UPPER MISSOURI DISTRICT HEALTH UNIT
REGULATIONS FOR INDIVIDUAL SEWAGE
TREATMENT SYSTEMS FOR HOMES AND OTHER ESTABLISHMENTS WHERE PUBLIC SEWAGE SYSTEMS ARE NOT AVAILABLE

Section 01 Intent

These regulations written in accordance with the authority granted the Board of Health in the North Dakota Century Code , Section 23-05 and 23-14, hereby provide the minimum standards and criteria for design, location, installation, use, and maintenance of individual sewage treatment systems. The purpose of these regulations is to protect the health, safety, and welfare of the residents of the Upper Missouri District Health Unit. The regulations will apply to all counties served by the Upper Missouri District Health Unit and will be enforced by said entity.

In any case where a provision of these regulations is found to be in conflict with a provision of any zoning, building, safety, health ordinance, or code, the provision which establishes the higher standard for the promotion of the health and safety of the people of the Upper Missouri District Health Unit shall prevail.

Section 02 Definitions

1. "UMDHU" under these regulations means the Upper Missouri District Health Unit or it's designee.

2. "Continuing Education" means a structured, professionally presented curriculum dealing with Onsite Sewage Treatment Systems; sanctioned wholly or in part by the UMDHU.

3. "Installer" means an individual, contractor, or corporation who engages in the construction of Onsite Sewage Treatment systems. Property owners who work on their own systems are not included in this definition.

4. "Mottled soil" means soil from a soil boring which is marked with spots of contrasting colors. Any soil having spots of contrasting colors is considered to be mottled.

5. "Sewage Treatment" means all private methods of collecting and disposing of domestic sewage including septic tanks, privies, chemical toilets, and any others.

6. A "Chamber or Pump Chamber" means a watertight receptacle for receiving effluent from the septic tank which will be used for placement of an effluent grade pump to distribute that effluent to the treatment area.

7. "Non Community" means a collector system for sewage disposal serving a group of homes which uses lagoons or other collective methods of disposal and treatment which are not otherwise regulated by EPA or State regulations.

8. "NDCC" means the North Dakota Century Code.

9. "Installation and/or install" means the construction of new individual sewage treatment systems, and any addition, repair, or alteration of any existing individual sewage treatment system.

10. "Seepage bed" means a wide area (width wider than three feet but no greater than 25 feet) prepared to accept septic tank effluent that is created below the surface of the soil, and built the same way as a trench system.

Section 03 General Provisions

1. All sewage treatment systems will be installed in accordance with these regulations.

2. No individual sewage treatment system will be installed during wet conditions or conditions by which the soil would become smeared during construction.

3. Surface and storm waters will not be discharged into any individual sewage treatment system.

4. The building contractor, owner, plumbing contractor, or installer are jointly

responsible for compliance with these regulations.

5. When a public or non community sewage system is deemed available to a premise used for human occupancy if such premise is within two hundred feet [60.96 meters], the UMDHU will require that sewage be discharged into that system.

6. Nothing contained in these regulations will be construed to prevent the UMDHU from requiring compliance with higher requirements than those contained herein where such higher requirements are essential to maintain a safe and sanitary condition.

7. Where public or non-community sewage treatment systems are not available and installation of an individual sewage treatment system is contemplated for a building of human occupancy or use, previous to beginning any construction the master plumber, general contractor, or installer, will be required to make application to the UMDHU for a written permit to make the desired installation.

8. All domestic sewage will be disposed of by an approved method of collection, treatment, and effluent discharge. Domestic sewage or sewage effluent will not be disposed of in any manner that will cause pollution of the ground surface, ground water, bathing area, lake, pond, watercourse, or create a nuisance. It will not be discharged into any abandoned or unused well, or into any crevice, sink hole, or other opening either natural or artificial in a rock formation.

9. Where water under pressure is not available, all human body wastes will be disposed of by depositing them in approved privies, chemical toilets, or such other installations acceptable to the UMDHU.

10. Water-carried sewage from bathrooms, kitchens, laundry fixtures, and other household plumbing will pass through a septic or other approved sedimentation tank prior to its discharge into the soil or into an alternative system. Where underground disposal for treatment is not feasible, consideration will be given to special methods of collection and disposal.

11. Abandoned disposal systems, septic tanks, pumping and other chambers, and seepage beds will be disconnected from the buildings. The tanks and chambers will be pumped out, and filled with earth. **UMDHU must be notified to approve abandonment procedures.**

12. No property will be improved in excess of its capacity to properly absorb sewage effluent in the quantities and by the means provided in these regulations.

13. Where there is insufficient lot area or improper soil conditions for adequate sewage treatment for the building or land use proposed, and the UMDHU so finds, no building permit will be issued and no private sewage treatment will be permitted. Where space or soil conditions are critical, no building permit will be issued until engineering data and test

reports satisfactory to the UMDHU have been submitted and approved or a private sewage treatment system complying with the provisions of these regulations has first been designed.

