.0	2
		single grain		weakly cemented-friable	0.45	2
		single grain		cemented-firm	0.00	0
Coarse and medium loamy sand*	4	single grain		loose	1.6	1
		single grain		weakly cemented-friable	0.78	2
		single grain		cemented-firm	0.00	0
Fine and very fine loamy sand	5	single grain		loose	1.0	2
		single grain		weakly cemented-friable	0.45	5.0
		single grain		cemented-firm	0.00	0

Coarse and medium sandy loam	6	pris, blk, gr	weak	v. friable, friable	0 6	2.6
		pris, blk, gr	weak	firm	0 45	5 0
		pris, blk, gr	mod or strong	v. friable, friable	1 0	1.3
		pris, blk, gr	mod or strong	firm	0 6	2.6
		platy	weak	v. friable, friable	0.6	2.6
		platy	weak	firm	0.45	5.0
		platy	mod or strong	v. friable, friable	0.6	2 6
		platy	mod or strong	firm	0.00	0.0
		massive		v friable, friable	0.45	5.0
		massive		firm	0 00	0 0
Fine and v fine sandy loam	7	pris, blk, gr	weak	v. friable, friable	0 45	5 0
		pris, blk, gr	weak	firm	0.45	5.0
		pris, blk, gr	mod or strong	v. friable, friable	0.78	2.0
		pris, blk, gr	mod or strong	firm	0 45	5.0
		platy	weak	v friable, friable	0 45	5.0
		platy	weak	firm	0.00	0.0
		platy	mod or strong	v. friable, friable	0.24	0.0
		platy	mod or strong	firm	0 00	0 0
		massive		v friable, friable	0 45	5 0
		massive		firm	0.00	0.0
Loam	8	pris, blk, gr	weak	v friable, friable	0 6	2.6
		pris, blk, gr	weak	firm	0.45	5.0
		pris, blk, gr	mod or strong	v. friable, friable	0.78	2.0

		pris, blk, gr	mod or strong	firm	0 45	5 0
		platy	weak	v friable, friable	0.45	5.0
		platy	weak	firm	0 00	0.0
		platy	mod or strong	v. friable, friable	0.24	0 0
		platy	mod or strong	firm	0.00	0.0
		massive		v friable, friable	0.45	5 0
		massive		firm	0.00	0.0
Silt loam	9	pris, blk, gr	weak	v. friable, friable	0.6	2.6
		pris, blk, gr	weak	firm	0.45	5.0
		pris, blk, gr	mod or strong	v. friable, friable	0 78	2 4
		pris, blk, gr	mod or strong	firm	0 45	5.0
		platy	weak	v. friable, friable	0.45	5.0
		platy	weak	firm	0.00	0.0
		platy	mod or strong	v friable, friable	0.00	0.0
		platy	mod or strong	firm	0.00	0.0
		massive		v. friable, friable	0.3	5.0
		massive		firm	0 00	0.0
Clay loam, silty clay loam, sandy clay loam	10	pris, blk, gr	weak	v. friable or friable	0.3	5.0
		pris, blk, gr	weak	firm	0.00	0.00
		pris, blk, gr	mod or strong	v. friable or friable	0 6	2.6
		pris, blk, gr	mod or strong	firm	0.3	5 0
		platy	weak	v friable or friable	0.00	0.00
		platy	weak	firm	0 00	0 00

		platy	mod or strong	v. friable or friable	0 00	0.00
		platy	mod or strong	firm	0.00	0.00
		massive		v friable or friable	0.00	0.00
		massive		firm	0 00	0 00
Clay, silty clay, sandy clay	11	pris, blk, gr	weak	v. friable, friable	0 00	0 00
		pris, blk, gr	weak	firm	0.00	0.00
		pris, blk, gr	mod or strong	v friable, or friable	0 3	5.0
		pris, blk, gr	mod or strong	firm	0 00	0.00
		platy	weak	v. friable, friable	0.00	0 00
		platy	weak	firm	0 00	0 00
		platy	mod or strong	v. friable, friable	0.00	0.00
		platy	mod or strong	firm	0.00	0 00
		massive		v. friable, friable	0 00	0.00
		massive		firm	0.00	0.00

All very firm consistence has a loading rate of 0.0

TABLE XIIa

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA FOR TRENCHES AND SEEPAGE BEDS FOR EFFLUENT TREATMENT LEVELS A AND B AND ABSORPTION RATIOS FOR DETERMINING MOUND ABSORPTION AREAS USING PERCOLATION TESTS

Percolation rate (minutes per inch)	Gallons per day per square foot of trench bottom	Mound absorption ratio
Faster than 0 1*	0 0	1
0.1 to 5*	1.6	1
0.1 to 5 (soil texture groups 3 & 5)	1.0	2
6 to 15	1.0	1 3
16 to 30	0 78	2
31 to 45	0 78	2.4

