Washington County Development Code

CHAPTER FOUR
SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

ORDINANCE 206
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Washington County

REVISED WASHINGTON COUNTY DEVELOPMENT CODE

CHAPTER FOUR

SUBSURFACE SEWAGE TREATEMENT SYSTEM REGULATIONS

ORDINANCE NO. 206

REVISED WASHINGTON COUNTY

DEVELOPMENT CODE

Pursuant to MSA Ch 394, Washington County has adopted official controls for areas and activities enumerated below. These official controls are compiled into and hereafter known as the Revised Washington County Development Code which consists of the following chapters each adopted through Ordinance.

(1)	Chapter One	Administration
(2)	Chapter Two	Zoning Regulations
(3)	Chapter Three	Subdivision Regulations
(4)	Chapter Four	Subsurface Sewage Treatment System Regulations
(5)	Chapter Five	Lower St. Croix River Bluffland and Shoreland Management Regulations
(6)	Chapter Six	Shoreland Management Regulations
(7)	Chapter Seven	Mining Regulations
(8)	Chapter Eight	Buffer Regulations
(9)	Chapter Nine	Floodplain Management Regulations
(10)	Chapter Ten	Official Map Regulation and Designation

REVISED WASHINGTON COUNTY DEVELOPMENT CODE
CHAPTER FOUR

SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

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Summaries in this column are for commentary and/or interpretive purposes only.

WASHINGTON COUNTY DEVELOPMENT CODE

CHAPTER FOUR

SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

This chapter of the Washington County Development Code shall be known as the Washington County Subsurface Sewage Treatment System Regulations and may be referred to within this chapter as, "this ordinance" or "this chapter". This Subsurface Sewage Treatment System Regulation is adopted by Washington County Ordinance No. 206. This chapter shall regulate the location, design, installation, use and maintenance of subsurface sewage treatment systems in all areas of Washington County other than cities and towns that have adopted ordinances that comply with Minnesota Statute 115.55 and are as restrictive as this Chapter. This chapter is authorized under Minnesota Statute Section 115.55 and 115.56 and Minnesota Statutes Chapter 145A.

SECTION 1. PURPOSE AND INTENT

The purpose of this Ordinance is to protect public, health, safety, and general welfare by the discharge of adequately treated sewage.

Purpose and Intent.

This Chapter is adopted for the following purposes:

(1) To protect the public health, safety, and general welfare by the discharge of adequately treated sewage to the groundwater via the proper location, design, installation, use, and maintenance of individual subsurface sewage treatment systems (ISTS) and midsized subsurface sewage treatment systems (MSTS).

(2) These environmental protection standards shall be adopted county wide and administered and enforced by the Department or local units of government as directed by Minnesota Rules, Chapter 7082, and Minnesota Statute, Section 115.55.

(3) This chapter does not regulate systems that will not receive sewage as defined in this chapter. If systems receive both sewage and nonsewage, the requirements of this chapter apply, in addition to any additional requirements governing the nonsewage portion of the wastewater.

(4) To provide prescriptive design, construction, and operational standards to reasonably protect surface water and groundwater and promote public health, safety, and general welfare.

(5) To protect individual water supply wells of the community from contamination by inadequate, improperly designed, located, installed or maintained subsurface sewage treatment systems.

(6) To provide for the orderly development of areas of the community which are not served by central public wastewater treatment systems and to reduce the need to install central public wastewater treatment systems in areas where they are not now currently planned.

(7) Technology and products employed in system design shall adequately protect the public health and the environment as determined by Minnesota Rules, Chapter 7083, and be approved for use by the Department or local unit of government.

(8) This Chapter does not intend to impose design standards for sewage treatment systems that discharge to the ground surface or surface

waters. Those systems require a National Pollutant Discharge Elimination System permit.

SECTION 2. DEFINITIONS

2.1 Certain Terms.

For the purposes of this Chapter, certain terms or words used are interpreted as follows: the words "shall" and "must" are mandatory and the words "should" and "may" are permissive.

2.2 Definitions.

For the purpose of this Chapter, the certain words and phrases are defined as follows:

Unless specifically defined here, interpretation of words and phrases shall be consistent with common usage.

(1) 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.

(2) Agency. "Agency" means the Minnesota Pollution Control Agency (MPCA).

(3) 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.

(4) Applicable requirements. "Applicable requirements" means:

(A) This Chapter; Minnesota Rules, Chapter 7082; and, Minnesota Statutes, section 115.55; or

(B) In areas of the County without complying ordinances to regulate SSTS, the requirements in this Chapter.

(5) As-builts. "As-builts" means drawings and documentation specifying the final in-place location, size, and type of all system components. These records identify the results of materials testing and describe the conditions during construction. An as-built also contains a certified statement.

(6) ASTM. "ASTM' means the American Society for Testing and Materials.

(7) 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.

(8) 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.

(9) Bedrock. "Bedrock" means geologic layers, of which greater than 50 percent by volume consists of un-weathered 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.

(10) 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.

(11) 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).

(12) Building. "Building" means any structure used or intended for supporting or sheltering any use or occupancy.

(13) Building sewer. "Building sewer" means the part of the drainage system which extends from the end of the building drain and conveys its discharge to a subsurface sewage treatment system.

(14) Capillary fringe. "Capillary fringe" means the soil layer directly above a saturated layer in which the pore spaces are nearly filled with water as water is drawn upward due to adhesive and cohesive forces.

(15) 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 organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification. $CBOD_5$ is commonly expressed in milligrams per liter (mg/L).

(16) Certificate of compliance. "Certificate of compliance" means a document, written after a compliance inspection, certifying that a system is in compliance at the time of inspection with applicable requirements.

(17) Certified. "Certified" means an individual is included on the Agency's SSTS certification list and is qualified to design, install, maintain, repair, pump, operate, or inspect an SSTS as appropriate with the individual's qualifications. A certified individual who is working under a license is subject to the obligations of the license. Certified individuals were previously known as registered professionals.

(18) Certified statement. "Certified statement" means a statement signed by a certified individual, apprentice, or qualified employee under Minnesota Rules, Chapter 7083 certifying that the licensed business or qualified employee completed the work in accordance with applicable requirements.

(19) Cesspool. "Cesspool" means an underground pit, receptacle, leaching pit, drywell, seepage pit, or seepage tank that receives sewage 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.

(20) Clean sand. "Clean sand" means a soil fill material required to be used in mounds. The standards for clean sand are set forth in Section 17.3 (3) (C).

(21) Commissioner. "Commissioner" means the commissioner of the Minnesota Pollution Control Agency.

(22) 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.

(23) Contour Loading Rate. "Contour Loading Rate" means the amount of effluent loaded to the soil per length of the dispersal unit or units along the single hillslope along the contour. The contour loading rate is determined on the relationship between the vertical and horizontal water movement in the soil and is based on the permeability difference between the absorption area and any deeper horizons, the depth between the absorption area and the change in permeability; and the land slope.

(24) Department. "Department" means the Washington County Department of Public Health and Environment.

(25) Design flow "Design flow" means the estimated or measured flow used to design the SSTS.

(26) Disinfection. "Disinfection" means the process of destroying or inactivating pathogenic microorganisms in sewage to render them noninfectious.

(27) Distinct. "Distinct" means a soil color that is not faint as described in Section 2.2 (39).

(28) 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.

(29) 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.

(30) 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 gravel-less pipe.

(31) Distribution pipes. "Distribution pipes" means perforated pipes that distribute effluent within a distribution medium.

(32) Domestic strength waste. "Domestic strength waste" means liquid waste produced by toilets, bathing, laundry, culinary operations, and 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. Domestic waste has a biochemical oxygen demand of 170 mg/L or less (or carbonaceous biochemical oxygen demand of 125 mg/L or less), a total suspended solids level of 60 mg/L or less, an oil and grease concentration of 25 mg/L or less and no hazardous wastes. Animal waste and commercial or industrial waste are not considered domestic strength waste.

(33) Drip dispersal system. "Drip dispersal system" means a small diameter pressurized wastewater distribution system in which the treated effluent is distributed under pressure to the infiltrative surface via drip tubing and enters the receiving environment.

(34) Drop box. "Drop box" means a distribution device used for the serial gravity application of sewage tank effluent to a soil dispersal system.

(35) Dwelling. "Dwelling" means any building with provision for living, sanitary, and sleeping facilities.

(36) 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.

(37) EPA. "EPA" means the United States Environmental Protection Agency.

(38) Existing system. "Existing system" means a system that has been previously inspected and approved by the Department or local unit of government during installation. In addition, all operating systems installed before the adoption of this Chapter are considered existing systems.

(39) Faint. "Faint" means a soil color in the Munsell Soil-Color Charts:

(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 or chroma.

(40) Fecal coliform or FC. "Fecal coliform" or "FC", for the 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.

(41) Fine Sand. "Fine sand" means a soil texture, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in Section 2.2 (46) where more than 50 percent of the sand has a particle size range of 0.05 millimeters which is a sieve size of 270, to 0.25 millimeters which is a sieve size 60.

(42) Flood fringe. "Flood fringe" means that portion of the floodplain outside of the floodway. Flood fringe is synonymous with the term "floodway fringe" used in flood insurance studies.

(43) 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, the estimates of the 100-year flood boundaries and elevations as developed by Washington County.

(44) 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.

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

(46) 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 into this ordinance.

(47) Graywater. "Graywater" means sewage that does not contain toilet wastes. Liquid wastes from a dwelling or other establishment produced

by bathing, laundry, culinary operation, and from floor drains associated with these sources are considered graywater.

(48) Graywater system. "Graywater system" means a system that receives, treats, and disperses only graywater or similar systems designated as such by the commissioner.

(49) Groundwater mound. "Groundwater mound" means the rise in height of the periodically saturated soil or regional water table caused by the addition of sewage effluent from a subsurface sewage treatment system into the soil.

(50) Hazardous waste. "Hazardous waste" means any substance that, when discarded, meets the definition of hazardous waste in Minnesota Statutes, section 116.06, subdivision 11, Minnesota Rules 7045, or the Washington County Hazardous Waste Management Ordinance.

(51) Holding tank. "Holding tank" means a tank for the storage of sewage until such time as it can be transported to a point of treatment and dispersal. Holding tanks are considered septic system tanks under Minnesota Statutes, section 115.55.

(52) Individual subsurface sewage treatment system or ISTS. "Individual subsurface sewage treatment system" or "ISTS" means a 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 also includes all holding tanks that are designed to receive a design flow of 10,000 gallons per day or less; sewage collection systems and associated tanks that discharge into ISTS treatment and dispersal components; and privies. ISTS does not include those components defined as plumbing under Minnesota Rules, Chapter 4715.

(53) 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 Minnesota Rules, Chapter 4720, Section 4720.5330.

(54) Invert. "Invert" means the lowest point of a channel inside a pipe.

(55) Licensed advanced design business. "Licensed advanced design business" means a business that is authorized to conduct site and soil evaluations, design systems, and write management plans for all sizes and types of SSTS up to 10,000 gallons per day.

(56) Licensed advanced inspection business. "Licensed advanced design business" means a business that is authorized to conduct compliance inspections and issue certificates of compliance and notices of noncompliance for all sizes and types of SSTS up to 10,000 gallons per day.

(57) Licensed basic design business. "Licensed basic design business" means a business that is authorized to conduct site and soil evaluations, design systems, and write management plans for a Type I, II or III ISTS as described in Section 17 to Section 19 serving dwellings or other establishments with a design flow of 2,500 gallons per day or less.

(58) Licensed installation business. "Licensed installation business" means a business that is authorized to construct, install, alter, extend, or repair all SSTS according to an approved design.

(59) Licensed basic inspection business. "Licensed basic inspection business" means a business that is authorized to conduct compliance inspections and issue written certificates of compliance and notices of noncompliance for an existing Type I, II, or III ISTS as described in Section 17 to Section 19 serving dwellings or other establishments with a design flow of 2,500 gallons per day or less.

(60) Licensed intermediate design business. "Licensed intermediate design business" means a business that is authorized to conduct site and soil evaluations, design systems, and write management plans for a Type I, II, III, IV or V ISTS as described in Section 17 to Section 21 serving dwellings or other establishments with a design flow of 2,500 gallons per day or less.

(61) Licensed intermediate inspection business. "Licensed intermediate inspection business" means a business that is authorized to conduct compliance inspections and issue written certificates of compliance and notices of noncompliance for an existing Type I, II, III, IV or V ISTS as described in Section 17 to Section 21 serving dwellings or other establishments with a design flow of 2,500 gallons per day or less..

(62) Licensed maintainer business. "Licensed maintainer business" means a business that is authorized to measure scum and sludge depths in sewage tanks for the accumulation of solids and removing these deposits; remove solids and liquids from toilet waste treatment devices; transport septage; land apply septage or dispose of septage in a treatment facility; identify problems related to sewage tanks, baffles, maintenance hole covers, extensions, and pumps and make the repairs; evaluate sewage tanks, pump tanks, distribution devices, valve boxes, or drop boxes for leakage; identify cesspools, seepage pits, leaching pits, and drywells; and clean supply pipes and distribution pipes for all SSTS.

(63) Licensed service provider business. "Licensed service provider business" means a business that is authorized to measure scum and sludge depths for the accumulation of solids; identify problems related to sewage tanks, baffles, effluent screens, maintenance hole covers, extensions, and pumps and make the repairs; evaluate sewage tanks, dosing chambers, distribution devices, valve boxes, or drop boxes for leakage; and clean supply pipes and distribution pipes. Service provider businesses are also authorized to assess, adjust, and service systems for proper operation; take, preserve, store, and ship samples for analysis; interpret sampling results and report results for an SSTS; and operate sewage collections systems discharging to an SSTS.

(64) 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.

(65) Long-term sewage treatment. "Long-term sewage treatment" shall mean enough lot area to contain two Type I or Type II soil treatment and dispersal areas.

(66) Lot. "Lot" means a parcel of land designated by metes and bounds, registered land survey, plat or other means, and which description is either recorded in the Office of the Washington County Recorder or Registrar of Titles or used by the County Treasurer or County Assessor to separate such parcel from other lands for tax purposes.

(67) Maintenance permit. "Maintenance permit" means the permit issued to

a licensed maintainer business prior to performing maintenance as described in Section 22.

(68) 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.

(69) 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 Section 2.2 (46).

(70) Midsized subsurface sewage treatment system or MSTS. "Midsized subsurface sewage treatment system" or "MSTS" means a subsurface 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 and that is designed to receive sewage with a design flow of greater than 5,000 gallons per day to 10,000 gallons per day. MSTS also includes sewage collection systems and associated tanks that discharge into MSTS treatment or dispersal components. MSTS does not include those components defined as plumbing under Minnesota Rules, Chapter 4715.

(71) 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 Section 2.2 (46).

(72) 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, utilizes pressure distribution and capped with suitable soil material to stabilize the surface and encourage vegetative growth.

(73) MPCA. "MPCA" means the Minnesota Pollution Control Agency.

(74) NPDES permit. "NPDES permit" means a National Pollutant Discharge Elimination System permit issued by the MPCA.

(75) 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.

(76) 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 with this Chapter.

(77) O&G. "O&G" means oil and grease, a component of sewage typically originating from foodstuffs such as animal fats or vegetable oils or consisting of compounds of alcohol or glycerol and fatty acids such as soaps and lotions, typically expressed in mg/L (also known as FOG, or fats, oil and grease).

(78) Operating permit. "Operating permit" means the permit issued to the owner of an SSTS that requires an operating permit as described in Section 7.

(79) Ordinary high water level. ""Ordinary high water level" means the boundary of public waters and wetlands, and shall be an elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape,

commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel. For reservoirs and flowage, the ordinary high water level is the operating elevation of the normal summer pool. On lakes with an established ordinary high water level by the Minnesota Department of Natural Resources, that elevation shall be considered the ordinary high water level.

(80) 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.

(81) Other establishment. "Other establishment" means any public or private structure other than a dwelling that generates sewage that discharges into an ISTS or MSTS.

(82) 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 foot per day.

(83) Owner. "Owner" means any person having possession of, control over, or title to property with an SSTS.

(84) Parent material. "Parent material" means the unconsolidated and chemically weathered geologic mineral or organic matter from which soils are developed through soil forming processes.

(85) Percolation rate. "Percolation rate" means the rate of a drop of water infiltrating into a test hole as specified in Section 9.7 (2).

(86) 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 Section 9.6 (5) or (6), or determined by other scientifically established technical methods or empirical field measurements acceptable to the local unit of government in consultation with the Department or the commissioner.

(87) Permit. "Permit" means a permit issued for the construction, replacement, repair, alteration, extension, operation or maintenance of a subsurface sewage treatment system, or a permit issued by the Agency.

(88) Permittee. "Permittee" means a person who is named on a permit issued pursuant to these regulations.

(89) Plastic limit. "Plastic limit" means the 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.

(90) Practical Difficulties. "Practical Difficulties " means the proposed use of the property and associated structures in question cannot be established under the conditions allowed by this Ordinance; the plight of the landowner is due to circumstances unique to his property, not created by the landowner after May 1, 1974; and the variance, if granted, will not

alter the essential character of the locality. Economic considerations alone do not constitute a practical difficulty for the reasonable use of the property and associated structures under the conditions allowed by this Ordinance. In addition, a variance that would permit any use that is prohibited by this Ordinance will not be granted. Conditions may be imposed in conjunction with the granting of a variance to insure compliance and to protect adjacent properties and the public interest,

(91) Pressure distribution. "Pressure distribution" means a network of distribution pipes in which effluent is forced through orifices under pressure.

(92) Privy. "Privy" means an aboveground structure with an underground cavity that meets the requirements of Section 18.3 that is used for the storage or treatment and dispersal of toilet wastes, excluding water for flushing and graywater. A privy also means a non-dwelling structure containing a toilet waste treatment device.

(93) Proprietary product. "Proprietary product" means a sewage treatment or distribution technology, method, or material subject to a patent or trademark.

(94) Public domain technology. "Public domain technology" means a sewage treatment or distribution technology, method, or material not subject to a patent or trademark.

(95) 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.

(96) Pump tank. "Pump tank" means a tank or separate compartment within a sewage tank, which receives sewage tank effluent 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 (p).

(97) Qualified employee. "Qualified employee" means a state or local government employee who designs, installs, maintains, pumps, or inspects SSTS as part of the person's duties.

(98) Redoximorphic features. "Redoximorphic features" means:

(A) a color pattern in soil, formed by oxidation and/or reduction of iron and/or manganese in saturated soil coupled with its 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 Section 9.6 (5).

(99) Replacement. "Replacement" means the removal or discontinued use of any major portion of an ISTS and reinstallation of that portion of the system.

(100) Rock fragments. "Rock fragments" means pieces of rock greater than two millimeters in diameter that are strongly cemented and resistant to rupture. Rock fragments are commonly known as gravel, stones, cobbles, and boulders.