14. The minimum lot size in which a private treatment system may be installed is one (1) acre, except where zoning requires more. If two (2) or more lots are required to equal one (1) acre, they must be replatted into one (1) lot before the sewer permit can be issued.

15. Malfunctioning individual sewage treatment systems are a menace to the health and general welfare of the public and are hereby declared a nuisance; and are subject to the requirements specified under NDCC Section 23-35.

16. Any person who violates, or refuses to comply with any provision of these regulations is guilty of a Class B Misdemeanor which can result in a maximum penalty of 30 days in jail and/or a $500.00 fine (NDCC Section 23-35).

Section 04 Installer licensing requirements

1. Installers will be required by the UMDHU to have or obtain a license to install individual onsite sewage treatment systems as described in these regulations. The license will expire on December 31st of each calendar year. Licenses shall be renewed each year by January first. After January 31st, the license fee shall be double the regular fee, with the exception of seasonal facilities.

2. Installers must obtain at least eight contact hours of suitable continuing education every two years which pertains to onsite septic system installation. Credit for training in other states may be granted on an individual basis by the UMDHU.

3. The installer will submit an "as built" drawing of the system to the UMDHU within thirty days after the system has been completed.

4. The installer of a treatment system must contact UMDHU two (2) days prior to backfill and filter cover for final approval. If upon inspection it is found that any construction does not meet regulations or has any other violation an order will be given to rectify the condition.

5. Any installation of an individual sewage treatment system by a licensee that is in violation of the provision of these regulations or a refusal on the part of a licensee to correct such defective work performed by said licensee, will be cause for revocation of or refusal to renew a license. Before any license issued under the provision of this Section may be revoked, the licensee will be given a hearing to show cause why such license should not be revoked. Notice of the time, place, and purpose of the said hearing will be in writing. See Section 08, Appeals.

6. License fees for installers will be established by UMDHU and will be reviewed and revised

at its' discretion.

Section 05 Permits Required

1. No installer and/or property owner will install an individual sewage treatment system in the district without first obtaining a permit from the UMDHU.

2. Application for such a permit will be made upon a form required by the UMDHU and will include complete plans and specifications for the desired installation. The permit to construct will be valid for a period of 12 months from the date of issuance. If the installation is not started within 12 months of the date of approval, the permit is void and a new application for permit will be made.

3. The UMDHU may require percolation tests or other pertinent tests to be conducted under its supervision. If so, such information will be made part of the permit.

4. The UMDHU will refuse to grant a permit for an installation of an individual sewage treatment system where a public sewer is available.

5. Permit fees will be established by the UMDHU and will be reviewed and revised at its' discretion.

Section 06 Inspection

1. The UMDHU will make inspections during any installation to determine compliance with these regulations. No part of any installation will be covered until inspected by the UMDHU, unless prior approval has been granted. Any part of any installation which has been covered prior to final approval will be uncovered upon order of the UMDHU.

2. It will be the duty of the owner or occupant of the property to give the UMDHU free access to the property at any reasonable time for the purpose of making the inspection.

3. It will be the duty of the installer or owner to give advance notification of at least two (2) working days stating the system is ready for inspection.

4. If upon inspection, it is determined any part of the system is not installed in accordance with the minimum standards provided in these regulations, the installer and/or property owner will be responsible for the correction or elimination of all defects, and no system will be placed in service until all defects have been corrected or eliminated.

5. Upon completion and final inspection of the system, if found satisfactory and meeting the approval of the inspection, the UMDHU will issue to the installer and/or property

owner a approved (signed) copy of the permit.

Section 07 Severability

If any section, subsection, sentence, clause, phrase or portion of these regulations is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision will not affect the validity of the remaining portions of these regulations.

Section 08   Appeals

1. Any person aggrieved by any order or determination of the UMDHU may within 30 days of such action petition the Upper Missouri District Board of Health for a hearing.

2. Such an appeal will be in writing and will specify in detail the grounds for the appeal. The appeal will be filed with the President of the Board of Health.

3. A hearing date will be set within 30 days of the filing.

4. The District Board of Health will fix a reasonable time for the hearing and give due notice to all interested parties.

5. The District Board of Health will rule on all appeals and the final decision of such appeal will be based on a majority vote of the Board.

6. The decision of the District Board of Health will be final and will be made in writing to the appellant.

Section 09 Design of individual sewage system

1. Design. The design of the individual sewage treatment system must take into consideration location with respect to wells or other sources of water supply, topography, water table, soil characteristics, area available, and maximum occupancy of the building.

2. Type of System. The type of system to be installed will be determined on the basis of location, soil permeability and ground water elevation.

3. Sanitary sewage. The system will be designed to receive all sanitary sewage, including laundry waste, from the building. Drainage from footings or roofs will not enter the system.

4. Discharge. The system will consist of a septic tank discharging into either a subsurface treatment field or one or more seepage beds or into a combination of both, if found adequate as such and approved by the UMDHU.

5. Ground Water. No plumbing fixture may be connected to any individual sewage treatment system where ground water may collect above the sewage treatment system causing a flooded condition, unless the elevation of the fixture trap is a sufficient height above the elevation of the finished grade of the ground in which the sewage treatment field is installed to prevent backup. The minimum separation distance from the bottom of the treatment area must equal or exceed twenty-four inches [60.96 cm].

