

CHAPTER 23

WASTE WATER TREATMENT AND DISPOSAL

SECTIONS:

- 23-1. SCOPE AND PURPOSE
- 23-2. DEFINITIONS
- 23-3. ILLEGAL DISCHARGE OF LIQUID WASTES OR WASTEWATER
- 23-4. ONSITE WASTEWATER TREATMENT & DISPOSAL SYSTEMS
- 23-5. ABANDONMENT
- 23-6. PERMITS REQUIRED
- 23-7. FEES
- 23-8. PLATS & LOTS SIZES HEREINAFTER ESTABLISHED
- 23-9. MINIMUM DISTANCES
- 23-10. REQUIREMENTS FOR SEWAGE DISCHARGE
- 23-11. BUILDING SEWER LOCATION AND CONSTRUCTION
- 23-12. REQUIREMENTS FOR BUILDING SEWERS
- 23-13. PRIMARY TREATMENT - SEPTIC TANKS
- 23-14. SECONDARY TREATMENT
- 23-15. CONSTRUCTION DETAILS (All soil absorption trenches)
- 23-16. GRAVITY DISTRIBUTION
- 23-17. SUBSURFACE SYSTEMS (Aggregate)
- 23-18. GRAVELLESS SYSTEMS
- 23-19. CHAMBER SYSTEMS
- 23-20. DOSING SYSTEMS
- 23-21. MOUND SYSTEMS
- 23-22. DRIP IRRIGATION
- 23-23. SAND FILTERS
- 23-24. FREE ACCESS SANDFILTERS
- 23-25. DOSING
- 23-26. INDIVIDUAL MECHANICAL/AEROBIC SYSTEMS
- 23-27. CONSTRUCTED WETLANDS
- 23-28. WASTE STABILIZATION PONDS
- 23-29. REQUIREMENTS FOR IMPERVIOUS VAULT TOILETS
- 23-30. REQUIREMENTS FOR PORTABLE TOILETS
- 23-31. REQUIREMENTS FOR CHEMICAL TOILETS
- 23-32. SEPTAGE COLLECTION, STORAGE, TRANSPORTATION & DISPOSAL
- 23-33. ALTERNATIVE OR INNOVATIVE ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS
- 23-34. VARIANCES
- 23-35. INSPECTIONS
- 23-36. REFUSAL OF ADMITTANCE
- 23-37. NOTICE
- 23-38. HEARINGS
- 23-39. JURISDICTION
- 23-40. ENFORCEMENT
- 23-41. MUNICIPAL INFRACTIONS
- 23-42. SEPARABILITY OF PROVISIONS
- 23-43. ORDINANCE EFFECTIVE DATE.

- APPENDIX A ESTIMATES OF HOUSEHOLD DOMESTIC SEWAGE FLOW RATES
- APPENDIX B PERCOLATION TEST PROCEDURES

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-1. SCOPE AND PURPOSE

This chapter establishes standards for the construction, use and operation of onsite wastewater treatment and disposal systems, the issuing of permits, and providing penalties for violation of the provisions herein.

SEC. 23-2. DEFINITIONS

The following words shall have the following meanings for the purpose of this Chapter.

"Administrative authority" is the Scott County Board of Health as authorized by Iowa Code Section 455B.172 and 567, Chapter 137.

"Approved" means accepted or acceptable under an applicable specification stated or cited in these rules, or accepted as suitable for the proposed use by the administrative authority.

"Aggregate" means crushed septic stone or gravel

"Area drain" means a drain installed to collect surface or storm water from an open area of a building or property.

"Available public sewer" means a public sewer available within 200 feet from any existing or proposed building or exterior drainage facility on any lot or premises which abuts and is served by public sewer.

"Board of Health" means the Scott County Board of Health.

"Building drain" is that part of the lowest horizontal piping of the building drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of any building and conveys the same to the building sewer.

"Building sewer" is that part of the horizontal piping from the building wall to its connection with the main sewer or the primary treatment portion of an on-site wastewater treatment and disposal system conveying the drainage of one building site.