(101) SDS permit. "SDS permit" means a State Disposal System permit issued by the MPCA.

(102) Sand. "Sand" means a sand soil texture, as described in the Soil Survey Manual (1993) developed by the Natural Resource Conservation

Service, United States Department of Agriculture. The manual is incorporated by reference into this ordinance.

(103) 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.

(104) Seepage pit. "Seepage pit" means an underground pit that receives sewage tank effluent and from which the liquid seeps into the surrounding soil.

(105) 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 types of 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.

(106) Septic tank. "Septic tank" means any 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 area.

(107) 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.

(108) Setback. "Setback" means a separation distance between two points measured horizontally.

(109) Sewage. "Sewage" means waste produced by toilets, bathing, laundry, or culinary operations, or the floor drains associated with these sources, and includes but is not limited to household cleaners, medications, and other constituents in sewage restricted to amounts normally used for domestic purposes.

(110) Sewage flow. "Sewage flow" means flow as determined by measurement of actual water measurement; or, if actual measurements are not available, by the best available data provided as determined by the Department.

(111) 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 Section 13 of this Chapter. Sewage tanks are considered a septic system in Minnesota Statutes, section 115.55, subdivision 1, paragraph (p).

(112) Sewage tank effluent. "Sewage tank effluent" means the liquid that flows from a septic tank or other treatment device.

(113) Site. "Site" means the area required for the proper location of the SSTS.

(114) Slope. "Slope" means the vertical rise, expressed as a percentage from a point A to a point C divided by the horizontal distance from point A to

point B where the line from point C to point B is perpendicular to the line from point A to point B.

(115) Soil dispersal area. "Soil dispersal area" means the area required for the soil dispersal system, including spacing between individual units or zones.

(116) 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.

(117) Soil Survey. "Soil Survey" means the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey available online at http://websoilsurvey.nrcs.usda.gov/.

(118) 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 Section 2.2 (46).

(119) Structure. "Structure" means a constructed lot improvement that is intended or used for human occupancy or that is determined by the Department to:

(A) Interfere with the construction, operation, or maintenance of an SSTS; or,

(B) Be interfered with by the construction, operation, or maintenance of an SSTS.

(120) 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.

(121) Subsurface sewage treatment system or SSTS. "Subsurface sewage treatment system" or "SSTS" is either an individual subsurface sewage treatment system as defined in Section 2.2 (52) or a midsized subsurface sewage treatment system as defined in Section 2.2 (70), as applicable.

(122) Supply pipe. "Supply pipe" means a non-perforated pipe, the purpose of which is to transport sewage tank effluent.

(123) 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 or systems:

(A) SSTS constructed in shoreland areas where land adjacent to public waters has been designated and delineated as shoreland in Chapter Six of the Washington County Development Code;

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

(C) SSTS serving food, beverage, and lodging establishments that are required to obtain a licenses under Minnesota Statutes, section 157.16, subdivision 1, and Washington County Ordinance No. 145 or 146, and includes manufactured home parks and recreational camping areas licensed according to Minnesota Statutes, chapter 327 and Washington County Ordinance No. 147.

(124) TN. "TN" means total nitrogen, which is the measure of the complete nitrogen content in wastewater, including nitrate (NO_3^-), nitrite (NO_2^-), ammonia (NH_3), ammonium (NH_4^+), and organic nitrogen, expressed as mg/L.

(125) TP. "TP" means total phosphorus, which is the sum of all forms of phosphorus in effluent, expressed in mg/L.

(126) Ten-year flood. "Ten-year flood" means the flood which can be expected to occur, on an average, of once in ten years, or the elevation to which flood waters have a ten percent chance of rising in any given year.

(127) Toilet waste. "Toilet waste" means waste commonly disposed of in toilets, including fecal matter, urine, toilet paper, and water used for flushing.

(128) 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.

(129) Topsoil. "Topsoil" means the natural, in-place organically enriched soil layer with a color value of less than 3.5 using the Munsell Soil-Color Charts.

(130) 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 using the Munsell Soil-Color Charts; and,
- (D) Adequate nutrients and pH to sustain healthy plant growth.

(131) Total suspended solids or TSS. "Total suspended solids" or "TSS" means solids that are in suspension in water and that are removable by laboratory filtering, expressed as mg/L.

(132) Trench. "Trench" means a soil treatment and dispersal system, the absorption width of which is 36 inches or less.

(133) Type I System. "Type I System" means a subsurface sewage treatment system that meets the prescriptive design criteria in Section 17 of this Chapter, and includes trenches, pressure beds, mounds and at grade systems with no pre-treatment ahead of the soil treatment area.

(134) Type II System. "Type II System" means a subsurface sewage treatment system that meets the prescriptive design criteria in Section 18 of this Chapter, and includes systems in a floodplain with no pre-treatment ahead of the soil treatment area, holding tanks, and privies.

(135) Type III System. "Type III System" means a subsurface sewage treatment system that meets the standards in Section 19 of this Chapter and does not require pre-treatment ahead of the soil treatment area, and is put on a site with less than ideal soil conditions, such as soil that has been compacted, cut, filled or otherwise disturbed. Type III systems include Graywater Systems as described in Section 19.5 of this Chapter.

(136) Type IV System. "Type IV System" means subsurface sewage treatment system that meets the standards in Section 20 of this Chapter and requires pre-treatment ahead of the soil treatment area, due to high strength waste from the source or for reduced vertical separation, and uses a pre-treatment device that is registered in accordance with Minnesota Rules, Chapter 7083.4030.

(137) Type V System. "Type V System" means a subsurface sewage treatment system that meets the standards in Section 21 of this Chapter and requires pre-treatment ahead of the soil treatment area and uses a pre-treatment device that is not registered in accordance with Minnesota

Rules, Chapter 7083.4030.

(138) Unclassified Body of Water. "Unclassified Body of Water" means any lake, pond, backwater, swamp, marsh, wetland, stream, drainage way, flowage, river, floodplain or other water oriented topographical features not designated as being a natural environment lake, recreational development lake, general development lake, or transition river or tributary stream on the zoning map.

(139) Uniform distribution. "Uniform distribution" means a method that distributes effluent evenly over the entire absorption area of a component over both time and space.

(140) Valve box. "Valve box" means a watertight structure designed for alternate distribution of sewage tank effluent to segments of a soil treatment system.

(141) 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.

(142) Watertight. "Watertight" means constructed so that no liquid can get into or out of a device except through designed inlets and outlets.

(143) Water Resources. "Water Resources" means all wetlands, streams, rivers, lakes not defined as Natural Environment, Recreational Development, or General Development Lake; Transition or Tributary River/Stream; or Wild and Scenic Rivers.

(144) Well capture zone. "Well capture zone" means the surface and subsurface area that supplies water to a water supply well.

(145) Wellhead protection area. "Wellhead protection area" means the surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well field as regulated under Minnesota Rules, 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 Minnesota Rules, Chapter 4720.

SECTION 3. ADMINISTRATION

3.1 Administrative scope.

This chapter shall apply and be in effect in all areas in Washington County other than cities and towns that have adopted ordinances that comply with Minnesota Statute Section 115.55, Minnesota Rules, Chapter 7082, and are as restrictive as this Chapter. The Washington County Department of Public Health and Environment shall be the Administrator of this Ordinance. .

3.2 Qualifications.

SSTS, including both ISTS and MSTS, must be designed, installed, inspected, maintained, repaired, and operated by licensed businesses and certified individuals meeting the qualifications in Minnesota Rules 7083.0700 to 7083.2040. SSTS must conform to all applicable state laws and rules and local requirements.

3.3 Federal regulations.

SSTS that are designed to receive sewage or non-sewage from a two family dwelling or greater, or receive sewage or non-sewage from another establishment that serves more than 20 persons per day, are regulated by the United States Environmental Protection Agency as Class V injection wells under Code of Federal Regulations, title 40, parts 144

and 146. Code of Federal Regulations, title 40, parts 144 and 146, prescribe additional design regulations applicable to certain systems designed under this Chapter. In addition, single family dwellings that receive non-sewage wastewater are regulated by these federal regulations. All systems that receive hazardous wastes are regulated by the Unites States Environmental Protection Agency as Class IV injection wells. Disposal of hazardous waste must be according to state and federal regulations. The owner or owner's agent of a new or replacement system classified as a Class V injection wells shall submit to the commissioner of the MPCA and the United States Environmental Protection Agency the inventory information specified in Code of Federal Regulations, title 40, section 144.26. All Class V injection wells must be identified as such in property transfer disclosures.

3.4 Variance procedures.

Variance procedures.

If the Department finds that by reason of exceptional circumstances, the strict enforcement of any provisions of this Chapter would cause Practical Difficulties or that strict conformity with the standards would be unreasonable, impractical, or not feasible under the circumstances, the Department may permit modifications in individual cases based on conditions it may prescribe for prevention, control or abatement of pollution, with the exception of sections related to setbacks or zoning. Modifications related to setbacks or zoning shall be heard by the Washington County Board of Adjustment and Appeals. The Department cannot issue variances for Sections 4.1, 4.7, 4.8, 4.9, and Sections 16.2 (1) through Section 16.2 (4). The Department can grant a variance for Section 4.8 (4) (A) for replacement MSTS serving existing dwellings or other establishments.

The Washington County Board of Adjustment and Appeals shall hear and decide appeals of any order, decision or determination made by the Department regarding the enforcement of this Chapter. Appeals of any administrative decision or determination may be filed by any person, county department, or township.

3.5 Adherence to these standards

All subsurface sewage treatment systems installed subsequent to the adoption of this Chapter and all alterations, extensions, modifications or repairs to existing systems irrespective of the date of original installation shall be regulated in accordance with all requirements of this Chapter.

3.6 MSTS qualifications.

All MSTS must be designed and operated according to this Chapter. All MSTS must be designed, installed, inspected, pumped and operated by a qualified employee under part 7083.1010, or a licensed business meeting the qualifications of Minnesota Rules, Chapter 7083. All MSTS must conform to applicable state statutes and rules.

3.7 Collection Systems.

Collection of greater than 2,500 gallons per day of sewage from multiple buildings or multiple other establishments discharging into an SSTS must be:

(1) Designed according to Prescriptive Designs and Design Guidance for Advanced Designers, incorporated by reference under Section 5.2(4); or

(2) Designed by a Minnesota licensed professional engineer.

3.8 MSTS septage

All septage generated from MSTS must be treated and dispersed to applicable standards for septage as set forth in Code of Federal Regulations, title 40, part 503, and any local requirements.

3.9 SDS permit required.

(1) The owner or owners of a single SSTS, or a group of SSTS under common ownership must obtain either an National Pollutant Discharge Elimination System (NPDES) or an State Disposal Permit (SDS) permit from the MPCA and comply with all NPDES or SDS requirements according to Minnesota Rules, Chapter 7001 when all or part of the proposed or existing soil dispersal components are within one-half mile of each other and the combined flow from all proposed and existing SSTS is greater than 10,000 gallons per day. For proposed SSTS, the flow must be determined according to Section 3.9(3). For existing SSTS, the flow is determined by the greater of:
(A) The average maximum seven-day measured flow; or
(B) The flow determined according to Section 3.9(3).

(2) An SDS permit is required for any subsurface sewage treatment system or group of subsurface sewage treatment systems that the commissioner determines has the potential or an increased potential to cause adverse public health or environmental impacts if not regulated under a state permit. Conditions for these permits include systems in environmentally sensitive areas, unsubstantiated or unexpected flow volumes, and systems requiring exceptional operation, monitoring, and management.

(3) Flow amounts to calculate whether an SDS permit is required must be determined according to Section 12.4 to 12.10. The highest calculated value of the various methods in Table II of Section 12 must be used to make this determination. An SDS permit is not required, for an SSTS not otherwise requiring an SDS, if a factor of safety is added to the design flow that results in a design flow that is in excess of the SDS permit threshold.

3.10 Other state regulations.

MSTS must conform to all applicable state statutes and rules. MSTS serving establishments licensed or regulated by the State of Minnesota, or MSTS owned by the State of Minnesota, must conform to this Chapter.

Other state and local regulations.

3.11 Local regulations.

Any SSTS requiring approval from the State of Minnesota must also meet all requirements set forth in this Chapter, and in all other local codes and ordinances.

3.12 Work done without permit.

Where work requiring a permit under this Chapter has commenced without first having obtained such permit, work shall be ordered to stop by the Department until all required permits have been approved and issued.

3.13 Authorized access.

To ensure compliance with this Ordinance, the Department or its authorized agent may enter on property where there is reason to suspect that a subsurface sewage treatment system is failing to protect groundwater or is an imminent threat to public health and safety.

3.14 Permit fees.

Fees for permits, operating permits, inspections required, or services rendered under this Chapter shall be set by the Washington County Board of Commissioners.

SECTION 4. COMPLIANCE CRITERIA

4.1 Treatment required.

Sewage discharged from a dwelling, group of dwellings, or other establishment that is not served by a system issued an operating permit containing effluent and discharge limits or specific monitoring requirements must be treated according to applicable requirements.

4.2 Compliance criteria for new construction.

An SSTS regulated under a current permit is considered compliant if it meets the applicable requirements of Section 16 to Section 21.

4.3 Compliance criteria for existing systems.

To be in compliance, an existing SSTS must meet the provisions of this subpart.

Compliance criteria for existing systems.

(1) The SSTS 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 which discharges 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 into a dwelling or other establishment; systems which pose electrical hazards; systems which have sewage tanks that are unsecured, damaged, or with weak maintenance hole covers. A determination of protectiveness for other conditions must be made by a qualified employee of the Department or licensed inspection business.

A system that discharges untreated sewage to the ground surface, ditches, storm water drains or surface water is considered to be an imminent threat to public health and safety.

(2) The SSTS must be protective of groundwater. A system that is not protective is considered a system failing to protect groundwater. At a minimum, a system that is failing to protect groundwater is a system that is a cesspool; a system with less than the required vertical separation distance described in Section 4.3 (4) and Section 4.3 (5) of this Section; and a system not abandoned in accordance with Section 24. A determination of the threat to groundwater quality for this and other conditions must be made by a qualified employee of the Department or licensed inspection business.

A system that is not protective of groundwater is considered to be failing to protect groundwater.

(3) The SSTS must meet performance standards and be managed and operated according to its operating permit.

(4) SSTS built after March 31, 1996, or in an SWF area as defined in Section 2.2 (122), shall have a three (3) foot vertical separation. No more than a fifteen (15) percent reduction in the vertical separation distance is allowed to account for settling of sand or soil, normal variation of measurements, and interpretations of the limiting layer conditions.

(5) SSTS built before April 1, 1996, in areas that are not SWF areas as defined in Section 2.2 (122), must have at least two (2) feet of vertical separation.

(6) The vertical separation measurement for Section 4.3 (4) and Section 4.3 (5) shall be measured outside of the area of system influence in an area of similar soil and on the same contour elevation.

(7) An existing SSTS which is found to be an imminent threat to public health and safety by a qualified employees of the Department, or a licensed inspection business, is hereby declared to be a public health nuisance and shall be abated within ten (10) days from the date the Owner is given notice. The system shall be repaired, upgraded, replaced or its use discontinued within ninety (90) days from the date the

Timeline for abatement and replacement for systems

Department gives the Owner notice and order to comply by the Department. Any further discharge of effluent must be prevented within ten (10) days (by such methods as reducing or stopping all water use or pumping the tank as necessary) until such time as the system is corrected.

(8) Any existing system which is found to be failing to protect groundwater shall be replaced or otherwise brought into compliance within six (6) months of notice and order to comply by the Department. The Department may grant a one-time, six month extension.

4.4 Compliance criteria for systems with a flow of greater than 2,500 gallons per day.

In addition to the requirements under Section 4.3, systems designed under Section 16.4 must demonstrate that the additional nutrient reduction component required under that section is in place and functioning.

4.5 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 this Chapter. The repaired or replaced components must meet the technical standards and criteria of this Chapter. The remaining components of the existing system must result in the system being in compliance with Section 4.3. If an existing sewage tank is to be used with the design of the new soil dispersal system, the tank must also be baffled, watertight, and the manhole cover brought to grade.

4.6 MSTS General.

Newly constructed, replacement, or existing MSTS designed under this Chapter are considered conforming if they meet the requirements of this Chapter. Existing MSTS constructed before the effective date of this Chapter are considered conforming if they meet the requirements of this Section, except for Section 4.8 (4) and Section 4.8 (5).

4.7 Public health and safety; imminent threat.

(1) To be in compliance, all MSTS must:

(A) Have treatment processes and devices that do not allow sewage or sewage effluent contact with humans, insects, or vermin;

(B) Disperse sewage effluent into soil or sand below final grade, with the effluent remaining below final grade;

(C) Not discharge to drainage tile, the ground surface, or surface water or back up sewage into dwellings or other establishments;

(D) Treat and disperse sewage effluent in a safe manner, including protection from physical injury and harm; and

(E) Not have received hazardous material.

(2) MSTS must be considered an imminent threat to public health and safety for noncompliance with Section 4.7 (1) and any other condition that poses an imminent threat as determined by a qualified employee of the Department or licensed advanced inspection business.

4.8 Groundwater protection.

To be in compliance, all MSTS must:

(1) Meet the requirements of Section 4.3 (4)

(2) Not be seepage pits, cesspools, drywells, leaching pits, sewage tanks, and treatment vessels that observably leak below the designated

operating depth;

(3) Not allow viable fecal organisms to contaminate underground waters or zones of seasonal saturation;

(4) Employ nitrogen reduction processes that reduce nitrogen contribution to groundwater as determined in sub-items (A) and (B):

(A) If the discharge from an MSTS will impact water quality of an aquifer, as defined in Minnesota Rules, Chapter 4725.0100, subpart 21, the effluent from an MSTS, in combination with the effective recharge to the groundwater, must not exceed a concentration of total nitrogen of 10 mg/L or greater at the property boundary or nearest receptor, which is closest; and

(B) If the discharge from an MSTS will not impact water quality of an aquifer, as defined in Minnesota Rules, Chapter 4725.0100, subpart 21, best management practices developed by the Commissioner to mitigate water quality impacts to groundwater must be employed; and

(5) Not exceed a groundwater discharge of phosphorus to a surface water that exceeds the phosphorus standard to the receiving water.

4.9 Other conformance.

To be in compliance, all MSTS must meet the following requirements:

(1) All methods and devices used to treat and disperse sewage must be designed to conform to all applicable federal, state and local regulations.

(2) Systems no longer in use must be abandoned according to Section 24.

4.10 System operation.

MSTS operation and management requirements.

To be in compliance, MSTS must meet performance standards and be operated and managed according to its operating permit and management plan, as described in Section 22.1. To be in compliance, an MSTS designed before February 4, 2008 must be operated according to applicable requirements in Section 22.