6. Alternate design. Where soil conditions are such that neither of the systems mentioned in subsection 4 can be expected to operate satisfactorily, approval of an alternate design will be secured from UMDHU.

7. Sewage Flow. Design criteria for sewage flow according to the type of establishment is indicated in the following table:

SEWAGE FLOWS ACCORDING TO TYPE OF ESTABLISHMENT

Type of Establishment	Gallons Per Day Per Person (unless noted otherwise)
Airports (per passenger)	5
Apartments/Multiple family (per resident)	60
Assembly halls (per seat)	2
Bars (per seat)	5
Bathhouses and swimming pools	10
Bowling Alleys (per lane)	75
Camps:	
Campground w/ central comfort stations	35
with flush toilets, no showers	25
Construction Camps (semipermanent)	50
Day Camps (no meals served)	15
Resort camps (night & day) w/ limited plumbing	50
Luxury camps	100
Churches (per sanctuary seat)	5
Churches w/ kitchens (per sanctuary seat)	7
Cottages and small dwellings (seasonal occupancy)	50
country clubs (per member present)	25
Dwellings:	
Boardinghouses	50
add for non residential boarders	10
Luxury residences and estates	150
Multiple family dwellings (apartments)	60
Rooming houses	40

Single family dwellings	75
Factories (gal/person/shift exclusive of industrial wastes)	35
Hospitals (per bed)	250
Hotels (per guest)	50
Institutions other than hospitals (per bed)	100
Laundries, self-service (gallons per machine)	500
Mobile home parks (per space)	250
Motels (per bed space)	50
Picnic Parks (sanitary waste only)	5
Picnic Parks w/ bathhouse, showers, flush toilets	10
Restaurants (toilets & kitchen wastes per patron)	10
Restaurants (kitchen wastes per meal served)	3
Restaurants additional for bars and cocktail lounges	2
Schools:	
Boarding	75
Day, without gyms, cafeterias or showers	15
Day, with gyms, cafeterias and showers	25
Day, with cafeteria, but without gyms or showers	20
Service Stations (per vehicle served)	10
Theaters:	
Movie (per auditorium seat)	5
Drive-in (per car space)	5
Travel Trailer parks without individual water an sewer hookups (per space)	50
Travel trailer parks with individual water and sewer hookups (per space)	100
Workers:	
Construction (at semipermanent camps)	50
Day, at school and offices (per shift)	15

Section 10 Location of individual sewage system

1. The minimum lot size in which a private treatment system may be installed is one acre (43,560 square feet). Smaller lot sizes may be approved by the UMDHU if a centralized sewage treatment system is provided and approved through the NDDOH.

2. The following table provides for the minimum distances that will be observed in locating the various components of the treatment system.

	Well <100'	Well >100'	Distribution Device	Treatment Area	Property Lines	Building
Bldg. Sewer	100	50	------	------	------	------
Septic tank	100	50	5	10	10	10
Distribution Device	100	50	------	------	10	20
Treatment area	100	50	5	------	10	10
Well <100'	--	--	100	100	n/a	n/a
Well >100'	--	--	50	50	n/a	n/a
water line (pressure)	--	--	10	10	n/a	n/a
(suction)	--	--	50	50	n/a	n/a
Surface Water bodies	n/a	n/a	100	100	n/a	n/a

3. All proposed sites for individual sewage treatment systems must be evaluated as to:
   a. Depth to the highest known or calculated ground water table or bedrock;
   b. Soil conditions, properties, and permeability
   c. Slope;
   d. The existence of lowlands, local surface depressions, and rock outcrops;
   e. All legal setback requirements from existing and proposed buildings, property lines, sewage tanks, soil treatment systems, water supply wells, buried water pipes and utility lines, the ordinary high water mark of lakes, rivers, streams, flowage, and the location of all soil treatment systems and water supply wells on adjoining lots to the proposed soil treatment system, sewage tank and water supply well; and
   f. Surface water flooding probability.
   g. Compaction, the system cannot go in in compacted soil and compaction will be kept to a minimum while installing. The system should not at any time after installation be compacted. (No driving over it)

4. Privies, septic tanks, and underground treatment means will not be within two hundred feet (200) [60.96 meters] measured horizontally from the high water level in the reservoir or the banks of tributary streams when situated less than three thousand feet (3000) [914.4 meters] upstream from potable water intake structures. Sewage treatment facilities situated beyond three thousand feet (3000) [914.4 meters] upstream from intake structures will be located no less than one hundred feet (100) [30.48 meters] measured horizontally from the high water level in the reservoir or the banks of the tributary streams.

Section 11 Percolation tests

1. Where Percolation tests are required, they must be made by a licensed soil testing company approved by UMDHU. Results are to be given to UMDHU and the homeowner prior to design of the system.

2. Test Hole dimensions and locations. Each test hole must be six inches [15.24 centimeters] in diameter, have vertical sides, and be bored or dug to the depth of the bottom of the proposed individual sewage treatment system. Soil texture descriptions must be recorded noting depths where texture changes occur.