WASTE WATER TREATMENT AND DISPOSAL

"Chamber system" is a buried structure, typically with a domed or arched top, providing at least a six-inch height of sidewall soil exposure, creating a covered open space above a buried soil infiltration surface.

"Crushed septic stone" is one and one-half inch (1-1/2") to two and one-half inch (2-1/2") washed crushed stone, which meets standards set by the Iowa Department of Transportation for concrete.

"CBOD5" means carbonaceous biological oxygen demand.

"Conventional" when used in reference to sewage treatment means a soil absorption system involving a series of two foot wide trenches filled with gravel one foot deep, containing a four inch diameter rigid pipe to convey the sewage effluent.

"Distribution box" is a structure designed to accomplish the equal distribution of wastewater to two or more soil absorption trenches.

"Drainage ditch" is any watercourse meeting the classification of a "general use segment" under rule 567-61.3(455B) which includes intermittent watercourses and those watercourses which typically flow only for short periods of time following precipitation in the immediate locality and whose channels are normally above the water table.

"Drip irrigation" is a form of subsurface soil absorption using shallow pressure distribution with low-pressure drip emitters.

"Drop box" is a structure to divert wastewater flow into a soil absorption trench until the trench is filled to a set level, then allow any additional waste, which is not absorbed by that trench, to flow to the next drop box or soil absorption trench.

"Dwelling" means any house or place used or intended to be used by humans as a place of residence.

"Fill soil" means clean soil, free of debris or large organic material, which has been mechanically moved onto a site and has been in place for less than one year.

WASTE WATER TREATMENT AND DISPOSAL

"Foundation drain" means that portion of a building drainage system provided to drain groundwater from the outside of the foundation or over or under the basement floor not including any wastewater and not connected to the building drain.

"Free access filter (open filter)" means an intermittent sand filter constructed within the natural soil or above the ground surface with access to the distributor pipes and top of the filter media for maintenance and media replacement.

"Gravel" means stone screened from river sand or quarried. Concrete aggregate designated as Class II by the Iowa Department of Transportation is acceptable.

"Gravelless pipe system" means an absorption system comprised of large diameter (8 and 10 inches) corrugated plastic pipe, perforated with holes on a 120-degree arc centered on the bottom, wrapped in a sheath of geotextile filter wrap and installed level in a trench without gravel bedding or cover.

"Groundwater table" means the zone of saturation where the water ceases to go downward and is directed instead along a horizontal plane, forming a more or less continuous bed of water in the porous stratum.

"Health Department" means the Scott County Health Department.

"Health Officer" means the Director of the Scott County Health Department or the Director's authorized representative.

"Holding tank" means a watertight receptacle designed for the temporary retention of sewage or liquid waste.

"Individual mechanical aerobic wastewater treatment system" means an individual wastewater treatment and disposal system employing bacterial action, which is maintained by the utilization of air or oxygen and includes the aeration plant and equipment and the method of final effluent disposal.

WASTE WATER TREATMENT AND DISPOSAL

"Intermittent sand filters" are beds of granular materials 24 to 35 inches deep underlain by graded gravel and collecting tile. Wastewater is applied intermittently to the surface of the bed through distribution pipes or troughs and the bed is underdrained to collect and discharge the final effluent. Uniform distribution is normally obtained by doing so as to flood the entire surface of the bed. Filters may be designed to provide free access (open filters), or may be buried in the ground (buried filters or subsurface sand filters).

"Lake" means a natural or man-made impoundment of water with more than one acre of water surface area at the high water level.

"Limiting layer" means bedrock, seasonally high groundwater level, or any layer of soil which a stabilized percolation rate exceeding 60 minutes for the water to fall one inch.

"Lined sand filter" means any sand filter designed and installed with a 30 millimeter Polyvinyl Chloride (PVC) material.

"Liquid wastes" means the discharges from any fixture, appliance, area, or appurtenance, which do not contain fecal matter.

"Lot of record" is a lot or a parcel of land, the deed and/or abstract of which has been recorded in the Office of the County Recorder, or a lot which is a part of a subdivision, and the plat of which has been recorded in the Office of the County Recorder.