4.11 Compliance criteria for systems receiving replacement components.

Components of existing MSTS that cause non-compliance must be repaired or replaced. The repaired or replaced components must meet technical standards and criteria of this Chapter. The remaining components must comply with Section 4.1 to Section 4.10if constructed after February 4, 2008.

4.12 Upgrade requirements.

(1) MSTS in compliance with this Chapter shall be issued a certificate of compliance. MSTS found not in compliance with this Chapter shall be issued a notice of noncompliance.

(2) MSTS issued a notice of noncompliance based on the criteria in Sections 4.7 shall be repaired or replaced in accordance with Section 4.3 (7) of this Chapter or as directed by Minnesota Statutes, Chapter 145A, whichever is more restrictive.

(3) MSTS issued a notice of noncompliance based on criteria in Section 4.8 or Section 4.9 shall be repaired or replaced in accordance with Section 4.3 (8) of this chapter.

(4) Systems issued a notice of non-compliance based on criteria in Section 4.10 must immediately be put into compliance with the operating permit.

SECTION 5. ACCEPTABLE AND PROHIBITED DISCHARGES

5.1 Sewage.

This Chapter provides design standards for SSTS that receive sewage. If an SSTS receives both sewage and non-sewage, the requirements of this chapter and requirements governing the non-sewage portion of the water apply.

5.2 System influent.

List of prohibited discharges into a SSTS.

(1) Footing or roof drainage and chemically treated hot tub and pool water must not be discharged into any part of a SSTS. Hazardous waste must not be discharged to a SSTS. Products containing hazardous chemicals must not be discharged to an SSTS other than normal amounts of household 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 a SSTS. Other unused products or substances, or unused medicines, must not be discharged to a SSTS as a method of disposal. Floor drains from garages serving dwellings, vehicle maintenance businesses, or any other floor drain that would have the potential to introduce hazardous waste into the SSTS, must not be connected to a SSTS.

(2) An ISTS must be designed to provide additional treatment if:

(A) Raw sewage exceeds 300 mg/L BOD, 200 mg/L TSS, or 50 mg/L oil and grease; or

(B) Sewage tank effluent applied to the soil from the sewage tank or other secondary treatment device is greater than the concentrations in Section 12.11.

(3) Additional treatment must be designed by a Minnesota licensed professional engineer or according to the recommendations in the Prescriptive Designs and Design Guidance for Advanced Designers, which is incorporated by reference, or must use a product registered under Minnesota Rules, Chapter 7083.

(4) Prescriptive Designs and Design Guidance for Advanced Designers, Minnesota Pollution Control Agency (October 2013 and as subsequently amended), is made a part of this ordinance by reference, is subject to frequent change, and is available at www.pca.state.mn.us/programs/ists/technical.html.

5.3 Domestic waste.

Only domestic strength waste shall be discharged to a soil dispersal and treatment area. Sewage tank effluent with a waste strength higher than domestic waste shall be pre-treated to a level equal to or less than domestic waste prior to final treatment and disposal in a soil treatment and dispersal area.

SECTION 6. PERMITS

6.1 Building Permit requirements.

No construction shall be allowed by any local unit of government until the permit required for the subsurface sewage treatment system has been issued.

SSTS permits are required prior to the start of construction.

6.2 Compliant system or permit issued.

No additions, enlargements, improvements, or remodeling involving fifty (50) percent or more of the structure, or alterations that would affect the water use, such as bedrooms, bathrooms or additions to living space (excluding such areas as screen porches, entry ways, decks, attics, patios, non-habitable storage space) shall be allowed until the subsurface sewage treatment system has been determined to be both adequate and conforming or a permit for a new treatment system has first been issued.

6.3 Permit required.

Permits shall be required for subsurface sewage treatment systems in the following instances:

Permit required to install, repair, replace, or change a SSTS.

(1) All new installations of sewage tanks, soil dispersal and treatment areas, and components thereof;

(2) All repair, extension, replacement or modification of existing systems and components; or

(3) Any change in use of a facility served by a subsurface sewage treatment system.

6.4 Permit application.

Permit applications shall be made in writing on forms provided by the Department and shall contain data, including, but not limited to, to be considered a completed permit application:

(1) Correct legal description of the property, including Property Identification Number or GEO Code;

(2) Site plan, drawn to scale, showing the location of all proposed and existing structures, property lines, water supply wells within 100 feet, terrain features, such as blufflines, water bodies or water ways, buried utilities, easements, and other unique features of the site;

(3) Soil test date, including soil boring logs, percolation test data with field notes (where required) and location and identification of test area.

(4) Plans and details of the proposed installation of work, including engineering data and final design.

(5) Building plans showing existing and proposed room arrangement and uses.

(6) For other than dwellings, calculated or measured water use rates, occupancy and occupant load.

(7) Where deemed necessary, a property survey may be required identifying corners and lines and other items such as elevations, contour lines, ordinary high water levels, and ten (10) year and one hundred (100) year flood elevations as applicable.

(8) Evidence of compliance with state or other jurisdiction regulations where applicable.

(9) A management plan for the proposed system, as described in Section 22.1.

(10) A site grading plan.

6.5 Site plan required.

Permit applications must include a site plan, management plan, and soil observations.

No permit will be issued until a detailed system design is submitted for the current proposed construction, including site plan, a management plan and current soil observations. If previous soil observations have been conducted and meet this Chapter, and there is no reason to believe the soil conditions have changed, those soil observations may be used for the design of the proposed SSTS.

Permits are valid for one year.

6.6 Permit time limit.

Permits shall be valid upon issuance and shall continue for a period of one (1) year. After one (1) year, the permit may be renewed if no changes are proposed. Such renewal shall require reapplication and payment of the established fee. Permits greater than five years old shall not be renewed until it has been determined that site conditions remain complaint with the requirements of this Ordinance.

6.7 Permit revocation.

Permits issued under this Chapter may be revoked upon written notice by the department when such permit has been issued based on erroneous or inaccurate data supplied by the applicant or erroneous interpretation of the law by a building official.

SECTION 7. OPERATING PERMITS

7.1 Operating permit required.

Operating permits are required for the following systems:

List of system types that require an Operating permit.

(1) Type IV Systems
(2) Type V Systems
(3) All MSTS
(4) Food, Beverage and Lodging Establishments that discharge high-strength waste to the soil treatment area.

7.2 Operating permits issued.

Operating permits will be issued by the Department.

7.3 Operating permit criteria.

Operating permits may include:

(1) Maintenance requirements, including frequency of maintenance;
(2) Operational requirements;
(3) Monitoring requirements;
(4) Compliance limits and compliance boundaries;
(5) Reporting frequency;
(6) A requirement that the permittee notify the Department when permit requirements are not met. Corrective actions must be taken as directed by the Department;
(7) Disclosure of the location and condition of the additional soil treatment and dispersal system; and
(8) A stipulation of acceptable and prohibited discharges.
(9) Any other requirement determined by the Department to be necessary to ensure that public health and the environment are being adequately protected.

7.4 Operating Permits

SSTS for which an operating permit has been issued, must be operated in accordance with the operating permit.

7.5 MSTS Maintenance

MSTS and other establishments must be maintained according to Section 22.

7.6 Grease Interceptors.
All external grease interceptors must be routinely inspected to determine the volume of grease present. All external grease interceptors must be properly maintained to prevent clogging of downstream piping and system components.

7.7 Operation and Maintenance Manual.
For all MSTS constructed after the effective date of this Chapter, the designer must complete an operation and maintenance manual and the manual must be submitted to the Department or the local unit of government before system operation. The manual shall include a copy of the plans and specifications, as-built drawings of the system, and information to properly operate the system.

7.8 Groundwater Monitoring.
Groundwater shall be monitored in accordance with Section 11.

7.9 Noncompliance.
Any operational noncompliance must be immediately corrected and reported by the owner or service provider to the Department.

SECTION 8. INSPECTIONS

8.1 Required inspections.
Inspections to determine compliance with this Chapter shall be performed by the Department or its authorized agent in the following circumstances:

List of circumstances that require a compliance inspection.

(1) Site inspections to verify and evaluate soil and site conditions and to determine the suitability of soils and system design prior to permit issuance.
(2) Investigations to determine compliance of existing systems at the time of remodeling, of alteration, or of additions to a dwelling.
(3) For all SSTS replacement or new construction when the system is near completion.
(4) Mound systems require a minimum of three construction inspections:
  (A) When the original soil under the mound has been roughened, but prior to placement of the sand fill. Enough of the proposed sand fill must be present to be viewed.
  (B) After placement of rock and piping, but prior to cover.
  (C) When the mound is completed.

8.2 Time of inspections.
Installation inspections shall be made by the Department prior to any work being covered by backfill.

8.3 Inspection scheduling.
The licensed installation business shall notify the Department a minimum of twenty-four (24) hours prior to the time work is ready for inspection or reinspection.

8.4 Work backfilled before inspection.
Work which is backfilled prior to a required inspection may be ordered to be uncovered whenever the Department deems it necessary to determine compliance.

8.5 Correction orders.
If upon inspection any part of the system is determined not to be in compliance with this Chapter, written notice shall be provided by the Department indicating the deficiency and the required corrections. Noted deficiencies shall be properly corrected and reinspected before any other work on the project is continued.

8.6 System placed into service
No system shall be replaced or placed in service until a final inspection has been completed and the system installation has been approved.

8.7 Department access.
The owner or occupant of a property shall provide access at a reasonable time to the Department or its authorized agent for the purpose of performing inspections required under this Chapter.

8.8 As-builts.
The Contractor, upon completion of installation, shall file with the Department as-built drawings indicating the location of system components dimensioned from a permanent reference point.

8.9 Disclosure.
If an inspection is conducted as a part of preparation of the disclosure required by Minnesota Statutes 115.55, subd. 6 and such inspection is conducted by a party who is not the property owner, such party must be licensed in accordance with MPCA rules and regulations and the notice of compliance or noncompliance provided to the property owner must also be provided to Washington County within thirty (30) days of the inspection.

8.10 Compliance inspection; new construction or replacement.
(1) A compliance inspection for all new construction or replacement must be conducted:
  (A) To ensure compliance with applicable requirements;
  (B) Unless the age of the system is less than 5 years, prior to the transfer of any real property;
  (C) To ensure compliance before issuance of a permit for the addition of a bedroom on property served by an SSTS;
  (D) By a qualified employee or licensed inspection business, authorized by the Department or local unit of government, who is independent of the owner and the installer; and
  (E) For an evaluation, investigation, inspection, recommendation, or other process used to prepare a disclosure if conducted by a party who is not the system owner. The disclosure action constitutes a compliance inspection and must be conducted according to Minnesota Rules, Chapter 7082;
  (F) When deemed necessary by the Department to ascertain the compliance of an existing system. A licensed inspection business that inspects an existing SSTS is allowed to subsequently design and install a new SSTS for that property, provided the inspection business is also licensed to design and install.
(2) A licensed inspection business working on behalf of the Department or local unit of government must not design or install a system if there is likelihood that the inspector or business will be responsible for permitting

or inspecting the system or system site.

(3) A licensed SSTS business may inspect an existing system which they installed once it has been independently inspected and found to be compliant.

(4) A person working for or on behalf of the Department or local unit of government is not allowed to use the person's position to solicit business for private gain.

8.11 Certificate of compliance; notice of noncompliance.

Completed SSTS work will be issued either a Certificate of Compliance or a Notice of Noncompliance.

(1) SSTS in compliance with applicable requirements must be issued a certificate of compliance. SSTS found not in compliance must be issued a notice of noncompliance. SSTS not in compliance with Section 4.3 (1) or Section 4.7 must be repaired or replaced within 90 days from notice by the Department or as directed under Minnesota Statutes, chapter 145A. Systems out of compliance with other applicable requirements must be repaired or replaced according to this Chapter. Systems issued a notice of noncompliance for operational or monitoring deficiencies must immediately be maintained, monitored, or managed according to the operating permit.

(2) The initial certificate of compliance must be issued if reasonable assurance is evident that the system was built according to applicable requirements as specified in the construction permit and an as-built as required by Section 8.8 is submitted to the Department.

(3) A Management Plan, as described in Section 22.1, must accompany a compliance inspection report in order for a Certificate of Compliance to be issued by the Department or local unit of government.

List of the information required in a Certificate of Compliance.

(4) The certificate of compliance for new construction and replacement must include the vertical separation distance report described in Section 8.13 (3) (B), and the management plan developed under Section 22.1. All certificates of compliance and notices of noncompliance for new construction and replacement must include property and property owner identification, date of inspection, system components, system location (dimensioned or drawn to scale), well setback distance, field check of soil conditions, SWF, as defined under part Section 2.2 (122), designations as applicable, and Class V designation as applicable.

A Certificate of Compliance or Notice of Noncompliance for a new system must be signed by a certified inspector or local unit of government and submitted to the owner within 15 days.

(5) A certificate of compliance or notice of noncompliance for new construction or replacement must be signed by a qualified employee certified as an inspector who is authorized by the Department or local unit of government. The certificate of compliance or notice of noncompliance for new construction and replacement must be submitted to the owner or owner's agent within 15 days. The certificate of compliance or notice of noncompliance for new construction and replacement must be submitted to the owner or owner's agent within 15 days after any compliance inspection

(6) A certificate of compliance or notice of noncompliance must include a certified statement from the qualified employee who conducted the compliance inspection and indicate whether the SSTS is in compliance with this Chapter.

(7) If a compliance inspection for new construction or replacement indicates that the system is not in compliance with applicable requirements, the notice must contain a statement to this effect and specify the reason for noncompliance.

(8) Certificates of compliance for new construction or a replacement system remain valid for five years from the date of issuance unless the Department or local unit of government finds evidence of noncompliance.

8.12 Compliance inspections; existing systems.

(1) A compliance inspection of an existing system must be conducted:

(A) Prior to the transfer of any real property, unless the age of the existing system is less than 5 years;

(B) When deemed necessary by the Department to ascertain the compliance of an existing system.

(2) A compliance inspection of an existing system must first determine whether the soil dispersal system, sewage tanks, or conditions pose an imminent threat to public health and safety. A determination must then be made as to whether the sewage tanks and soil dispersal area are failing to protect groundwater. The inspection must also verify compliance with Section 4.3 (3).

(3) The Agency's inspection report form for existing SSTS supplemented with any necessary or locally required supporting documentation, must be used for the existing system compliance inspections in sub-items (A) to (D). Allowable supporting documentation includes tank integrity assessments made within the past three years and prior soil separation assessments.

Existing SSTS must be checked for tank integrity, soil separation, and hydraulic and operational performance during the inspection.

(A) A tank integrity and safety compliance assessment must be completed by a licensed SSTS inspection, maintenance, installation or service provider business, or a qualified employee inspector with jurisdiction. An existing compliant tank integrity and safety compliance assessment is valid for three years unless a new evaluation is requested by the owner or owner's agent or is required by the Department or local unit of government.

(B) A soil separation compliance assessment must be completed by a licensed inspection business or a qualified employee inspector with jurisdiction. Compliance must be determined either by conducting new soil borings or by prior soil separation documentations made by two independent parties. The soil borings used for system design or previous inspections are allowed to be used. If the soil separation has been determined by two independent parties, a subsequent determination is not required unless requested by the owner or owner's agent or required by the Department or local unit of.

(C) Determination of hydraulic performance and other compliance in Section 4.3(1) must be completed by either a licensed inspection business or a qualified employee inspector with jurisdiction.

(D) A determination of operational performance and other compliance in Section 4.3 (4) and Section 4.4, must be completed by a licensed advanced inspection business, a qualified employee with an advanced inspector certification with jurisdiction, or a service provider. A passing report is valid until a new inspection is requested.

(4) A certificate of compliance or notice of noncompliance for an existing system must be based on the results of the verifications in item 3. The

A Certificate of Compliance or Notice of Noncompliance for an existing system must be signed by a certified inspector or local unit of government and submitted to the owner within 15 days

certificate of compliance or notice of noncompliance for an existing system must be signed by a licensed inspection business or a qualified employee inspector with jurisdiction. The certificate or notice for an existing system must be submitted to the Department or local unit of government with jurisdiction and the property owner or owner's agent no later than 15 days after a compliance inspection. The completed form must also be submitted to the owner or owner's agent. The certificate of compliance for an existing system is valid for three years from the date of issuance, unless a new inspection is requested by the owner or owner's agent or is required by the Department or local unit of government.

(5) If a compliance inspection for an existing system indicates that the system is noncompliant, the notice must be signed by a licensed inspection business or qualified employee inspector with jurisdiction, contain a statement of noncompliance and specify the reason for noncompliance or each component as specified in Section 8.13(3).

8.13 Periodically saturated soil disagreements.

Procedures for resolving any periodically saturated soil discrepancies.

(1) If a documented discrepancy arises on the depth of the periodically saturated soil between licensed businesses for SSTS design or compliance purposes, all disputing parties must follow the procedure outlined in this subpart.

(2) One or more of the methods in units (A) to (C) must be employed.

(A) Obtain an opinion from a qualified employee of the Department or local permitting authority with jurisdiction, if the Department or local permitting authority is willing to provide an opinion.

(B) Obtain an opinion from an SSTS technical evaluation committee, if a committee has been developed for this purpose and is available and willing to render an opinion. The committee must be created in cooperation with the commissioner.

(C) Obtain an opinion from a Minnesota licensed professional soil scientist who is a certified SSTS designer or inspector and who is independent of, and agreed upon by, both parties.

(D) If options under Section 8.13 (2) (A) or Section 8.13 (2) (B) are not viable, an opinion must be rendered under Section 8.13 (2) (C).

(3) If opinions rendered in items Section 8.13 (1) or Section 8.14 (2) do not resolve the dispute, all initial and follow-up documents and information generated must be submitted to the Department or local unit of government. The Department or local unit of government shall take into consideration all information and opinions rendered and make a final judgment. The Department or local unit of government shall render findings of fact, conclusions of law, and findings setting forth the reasons for any final decisions it renders.

(4) If a documented discrepancy arises on the depth of the periodically saturated soil between an SSTS licensed business and the Department or local unit of government for SSTS design or compliance purposes, all disputing parties shall follow the procedure outlined in this item.

(A) The Department or local unit of government and the licensed business must meet at the disputed site in an attempt to resolve differences.

(B) If the provision in Section 8.13 (4) (A) does not resolve

differences, then one or more of the methods in Section 8.13 (2) (B) or Section 8.13 (2)(C), are allowed to be employed.

(C) If opinions in Section 8.13 (4)(B) are not sought or do not resolve the dispute, the Department or local unit of government shall take into consideration all information and opinions rendered and make a final judgment. The Department or local unit of government shall render findings of fact, conclusions of law, and findings setting forth the reasons for any final decisions they render.

(5) Upon resolution of a dispute, amendments to initial disputed documents containing the resolution shall be made and submitted to the Department and all other parties involved.

SECTION 9. SITE EVALUATION AND SOIL TESTING

9.1 Design Phase I; Site Evaluation.

Site evaluations consisting of preliminary and field evaluations according to parts this Section must be conducted for all proposed sites for SSTS, including both ISTS and MSTS. The site evaluation is considered the first phase of an SSTS design.