3. Preparation of the test hole. 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 may penetrate.

4. All loose material must be removed from the bottom of the test hole and two inches [5.08 centimeters] of one-fourth inch to three-fourths inch [.635 centimeters to 1.90 centimeters] diameter gravel must be added to protect the bottom from scouring.

5. Soil saturation and swelling. The hole must be carefully filled with clear water to a minimum depth of twelve inches [30.48 centimeters] over the soil at the bottom of the test hole and maintained for no less than four hours. The soil must then be allowed to swell for at least sixteen, but not more than thirty hours. In sandy soils, the saturation and swelling procedure is not required and the test may proceed if one filling of the hole has seeped away in less than ten minutes.

6. Percolation rate measurement

   a. In sandy soils. Adjust the water depth to eight inches [20.32 centimeters] 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 [centimeters] to the nearest one-eighth inch [0.34 centimeters] at approximately 10 minute intervals. A measurement can also be made by determining the time it takes for the water level to drop one inch [2.54 centimeters] from an eight inch [20.32 centimeters] reference point. If eight inches [20.32 cm] of water seeps away in less than 10 minutes, a shorter interval between measurements must be used, but in no case may the water depth exceed eight inches [20.32 cm]. The test must continue until three consecutive percolation rate measurements vary by a range of no more than ten percent.

b. In other soils. Adjust the water depth to eight inches [20.32 centimeters] 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 [centimeters] to the nearest one-eight inch [0.34 centimeters] at approximately 30 minute intervals, refilling between measurements to maintain an eight inch [20.32 cm] starting head. The test must continue until three consecutive percolation rate measurements vary by a range of no more than ten percent. The percolation rate can also be made by observing the time it takes for the water level to drop one inch [2.54 centimeters] from an eight inch [20.32 centimeters] reference point if a constant water depth of at least eight inches [20.32 cm] has been maintained for at least four hours prior to the measurement.

c. Calculating the percolation rate. Divide the time interval by the drop in water level to obtain the percolation rate in minutes per inch [2.54 cm].

7. Percolation rates determined for each test hole must be averaged to determine the final soil treatment system design.

8. A percolation test may not be run where frost exists below the depth of the proposed treatment system.

Section 12 Soil bores

1. Each boring or excavation must be made to a depth of at least three feet [0.91 meters] deeper than the bottom of the proposed system or until bedrock or a water table is encountered, whichever is less.

2. A soil texture description must be recorded by depth and notations made where texture changes occur.

3. Particular effort must be made to determine the highest known water table by recording the first occurrence of mottling observed in the hole, or if mottling is not encountered, the open holes in clay or loam soils must be observed after standing undisturbed a minimum of sixteen hours, and depth to standing water if present, must be measured.

Section 13 Septic tanks

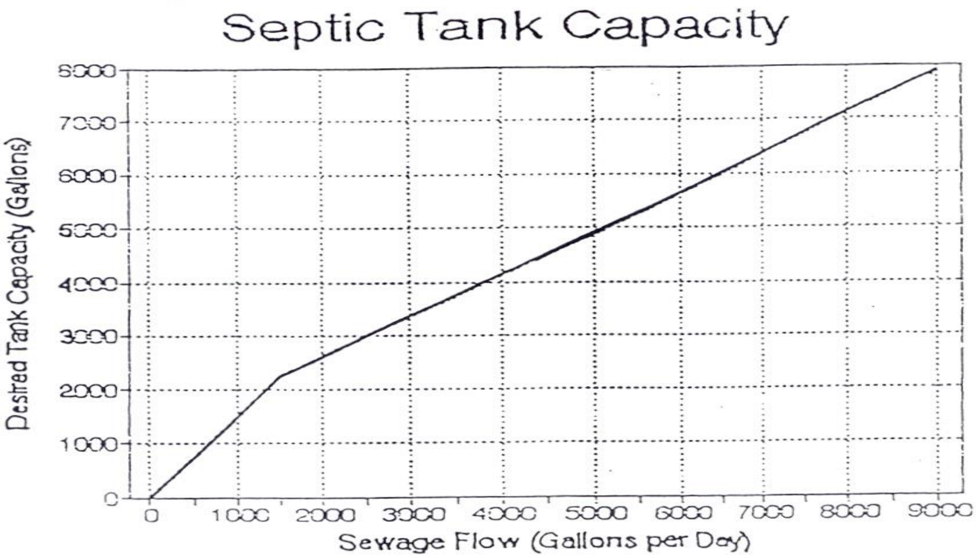
1. Liquid capacity. The liquid capacity of all septic tanks will conform to the tables contained in subsection 7 of section 03 and this subsection as determined by the number of bedrooms or apartment units in dwelling occupancies and the occupant load or the number of plumbing fixture units as determined from the table in subsection 1 of section 62-03-11-04 of the ND State Plumbing Code, whichever is greater in other building occupancies.