"Mound system" is an alternative aboveground system used to absorb effluent from septic tanks in cases where either seasonally high water table, high bedrock conditions, slowly permeable soils or limited land areas prevent conventional subsurface absorption systems.

"NPDES Permit #4" means National Pollution Discharge Elimination System.

"On-site wastewater treatment and disposal system" means all equipment and devices necessary for proper conduction, collection, storage, treatment, and disposal of wastewater

WASTE WATER TREATMENT AND DISPOSAL

from four or fewer dwelling units or other facility serving the equivalent of 15 persons (1,500 gpd) or less. This includes domestic waste whether residential or nonresidential but does not include industrial waste of any flow rate. Included within the scope of this definition are building sewers, septic tanks, subsurface absorption systems, mound systems, sand filters, constructed wetlands and individual mechanical/aerobic wastewater treatment systems.

"Percolation test" is a falling water level procedure used to determine the ability of soils to absorb primary treated wastewater. (See Appendix B.)

"Person" means any individual, partnership, corporation, association, governmental subdivision or public or private organization of any character.

"Pond" means a man-made impoundment of water with a water surface area of one are or less at the high water level.

"Primary treatment" is a unit or system to separate the floating and settleable solids from the wastewater before the partially treated effluent is discharged from secondary treatment.

"Professional soil analysis" is an alternative to the percolation test, which depends upon a knowledgeable person evaluating the soil factors, such as color, texture, and structure, in order to determine an equivalent percolation rate. Demonstrated training and experience in soil morphology (testing absorption qualities of soil by the physical examination of the soil's color, mottling, texture, structure, topography and hillslope position) shall be required to perform a professional soil analysis.

"Reconstruct" is work involving the replacement or addition of construction materials to any part of an onsite wastewater treatment and disposal system.

"Roof drain" is a drain installed to receive water collecting on the surface of a roof and discharging into an area or storm drain system.

WASTE WATER TREATMENT AND DISPOSAL

"Secondary treatment system" is a system which provides biological treatment of the effluent from septic tanks or other primary treatment units to meet minimum effluent standards as required in these rules and NPDES General Permit No. 4. Examples include soil absorption systems, sand filters, mechanical/aerobic systems, or other systems providing equivalent treatment.

"Septage" means the liquid contents (including sludge and scum) of a septic tank normally pumped out periodically and transported to an approved disposal site.

"Septic tank" is a watertight structure into which wastewater is discharged for solids separation and digestion, referred to as part of the closed portion of the treatment system.

"Sewage wastewater" is the water-carried waste derived from ordinary living processes.

"Sludge" means the digested or partially digested solid material accumulated in a wastewater treatment facility.

"Stream" means any watercourse listed as being a "designated use segment" in rule 567-61.3(455B) which includes any watercourse which maintains flow throughout the year, or contains sufficient pooled areas during intermittent flow periods to maintain a viable aquatic community of significance.

"Subsurface absorption system" is a system of perforated conduits connected to a distribution systems, forming a series of subsurface, water-carrying channels into which the primary treated effluent is discharged for direct absorption into the soil (referred to as part of the open portion of the treatment system).

"Subsurface sand filter" is a system in which the effluent from the primary treatment unit is discharged into perforated pipes, filtered through a layer of sand, and collected by lower perforated pipes for discharge to the surface or to a subsurface or to a subsurface absorption system. A subsurface sand filter is an intermittent sand filter, which is placed within the ground and provided

WASTE WATER TREATMENT AND DISPOSAL

with a natural topsoil cover over the crown of the distribution pipes.

"TSS" means total suspended solids.

"Vault type privy" is a watertight receptacle designed to temporarily store and digest human excreta, covered by a structure affording privacy and shelter and containing a covered seat with an opening into the vault meeting the standards of the Iowa Department of Public Health.

"Vent" is a pipe provided to ventilate a house or private sewage drainage system and to prevent trap siphonage and back pressure.

"Wastewater" means the water-carried waste derived from ordinary living processes.

"Wastewater management district" means an entity organized in accordance with permitting legislation to perform various specific functions such as planning, financing, construction, supervision, repair, maintenance, operation and management of onsite wastewater treatment and disposal systems within a designated area.