9.2 Preliminary Evaluation.

A preliminary evaluation for individual subsurface sewage treatment systems shall consist of determination, location, or existence of the following :

List of required information for a Preliminary Evaluation of a SSTS.

(1) Design flow, anticipated effluent concentrations of biochemical oxygen demand, total suspended solids, oil and grease, and anticipated presence of nondomestic waste from the dwelling, dwellings, or other establishments.

(2) Proposed or existing:

(A) Water supply wells within 100 feet of the proposed SSTS;

(B) Existing and proposed buildings or improvements on the lot; and,

(C) Buried water supply pipes within 50 feet of the proposed system.

(3) Easements on the lot.

(4) The ordinary high water level of public waters, if adjacent to the lot.

(5) Floodplain designation and flooding elevation from published data or data that is acceptable to and approved by the Department or local unit of government or the Minnesota Department of Natural Resources, if applicable.

(6) Property lines.

(7) All required setbacks from the system.

(8) The soil characteristics at the proposed soil treatment and dispersal areas as obtained by the soil survey report, 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.

(9) A geocode or property identification number.

(10) Names of property owners.

(11) The inner wellhead management zone or wellhead protection area of a public water supply, if applicable.

9.3 Field Evaluation.

A field evaluation for an individual subsurface sewage treatment system shall consist of the following items:

(1) Lot lines. Lot lines shall be confirmed in the field. Lot improvements, required setbacks, and easements must be identified.

(2) Surface features. The following surface features must be described:

(A) The percent and direction of the slope of 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.

(E) A geomorphic description.

9.4 Minimum Size, Soil Treatment Area.

For new subdivision testing, enough soil observations must be conducted to assure that at least 10,000 square feet of suitable soil exists for each lot for long-term sewage treatment. On previously subdivided lots, enough area of suitable soil must be identified for two soil treatment and dispersal areas. Percolation tests are not required for subdivision or lot approval testing unless the permeability cannot be estimated or there is reason to believe the soil is not original or has been disturbed.

9.5 Soil observations.

Complete soil testing on each individual lot must be conducted prior to permit issuance independent of any prior subdivision or lot approval testing. For permit issuance, a minimum of four (4) soil observations encompassing the proposed sewage treatment area are required. At least one soil observation must be performed in the portion of the soil treatment area anticipated to have the most limiting conditions. Larger areas may be required where conditions of use, soils, topography, or vegetation require. Soil observations must comply with the following requirements:

(1) The soil observation must be conducted within or on the borders of the proposed site;

(2) The soil observations must be performed in an exposed pit, by hand bucket auger, or probing. The use of flight augers is not allowed;

(3) The soil observation method must allow observation of the different soil horizons that constitute the soil profile and, if determining the loading rate by use of Table VI an undisturbed soil sample must be observed;

(4) Underground utilities must be located before soil observations are undertaken;

(5) Required safety precautions must be taken before entering soil pits;

(6) 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

(7) 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.

9.6 Soil descriptions for determination of limiting layers.

Site and weather conditions must be right for an accurate soil profile to be done.

Each soil profile observed at the proposed soil treatment and dispersal area must be evaluated under adequate light conditions with the soil in a moist unfrozen state for the

characteristics in items (1) through (8):

(1) 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 characteristics that affects water movement or treatment of effluent;

(2) 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;

(3) 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 Section 2.2 (46);

(4) Depth to bedrock.

(5) Depth to periodically saturated soil for new construction or replacement as determined by redoximorphic features and other indicators, as determined in sub-items (A) to (C):

(A) In subsoil and parent material, redoximorphic features include:

i. Distinct redoximorphic iron accumulation or distinct redoximorphic iron depletions;

ii. 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

iii. Faint redoximorphic concentrations or faint redoximorphic depletions in subsoil or parent material with a hue of 7.5YR or redder.

(B) 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:

i. Soil colors with a redoximorphic chroma of two or less; or

ii. Redoximorphic accumulations or depletions.

(C) In the upper 12 inches of the topsoil layer, if it is immediately followed by a periodically saturated horizon, the depth of seasonal saturation is determined by one or more of the indicators in units (i) to (vi):

i. Soil colors with a chroma of zero;

ii. Organic soil textures or mineral soil textures with an organic modifier;

iii. Dominance of hydrophytic vegetation;

iv. 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;

v. Redoximorphic accumulations or depletions; or

vi. 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 and subsequently amended). This field book is incorporated by reference, is available through the Minitex interlibrary loan system, and subject to

frequent change.

(6) Depth to periodically saturated soil for all existing systems, determined by redoximorphic features in item (5), except sub-items (B), unit (i), and (C), units (i), (iii), and (iv), as measured outside the area of the system influence in an area of similar soil.

(7) Depth of standing water in the soil observation excavation, measured from the soil surface, if observed.

(8) Any other soil characteristics 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 Section 2.2 (46).

9.7 Determination of loading rate and absorption area size.

The loading rate can be determined based on the undisturbed soil's texture, structure, and consistency.

The effluent loading and absorption area size must be determined by either item (1) or (2).

(1) The loading rate based on an examination of soil texture, undisturbed soil structure, and soil consistence at the depth of either the proposed absorption area or the most restrictive layer within three feet of the proposed soil absorption area 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 Section 2.2 (46); or

Procedure for determining the loading rate based on the soil's percolation rate.

(2) The loading rate based on the percolation procedure described in sub-items (A) to (H).

(A) Each test hole must be six to eight inches in diameter, and have vertical sides. 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 must be at the depth of either the proposed absorption area or the most restrictive layer within three feet of the proposed soil absorption area;

(B) Soil texture descriptions for percolation test holes must note the depths from the ground surface where texture changes occur;

(C) 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;

(D) 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;

(E) 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;

(F) 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;

(G) 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

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

9.8 Phase I; Site Evaluation Reporting.

The findings from the Preliminary Evaluation must be included in the Site Evaluation Report.

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

(1) Preliminary and field evaluation results from Sections 9.2 through 9.7

(2) Dates of preliminary and field evaluations.

(3) Design calculations using the most current version of the design forms furnished by the University of Minnesota.

(4) A map drawn to scale or dimension, with a north arrow, and including:

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

(B) The location of any unsuitable, disturbed, or compacted areas.

(C) The access route for system maintenance.

(5) The estimated depth of periodically saturated soil layer, bedrock, or flood elevation, if appropriate.

(6) The proposed elevation of the bottom of the soil treatment and dispersal system.

(7) Anticipated construction related issues.

(8) The name, address, telephone number, and certified statement of the individual conducting the site evaluation.

(9) 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.

(10) 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.

(11) A notation of any differences between observed soil characteristics and those identified in the soil survey report.

9.9 Soil testing required.

Applicants for subsurface sewage treatment system permits, site approvals or subdivision approvals will be required to submit soil test data from soil borings and percolation tests, or soil pits, for each proposed site or installation. The minimum testing shall be that necessary to verify suitable conditions for two complete soil dispersal and treatment areas.

9.10 Qualifications.

All soil testing shall be conducted in accordance with the requirements of this Chapter and shall be conducted by appropriately licensed businesses and certified individuals in accordance with Minnesota Rules, Chapter 7083.

Heavy machinery or other vehicles compact and damage soil reducing or eliminating its ability to support an SSTS.

9.11 Site Protection.

Prior to and during construction or lot improvements, the proposed initial and replacement soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

9.12 Utilities.

Underground utilities must be located before soil observations are undertaken. Required safety precautions must be taken before entering soil observation pits.

9.13 Mound soil testing.

Where soil tests require a mound, testing and design must clearly show suitable area for installation of two (2) complete mounds. Where site conditions are such that the only backup mound will likely be disturbed, the Department, at its discretion, may require both mounds to be constructed at once.

9.14 Compliance.

Designs for new construction or replacement SSTS must comply with all applicable requirements and any other applicable codes, rules, and laws.

9.15 Phase II Reporting.

Phase II design reports must include detailed drawings, design flows, system component sizing and calculations, hydraulic and organic loading rates, setbacks, location and elevations for construction, and management plans as described in Section 22.1, and a certified statement.

SECTION 10. MSTS SITE EVALUATION AND SOIL TESTING

10.1 Necessity of Soil and Site Evaluations.

Soil and site evaluations must be conducted for MSTS design. The evaluations must be conducted according to this Section and Section 9 of this Chapter. Evaluations must identify and delineate an initial and replacement soil treatment and dispersal area with appropriate system boundaries.

List of required information for a Preliminary Evaluation of a MSTS

10.2 Preliminary Evaluation.

A preliminary evaluation for midsized subsurface sewage treatment systems shall consist of determining:

(1) The design flow, anticipated effluent concentrations of biochemical oxygen demand, total suspended solids, and oil and grease, and anticipated presence of nondomestic strength waste from the dwelling, dwellings, or other establishments.

(2) Whether the location of water supply wells impacts the location of the system due to setback constraints.

(3) Whether building improvements will be within 50 feet of the proposed soil treatment and dispersal area.

(4) Whether buried water supply pipes will be within 50 feet of the proposed system.

(5) Whether easements will be within 50 feet of the proposed system.

(6) Whether the ordinary high water level of public waters will be within 500 feet of the proposed soil treatment and dispersal area and if so, a preliminary assessment of phosphorus impacts to the surface water.

(7) Whether the system will be located in a floodplain and the system location in relation to the 100-year flooding elevation from published data if available or data that is acceptable to the Department or local unit of government.

(8) The required setbacks from the proposed soil treatment and dispersal system.

(9) The soil survey information on the proposed soil dispersal area, including the soil map, map units, landscape position, parent material, flooding potential, slope range, periodically saturated soil level, depth to bedrock, texture, color, and structure of soil horizons, and permeability of soil horizons.

(10) A geocode or property identification number.

(11) The names of the property owners; and

(12) The location of the system on a United States Geological Survey quadrangle map of the proposed soil treatment and dispersal area and the area within one mile.

10.3 Field Evaluation.

Before conducting a field evaluation, the designer shall confer with the Department to determine the requirements and scope of the evaluation, dependent upon system size, soil conditions, and other applicable factors. At a minimum, the requirements in this Section must be met:

(1) Property Lines. Verifying property line location and soil test locations is the responsibility of the property owner. Site improvements, required setbacks, and easements must be identified, located, and marked.

(2) Site Area. A general evaluation and description of the proposed soil dispersal area, including a general geomorphic description, current land

use, and past land use, if known, must be provided.

(3) Surface Features. The following surface features must be identified and described:

(A) The dominant vegetation.

(B) Evidence of disturbed or compacted soil or flooding or run-on potential.

(C) Landscape position, including landform, slope gradient, slope direction, and surface morphometry as described in the Field Book for Describing and Sampling Soils Version 2.0, September 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.

(4) Soil Pits.

(A) Soil pits are required to investigate the soil for MSTS design. The required number of soil pits to adequately define the limiting layer and soil dispersal system sizing must be determined by professional judgment based on the size of the area, and consistency of the soil, and must be approved by the Department.

(B) The qualifying soil observation pits to be used for the MSTS design must be located on or near the borders of the proposed soil treatment and dispersal area. Soil observation pits must be dug outside the soil dispersal area, if possible. The soil must be observed and described to a depth of at least three feet below the proposed depth of the system. Other soil observation pits are allowed to supplement the required soil observation pit information.

(C) Underground utilities must be located before soil observations are undertaken. Required safety precautions must be taken before entering soil observation pits.

10.4 Soil Description.

The following soil observations must be made:

List of required soil observations.

(1) The soil properties and features described in items (A) to (M) must be described according to the Field Book for Describing and Sampling Soils, version 2, Natural Resources Conservation Service, United States Department of Agriculture (September 2001), for each soil horizon at each qualifying pit. The field book is incorporated by reference under Section 2.2 (46).

(A) Matrix soil color.

(B) Soil features that have different colors from the matrix color, including, but not limited to, clay films, organic stains, silt coats, nodules, and concretions.

(C) Abundance, size, color, and contrast of redoximorphic features.

(D) Soil texture, with modifiers.

(E) Grade, size, and shape of soil structure.

(F) Moist soil consistence.

(G) Abundance and size of rock fragments.

(H) Abundance and size of roots.

(I) Horizon boundary conditions.

(J) Parent materials.
(K) Pores, quantity and size.
(L) Quantity of boulders and tree stumps affecting construction.
(M) Any other characteristics of feature that affects permeability of the soil or treatment of sewage effluent.

(2) The depth to bedrock, if encountered, must be determined by the definition in Section 2.2 (9).
(3) The elevation of standing water evident in any soil pit must be identified.
(4) The soil must not be described when frozen, at improper moisture content, or under poor light conditions.

10.5 Method.
Hydraulic conductivity testing of the soil must be employed, along with a determination of the soil's texture, structure, and consistence, to determine the loading rate of effluent in the soil. The frequency of observations and measurements must be determined by the professional judgment of the designer, dependent on the variation in soil conditions and the system size, with the frequency of the observations and measurements approved by the Department.

10.6 Comparison with Soil Survey.
All field soil information gathered must be compared with soil survey information. Any discrepancies shall be identified.

10.7 Site and Soil Information.
Site and soil information gathered in Section 10.2 through Section 10.6 must be interpreted for suitability for MSTS siting, design, and construction, with consideration of the following:

(1) Surface features impacts from precipitation, run-on, and interflow or any other item that could have potential to adversely impact the ability of the soil to accept water.
(2) Cultural features, including, but not limited to, setbacks and easements.
(3) Site conditions affecting system layout, distribution system requirements, and constructability.
(4) Layers of coarse soil textures that affect treatment.
(5) Disturbed, compacted, cut-filled, or other unnatural condition, if present.
(6) The uniformity of the soil over the site.
(7) Future surrounding land use changes.
(8) Soil sizing factor or loading rate.
(9) An approximation of the rise in groundwater from system operations as determined by groundwater mounding calculations. A narrative evaluation of the accuracy of the approximation must be provided. The approximation must be related to the requirements in Section 16.5 (7).

10.8 Flood Fringe.
Whenever possible, the placement of a system within any part of the floodplain should be avoided.
Systems proposed to be located in flood fringes must determine feasibility of relocating the system outside the floodplain.

10.9 Depth.
The limiting layer in the soil shall be determined based on the depth of bedrock or periodically saturated soil if encountered. The depth of periodically saturated soil shall be determined according to Section 9.6 (5), and the depth to bedrock shall be as defined in Section 2.2 (9).

10.10 Site Protection.

The proposed soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

10.11 Soil and Site Report.

All information required in Section 10.2 through Section 10.10 must be submitted for review by the Department prior to final design. The submittal must also contain:

(1) A map of the proposed soil dispersal area, drawn to scale, showing:
  (A) Features with a setback within 150 feet of the system;
  (B) Easements within 50 feet of the system;
  (C) Floodplains, wetlands, and surface waters, within 100 feet of the system;
  (D) Location and elevation of all soil pits, borings, and hydraulic tests;
  (E) Two-foot contour lines;
(2) Dates and weather conditions during the field evaluation;
(3) Elevations of the periodically saturated soil or bedrock;
(4) Proposed depths of the system bottom;
(5) Proposed soil loading rate;
(6) System site boundaries;
(7) Anticipated construction related issues;
(8) The name, address, telephone number, and certified statement of the individual conducting the site evaluation; and
(9) A narrative explaining any difficulties encountered during the site evaluation, such as, but not limited to, identifying and interpreting soil and landform features, and how the difficulties were resolved.

SECTION 11. GROUNDWATER INVESTIGATION

11.1 Necessity of Investigation.

A preliminary groundwater evaluation must be conducted for all proposed MSTS according to this Section.

11.2 Preliminary Investigation.

The following information must be ascertained from the best available information:

(1) The size of the soil dispersal system, proposed loading rate, and system geometry;
(2) The geocode(s) or parcel identification number(s) of the parcel(s) where the proposed soil dispersal area is to be located;
(3) Any anticipated discharges from nondomestic sources to the proposed MSTS;
(4) The location of the MSTS on a United States Geological Survey quadrangle topographic map, including the area within a one-mile radius of the proposed soil treatment system;
(5) A determination of the general geology, periodic soil saturation, regional groundwater setting, and aquifers used for water supply and a description of the general site hydrology characteristics, including, but not limited to, identification and estimated depth measurements to geologic units and aquifers, and identification of groundwater confining strata;
(6) A determination whether the proposed system is in a drinking water

supply management area, inner wellhead management zone, source water protection area, or groundwater sensitive area;

(7) An assessment of all water supply wells within a 300-foot radius of the proposed soil treatment area with a minimum assessment of well locations and casing depths from well construction log records. If no records exist, the well locations and casing depths must be estimated;

(8) A determination or estimation of groundwater flow direction; and

(9) An assessment of nitrogen impacts from the system.

11.3 Field or Further Investigation.

The designer must consult with the Department to determine whether the Department will require a field or further groundwater investigation and, if so, the extent of the investigation. The field or further investigation must be conducted if information gained in Section 11.2 indicates that a proposed system is a potential contaminant threat to a regional water table, an aquifer, water supply well(s), or surface waters. The threats of concern include, but are not limited to, fecal organism contamination, nitrate contamination, or phosphorus impacts to surface waters.

11.4 Monitoring.

The designer must consult with the Department to determine if effluent or groundwater monitoring is required and, if so, the extent of the monitoring. Monitoring must be conducted if information gained in Section 11.2 and 11.3 indicates that a proposed system is a potential contaminant threat to a regional water table, an aquifer, or a water supply well or impacts surface waters. The potential groundwater mound height must be monitored under all MSTS during operation.

11.5 Hydrological Interpretations.

The information gathered in this part must be used to estimate or measure if the system adequately protects the groundwater and surface water as prescribed in Section 4.8. The interpretation must include an evaluation of whether contaminant plumes will intersect water supply well capture zones.

11.6 Groundwater Report.

All information required in Section 11 must be submitted for review and approval of the Department prior to final design, including all applicable information delineated on a map.

SECTION 12. SEWAGE FLOW DETERMINATION

12.1 Design Phase II: System Design.

Completion of tasks outlined in Section 12 to Section 21 is considered the second phase of SSTS design.

12.2 Design Flow.

The estimated design flow for any dwelling must provide for at least two (2) bedrooms. For multiple or multifamily dwellings, the design flow must be calculated according to Section 12.4 to 12.6.

12.3 Design Flow by Bedrooms.

The estimated design flow for dwellings is determined by Table I. For more than six bedrooms, the design flow is determined by multiplying the number of bedrooms by 150 gallons per day.