CAPACITY OF SEPTIC TANKS*

Single family dwellings-number of bedrooms	Multiple dwelling units or apartments-one bedroom each	Other uses; maximum fixture units served	Minimum septic tank working capacity in gallons
1-3		20	1000
4	2 units	25	1200
5 or 6	3	33	1500
7 or 8	4	45	2000
	5	55	2250
	6	60	2500
	7	70	2750
	8	80	3000
	9	90	3250
	10	10	3500

Extra bedroom, 150 gallons each
Extra dwelling units over 10, 250 gallons each
Extra fixture units over 100, 25 gallons per fixture unit

*NOTE: Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposal units without further volume increase.



RESTAURANTS:	*To provide cooling of dishwasher wastes for grease coagulation, provide twice the capacity shown on graph.*
LAUNDROMATS:	*To provide cooling of wastewater for suds and grease flotation, provide at least twice the capacity shown on graph.*
SLAUGHTER HOUSES:	*Do not allow blood to enter the system. Collect the blood separately and sell to renderer. To provide sufficient time to stabilize the remaining high strength waste, twice the capacity shown on graph is required.*
DAIRIES:	*Septic tanks and absorption beds will not treat milk or whey wastes.*

2. Septic tank construction. Septic tanks must be constructed of sound durable materials not subject to excessive corrosion or decay and must be watertight. Each such tank must be structurally designed to withstand all anticipated earth or other loads and must be installed level and on a solid bed. All tanks regardless of material or method of construction must conform to the following criteria:

   a. The liquid depth of any septic tank or compartment will be not less than thirty inches [76.20 cm], nor more than six and one-half feet [1.97 meters]. No tank may have an inside horizontal dimension less than twenty-four inches [60.96 cm].

   b. The space in the tank between the liquid surface and the top of the inlet and outlet baffles must be not less than twenty percent of the total required liquid capacity, except that in horizontal cylindrical tanks this space must be not less than fifteen percent of the total required liquid capacity.

   c. There must be at least one inch [2.54 cm] between the underside of the top of the tank and the highest point of the inlet and outlet devices. The inlet invert must be not less than three inches [7.62 cm] above the outlet invert.

d. Baffles must be integrally cast with the tank, affixed with permanent waterproof adhesive or affixed with stainless steel connectors, top and bottom, and be constructed of acid-resistant concrete, acid resistant fiberglass or plastic.

e. The inlet baffle must extend at least six inches [15.24 cm], but not more than twenty percent of the total liquid depth below the liquid surface and at least one inch [2.54 cm] above the crown of the inlet sewer.

f. The outlet baffle and the baffles between compartments must extend below the liquid surface a distance equal to forty percent of the liquid depth, except that the penetration of the indicated baffles or sanitary tees for horizontal cylindrical tanks must be thirty five percent of the total liquid depth. They also must extend above the liquid surface. In no case may they extend less than six inches [15.24 cm] above the liquid surface.

g. Inlet baffles must be no less than six inches [15.24 cm] or no more than twelve inches [30.48 cm] measured from the end of the inlet pipe to the nearest point on the baffle. Outlet baffles must be six inches [15.24 cm] measured from beginning of the outlet pipe to the nearest point on the baffle. Sanitary tees used as baffles must be at least four inches [10.16 cm] in diameter.

h. The inlet and outlet must be located opposite each other along the axis of maximum dimension. The horizontal distance between the nearest points of the inlet and outlet devices must be at least four feet [1.22 cm].

i. There may be one or more manholes. Manholes must be at least eighteen inches [45.72 cm] in diameter, and located within six feet [1.83 meters] of all walls of the tank. The manhole must extend through the cover to a point within twelve inches [30.48 cm] but no closer than six inches [15.24 cm] below finished grade. The manhole cover must be corrosion resistant, rated three hundred-pound [136.07 kilograms] load bearing, and covered with at least six inches [15.24 cm] of earth. When in the opinion of the UMDHU, the manhole is permitted above finish grade, it must be safely secured.

j. There must be an inspection pipe of at least four inches [10.16 cm] in diameter or a manhole over both the inlet and outlet devices. The inspection pipe must extend through the cover and be capped flush or above finished grade. A downward projection of the centerline of the inspection pipe must be directly in line with the centerline of the inlet or outlet device.

3. Multiple tanks.

a. Where more than one tank is used to obtain the required liquid volume, the tanks must be connected in series.

b. No more than four tanks in series can be used to obtain the required liquid volume.

c. The first tank must be no smaller than a subsequent tank in series.

4. Septic tank materials. See subsection 10 of section 62-03-03.1-03 of the ND State Plumbing Code.

5. Depth of septic tank. Where septic tanks are installed above the frostline, precautions must be taken to prevent the septic tank from freezing. Precautions must be taken to prevent shallow pipe from freezing. For any septic tank installation that will have less than 4 feet of earth cover over the pipe coming out of the house connecting to the tank will require 2-inch thick rigid Styrofoam insulation be placed above the house sewer pipe. The pipe should be insulated from the basement wall all the way to the septic tank. The rigid foam board should extend at least 1 foot on either side of the pipe (it should be the width of the trench). A 1 foot vertical piece of foam can also be placed on each side of the trench.