46 to 60	0 6	2 6
61 to 120	0 3	5 0
Slower than 120	-	-

*See part 7080 2260 for requirements for these soils

Statutory Authority: *MS s 115.03; 115 55*

History: *32 SR 1347*

7080.2400 TYPE V SYSTEMS.

A system designed according to this part is considered a Type V system. The system must

A employ design flow values in parts 7080 1850 to 7080 1885,

B meet or exceed the requirements of part 7080 2150, subpart 2; and

C. be designed with a vertical separation that ensures adequate sewage dispersal and treatment. Design factors to consider include, but are not limited to, effluent quality, loading rates, groundwater mounding if loading rates are in excess of those in part 7080 2350, subpart 2, Table XII or XIIa, loading methods, and soil conditions.

ISTS must not contaminate underground waters or zones of periodic saturation with viable fecal organisms

Statutory Authority: *MS s 115 03, 115 55*

History: *32 SR 1347*

7080.2430 REPORTING.

Phase II design reports must include detailed drawings, design flows, system component sizing and calculations, hydraulic and organic loadmg rates, setbacks, location and elevations for construction, and management plans as described in part 7082 0600, subpart 1, and a certified statement

Statutory Authority: *MS s 115 03; 115 55*

History: *32 SR 1347*

7080.2450 MAINTENANCE.

Subpart 1 **General.** All ISTS must be operated under the regulatory requirements of part 7082.0600 ISTS and all components must be maintained in compliance with this chapter and manufacturer requirements Subpart 2, items A and B, are intended to apply to ISTS and systems that do not qualify as an ISTS, but receives sewage such as cesspools, drywells, leaching pits, or other pits

Subp 2 **Frequency of assessment.** The owner of an ISTS or the owner's agent shall regularly, but in no case less frequently than every three years

A assess whether sewage tanks leak below the designed operating depth and whether sewage tank tops, riser joints, and riser connections leak through visual evidence of major defects, and

B measure or remove the accumulations of scum, grease, and other floating materials at the top of each septic tank and compartment, along with the sludge, which consists of the solids denser than water

Subp 3 **Removal of material.**

A All solids and liquids must be removed by pumping from all tanks or compartments in which the top of the sludge layer is less than 12 inches from the bottom of the outlet baffle or transfer hole or whenever the bottom of the scum layer is less than three

inches above the bottom of the outlet baffle or transfer hole Total sludge and scum volume must not be greater than 25 percent of the tank's liquid capacity

B Removal of accumulated sludge, scum, and liquids from septic tanks and pump tanks must be through the maintenance hole The removal of solids from any location other than the maintenance hole is not a compliant method of solids removal from a sewage tank, and this method does not fulfill the solids removal requirement of this part or a management plan Liquid and solids removal from clean-out pipes is allowed for holding tanks.

C After removal of solids and liquids, the system shall be brought into compliance with part 7080.1970, item C. Covers secured by screws shall be refastened in all screw openings If the maintenance hole does not extend to finish grade, it must be brought into comphance with part 7080 1970, item C, or secured by covering with a minimum of 12 mches of soil

D Pump tanks must be maintained according to this part. Sludge must be removed if within one inch of the pump intake

Subp 4 **Toilet waste treatment devices and privies.**

A For primitive dwellings using toilet waste treatment devices in low dwelling density areas, septage disposal from these devices by the owner must be in accordance with local ordinances If no ordinance exists, the septage must not be discharged to surface waters, drainageways, steeply sloping areas, or wet areas in a manner or volume that is harmful to the environment or public health or that creates a nuisance The material must be buried or covered with soil. For site conditions not met in this subpart, the solids disposal from toilet waste treatment devices shall be according to subpart 6 by a licensed maintenance business

B. When the privy is filled to one-half of its capacity, the solids must be removed. Abandoned pits must have the sewage solids and contaminated soil removed and must be filled with clean earth and slightly mounded to allow for settling Removed solids shall be disposed of according to subpart 6.