Table I

Number of Bedrooms	Gallons Per Day
2	300
3	450
4	600
5	750
6	900

12.4 Sum of design flow for existing dwellings.
The design flow for MSTS serving existing dwellings is determined by the following calculation in conjunction with Section 12.3:

Total flow from the ten highest flow dwellings + (total flow from the remaining dwellings X 0.45)

12.5 New housing developments.
For new housing developments to be served by a common SSTS, the developer shall determine and restrict the total number of bedrooms for the development and determine the design flow by multiplying the total number of bedrooms by 150 gallons per day. If the ultimate development of phased or segmented growth meets or exceeds 10,000 gallons per day, the initial system or systems and all subsequent systems require a state disposal system permit.

12.6 Additional Capacity.
If construction of additional dwellings or bedrooms, installation of water-using devices, or other factors likely to increase the flow volumes can be reasonably anticipated, the MSTS must be designed to accommodate the additional capacity as determined by the Department.

12.7 Design 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 are determined by methods in item (1) or (2):

(1) The design flow of sewage for other establishments is estimated using Table II.

(2) The measured design flow of sewage for other establishments is determined by averaging the measured daily flows for a consecutive seven-day period in which the establishment is at maximum capacity or use.

The design flow for an Other Establishment can be determined either by using Table II or by using a measured design flow.

Table II – Estimated Design Sewage Flow from Other Establishments

Dwelling Units (also see outdoor recreation)	Unit	Design Flow (gallons/day/unit)
Hotel or luxury hotel	Guest	55
	Square Foot	0.28
Motel	Guest	38
	Square Foot	0.33
Rooming House	Resident	45
	Add for each non-resident meal	3.3

Daycare (no meals)	Child	19
Daycare (with meals)	Child	23
Dormitory	Person	43
Labor Camp	Person	18
Labor Camp, semi-permanent	Person	50
Commercial/Industrial	Unit	Design Flow (gallons/day/unit)
Retail Store	Square Foot	0.13
	Customer	3.8
	Toilet	590
Shopping Center	Employee	11.5
	Square Foot	0.15
	Parking Space	2.5
Office	Employees/8-Hour Shift	18
	Square Foot	0.18
Medical Office*	Square Foot	1.1
	Practitioner	275
	Patient	8
Industrial Building	Employees/8-Hour Shift	17.5
	Employees/8-Hour Shift with Showers	25
Laundromat	Machine	635
	Load	52.5
	Square Foot	2.6
Barber Shop	Chair	68
Beauty Salon	Station	285
Flea Market	Nonfood vendor/space	15
	Limited food vender/space	25
	With food vendor/space	50
Eating and Drinking Establishments	Unit	Design Flow (gallons/day/unit)
Restaurant (does not include bar or lounge)	Meal without alcoholic drinks	3.5
	Meal with alcoholic drinks (open 16 hours or less)	8
	Seat (open 16 hours or less)	30
	Seat (open more than 16 hours)	50
	Seat (open 16 hours or less, single service articles)	20
	Seat (open more than 16 hours, single service articles)	35
Restaurant – short order	Customer	7
Restaurant – drive-in	Car Space	30
Eating and Drinking Establishments	Unit	Design Flow (gallons/day/unit)
Restaurant – carry out,	Square Foot	0.5

including caterers		
Institution Meals	Meal	5.0
Food Outlet	Square Foot	0.2
Dining Hall	Meal	8.5
Coffee Shop	Customer	7
Cafeteria	Customer	2.5
Bar or lounge (no meals)	Customer	4.5
	Seat	36
Entertainment Establishments	**Unit**	**Design Flow (gallons/day/unit)**
Drive-in Theater	Car Stall	5
Theater/Auditorium	Seat	4.5
Bowling Alley	Alley	185
Country Club	Member (no meals)	22
	Member (with meals and showers)	118
	Member (resident)	86
Fairground and Other Similar Gatherings	Visitor	1.5
Stadium	Seat	5
Dance Hall	Person	6
Health Club/Gym	Member	35
Outdoor Recreation and Related Lodging Facilities	**Unit**	**Design Flow (gallons/day/unit)**
Campground	Campsite with sewer hook-up (per person)	32
	Campsite with sewer hook-up (per site/space)	100
	Campsite without sewer hook-up, with central toilet or shower facility (per site)	50
	Campsite without sewer hook-up, with central toilet or shower facility, served by central dump station (per site)	63
Permanent Mobile Home	Mobile Home	225
Camp, day without meals	Person	20
Camp, day with meals	Person	25
Camp, day and night with meals	Person	45
Resort/Lodge Hotel	Person	62
Cabin, resort	Person	50
Retail Resort Store	Customer	4
Park or Swimming Pool	Guest	10
Visitor Center	Visitor	13

Transportation	Unit	Design Flow (gallons/day/unit)
Gas Station/Convenience Store	Customer	3.5
Service Station*	Customer	11
	Service Bay	50
	Toilet	250
	Square Foot	0.25
Car wash*(does not include car wash water)	Square Foot	5
Airport, Bus Station, Rail Depot	Passenger	5
	Square Foot	5
	Restroom	565
Institutional	**Unit**	**Design Flow (gallons/day/unit)**
Hospital*	Bed	220
Mental Health Hospital*	Bed	147
Prison or Jail	Inmate	140
Nursing Home, other adult congregate living	Resident	125
Other Public Institution	Person	105
School (no gym, no cafeteria, and no showers)	Student	14
School (with cafeteria, no gym, and no showers)	Student	18
School (with cafeteria, gym, and showers)	Student	27.5
School (boarding)	Student	95
Church	Seat	4
Nursing Home, other adult congregate living	Add for each meal prepared	5
Assembly Hall	Seat	4
Miscellaneous	**Unit**	**Design Flow (gallons/day/unit)**
Public Lavatory	User	5
Public Shower	Shower Taken	11

* Waste other than sewage is only allowed to be discharged into the system if the waste is suitable to be discharged to groundwater.

12.8 Employees in Design Flow Calculation.

Unless otherwise noted in Table II, the flow values do not include flows generated by employees. A flow value of 15 gallons per employee per eight hour shift must be added to the flow amount for determining the design flow for other establishments. Design flow determination for establishments not listed in Table II shall be determined by the available information and approved by the Department.

12.9 Measured Flow

The measured flow of sewage for existing Other establishments may be used to modify estimated flow values determined in this part if the length and frequency of the measured flow accurately represents the annual average water use, along with the peak weekly and daily water use.

12.10 Infiltration.

The design flow for MSTS must also include 200 gallons of infiltration and inflow per inch of collection pipe diameter per mile per day with a minimum pipe diameter of two inches to be used for the calculation. Flow values are allowed to be further increased if the system employs treatment devices that are exposed to atmospheric conditions that will infiltrate precipitation. Flow estimates as calculated in this Chapter shall not be relied upon for the design of collection systems.

12.11 Waste Concentration.

If concentrations from the sewage are expected to be higher than 170 mg/L BOD (or 125 mg/L of $CBOD_5$), 60 mg/L TSS, or 25 mg/L of oil and grease, , or if the design is for an Other Establishment or MSTS, an estimated or measured average concentration must be determined and be acceptable to the Department. System design must account for concentrations of these constituents so as to not cause internal system malfunction, such as, but not limited to, clogging of pipes, orifices, treatment devices, or media.

SECTION 13. SEWAGE TANKS

13.1 Sewage Tanks, General.

Sewage tanks serving SSTS must meet or exceed the applicable requirements of this Section unless otherwise approved by a Minnesota licensed professional engineer and approved by the Department.

13.2 Tank Strength Requirements.

Tanks, fittings, risers, and apertures must:

Strength requirements for tanks

(1) 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.

(2) Be capable of withstanding a lateral load for the conditions the tank will be placed.

(3) 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.

(4) Be structurally capable of withstanding exposure and stresses from freezing conditions.

13.3 Poured-in-place concrete Tanks.

Poured-in-place concrete tanks must be designed to meet each requirement in Section 13.2, and be designed by a Minnesota licensed professional engineer.

13.4 Septic Tank Design.

Septic tanks must:

Septic tank design requirements.

(1) 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.

(2) 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.

(3) If site conditions warrant, the inlet and outlet are allowed to be located on walls that are not opposite each other along axis of the maximum dimension; however, the requirements of Section 13.4 (2) must be met.

(4) Have an inlet invert at least two inches above the outlet invert.

(5) Have a space between the liquid surface and the top of the inlet and outlet baffles of not less than six inches or 100 gallons, whichever is greater, for all liquid depths with an effluent screen and alarm or for liquid depth of less than 39 inches without an effluent screen and alarm. The space between the liquid surface and the top of the inlet and outlet baffles must not be less than eight inches for the liquid depths of 39 inches or more without an effluent screen and alarm. In addition, 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.

13.5 Minimum Tank Capacity.

For dwellings, there shall be two (2) septic tanks in series with the liquid capacity based on the number of bedrooms in the dwelling; such tanks shall be as large as the capacities in Table III. The only exception to this requirement is for the upgrade of an existing compliant system if the primary tank capacity is met and there is no garbage disposal or sewage pump. System replacement shall require two (2) tanks in series.

Table III – Minimum Septic Tank Capacity

Number of Bedrooms	Tank 1	Tank 2
Two or less	1,000	500
Three	1,000	1,000
Four to Five	1,500	1,000
Six to Seven	2,000	1,000
Eight to Nine	2,500	1,250
Ten or More	Septic tank shall be sized as an MSTS with the second tank in series being at least 50 percent of the capacity of the first tank	
Multiple Family Dwelling containing two or more units	Size shall be the sum of the individual dwelling unit requirements.	

13.6 Common tanks.

For systems serving ten (10) or fewer dwellings with a common septic tank, the liquid capacity must be determined by adding the capacities for each dwelling as determined in this section.

13.7 Septic tank capacity for multiple dwellings.

For systems serving more than ten (10) dwellings with a common septic tank, the requirements of subpart (1) and (2) apply:

(1) Total septic tank capacity for common tanks serving multiple dwellings under gravity flow to common tanks is determined by multiplying the design flow by 3.0; or

(2) Total septic tank capacity for common tanks serving multiple dwellings

under pressure flow to common tanks is determined by multiplying the design flow by 4.0.

(3) Total septic tank liquid capacity for systems employing individual tanks at each dwelling discharging into a collection system must be determined:

(A) By a Minnesota licensed professional engineer; or

(B) According to the Prescriptive Designs and Design Guidance for Advanced Designers, incorporated by reference under part 7080.1550, subpart 2.

13.8 Septic tank capacity for other establishments.

Total septic tank liquid capacity for other establishments with domestic strength waste as defined in Section 2.2 (32), is determined by multiplying the design flow by 3.0 if receiving sewage under gravity flow, by multiplying the design flow by 4.0 if receiving sewage under pressure flow, or in accordance with Section 13.12 (Prior to other treatment devices). Additional design considerations, such as equalization tanks, additional capacity, grease interceptors, or secondary treatment, are required for influent concentrations that exceed the levels identified in Section 5.2 (2)(A).

13.9 Holding Tank Capacity for Other Establishments.

Holding tanks serving Other Establishments must provide storage of at least five times the design flow.

13.10 Effluent Filters Required

An effluent screen with an alarm must be installed on the outlet of the last tank in series.

13.11 Tanks connected in series.

Septic tanks must be connected in series. Each tank or compartment must contain at least 25 percent of the required total liquid capacity. The first tank must be equal to or larger than any subsequent tank in the series.

13.12 Prior to other treatment devices.

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

13.13 Compartmentalization of Single Tanks.

If septic tanks are compartmentalized, items (1) to (5) of this Section apply:

(1) 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.

(2) 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 of 12-square inch transfer hole located above the clarified liquid zone that is baffled according to Section 13.14. The final compartment of a tank that employs a transfer hole in the clarified zone shall not be used as a pump tank.

(3) 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 two compartments.

(4) 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.

(5) All compartmental walls must be designed to withstand the weight of the effluent against an empty compartment.

13.14 Septic Tank Baffles.

All septic tanks must be baffled according to (1) to (7) of this Section. Effluent screens are allowed to be substituted for outlet baffles.

(1) 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.

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

(3) 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.

(4) The inlet baffle must extend at least six inches, but not more than 20 percent of the total liquid depth, below the liquid surface. The inlet baffle must extend above the liquid surface in compliance with Section 13.4 (5), and at least one inch above the crown of the inlet sewer.

(5) 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 Section 13.4(5).

(6) 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.

(7) The nearest point on the inlet baffles other than sanitary tees must be no less than 6 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 6 inches and no more than 12 inches from the beginning of the outlet pipe of the baffle. Sanitary tees used as inlet or outlet baffles must be at least 4 inches in diameter.

13.15 Sewage Tank Access.

Access requirements for septic and pump tanks.

Septic tanks shall have a minimum of two maintenance holes with a minimum diameter of 20 inches (least dimension). Maintenance holes must be placed over the inlet baffle and the outlet device (baffles or screen). The maintenance holes must be large enough to allow pumping without interference Enough maintenance holes must be provided so access can be gained within six feet of all walls for solids removal of each compartment. Inspection pipes of no less than six inches in diameter shall be provided over any baffles that are not otherwise accessible through a maintenance hole.

13.16 Pump Tank Access.

Pump tanks must have a minimum of one maintenance hole with a minimum diameter of 20 inches (least dimension). Enough maintenance holes must be provided so access can be

gained within six feet of the walls for solids removal.

13.17 Maintenance Hole Risers to Grade.

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

13.18 Maintenance Hole Covers.

Maintenance Hole cover requirements.

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 Department or 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.

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

13.19 Concrete Tank Construction.

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.

13.20 Non-Concrete Tank Construction.

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.

13.21 Precast Reinforced Concrete Tanks.

Precast reinforced concrete tanks must:

(1) Have a method to lift the tank for an ultimate load that is four times the working load.

(2) Undergo proper curing to achieve a compressive strength of 4,000 pounds per square inch before transport, placement, or use; and

(3) 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 Department.

13.22 Other Tanks.

Fiberglass-reinforced polyester or polyethylene tanks must be protected against deterioration during storage.

13.23 Location and installation of tanks:

(1) Sewage tanks must not be located in areas that limit removal of solids and liquids from the tank according to Section 22.

(2) Sewage tanks must be set back as specified in Table V in Section 16.

(3) The top of sewage tanks must not be buried deeper than four feet from final grade for new dwellings and not 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.

(4) Sewage tanks must not be placed in floodways, drainage ways, 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.

(5) Sewage tanks must not be placed in areas subject to vehicular traffic unless engineered for the anticipated load.

(6) 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.

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

Insulation requirements for tanks less than two feet from final grade.

(8) 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.

Floatation protection requirements for tanks placed below the level of the periodically saturated soil.

(9) 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.

(10) 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.

(11) 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.

13.24 Tank Assessment

(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:

i. The structural integrity of the tank design; and

ii. 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.

(2) Structural Integrity of Design Test. The structural integrity of each model of tank 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 re-verified 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.

Precast tanks must have one tank per year, per model tested for watertightness.

(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 sub-items (i), (ii), or (iii):

i. When empty, a tank must maintain a vacuum of at least two inches of mercury for five minutes, without loss of pressure;

ii. 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

iii. 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.

13.25 Tank Identification.

Tank identification requirements.

(1) Sewage tanks must be marked near the outlet with:

(A) The manufacturer's name.

(B) The model number.

(C) The liquid capacity.

(D) The date of manufacture.

(E) The maximum depth of burial.

(2) The tank manufacturer or manufacturer's agent shall provide the information in Section 13.25(1) to the installer in writing.

(3) The tank inlet or outlet must be clearly marked.

(4) The installer shall submit the information in Section 13.25 (1) with the as-built drawing.

13.26 Sewage Tanks for MSTS, General.

All holding or treatment tanks or vessels, including lined vessels and grease interceptors serving MSTS, must conform to the applicable requirements of this Section, except as modified in Section 13.26 through 13.30, or as designed by a professional engineer and

approved by the Department or local unit of government.

Capacity requirements for septic tanks in a MSTS.

13.27 MSTS Septic Tank Capacity.

Septic tank capacity for MSTS or Other Establishments shall be determined by:

(1) Total septic tank liquid capacity for a common tank serving multiple dwellings under gravity flow to the common tank is determined by multiplying the design flow by 3.0.

(2) Total septic tank liquid capacity for a common tank serving multiple dwellings under pressure flow to the common tank is determined by multiplying the design flow by 4.0.

(3) Common multiple septic tanks must be connected in series. Individual tanks connected in series or any compartment of a tank must have a capacity of more than one-fourth of the required to total liquid capacity.

(4) For MSTS that have individual septic tanks at each dwelling, the individual tanks must meet the requirements of Section 13.5.

(5) Total septic tank liquid capacity prior to other treatment devices shall be according to manufacturer's requirements or accepted standards.

(6) Holding tanks serving Other Establishments must provide storage of at least five times the design flow.

(7) An effluent screen or pressure filter must be used on all systems. If multiple septic tanks are used, the effluent screen must be placed in the last tank in the series and be provided with an alarm. Lint filters are recommended if the sewage contains laundry waste.

(8) Total septic tank liquid capacity for systems employing individual tanks at each dwelling discharging into a collection system must be determined:

(A) By a Minnesota licensed professional engineer; or

(B) According to the Prescriptive Designs and Design Guidance for Advanced Designers, incorporated by reference under Section 5.2(4) of this Chapter.

(9) Total septic tank capacity for other establishments with domestic strength waste is determined by multiplying the design flow by 3.0 if receiving sewage under gravity flow, by multiplying the design flow by 4.0 if receiving the sewage flow under pressure flow, or according to Section 13.8, Additional design considerations, such as equalization tanks, additional capacity, or secondary treatment, are required for influent concentrations that exceed the levels identified in Section 5.2(2)(A)

13.28 MSTS Tank Geometry.

The maximum liquid depth of septic tanks to determine liquid capacity must be no greater than 84 inches. The length-to-width ratio and the length-to-depth ratio must facilitate settling of solids.

13.30 MSTS Tank Testing.

All tanks used for MSTS must be tested for watertightness in accordance with Minnesota Rules, Chapter 7080.2010[2], Subp. (3). The test shall be conducted to include the watertightness of all connections and risers.

13.31 MSTS Liners.

Liners used as watertight barriers for treatment devices must be designed and constructed according to liner requirements developed by the Commissioner of the Minnesota Pollution

Control Agency. If conflicts exist between this Chapter and those requirements, this Chapter applies. Compacted soil liners must not be used as watertight barriers for treatment devices. Liners must be tested and must hold water without loss for 24 hours after being filled to the top of the liner.

SECTION 14. DISTRIBUTION OF EFFLUENT

14.1 General.

Distribution of effluent for SSTS must meet or exceed the requirements of this Section and Minnesota Rules, Chapter 7080.2050.

Construction requirement for supply pipe.

14.2 Supply Pipes.

(1) 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 Specifications for Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedule 40, 80, 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.

(2) Supply pipes must:

(A) Be made from materials resistant to breakdown from sewage and soil.

(B) Be watertight, including all joints.

(C) Be durable throughout the design life.

(D) Not deflect, buckle, crush, or longitudinally bend.