6. Service limited. No septic tank will serve more than one property unless authorized by the UMDHU.

7. Disposal of effluent. The effluent from all septic tanks will be disposed of underground by subsurface absorption trench, seepage beds, or approved alternative systems.

Section 14 Distribution box

1. Use. A distribution box may be used when more than one line of absorption field or more than one seepage bed is used.

2. Connection. Each lateral line will be connected separately to the distribution box and will not be subdivided.

3. Invert level. The inlet invert will be at least one inch [[2.54 cm] above the invert of the outlets. The size of the distribution box will be sufficient to accommodate the number of lateral lines.

4. Watertight. The distribution box will be of watertight construction arranged to receive the septic tank effluent sewer and with an outlet or connecting line serving each trench or seepage bed.

5. Inspection. The sides of the box should extend to within a short distance of the ground surface to permit inspection, and will have a concrete marker at grade.

Section 15 Absorption trenches

1. Design. Absorption trenches will be designed and constructed on the basis of the percolation test results or other soil data. Trench bottom area required is shown in the table in subsection 4. The bottom of the trench will be dug so it is dead level throughout its length. The maximum depth to the bottom of absorption trenches will not exceed 48 inches [121.92 cm]. The trench bottom must be at least twenty-four inches [60.96 cm] above the mottled soil condition indicating a water table or from standing water in the bore hole.

2. Filter material. The filter material will cover the 4 inch [10.16 cm] diameter pipe to a depth of 2 inches [3.08 cm] measured from the crown of the pipe and extend the full width of the trench and will be not less than six inches [15.24 cm] deep beneath the bottom of the 4 inch [10.16 cm] diameter pipe. The filter material may be washed rock or crushed stone ranging in size from one inch to three inches [2.54 cm to 7.62 cm]. Installers may use alternative filter material on land in excess of 40 acres at the discretion of Upper Missouri District Health Unit. The filter material will be covered by red rosin paper, hay, straw, or approved filter fabric, as the laying of the pipe proceeds. Approved graveless systems may be used in lieu of rock fill providing an equivalent surface area of soil is utilized.

3. Spacing. Trenches must have a minimum spacing of undisturbed earth of six feet [1.83 meters] for eighteen inch to twenty-four inch [45.72 cm to 60.96 cm] trench widths, and nine feet [2.74 meters] for trenches up to thirty-six inches [91.44 cm] wide

4. Absorption field. The size and requirements for absorption fields will conform to those given in the following table:

Table - Recommended absorption trench area.

Percolation rate minutes/inch	Soil Classification	Depth of Rock below distribution pipe 6"	12"	18"	24"
	- Trench bottom area loading rate, gal/ft^2./day				
.1 to 5	Sand	1.2	1.5	1.80	2.1
6 to 15	Sandy loam	0.8	1.0	1.20	1.4
16 to 30	Loam	0.6	0.75	0.90	1.05
31 to 45	Silt Loam	0.5	0.63	0.76	0.89
46 to 60	Clay Loam	0.45	0.57	0.68	0.79
	-Square feet of trench bottom/bedroom[1]				
.1 to 5	Sand	125	100	85	70
6 to 15	Sandy Loam	190	150	125	110

16 to 30	Loam	250	200	165	145
31 to 45	Silt Loam	300	240	200	170
46 to 60	Clay Loam	330	265	220	190

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[1] Based on Sewage volume of 150 gpd/bedroom

5. Absorption lines.
   a. Gravity distribution. Absorption lines will be constructed of four inch [10.16 cm] pipe or approved gravelless type of materials. For approved plumbing materials, see table 62-03-03.1 of Chapter 62-03-03.1 of the North Dakota State Plumbing Code, as amended.

   b. Pressure distribution. Absorption lines must be constructed of one and one-half inch to 2 inch [3.81 cm to 5.08 cm] rigid plastic pipe with one-fourth inch [6.35 mm] holes drilled in the bottom of the pipes. The number of perforations and spacing of perforations for different diameter pipes for pressure distribution laterals must not exceed 10% of the average pressure head on the perforations. The pipe and connections must be able to withstand a pressure of at least 40 pounds per square inch. The perforated laterals should be attached to a 2 inch [5.08 cm] manifold pipe and should have the ends capped. The pipe must be installed level. The laterals should be spaced no further than 40 inches [101.6 cm] on center and no further than 20 inches [50.80 cm] from the edge of the rock. The manifold must be supported and backfilled by hand.

6. Grade. The absorption trench bottom must be level. No individual run will be longer than 100ft.

Section 16 Piping Material

All piping from building drain to sewage system will be four inches [10.16 cm] or larger service schedule 40 acrylonitrile-butadiene-styrene or polyvinyl chloride plastic pipe, type PSP PVC sewer pipe SDR 35, and fittings A.S.T.M. D3033 or d3034, exclusive of the absorption lines, which will be as in subsection 5 of section 08.

Section 17 Pumps and pump systems

This section pertains to pumps installed after the septic tank. Sumps and ejectors installed before the septic tank must meet the requirements set forth in section 62-03-11-07 of the ND State Plumbing Code.