Subp 5. **Additives.** ISTS additives, which are products added to the sewage or to the system with the intent to lower the accumulated solids in sewage, must not be used as a means to reduce the frequency of proper mamtenance and removal of sewage solids from the sewage tanks as specified in this part The use of additives does not fulfill the solids removal requirement of this part or a management plan ISTS additives that contain hazardous materials must not be used in an ISTS

Subp 6 **Septage disposal.** Septage or any waste mixed with septage must be disposed of in accordance with state, federal, or local requirements for septage and other wastes If septage is disposed of into a sewage or septage treatment facility, a written agreement must be provided between the accepting facility and the mamtenance busmess

Subp 7. **Use of soil treatment site.** Activities on the current soil dispersal and treatment system or the reserve soil dispersal and treatment area as specified in part . , that impair the current or future treatment abilities or hydraulic performance of the soil treatment and dispersal system are prohibited This includes, but is not limited to, covering all or part of the soil treatment system with an impermeable surface as determined by the local unit of government

Subp. 8 **System remediation.** Any maintenance activity used to increase the acceptance of effluent to a soil treatment and dispersal system must

A not be used on a system failing to protect groundwater as defined in part 7080 1500, subpart 4, item B, unless the activities meet the requirements of parts 7080.2350 and 7080 2400,

B not cause preferential flow from the soil treatment and dispersal system bottom to the periodically saturated soil or bedrock, and

C be conducted by an appropriately certified qualified employee or an appropriately licensed business as specified in part 7083.0790.

Any substance added with the intent to increase the infiltration rate of the soil treatment and dispersal system must not contain hazardous substances

Statutory Authority: *MS s 115.03, 115.55*

History: *32 SR 1347*

7080.2500 SYSTEM ABANDONMENT.

Subpart 1 **Tank abandonment.** All systems with no future intent for use must be abandoned accordmg to this part. Tank abandonment procedures for sewage tanks, cesspools, leaching pits, drywells, seepage pits, vault privies, pit privies, and distribution devices must meet the requirements in items A to C.

A. All solids and liquids must be removed and disposed of accordmg to part 7080.2450, subpart 6, by a licensed maintenance business.

B. All electrical devices and devices containing mercury must be removed and disposed of accordmg to applicable regulations.

C. Abandoned tanks or any other underground cavities must be removed or remain in place and crushed with the remaining cavity filled with soil or rock material.

Subp. 2 **Future discharge.** Access for future discharge to the system must be permanently denied.

Subp. 3 **Removal of system.** If soil treatment and dispersal systems are removed, contaminated materials shall be properly handled to prevent human contact. Contaminated materials include distribution media, soil or sand within three feet of the system bottom, distribution pipes, tanks, and contaminated soil around leaky tanks. Contaminated material also includes any soil that received sewage from a surface failure. Contaminated materials must be disposed of according to items A to D.

A. Contaminated materials disposed of off-site must be disposed of accordmg to part 7080.2450, subpart 6.

B. If contaminated material is to be spread or used on-site within one year of contact with sewage, the material must be placed in an area meeting the soil and setback requirements described in part 7080.2150, subparts 2, item F, Table VII, and 3, item C, and the material must be covered with a minimum of six inches of uncontaminated soil and protected from erosion. After one year following contact with sewage, the material is allowed to be spread in any location meeting the setback requirement of part 4725.4450, covered with a minimum of six inches of uncontaminated soil, and protected from erosion. After one year following contact with sewage, the material is allowed to be used to fill in the abandoned in-place sewage tanks.

C. Contaminated pipe, geotextile fabric, or other material must be dried and disposed of in a mixed municipal solid waste landfill.

D. The person or business abandoning the system must complete and sign a record of abandonment that states the system was abandoned accordmg to this part. The record must be sent to the local unit of government within 90 days of abandonment.

Statutory Authority: *MS s 115.03, 115.55*

History: *32 SR 1347*

7080.2550 SEEPAGE PITS, DRYWELLS, AND LEACHING PITS.

Subpart 1 **Intended use of this part.** This part must be used when conducting existing system compliance inspections. This part defines what constitutes seepage pit, drywell, or leaching pit systems. Seepage pit, drywell, or leaching pit systems are not considered compliant systems as determined in part 7080.1500, subpart 4, item B, but these existing systems may be allowed continued use under Minnesota Statutes, section 115.55, subdivision 5a, paragraph (f), by local units of government that have adopted alternative local standards for these systems under part 7082.0050, subpart 5.

Subp 2 **Requirements for seepage pits, drywells, and leaching pits.** A seepage pit, drywell, or leaching pit is a system that:

A. has a sewage tank that does not obviously leak below the designed liquid capacity preceding the pit,

B has a pit that is not located in a geologic formation that is used as a source of drinking water,

C has at least three feet of vertical separation from the bottom of the pit to the periodically saturated soil or bedrock,

D has an absorption area that has been determined by dividing the design flow in parts 7080.1850 to 7080 1885 by the soil loading rate under Table IX or IXa in part 7080 2150, subpart 3, item E, based on the weighted average of each vertical stratum penetrated by the seepage pit, drywell, or leaching pit;

E has a pit that has not been placed in a soil stratum with a texture group of 1 or 4 in Table IX in part 7080 2150, subpart 3, item E;

F has a pit with a minimum inside diameter of five feet; and

G meets all setback requirements

Statutory Authority: *MS s 115 03, 115.55*

History: *32 SR 1347*