(E) Be resistant to pressures, fatigue, and strain for the application.

(F) Be installed according to American Society for 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.

(G) Be designed, installed, and protected to minimize the danger of freezing in the pipe.

(H) Not be closer than six inches from final grade. Pipes susceptible to freezing shall be insulated.

(I) Be setback from the water supply wells and water service pipes according to Minnesota Rules, Chapters 4715 and 4725.

(3) The minimum slope for gravity supply pipes is one percent (⅛-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.

(4) Access to each supply pipe must be provided for cleanout. The access point must be accessible from final grade.

14.3 Gravity Distribution

(1) 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.

(2) If drop boxes are used for serial distribution, Sub-items (A) to (F) apply.

Drop boxes.

(A) Drop boxes must be employed on each trench, be watertight, and constructed for the intended purpose out of durable materials not subject to corrosion or decay.

(B) 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.

(C) 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.

(D) 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.

(E) 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.

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

(3) If valve boxes are used, all requirements in Section 14.3(2) apply.

(4) Distribution boxes must meet the standards in items (A) to (F).

Installation and construction requirements for distribution boxes.

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

(B) The distribution 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 the finished grade.

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

(D) 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.

(E) 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.

(F) 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.

(5) Non-pressurized distribution pipes must meet the requirements of items (A) to(C) below.

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

(B) 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.

(C) 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.

14.4 Pressure Distribution

Construction and installation requirements for pressure distribution.

(1) Pressurized distribution pipes must conform to the requirements of Sections 14.2(2) (A, C, D and E)

(2) 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.

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

(5) (4) Perforations must be no smaller than ⅛-inch diameter and no larger than ¼-inch diameter. The number of perforations, perforation spacing, and pipe size for pressure distribution must be in accordance with Table IV below. The friction loss in any individual perforated lateral must not exceed 20 percent of the average pressure head on the perforations. 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 drain after the pump turns off.

(6) 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.

(7) 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 of manifold pipe must be connected to the supply pipe from the pump.

(8) 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.

(9) Pressure distribution cleanouts must be provided to check the system for proper operation and cleaning of plugged perforations. Cleanouts must be accessible from final grade.

(10) Existing systems with gravity distribution which are retrofitted with an advanced treatment device meeting treatment level A or B in Minnesota Rules 7083.4030, must monitor the system to determine the presence of even distribution over the absorption area. If even distribution is not occurring, pressure distribution must be employed.

Table IV – Maximum Number of Perforations Per Lateral

1/4-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	10	13	18	30	60
2.5	8	12	16	28	54
3.0	8	12	16	25	52
7/32-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	11	16	21	34	68
2.5	10	14	20	32	64
3.0	9	14	19	30	60
3/16-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	12	18	26	46	87
2.5	12	17	24	40	80
3.0	12	16	22	37	75
1/8-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	21	33	44	74	149
2.5	20	30	41	69	135
3.0	20	29	38	64	128

14.5 Distribution of Effluent for MSTS.

For MSTS, distribution of effluent into a soil treatment and dispersal area must comply with all parts of Section 14, or be designed by a registered professional engineer and approved by the Department.

14.6 Pressure Distribution Required for MSTS

MSTS must employ pressure distribution except as allowed under Section 14.4(10).

14.7 MSTS Zones Required

The distribution system for MSTS must be designed to dose and rest zones in accordance with operational requirements.

SECTION 15. DOSING OF EFFLUENT

15.1 General.

When pumping or dosing is necessary, it must comply with this Section.

15.2 Pump Tanks.

Pump tank requirements.

(1) Pump tanks shall meet or exceed the requirements of Section 13.2 or 13.3. All dosing chambers must be vented. Pump tanks shall have a maintenance hole with a minimum diameter of 20 inches (least dimension) which allows access and removal of any plumbing or other

device. These maintenance holes shall meet or exceed the requirements of Section 13.17 and Section 13.18 of this Chapter.

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

(3) 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.

(4) An SSTS with a pump must employ an alarm device to warn of failure.

(5) 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.

(6) Electrical installations must comply with applicable laws and ordinances including the most current codes, rules, and regulations of public authorities having jurisdiction and with Minnesota Rule, Chapter 1315.0200, which incorporates the National Electrical Code.

(7) MSTS and Other Establishments must include an alternating two-pump system and have a minimum capacity of 50 percent of the design flow.

15.3 Pumps for Gravity Distribution.

If a pump is used to lift effluent into a gravity distribution system, the following apply:

(1) The pump must discharge at least 10 gallons per minute but no more than 45 gallons per minute.

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

(3) The pump must have sufficient dynamic head for both the elevation difference and friction loss.

15.4 Pumps for Pressure Distribution.

Pumps used for pressure distribution must meet the following requirements:

(1) Pumps must be constructed and fitted with sound, durable, and corrosion-resistant materials.

(2) The pump discharge capacity must be based on the perforation discharges for a minimum average head of:

(A) 1.0 foot for ¼-inch and 3/16-inch perforations for dwellings;

(B) 2.0 feet for 1/8-inch perforations for dwellings

(C) 2.0 feet for ¼-inch and 3/16-inch perforations for MSTS and other establishments; and,

(D) 5.0 feet for 1/8-inch perforations for MSTS and other establishments.

(3) Perforation discharge is determined by the following formula:

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

Where: Q = Discharge in Gallons Per Minute (GPM)
c = 0.6- = coefficient of discharge
d = perforation diameter in inches
h = head in feet

15.5 Pump Discharge Head.

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.

15.6 Maximum Dose Volume.

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

SECTION 16. TREATMENT AND DISPERSAL

16.1 General.

Treatment and dispersal of all sewage for new construction or replacement SSTS must in compliance with this Section and Section 17 to Section 21.

16.2 General Technical Requirements for All Systems.

All new construction or replacement SSTS must be designed to meet or exceed the following provisions:

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

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

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

(4) 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.

(5) Soil treatment and dispersal systems must not be designed in floodways. Soil treatment and dispersal systems installed in flood fringes must meet the requirements of Section 18.2. All soil treatment systems located in areas subject to excessive run-on must have a diversion constructed upslope from the system.

(6) SSTS components must be setback in accordance with Table V.

(7) No component of an SSTS is allowed to be located under or within the structure or other impermeable surface.

(8) Flow measurement must be employed for all single family dwellings and other establishments with a pump tank, all single family dwellings with a Type III, IV, V systems, and all multi-family dwellings.

Table V – Minimum Setback Distances (Feet)

Feature	Sewage Tank	Soil Treatment and Dispersal Area
Water supply wells less than 50 feet deep and not encountering at least 10 feet of impervious material	50	100
Any other water supply well or buried suction pipe	50	50
Buried pipe distributing water under pressure	10	10
Occupied buildings and buildings with basements or crawl spaces	10	20
Non-occupied structures, deck post footings	5	10
Property lines	10	10

Above ground and in-ground swimming pools	10	10
The Ordinary High Water Level (OHWL)of:		
Natural Environment Lakes	150	150
Recreational Development Lakes	75	75
General Development Lakes	75	75
Unclassified Body of Water	75	75
Transition Rivers/Streams	150	150
Tributary Rivers/Streams	150	150
St. Croix River-Rural Districts	150	150
St. Croix River-Urban Districts	100	100
Blufflines:		
St. Croix River Blufflines	40	40
Shoreland Blufflines	20	20

16.3 Other Technical Requirements for Systems.

The following items are required for specific designs as determined in Section 17 to Section 21.

(1) Employ components registered under Minnesota Rules 7083.4070 and 7083.4080 that are installed, used and operated according to the conditions placed on the registration.

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

(3) For acceptable treatment of septic tank effluent by soil, the soil treatment and dispersal systems must meet the following requirements:

(A) A minimum three-foot vertical soil treatment and dispersal zone must be designed below the distribution media that meets the following criteria:

i. 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.

ii. Any soil layers that are any of the United Stated Department of Agriculture (USDA) soil textures classified as sand with 35 to 50 percent rock fragments must be credited at only one-half their thickness as part of the necessary treatment zone. Soil layers regardless of soil texture, with greater than 50 percent rock fragments must not be credited as part of the necessary treatment zone. Layers that are given full, partial, or no credit must, in any layering arrangement in the soil profile, be cumulatively added to determine the amount of soil treatment zone in accordance with other soil treatment zone provisions.

iii. The entire treatment zone depth must be within seven feet from final grade.

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

(4) The system's absorption area must be in original soil.

(5) The system's absorption area and mound absorption ratio must be sized according to the Table VI Loading Rate for Determining Bottom Absorption Area and Absorption Ratios Using Detailed Soil Descriptions, or by using Table VIa if not using detailed soil descriptions. Soils with a loading rate less than 0.45 gallons per day per square foot cannot be used in a Type I or Type II system for new construction.

Table VI
Loading Rates for Determining Bottom Absorption Area and Absorption Ratios Using Detailed Soil Descriptions*.

		Treatment Level C	Treatment Level C	Treatment Levels A, A-2, B, and B-2	Treatment Levels A, A-2, B, and B-2
USDA Soil Texture	Soil Structure and Grade	Absorption Area Loading Rate (gpd/ft^2)	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft^2)	Mound Absorption Ratio***
Sand, coarse sand, loamy sand, loamy coarse sand, fine sand, very fine sand, loamy fine sand, loamy very fine sand, 35-50% rock fragments	Single grain, granular, blocky, or prismatic structure; weak grade	**	1.0	**	1.0
Sand, coarse sand, loamy sand, loamy coarse sand, <35% rock fragments	Single grain, granular, blocky, or prismatic structure; weak grade	1.2	1.0	1.6	1.0
Fine sand, very fine sand, loamy fine sand, loamy very fine sand, <35% rock fragments	Single grain, granular, blocky, or prismatic structure; weak grade	0.6	2.0	1.0	1.6
Sandy loam, coarse sandy loam, fine sandy loam, very fine sandy loam	Granular, blocky, or prismatic structure; weak to strong grade	0.78	1.5	1.0	1.6
Sandy loam, coarse sandy loam, fine sandy loam, very fine sandy loam	Platy with weak grade or massive	0.68	1.8	0.87	1.8

Loam	Granular, blocky, or prismatic structure; weak to strong grade	0.6	2.0	0.78	2.1
Loam	Platy with weak grade or massive	0.52	2.3	0.68	2.4
Silt loam, silt	Granular, blocky, or prismatic structure; weak to strong grade	0.5	2.4	0.78	2.1
Silt loam, silt	Platy with weak grade or massive	0.42	2.9	0.65	2.5
Clay loam, sandy clay loam, silty clay loam	Granular, blocky, or prismatic structure; moderate to strong grade	0.45	2.6	0.6	2.7
Clay, sandy clay, silty clay	-	-	**	**	**

*Only includes soil horizons with <50% rock fragments, with very friable and friable consistence, and loose non-cemented sands. Soil horizons with >50% rock fragments must not come in contact with soil dispersal system media.
** Conduct percolation test and size under Table VIa. May need to be designed as a Type III System under Section 19 of this Chapter.
*** Assume a hydraulic loading rate to the sand at 1.6 gpd/ft^2.

Table VIa
Loading Rates for Determining Bottom Absorption Area and Absorption Ratios using Percolation Tests

Percolation Rate (Minutes Per Inch)	Treatment Level C Absorption Area Loading Rate (gpd/ft^2)	Treatment Level C Mound Absorption Ratio	Treatment Levels A, A-2, B, and B-2 Absorption Area Loading Rate (gpd/ft^2)	Treatment Levels A, A-2, B, and B-2 Mound Absorption Ratio
<0.1	-	1.0	-	1.0
0.1 to 5	1.2	1.0	1.6	1.0
0.1 to 5 (fine sand and loamy fine sand)	0.6	2.0	1.0	1.6
6 to 15	0.78	1.5	1.0	1.6
16 to 30	0.6	2.0	0.78	2.0
31 to 45	0.5	2.4	0.78	2.0
46 to 60	0.45	2.6	0.6	2.6
>60*	-	-	-	-

** Soil with too high a percentage of clay for installation of a Type I, or Type II system. Systems in soils with this Percolation Rate must be a Type III, Type IV or Type V system.

(6) 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.

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

(8) 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 the media or designed coverage materials. If the areas are exposed to direct rainfall, they must be allowed to dry and must be re-prepared according to Section 17.3(3) (J).

(9) A minimum of six inches of topsoil borrow shall be placed over the system.

(10) 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 vegetation establishment shall begin immediately after the placement of the topsoil borrow. If the climatic season does not allow immediate establishment of vegetation, the soil treatment and dispersal system must be protected from erosion and excessive frost and a vegetative cover must be established as soon as favorable climatic conditions exist. 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.

(11) Sewage tank effluent concentrations to the soil dispersal system must not exceed a BOD concentration of 170 mg/L, a $CBOD_5$ concentration of 125mg/L, a TSS concentration of 60 mg/L, or an oil and grease concentration of 25 mg/L.

(12) The distribution media must not be in contact with soils that have any sand soil texture containing 35 percent or more rock fragments or any soils that have a percolation rate of less than 0.1 minutes per inch.

(13) The contour loading rate for soil dispersal systems must be between 1 and 12 gallons per lineal foot per day

16.4 Nitrogen BMP.

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 Minnesota Rules, Chapter 4725.0100, subpart 21, must employ best management practices for nitrogen reduction developed by the Commissioner to mitigate water quality impacts to groundwater.

16.5 Final treatment and dispersal for MSTS:

(1) General. Final treatment and dispersal must be according to applicable design requirements of this Chapter, except as modified in this Section. Code of Federal Regulations, Title 40, Parts 144 and 146, prescribe additional design regulations applicable to certain systems. At a minimum, flow amounts to be used for the purpose of this Section must be derived from Table I or II in Section 12 of this Chapter.

(2) Setbacks. MSTS must meet all setbacks in Table V.

(3) Minimal Soil and Site Conditions. The site proposed to support the soil treatment and dispersal system must:

(A) Have the upper 18 inches of the absorption area:

i. Be original soil;

ii. Have a soil loading rate of greater than zero as listed in Table VI or Table VIa, in Section 16.3;

iii. Be above the periodically saturated soil or bedrock;

(B) Not be a wetland or floodway;

(C) Not be in an area in which surface runoff from precipitation will concentrate (concave hillslope); and

(D) Allow the system to be placed on contour.

(4) Inspection Pipes. Inspection pipes must be located to adequately assess the hydraulic performance of the entire soil dispersal system.

(5) Soil Absorption Area Sizing

(A) Effluent loading rates to the soil shall be no greater than loading rates prescribed in:

i. Table VI, or Table VIa in Section 16.3, if the absorption area receives treatment level C effluent as described in Minnesota Rules 7083.4030.

ii. Section 21.

(6) If the absorption area receives effluent not as described in Section 16.5 (5)(A), the absorption area shall be increased by 50 percent of the amount derived in Table VI or VIa, and zoned for dosing and resting.

(7) System Geometry, Lawn Area Sizing, and Groundwater Mounding. The system geometry and lawn area sizing shall be sized to prevent groundwater mounding from violating the unsaturated zone beneath the soil system according to Section 16.5 (9) for proper hydraulic functioning, and for concentration reduction of nitrogen and phosphorus, if applicable.

(8) Reserve Land Area. Additional set-aside land area of 100 percent of the size determined in Section 16.5 (5) to 16.5(7) is required for systems whose absorption area receives effluent meeting treatment level A or B in part Minnesota Rules, 7083.4030 or designed in accordance with Section 21. Additional land area of 50 percent of the size determined in Section 16.5 (5) to 16.5(7) is required for systems whose absorption area receives treatment level C in part Minnesota Rules, 7083.4030. The reserve land area must be identified and protected for future use if necessary. Replacement MSTS proposed on sites that cannot meet this requirement are allowed to be exempted by the Department.

(9) Soil Treatment Zone. For treatment of effluent by soil to meet the performance criteria in Section 4.8 (3) of this Chapter, the soil treatment and dispersal systems must meet the requirements below:

(A) For soil treatment and dispersal systems that receive treatment

level A-2, B-2, or C effluent as described in Minnesota Rules, 7083.4030, the soil treatment zone requirements must meet Section 16.3 (3). The required three-foot vertical separation must be maintained during operation after accounting for groundwater mounding.

(B) For soil treatment and dispersal systems that receive treatment level A or B effluent as described in Minnesota Rules, 7083.4030, the soil treatment zone requirements must meet or exceed the requirements of Section 16.3 (3), unless modified in Table VI in Section 16.3 (5), with a minimum vertical separation of two feet. The required vertical separation must be maintained during operation after accounting for groundwater mounding.

(C) The minimum vertical separation can be determined by the method described in Section 21.1(3) to meet provisions of Section 4.8 (3).

(D) An observation well to measure the height of the periodically saturated soil beneath the operating system must be installed and monitored according to the operating permit.

(10) Nitrogen Reduction. MSTS systems must employ nitrogen mitigation methods to achieve compliance with Section 4.8 (4), and must be monitored in accordance with Section 11.4 of this Chapter.

(11) Phosphorus Reduction. Phosphorus mitigation methods must be employed to achieve compliance with Section 4.8 (5), if natural processes are found inadequate.

(12) Design Report. All information required in this Section shall be submitted for review and approval by the Department prior to system construction, including all applicable information delineated on a map.

16.6 Collection Systems.

The collection system for the collection of sewage from multiple buildings or multiple other establishments discharging into an MSTS must be designed:

(1) According to the Prescriptive Designs and Design Guidance for Advanced Designers, incorporated by reference under Section 5.2(4); or

(2) By a Minnesota licensed professional engineer.

16.7 Construction Requirements.

MSTS construction must be according to applicable construction requirements of this Chapter.

16.8 MSTS Design Standards.

The design standards for new construction or replacement MSTS are provided to meet many of the public health and environmental outcomes in Section 4. In some cases, specific design methods must be employed in addition to the standards provided in this Chapter.

16.9 Prohibited Discharges.

MSTS must not receive storm water or other sources of clean water.

16.10 Component Longevity.

All structural components of the system and sealants must be designed to operate throughout the system's design life.

16.11 Flow Measurement Device.
A flow measure device must be employed on all MSTS.

16.12 System Access.
The system must be designed with sufficient access and ports to monitor the system as applicable.

16.13 Registered Products.
MSTS must employ components registered under parts 7083.4000 to 7083.4110 or have sufficient regulatory oversight in the operating permit.

16.14 Designer Inspections.
The MSTS designer must observe critical periods of the system construction. The designer shall prepare a report of observed construction activities and submit the report to the Department prior to the final inspection.

SECTION 17. TYPE I SYSTEMS

17.1 Type I Systems.
Systems designed according to this Section are considered Type I Systems, as defined in Section 2.2 (132). Systems in soils with a loading rate less than 0.45 gallons per day per square foot must not be used in a Type I system for new construction.