1. Pumping chambers.
   a. The pumping chambers must be watertight and constructed of corrosion-resistant materials.

b. The working capacity of the pumping chamber must equal one-fourth of the daily sewage flow. Total capacity of the pumping chamber must equal or exceed daily sewage flow.

c. The desired pump cycling frequency if four times a day.

d. A secure cover must be provided that is either bolted on or heavy enough to prevent unauthorized entry.

e. An external electrical outlet must be provided for connection to the pump and control switches. Openings for wiring into the pump chamber must be sealed.

f. No electrical splices or connections will be located in the pump chamber or riser.

2. Pumps.

a. Effluent lift pumps must be of cast bronze, cast iron, or plastic construction and must be designed for handling septic tank effluent. Pedestal sump pumps with an open motor are not allowed.

b. Set the pump on a pedestal on the bottom of the pump chamber to minimize grit and solids entering the impeller.

c. The pump must have maximum lift capability at least five feet [1.52 meters] greater than the actual elevation, plus pipe friction loss. A pump to a sewage mound ("Wisconsin Mound") will deliver seven and five-tenths gallons [28.38 liters] per minute for each one hundred square feet [9.29 square meters] of rock area.

d. Outlet piping must be one and one-fourth inches [31.75 millimeters] in diameter or greater. The pipe must be laid below frostline or uniformly graded to drain back to the pump chamber. Volume of drain back should not exceed ten percent of the working capacity of the pump chamber. If piping is set to drain back, any check valves on the pump should be removed, and a one-fourth inch [6.35 mm] drainhole drilled on the low point of the outlet pipe. Piping connection to the pump must be with a union or quick disconnect coupling near the top of the pump chamber.

3. Pump controls.

a. On-off switching for sewage pumps must be sealed mercury float switches or of a type approved by the UMDHU.

b. Electrical connections must not be made in the pump chamber or pump chamber riser.

Section 18 Alternative Systems

1. Mounds. Mounds may be constructed on soils having a percolation rate faster than one hundred twenty minutes per inch [2.54 cm]. For soils slower than one hundred twenty minutes per inch [2.54 cm], either the system must be moved to more amenable soil.

    a. Location. Mounds may not be located on sites of greater than twelve percent slope. For moderately permeable soils, the UMDHU may approve construction on slopes over six (6) percent. Mounds may not be built in areas where water may pond.

    b. Design. The basal sand area of the mound must be sized on the basis of eighty-three hundredths gallons [3.12 liters] per square foot [0.09 square meter] per day. The basal sand may be twelve inches to twenty four inches [30.48 cm to 60.96 cm] deep and must extend at least five feet [1.52 meters] beyond the rock filter material in all direction. The rock layer may be twelve inches to twenty-four inches [30.48 cm to 60.96 cm] deep, and may not exceed ten feet [3.05 meters] in width. Only pressure distribution may be used in the mound, so piping will be one and one-half inch to two inch [38.10 mm to 50.80 mm] diameter rigid ABS or PVC. one-fourth inch [6.35 mm] hole must be drilled every thirty-six inches [91.44 cm] and the ends of the lateral must be capped. A one-quarter inch hole will be drilled in the top of the cap to serve as a siphon break. Laterals will be spaced no further than fourth inches [101.60 cm] on center and no further than twenty inches [50.80 cm] from the edge of the filter rock. Surface water must be diverted by a berm located uphill from the base of the mound.

    c. Specifications. Sand must be uniformly graded, with no more than fifteen percent fines. Filter rock must be one inch to three inches [25.40 mm to 76.20 mm] in diameter, washed or screened to less than ten percent fines.

    d. A jar test should be used to determine sand suitability. In a one quart jar, place two inches of the sand. Add water to three-fourth level, cap, shake and set aside to settle. If a layer of silt is present on top which is more than one-eighth inch thick, the sand is not suitable for mound construction.

    e. Construction.

        (1) Scarify the area with backhoe teeth or a cultivator. Do not remove topsoil. Bring outlet pipe from pump up into the center to the mound area.

        (2) Lay sand on scarified area. Do not compact the soil with machinery tires. Level sand to desired depth.

        (3) Lay filter rock down the center of the sand layer. Level.

(4) Connect piping to manifold and lay pipe on rock. Cover pipe with rock and level by hand. Holes must be on bottom of the pipe.

(5) Lay sand up to the top of the rock on all sides, sloping sand away at a three to one or four to one slope.

(6) Cover rock with red rosin paper and straw, hay, or filter fabric

(7) Backfill entire mound to a three-to-one or four-to-one grade. Downhill side of mound on slope must be backfilled at a four to one or longer grade. Cover mound with topsoil.

(8) Seed grass over mound. Trees and shrubs may be planted on the toe and up the sides of the mound, but do not plant shrubs or trees on top. If vegetation is not established before winter, cover mound with hay or straw to prevent freezing.

2. Seepage Beds. Seepage beds are not designed as a space saving way to get around UMDHU size requirements and thus will not be used without prior approval by UMDHU. Beds are more prone to problems due to reduced oxygen transfer than are trenches as trenches have more sidewall. The sidewalls are sometimes too far apart to provide sufficient oxygen for the entire seepage bed bottom are, and the biomat may increase in thickness. The thicker the biomat, the more slowly the water will leave the system. Another cause of seepage bed system failure is reduced sidewall surface area available for biological growth. Therefore, sizing beds is critical, and designers should size beds with greater surface area than trenches receiving the same flow. Alternatively, a bed system could use pressure distribution to apply the effluent to the soil. This would allow for better transfer of oxygen and would not require the seepage bed to be any larger than a trench system. Seepage beds may not be used where soils have a percolation rate slower than 60 mpi (our clay loam).

If gravity distribution pipes are used they must not be more than 30 inches from the sidewalls of the bed. Very little effluent is distributed through the distribution pipe. Effluent flows through the orifices in the first length of pipe into the media and is distributed over the soil absorption area to the biomat.

The construction of a seepage bed is essentially the same as that for a trench, except the bed is wider. A gravity fed seepage bed will need to be 50% greater than that of trenches to allow for the low oxygen transfer and reduced amount of sidewall. Pressure distribution must be used for all seepage beds where: the soil percolation rate is 0.1 to 5 mpi and where the soil has a medium sand texture or coarser or the width is greater than 12 feet. If pressure distribution is used the absorption bed will be sized equal to trenches.

3. Alternative design. Alternate designs for construction of sewage treatment systems complying with the intent of this code may be submitted to the UMDHU for approval.

4. Holding Tanks.
   a. Holding tanks may be allowed only as replacements for existing non-conforming systems or on existing parcels or lots as of the date of the enactment of these regulations and only where it can conclusively be shown that a standard system cannot be feasibly installed.

   b. A holding tank shall be constructed of the same materials and by the same procedures as those specified for watertight septic tanks. The minimum size for a holding tank is 1000 gallons.

   d. The tank shall be protected against flotation by weight of tank, earth anchors, or shallow bury depths.
   e. The tank capacity shall be at least 7 times the daily flow rate. The minimum size for a holding tank is 1000 gallons.
   f. Holding tanks shall be located in an area that is readily accessible for pumping under all weather conditions and where accidental spillage will not create a nuisance.
   g. A contract for disposal and treatment of the sewage wastes shall be maintained by the owner with a pumper, municipality, agency or firm established for that purpose.
   h. A holding tank must be placed at least 50 ft from a water well.

Section 19 Chemical toilets

1. A chemical toilet consists of a toilet seat connected by a metal hopper to a metal tank containing chemicals, usually sodium hydroxide. All connections to the toilet seat and the tank will be watertight.

2. A supply of the chemical will be available in a closed container for periodic additions to the toilet.

Section 20 Privies

1. All requests for permission to erect and use privies will be approved by the UMDHU.

2. General specifications for the design and construction of a privy. A privy pit must be constructed by providing a watertight structure in the pit. The watertight structure will provide a minimum capacity of one hundred thirty four cubic feet [1000 gallons]. A privy building will be placed over the structure. The floor of this building will be of wood or concrete with the privy seat of suitable material which is easily cleaned and serviceable. A

vent located adjacent to the seat will extend from the vault to a point above the roof of the building. The seat will be provided with a cover which will be self-closing.

3. All openings in the building will be screened to prevent the entrance of flies. The building will be constructed so as to prevent the entrance of rats to the vault. The privy door will be self closing.

4. Removable cans. When removable cans are used in a privy, they will be placed in watertight vaults and provision made for removing the seat so the cans can be moved for disposal of the contents in a manner acceptable to the UMDHU. The privy building will comply with the above specifications for a pit privy building.

Section 21 Septic tank pumpers

1. Every person engaged in the business of removing and disposing of the solid and liquid contents of private sewage treatment systems will obtain an annual license from the ND State Department of Health.

2. All solid and liquid contents of chemical toilets, septic tanks, pump chambers, and watertight pits for septic tank effluent will be removed when necessary, and disposed of in conformance with subsections 3 through 9.

3. Every pumper will obtain a license to engage in such operations as specified in the appropriate rules of the ND State Department of Health, Chapter 33-21-01.

4. A metal license tag with the number of the license issued will be posted in a conspicuous place on the left side of the servicing unit.

5. Every vehicle used for pumping purposes will be equipped with a watertight tank so that there will be no spillage on private premises or on highways or roads.

6. All portable receptacles used for transporting liquid or solid waste will be watertight, equipped with tight-fitting lids and will be cleaned daily.

7. All pumps and hose lines will be maintained so as to prevent leakage.

8. All waste material will be disposed of in such a place and in such a manner as will not constitute a nuisance or menace to public health.

9. Water material collected by a pumper will not be discharged into ditches, watercourses, lakes, ponds, tidewater, or at any point where it can pollute any water supply, bathing area, or shellfish growing area. It will not be deposited on the surface of the ground within one thousand feet [304.8 meters] of any residence or public road.