17.2 Trenches and Seepage Beds
- (1) Characteristics. To qualify as a trench or seepage bed system, the system must meet or exceed the following requirements:
  - (A) Employ flow values in Section 12.
  - (B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.
  - (C) Meet or exceed the requirements of Sections 16.2 and 16.3.
- (2) General. Seepage bed placement must be limited to areas having natural slopes of less than six (6) percent. Absorption areas for seepage beds must not be placed in soils with a loading rate of less than 0.45 gallons per day per square foot or as shown in Table VI or VIa. Seepage beds must not be located in floodplains.
- (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 VI or Table VIa.
  - (B) 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 and then multiplying that value by 1.5.
  - (C) 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 VI or Table VIa.

(D) The minimum sidewall absorption is six (6) inches. The bottom absorption area is allowed to be reduced, for gravity distribution trenches only, by the following:

Sidewall Absorption-Inches	Sizing Equivalent
12-17	20%
18-23	34%
24	40%

(E) A 40 percent reduction is not allowed with a loading rate of 1.2 gallons per day per square foot.

(4) Design and Construction of Trenches and Seepage Beds

Construction and installation requirements for trenches and seepage beds

(A) Trenches must be no more than 36 inches wide. Any excavation wider than 36 inches is 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.

(B) A vertical inspection pipe at least four inches in diameter must be installed and secured in the distribution medium of every trench and 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.

(F) Trenches and seepage beds in which the distribution media is in contact with soils that are sand, loamy sand, fine sand, or loamy fine sand or soils with a percolation rate of 0.1 to 5 minutes per inch must employ one or more of the following measures:

i. Employ pressure distribution according to Section 14.4;

ii. Divide the total dispersal area into multiple units that employ serial distribution, with each dispersal unit having no greater than 15 percent of the required bottom absorption area;

iii. Have a vertical separation distance of at least five feet.

17.3 Mounds

(1) Mound System Requirements. To qualify as a mound system, the system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.

(C) Meet or exceed the requirements of Sections 16.2 and 16.3.

(2) Location of Mounds

(A) The upper 12 inches of the original soil mound absorption area must have a minimum loading rate of 0.45 gallons per day per square foot and a mound absorption ratio greater than zero, but no more than 2.6 in Table VI or Table VIa.

(B) The upper 12 inches of the absorption area must also be above the periodically saturated soil or bedrock.

(C) Setbacks must be according to Table V. Setbacks must be measured from the original soil absorption area.

(D) On slopes of one percent or greater and where the original soil mound absorption ratio is 2.6 or greater in Table VI or Table VIa, 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.

(E) In no case shall mounds be placed on slopes greater than 12 percent.

(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 1.0 gallons per square foot per day.

(B) Mound distribution media bed width is determined according to Section 16.3 (13) and must be no wider than ten feet.

(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:

Construction and installation requirements for Type I Mounds.

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 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 the original soil of the proposed mound absorption area shall be determined according to Table VI or Table VIa.

(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 absorption area, if necessary.

(G) Distribution of effluent over the mound distribution media bed must be by level perforated pipe under pressure according to Section 14 and Section 15.

(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) All surface preparation must take place when the upper 12 inches of soil has a moisture content of less than the plastic limit and soil conditions allow field testing of soil properties and these properties are maintained throughout the installation.

(L) 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.

(M) If rainfall occurs on the prepared surface, the site must be allowed to dry below the plastic limit and roughened as described in Section 17.3 (3)(J).

(N) 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.

(O) 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.

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

(Q) 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.

(R) On slopes of one percent or greater, the upslope edge of the mound absorption bed must be placed on the contour.

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

(T) A minimum of six inches of sand, sandy loam or loam material must be placed on the top of the mound absorption bed and sloped upwards towards the center of the mound a minimum of ten horizontal units to one vertical unit.

(U) Construction vehicles must not be allowed on the distribution media until backfill is placed.

(V) A minimum of six inches of topsoil borrow must be placed over the entire mound.

(W) A vegetative cover must be established over the entire area of the mound. The mound shall be protected until a vegetative cover is established by use of erosion control. The established vegetative cover shall not interfere with the hydraulic performance of the system and shall provide adequate frost and erosion protection.

17.4 At-Grade Systems

(1) At-Grade Systems. To qualify as an at-grade system, the system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed the applicable technical requirements of Section 13, Section 14, and Section 15.

(C) Meet or exceed the requirements of Sections 16.2 and 16.3.

(2) Location of At-Grade Systems

Construction and installation requirements for at-grade systems.

(A) The upper 12 inches of the absorption area must have a loading rate of 0.45 gallons per day per square foot or greater as shown in Table VI or Table VIa.

(B) At-grade systems must not be installed in areas with slopes greater than 12 percent.

(C) Setbacks must be according to Table V. Setbacks must be

measured from the original soil absorption area.

(3) Design and Construction of At-Grade Systems

(A) The at-grade absorption width must be determined by dividing the contour loading rate, according to Section 16.3 (13), by the soil loading rate, and must not exceed a width of 15 feet. The at-grade 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 VI or VIa, for the upper 12 inches of soil and dividing by the absorption bed width.

Table VII
At-Grade Contour Loading Rates

Perc Rate (mpi)	Loading Rate	Soil Texture	Other Characteristics in upper 48 inches	Contour Loading Rate (GPD/ft)
<0.1	0.00	Coarse Sand	No textural change	6
			Saturated soil <3' Bedrock<4'	5
0.1 to 5.0	1.60	Sand Loamy Sand Fine Sand	No textural change	8
			Layers of other textures	7
			Banding	4
			Saturated soil <3'	5
			Bedrock<4'	5
6 to 15	1.00	Sandy Loam	Strong to moderate structure No textural change	7
			Weak structure Layers of other textures	6
			Platy or massive structure Saturated soil <3' Bedrock<4'	5
16 to 60	0.6-0.78	Loam Silt Loam Silt Clay Loam Sandy Clay Silty Clay	Strong to moderate structure No textural change	6
			Weak structure Layers of other textures	5
			Platy or massive structure Saturated soil <3' Bedrock<4'	4
61 to 120 >120	0.0-0.3	Clay Sandy Clay	Strong to moderate structure No textural change	3
			Weak structure Layers of other textures	2

			Silty Clay	Platy or massive structure Saturated soil <3' Bedrock<4'	2

(C) At-grade systems must employ pressurized distribution by meeting or exceeding the applicable requirements of Section 14.4 and Section 15 except where modified by this section. 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 being 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 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 pipe must have three-eight's inch or larger perforations spaced vertically no more than six inches apart. Perforations must not exist above the distribution medium. The inspection pipe must extend to the absorption bed and soil interface, be secured, and be capped, flush with or above finished grade.

(H) A vegetative cover must be established over the entire area of the at-grade. The at-grade shall be protected until a vegetative cover is established by use of erosion control. The established vegetative cover shall not interfere with the hydraulic performance of the system and shall provide adequate frost and erosion protection.

SECTION 18. TYPE II SYSTEMS

18.1 Type II Systems.

Systems designed according to this Section are considered Type II systems. Systems in soils with a loading rate less than 0.45 gallons per day per square foot must not be used in a Type II system for new construction.

18.2 Floodplain Areas

Construction and installation requirements for systems in floodplain areas.

(1) General. SSTS 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 Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15, except as modified in this part.
(C) Meet or exceed the requirements of Sections 17.2 to 17.4.
(D) Meet or exceed requirements of Section 16.2 and 16.3, except as modified in this part.
(E) Meet the requirements of Section 18.2 (2) to Section 18.2 (11).

(2) State and Local Requirements. The allowed use of systems in floodplains must be according to state and local floodplain requirements.

(3) Location of System. An SSTS 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 of Section 18.2 (4) to Section 18.2 (11) are met.

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

(5) Highest Feasible Area. An SSTS must be located on the highest feasible area of the lot and must have the 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.

(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.

(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 Section 17.3 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 on-half foot above the ten-year flood elevation, if ten-year flood data are available.
(B) In no case shall the sand fill for the mound exceed 48 inches below the mound bed absorption area.
(C) Inspection pipes must not be installed unless the top of the mound is above the 100-year flood elevation.
(D) The placement of clean sand and other fill must be done according to any community adopted floodplain management ordinance.

(8) Inundation of Top. When the top of a sewage tank is inundated, the dwelling must cease discharging sewage into it.

(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.

(10) Holding Tank. If a holding tank is used to serve a dwelling, the holding tank's 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, of 1,000 gallons, whichever is greater. The holding tank must be accessible for removal of tank contents under flooded conditions.

(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.

18.3 Privies

Construction and installation requirements for privies.

(1) Privies Allowed. Privies shall only be considered when there is no water supplied to the dwelling.

(2) Pit Privies and Vault Privies. Pit privies shall not be installed where the bottom of the pit is less than three feet above the saturated soil or bedrock. A vault privy shall be used in areas not meeting the three foot separation. The vault of a vault privy shall be constructed in the same manner as a sewage tank in accordance with Section 13.

(3) Setbacks. Privies shall be set back from surface waters, buildings, property lines, and water supply wells as prescribed in Table V.

(4) Privy Sizing. Pits or vaults shall be of sufficient capacity for the dwelling they serve, but shall have at least 50 cubic feet of capacity. The sides of the pit shall be curbed to prevent cave-in. The privy shall be constructed so as to be easily maintained and it shall be insect proof. The door and seat shall be self-closing. All exterior openings, including vent openings, shall be screened.

(5) Vented. Privies shall be adequately vented.

(6) Maintenance. When the privy is filled to one half of its capacity, the solids shall be removed.

(7) Abandonment. Abandoned pits shall have the solids removed and be filled with clean earth and slightly mounded to allow for settling. Removed solids shall be disposed of in accordance with Section 22.

18.4 Holding Tanks

Construction and installation requirements for holding tanks.

(1) Holding Tanks Residential Use. Holding tanks may be installed on previously developed sites, for use on a temporary basis for periods of up to 12 months, during which time measures are taken to provide municipal sewer service or the installation of an approved system as provided in this Chapter. Holding tanks may also be considered on a permanent basis on previously developed seasonal sites where occupancy is no more than 180 days per year, water use is no more than 75 gallons per day and a development agreement has been submitted and approved by the Department. Development Agreement shall be recorded against the property in the office of Property Records and Taxpayer Services.

(2) Holding Tanks Non-Residential Use. Holding tanks may be considered on a permanent basis for non-residential, low water use establishments with a sewage flow of 150 gallons per day or less, subject to approval by the Department. Holding Tanks Required. Holding tanks must be used for floor drains for vehicle parking areas and existing facilities potentially generating hazardous waste.

(3) Holding Tank Requirements. To qualify as a holding tank, the system must:

(A) Meet or exceed the requirements of Section 13.2 or 13.3

(B) Meet or exceed the requirements of Section 16.2(6).

(C) Meet or exceed the requirements of Section 16.3 (2).

(4) Watertightness All tanks used as holding tanks must be tested once placed at the final location for watertightness as specified in Minnesota Rules, Chapter 7080.2010.

(5) Holding Tank Access. 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 the Section 13.18.

(6) Holding Tank Sizing. 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 Section 18.2 (9).

(7) Location. 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 of Table V.

(8) Alarm Required. Holding tanks must have an alarm device to minimize the chance of accidental sewage overflow unless regularly scheduled pumping is used. An alarm device shall identify when the holding tank is at 75 percent capacity.

(9) Maintenance Contract. A contract for disposal and treatment of the septage shall be maintained by the owner with a licensed Maintainer.

SECTION 19. TYPE III SYSTEMS

Type III system design requirements.

19.1 Type III Systems.

A system that deviates from the requirements in Section 17 is considered a Type III system. A system in soils with a loading rate of less than 0.45 gallons per day per square foot may be installed on previously developed sites as a Type III system. Deviations from the standards in Section 17 of the Chapter must be submitted to the Department or for approval or denial. However, no deviation is allowed from the following standards; and, at a minimum a Type III system must:

(1) Employ design flow values set forth in Section 12.

(2) Meet the requirements of Section 13.

(3) Meet or exceed technical requirements in Section 14.

(4) Meet the requirements in Section 15 with mound and at-grade systems required to have pressure distribution.

(5) Provide flow measurement.

(6) Meet the requirements of Section 16.2 and 16.4.

(7) Meet the requirements of Section 16.3 (1), Section 16.3 (2), Section 16.3 (3), Section 16.3 (6), Section 16.3 (7), Section 16.3 (8), and Section 16.3 (9).

(8) Follow the absorption loading rates in Table VI or Table VIa.

(9) For previously developed sites, if the site cannot accommodate a soil treatment and dispersal system sized in accordance with Table VI or Table VIa, 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 VI or Table VIa. In those cases where a loading rate or mound absorption ratio is not listed in Table VI

or Table VIa, an alternative loading rate or absorption ratio must be proposed.

19.2 Flow Restriction Device.
Absorption areas sized smaller than a Type I system must employ flow restriction devices that to not allow absorption area loadings in excess of those in Table VI or Table VIa. This provision does not apply to the original soil, clean sand absorption area of a mound system.

19.3 Previously Developed Sites.
Type III systems may be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

19.4 Type III Systems Allowed.
Type III systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type III soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type III system.

19.5 Graywater Systems
(1) General. Graywater Systems shall be classified as a Type III system and must meet or exceed the following requirements:
(A) Employ 60 percent of the flow values in Section 12.
(B) Meet or exceed applicable requirements of Section 13, Section 14, and Section 15, except as modified in this part.
(C) Meet or exceed the requirements of Section 17.
(D) Meet or exceed the requirements of Section 16.2 and Section 16.3.
(2) Toilet Waste. Toilet waste must not be discharged to a graywater system.
(3) Sewage Tanks. The liquid capacity of a graywater septic tank serving a dwelling must be based on the number of bedrooms existing and anticipated in the dwelling served and shall be at least as large as the capacities given in Table VIII.

Table VIII – Minimum Septic Tank Capacity for Graywater Systems

Number of Bedrooms	Tank 1	Tank 2
Two or less	1,000	500
Three	1,000	500
Four to Five	1,000	1,000
Six to Seven	1,250	1,000
Eight to Nine	1,500	1,000
Ten or More	Septic tank shall be sized as: (2,000 + ((# of bedrooms -9) X 150)).	

SECTION 20. TYPE IV SYSTEMS

Type IV system design requirements.

20.1 General.
A system designed according to this part is considered a Type IV System. This system must:

(1) Employ design flow values set forth in Section 12.
(2) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.
(3) Meet or exceed the requirements of Section 16.2.
(4) Meet or exceed the requirements of Section 16.3except as modified in this part.
(5) Meet or exceed the requirements of Table IX.
(6) Meet soil dispersal requirements of Section 17, except that the reductions in Section 17.2(3) (D)) are not applicable.

20.2 Previously Developed Sites.
Type IV systems may be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

20.3 Type IV Systems Allowed.
Type IV systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type IV soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type IV system.

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

<table>
<tr><th rowspan="2">Vertical Separation (inches)</th><th colspan="3">Texture Group[2]</th></tr>
<tr><th>All Sands and Loamy Sands</th><th>Sandy Loam, Loam, Silt Loam</th><th>Clay, Clay Loam</th></tr>
<tr><td>12 – 17[3]</td><td colspan="3">Treatment Level A, Uniform Distribution, Timed Dosing</td></tr>
<tr><td>18 - 35[3]</td><td colspan="2">Treatment Level B, Uniform Distribution, Timed Dosing</td><td>Treatment Level B, Uniform Distribution</td></tr>
<tr><td>–36+[3]</td><td>Treatment Level A-2 or B-2, Uniform Distribution, Treatment Level C</td><td colspan="2">Treatment Level A-2 or B-2, Uniform Distribution, Treatment Level C</td></tr>
</table>

[1] The treatment component performance levels correspond with those established for treatment components under the product testing requirements in Table III of Minnesota Rules, 7083.4030.
[2] With less than 50 percent rock fragments.
[3] Additional vertical separation distance is required as determined in Section 16.3(3).

20.4 Soil Loading Rates.
The absorption area and mound absorption ratio must be sized according to Table VI or Table VIa.

SECTION 21. TYPE V SYSTEMS

Type V system design requirements.

21.1 Type V Systems.

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

(1) Employ design flow values set forth in Section 12.

(2) Meet the requirements of Section 16.2.

(3) Be designed with 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 Table VI or Table VIa, loading methods, and soil conditions. SSTS must not contaminate underground waters or zones of periodic saturation with viable fecal organisms.

21.2 Previously Developed Sites.

Type V systems may be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

21.3 Type V Systems Allowed.

Type V systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type V soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type V system.

SECTION 22. MAINTENANCE

List of information that must be included in a Management Plan.

22.1 Management Plans Required.

All new and replacement SSTS must be operated in accordance with the management plan submitted, reviewed and approved by the Department prior to issuance of a construction permit. At a minimum, management plans must include the following:

(1) Maintenance requirements, including frequency;

(2) Operational requirements, including which tasks the owner can perform and which tasks a licensed service provider or maintainer must perform;

(3) Monitoring requirements;

(4) Requirements that the owner notify the Department when the management plan requirements are not met;

(5) Disclosure of the location and condition of the additional soil treatment and dispersal area on the lot or serving that residency; and

(6) Other requirements determined by the Department.

22.2 General.

SSTS and all components must be maintained in compliance with this Chapter and manufacturer requirements.

22.3 Frequency of Assessment.

The owner of an SSTS or the owner's agent shall regularly, but in no case less frequently than every three years:

(1) 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.

(2) Measure or remove the accumulation of scum, grease, and other floating materials at the top of each septic tank and compartment, along with the sludge, which consists of solids denser than water.

22.4 Maintenance Permit and Reporting.

Procedure for properly performing maintenance

Prior to performing the maintenance required in Section 22.3 (2) a maintenance permit must be obtained by the licensed maintenance business from the Department. A valid maintenance permit must be on the site where the maintenance activities are being performed. A completed pumping record must be provided to the Department within 90 days of the maintenance activity.

22.5 Removal of Material.

(1) 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.

(2) 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 requirements of this Section or a management plan. Liquid and solids removal from cleanout pipes is allowed for holding tanks.

(3) After removal of solids and liquids, from a system installed after the effective date of this Chapter, the maintenance hole cover must be secured as described in Section 13.18(1). Covers secured by screws shall be refastened in all screw openings.

(4) After removal of solids and liquids from a system installed prior to the effective date of this Chapter maintenance hole covers must be sound, durable, and of adequate strength as specified in Section 13.18(3), and:

(A) Be buried with a minimum of 12 inches of soil cover or, if the cover is currently at or above the ground surface or within 12 inches from final grade, be secured by a method that was deemed secure prior to the effective date of this Chapter.

(B) Meet the requirements of Section 13.18(1) if the cover is to be raised at or above the ground surface or within 12 inches from final grade.

22.6 Pump Tank Maintenance

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

22.7 Privies.

When a 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 Sections 22.9 and 23.

22.8 Additives.

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 maintenance and removal of sewage solids from the sewage tanks as specified in this Section. The use of additives does not fulfill the solids removal requirement of this Section or a management plan. Additives that contain hazardous materials must not be used in an SSTS.

22.9 Septage.

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 maintenance business.

22.10 Land Spreading of Septage

Land application of septage must be done in accordance with Section 23 of this Chapter.

22.11 Use of Soil Treatment Site.

Activities on the current soil dispersal system or the reserve soil dispersal system, as defined in Section 2.2 (65) and described in Section 9.4, that impair the current or future treatment abilities or hydraulic performance of the soil 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 Department.

22.12 System Remediation.

Any maintenance activity used to increase the acceptance of effluent to a soil treatment and dispersal system must:

(1) Not be used on a system failing to protect groundwater as defined in Section 4.3 (2), unless the activities meet the requirements of Section 20 or Section 21.

(2) Not decrease the separation to the periodically saturated soil or bedrock.

(3) Not cause preferential flow from the soil treatment and dispersal system bottom to the periodically saturated soil or bedrock.

(4) Be conducted by an appropriately certified qualified employee or an appropriately licensed business as specified in Minnesota Rules, Chapter 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.

SECTION 23. LAND APPLICATION OF SEPTAGE

23.1 Allowed Septage Application

This section applies to land application domestic septage only.

23.2 Permits and Licenses Required

(1) A Permit from this Department is required for each parcel of land to which septage is applied.

(2) Land spreading must be conducted by a licensed maintainer business.

23.3 Permit Application

(1) An application for a Permit to land apply septage on a specific parcel of land shall made to the Department on forms provided by the

List of information that must be included in a Land Application permit application

Department. At a minimum the application must contain the following information: The geocode for the proposed receiving site;

(2) The name and address of the landowner;

(3) A signed copy of the agreement with the landowner for land application on the specified parcel of land;

(4) A map to scale of the parcel showing the exact location within the parcel where land application is being proposed;

(5) Soils information at each land application site. Soil information shall include soil observation logs and a soil survey map of each site;

(6) Information regarding the nutrient suitability for land application of the proposed site, including current soil nutrient levels and proposed nutrient loading rates;

(7) Information regarding the drainage, slope, absorption rates, and separation distance from saturated soil conditions, bedrock, or other restrictive layer of the proposed site.

(8) The proposed application rates, volumes of septage to be applied, method of application, incorporation, date(s) of application and limiting conditions to application;

(9) The cover crop and/or proposed cropping information;

(10) A description of the pathogen and vector control methods to be used;

(11) A description of how public access to the site will be controlled;

(12) Documentation from the local unit of government indicating that the proposed activity is allowed.

23.4 Duration of Permit

A Permit shall be valid for a period of no longer than two years from the date of issuance.

23.5 Maximum Volume

The maximum volume of septage that can be applied to each acre of land in each land application site must be determined using the following equation:

AAR=N/0.0026

Where:
AAR = Annual Application Rate in gallons per acre per 365 days
N = amount of Nitrogen in pounds per acre per 365 days needed by the crop or vegetation to be grown on the land

The maximum allowable volume of domestic septage shall also take into account any nitrogen fertilizer applied in association with the septage.

23.6 Requirements for Land Application Sites

To be approved as a site for land application of domestic septage, the following minimum requirements must be met:

Minimum requirements a site must meet for Land Application

(1) The site shall:

(A) Be a non-public site;

(B) Not be in a shoreland area;

(C) Be located in an Agricultural Zoning District. No land application is allowed in residential, institutional or commercial/industrial zones;

(D) Contain soils that are not rapidly permeable at the application depth;

(E) Not be located in a floodway or floodplain;
(F) Not contain slopes greater than 12 percent; and
(G) Not be classified as Very High Sensitivity or High Sensitivity of groundwater pollution according to the "Prairie du-Chien-Jordan Aquifer" map (Plate 6) of the Geologic Atlas of Washington County (1990), developed by the Minnesota Geologic Survey of the University of Minnesota. The Geologic Atlas of Washington County (1990) is incorporated by reference, and is not subject to frequent change.

(2) Unless limed, septage shall either be injected or incorporated within six hours of surface application to a minimum depth of six inches. No significant amount of septage shall be present at the land surface after septage is injected or incorporated.
(3) Be protected from unauthorized access.
(4) Septage shall not be applied such that ponding or runoff occurs.
(5) Septage must not be applied unless the soil has dried adequately from previous applications or rainfall so that ponding does not occur.
(6) Septage shall not be applied by spray irrigation or other methods that will cause aerosols to drift from the application site.

23.7 Soil Suitability

For the land application site to be suitable, the soil on the site must meet the following requirements:

(1) Have medium or fine surface textures with a soil hydraulic loading rate less than or equal to 0.78 gpd/ft^2 (percolation rate slower than 5 minutes per inch). Land application must not be performed on sand or peat surface textures;
(2) Have a three foot vertical separation from the application depth to saturated soil conditions or bedrock;
(3) Have six inches of available water holding capacity between the application depth and saturated soil conditions or bedrock;
(4) Have at least one horizon in the upper five feet that has a soil hydraulic loading rate less than 0.6 or fine sand (percolation rate slower than 10 minutes per inch).

Table X

Daily surface application rates of domestic septage on non-frozen, non-snow covered sites	
Soil Texture	Maximum Daily Application Rates – Gallons/Acre/Day
Coarse Sand, Sand, Loamy Coarse Sand	0
Fine Sand, Very Fine Sand, Loamy Sand, Loamy Fine Sand, Loamy Very Fine Sand	10,000
Sandy Loam, Coarse Sandy Loam, Fine Sandy Loam, Very Fine Sandy Loam. Loam, Silt Loam, Silt	10,000
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay,	10,000
Silty Clay, Clay	0

23.8 Required Application Methods

Acceptable application methods.

(1) Land application methods must comply with Code of Federal Regulations (CFR) 40, Part 503 for pathogen reduction, vector

attraction, and for maximum volume of septage that may be applied to any site during a 365 day period.

(2) When soils are snow covered or frozen, the application rate is limited to 10,000 gallons per acre or less, and application is only allowed on slopes of 2 percent or less. Each area of the site may only be covered once.

(3) Septage must not be applied on areas with ponding water.

(4) Land application sites shall not be used for crops for direct human consumption unless the waiting periods on Table XI below are followed:

Table XI

Restricted Activity	Waiting Period
Food crops whose harvested part may touch the soil/septage (melons, squash, tomatoes, etc.	14 months
Food crops with harvested parts below the surface (potatoes, carrots, etc.)	38 months
Feed, food, or fiber crops that do not touch the soil surface (field corn, sweet corn, hay, flax, etc.)	30 days
Turf harvest	1 year
Grazing of animals	30 days
Public access to land High potential for exposure Low potential for exposure	 1 year 30 days

23.9 Slope Restrictions

Slope	Surface Application	Incorporated within 48 hours	Frozen Soil	Injected
<2%	Allowed	Allowed	Allowed	Allowed
2-6%	Allowed	Allowed	Not Allowed	Allowed
6-12%	Not Allowed	Allowed	Not Allowed	Allowed
>12%	Not Allowed	Not Allowed	Not Allowed	Conditionally Allowed*

*The Department may approve land application of domestic septage through injection on sites previously used for crop production with slopes exceeding twelve percent (12%) on a case-by case basis. The Department may impose any conditions necessary to protect public health, public safety and the environment.

23.10 Setback Requirements

Table XII

Required setbacks for a Land Application Site.

Setbacks to Physical Features			
	Setback Distances in Feet		
	Surface Application	Incorporated within 48 hours	Injected
Private drinking water well	200		
Public drinking water well*	1000		
Irrigation well	50	25	25
Occupied building (residences)	200	200	100

Residential developments		600	600	300
Commercial subdivision		600	600	300
Recreation area		600	600	300
Public contact sites		600	600	300
Property line		50	50	50
Road right-of-way		50	50	50
Down gradient lakes, rivers, streams, wetlands, intermittent streams, or tile inlets connected to these surface water features**, and sinkholes	Slope 0 % to 6 % Slope 6 % to 12 % Winter (0 % to 2 %)	200 Not Allowed 600	50 100 Not Applicable	50 100 Not Applicable
Grassed Water Ways***	Slope 0 % to 6 % Slope 6 % to 12 %	100 Not Allowed	33 33	33 33
Shoreland Area		Not Allowed	Not Allowed	Not Allowed

*There may be special requirements if the land application site is within a wellhead protection area.
**Intermittent stream means a drainage channel with definable banks that provides for runoff flow to any of the surface waters listed in the above table during snow melt or rainfall events.
***Grassed waterways are natural or constructed and seeded to grass as protection against erosion. Separation distances are from the centerline of grassed waterways. For a grassed waterway which is wider than the separation distances required, application is allowed to the edge of the grass strip.

23.11 Reporting Requirements

The permittee must submit to the Department an annual report. The reporting year will run from September 1 of each year through August 31 of the following year. Such report shall be submitted to the Department no later than November 1 of each year. The following information is required to be included in the report:

(1) Daily land application activities, including, but not limited to:
- (A) Each site where septage was applied, the date of application, permit number for the site, and Geocode of the site;
- (B) The exact location on the site septage was applied, and the number of acres which received septage;
- (C) The total volume of septage applied to each land application site;

(D) The method of application used for each land application site;

(E) Vector attraction reduction and pathogen reduction method used. If lime stabilization is used, records must indicate the pH of each load;

(F) A description of any additional management practices and site restrictions that were used.

(2) Any other analysis of information as required by the Department in the Permit.

SECTION 24. SYSTEM ABANDONMENT

24.1 Tank Abandonment.

Procedure for properly abandoning tanks, cesspools, leach pits, drywells, seepage pits, and privies.

All systems with no future intent for use must be abandoned according to this Section. Tank abandonment procedures for sewage tanks, cesspools, leaching pits, drywells, seepage pits, vault privies, and pit privies must meet the requirements of Section 24.1(1) to Section 24.1(3).

(1) All solids and liquids must be removed and disposed of according to Section 22 by a licensed maintenance business.

(2) All electrical devices and devices containing mercury must be removed and disposed of according to applicable regulations.

(3) 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.

(4) The removed tank or tank fragments and any soil visually contaminated with sewage shall be disposed in accordance with Section 24.3.

24.2 Future Discharge.

Access for future discharge to the system must be permanently denied.

24.3 Removal of System.

Proper disposal methods if the soil treatment and dispersal systems are removed.

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 disposed of offsite must be disposed of according to Section 24.3(1) to 24.3(2).

(1) 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 Table V in Section 16 and Section 16.3 (3) of this Chapter 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 Minnesota Rules, Chapter 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.

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

(3) The person or business abandoning the system must complete and sign

a record of abandonment that states the system was abandoned according to this Section. A description of the abandonment procedure must be recorded including a map of the remaining in-place components and location of the components removed. The record must be sent to the Department or local unit of government within 90 days of abandonment.

24.4 MSTS Abandonment.
MSTS no longer in use must be abandoned according to this Section 24.

SECTION 25. PRODUCT REGISTRATION

25.1 Product Registration in Compliance with State Rules.
All product registration shall be in accordance with Minnesota Rules 7083.4000 to 7083.4120.

25.2 Registered Products Approved by the Local Unit of Government.
Technology and products employed in system design shall adequately protect the public health and the environment as determined by Minnesota Rules, Chapter 7083, and be approved for use by the Department.

SECTION 26. ENFORCEMENT

26.1 Misdemeanor.
It is hereby declared unlawful for any person, firm or corporation to violate any term or provision of this Ordinance. Any violation of this Ordinance shall be a misdemeanor. Each day that a violation is allowed to continue shall constitute a separate offense. Citations may be issued by the Department pursuant to the procedure set forth in the Washington County Administrative Ordinance.

26.3 Corrective Actions Required.
In the event of a violation or threatened violation of this Chapter, the Department, may institute appropriate civil actions including but limited to a request for injunctive relief to prevent, restrain, correct or abate such violations or threatened violations. In addition, written notice in the form of a license complaint may be made to the Commissioner of the Minnesota Pollution Control Agency.

26.3 Public Health Nuisance Control.
In cases where a public health nuisance has been determined to exist, the Department may institute enforcement action under the Local Public Health Act, Minnesota Statutes, Chapter 145A; the Washington County Public Health Nuisance Ordinance, or subsequent revisions thereof: and the Washington County Administrative Ordinance.

SECTION 27. SEPARABILITY

27.1 Separability.
It is hereby declared to be the intent that the several provisions of this regulation are separable in accordance with the following:

(1) If any court of competent jurisdiction shall adjudge any provision of the regulation to be invalid, such judgment shall not affect other provisions

of this regulation not specifically included in said judgment.

(2) If any court of competent jurisdiction shall adjudge invalid the application of any provision of this regulation to a particular property, building or structure, such judgment shall not affect the application of said provision to any other property, building or structure not specifically included in said judgment.

SECTION 28. REPEAL

28.1 Repeal.
Chapter Four (Ordinance #196), Subsurface Sewage Treatment System Regulations, of the Washington County Development Code as adopted by the County Board April 28, 2015 is hereby repealed and replaced by this Ordinance.

SECTION 29. EFFECTIVE DATE

29.1 Effective Date of Ordinance.
The regulations contained in this Ordinance shall become effective immediately upon passage by the County Board and publication according to law.

Passed by the Board of County Commissioners of Washington County, Minnesota, this 5th day of June, 2018.

Gary Kriesel, Chair
Board of County Commissioners

Attest:

Molly O'Rourke
Washington County Administrator

Approved as to form:

George Kuprian
Assistant Washington County Attorney

Ordinance prepared by:

Washington County
Department of Public Health and Environment
14949 62nd Street North
PO Box 6
Stillwater, MN 55082-0006

STATE OF MINNESOTA)
)
COUNTY OF WASHINGTON)

I, Molly F. O'Rourke, qualified County Administrator for the County of Washington, State of Minnesota, do hereby certify that I have compared the foregoing copy of Resolution No. 2018-054 with the original minutes of the proceedings of the Board of Commissioners, Washington County, Minnesota, at its session on the 5th day of June, 2018, now on file in my office and have found the same to be a true and correct copy thereof.

Witness my hand and official seal at Stillwater, Minnesota, this 27th day of June, 2018.

Molly F. O'Rourke
County Administrator

BOARD OF COUNTY COMMISSIONERS
WASHINGTON COUNTY, MINNESOTA

RESOLUTION NO. 2018-054

DATE June 5, 2018

DEPARTMENT Public Works

MOTION BY COMMISSIONER Miron

SECONDED BY COMMISSIONER Karwoski

REPEAL OF CURRENT ZONING/LAND USE ORDINANCES AND ADOPTION OF NEW ZONING/LAND USE ORDINANCES.
AND
REPEAL OF EXISTING DEVELOPMENT CODE AND ADOPTION OF THE REVISED DEVELOPMENT CODE

ZONING/LAND USE ORDINANCE NUMBERS 203, 204, 205, 206, 207, 208, 209, 210, 211 & 212

WHEREAS, Washington County is authorized to carry on County planning and zoning activities in the unincorporated areas of the County pursuant to Minn. Stat. Chapt. 394; and

WHEREAS, the Washington County Comprehensive Plan was adopted by the Washington County Board of Commissioners on April 22, 1997 and became effective October 1, 1997 as Washington County Ordinance No. 124, amended on September 7, 2010 to the Washington County Comprehensive Plan 2030 as Washington County Ordinance No. 184, and amended on August 16, 2016 as Washington County Ordinance 198; and

WHEREAS, pursuant to Minn. Stat. 473.865 the Washington County Comprehensive Plan is the implement by which the County's regulation of land use is devolved through adoption of official controls under Chapter 394.

WHEREAS, the current official controls as reflected in the Washington County Development Code were adopted by the Washington County Board of Commissioners and became effective on October 20, 1997 as Washington County Ordinance No. 127; and

WHEREAS, all the townships in Washington County have assumed regulatory control of land use through adoption of the Comprehensive Land Use Plans under the 2030 Regional Development Framework pursuant to the authority contained in Minn. Stat. 473.861 and the County's relinquishment of such controls; and

WHEREAS, such transformation has been found by the Metropolitan Council to conform to the regional system plans for transportation, water, resources management and parks; and

WHEREAS, the Township's plans are consistent with the Washington County 2030 Comprehensive Plan and are compatible with the plans of adjacent and affected jurisdictions; and

WHEREAS, the recasting of the County's official controls necessitate revision of the Washington County Development Code; and

WHEREAS, the forty-three (43) current zoning/land use ordinances, attached as Exhibit A, are determined to be anachronistic and must be repealed; and

WHEREAS, ten (10) new zoning/land use ordinances, attached as Exhibit B, must be enacted; and

WHEREAS, the existing Washington County Development Code must be repealed and the ten (10) new zoning/land use ordinances must be codified as the Revised Washington County Development Code.

WHEREAS, on April 24, 2018 a public hearing was held before the Washington County Planning Advisory Commission (PAC) to consider an action to do the following: 1) repeal the existing forty-three (43) zoning/land use ordinances as set forth in Exhibit A; 2) the adoption of ten (10) new zoning/land use ordinances as set forth in Exhibit B; and 3) repeal the existing Washington County Development Code and adopt a revised Washington County Development Code attached as Exhibit C.

WHEREAS, on April 24, 2018 the PAC recommended the Washington County Board of Commissioners approve the following: 1) the repealing of the forty-three (43) existing zoning/land use ordinances as set forth in Exhibit A; 2) adoption of ten (10) new zoning/land use ordinances attached as Exhibit B; 3) repealing of the existing Washington County Development Code and adoption of the Revised Washington County Development Code as set forth in Exhibit C.

WHEREAS, the records of the public hearing consists of the minutes of both the Washington County Board of Commissioners and the Planning Advisory Commission meetings, staff reports, a presentation by the Washington County Public Works Department, and comments from members of the public.

NOW, THEREFORE IT BE RESOLVED, that the Washington County Board of Commissioners hereby adopts the findings and recommendations of the Washington County Planning Advisory Commission.

BE IT FURTHER RESOLVED, based upon the hearing record, the Washington County Board of Commissioners hereby repeals the existing forty-three (43) zoning/land use ordinances attached and incorporated herein as Exhibit A.

BE IT FURTHER RESOLVED, the Washington County Board of Commissioners hereby adopts the ten (10) new zoning/land use ordinances attached as Exhibit B, which is attached hereto and incorporated herein.

BE IT FUTHER RESOLVED, the Washington County Board of Commissioners hereby codifies the ten (10) new zoning/land use ordinances into the Revised Washington County Development Code as fully set forth in Exhibit C, which is attached hereto and incorporated herein.

ATTEST: _____

COUNTY ADMINISTRATOR

_____

COUNTY BOARD CHAIR

	YES	NO
MIRON	X	____
KARWOSKI	X	____
KRIESEL	X	____
LAVOLD	X	____
WEIK	X	____