SEC. 23-3. ILLEGAL DISCHARGE OF LIQUID WASTES OR WASTEWATER

No person, firm or corporation shall discharge any household, commercial or industrial liquid wastes or wastewater into any ditch, stream, lake, pond, natural or artificial waterway, filed drain tile, road drain tile, or onto the surface of the ground without proper treatment as prescribed in this Chapter. Under no conditions shall effluent from onsite wastewater treatment and disposal systems be discharged to any abandoned well or sinkhole. Existing discharges to any of the above-listed locations or structures shall be eliminated by constructing a system, which is in compliance with the requirements of this Chapter.

SEC. 23-4. ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

A. No person, firm or corporation shall begin construction, or reconstruction of any onsite wastewater treatment and disposal system for any purpose in the County of Scott, State of Iowa, without first having obtained a Permit as

WASTE WATER TREATMENT AND DISPOSAL

herein provided. In the event any of the provisions of this Chapter are violated, the Health Officer may issue a Stop Work Order and all construction shall immediately cease.

- B. No onsite wastewater treatment and disposal system shall be installed, repaired, or rehabilitated where a public sanitary sewer is available within two hundred feet (200') from any existing or proposed building or exterior drainage facility on any lot or premises which abuts and is served by such public sewer. The administrative authority shall make final determination of availability.
- C. When a public sanitary sewer becomes available within two hundred feet, any building then served by an on-site wastewater treatment and disposal system shall connect to said public sewer by gravity within ninety (90) days of availability or upon receipt of notification from the administrative authority.
- D. When a public sanitary sewer is not available, every building wherein persons reside, congregate or are employed shall be provided with an approved on-site wastewater treatment and disposal system.
- E. If a building is to be connected to an existing on-site wastewater treatment and disposal system, that existing system shall meet the standards of this Chapter and be appropriately sized.
- F. No structure intended for human occupancy shall be occupied until it is connected to an approved onsite wastewater treatment and disposal system or other method of wastewater disposal as approved by the Health Officer.
- G. Any structure occupied by humans, which is not connected to an approved onsite wastewater treatment and disposal system, may be designated as unfit for human habitation by the Health Officer. Any structure that has been designated an unfit for human habitation and has been so placarded shall be vacated within the time limit specified by the Health Officer.

WASTE WATER TREATMENT AND DISPOSAL

- H. Whenever an order has been issued by the Health Officer, designating a structure as unfit for human habitation, and the owner and/or occupant fails, neglects or refuses to vacate the same, the Health Officer may apply to a court of competent jurisdiction for an Order requiring that the structure be vacated.

SEC. 23-5. ABANDONMENT

All abandoned septic tanks and privy vaults shall be cleaned, disinfected and filled to the surface of the surrounding ground with materials as approved (broken concrete, crushed stone, gravel) by the Health Officer.

SEC. 23-6. PERMITS REQUIRED

Construction or alteration. All on-site wastewater treatment and disposal systems constructed or altered after the effective date of these rules shall comply with these requirements. Alteration includes any changes that effect the treatment or disposal of the waste. Repair of existing components that do not change the treatment or disposal of the waste would be exempt. However, the discharge restrictions in Sec. 23-3, above would always apply.

- A. Any person, agent, firm, or corporation desiring to construct, or reconstruct an onsite wastewater treatment and disposal system, including a vault type privy, or to abandon a septic tank, shall file with the Health Officer an application for a permit stating therein the owner's name, building address, name of street, city and such information as may be required including percolation test results. Upon approval of the Health Officer, a Permit will be issued.
- B. The installation of the onsite wastewater treatment and disposal system shall be in accordance with this Chapter.
 - 1. Site evaluation. A site evaluation shall be conducted prior to issuance of a construction permit. Consideration should be given, but not be limited to, the impact of the following: topography; drainageways; terraces; floodplain; percent of land slope; location of property lines; location of

WASTE WATER TREATMENT AND DISPOSAL

easements; buried utilities; existing and proposed tile lines; existing, proposed and abandoned water wells; amount of available area for the installation of the system; evidence of unstable ground; alteration (cutting, filling, compacting) of existing soil profile; and soil factors determined from a soil analysis, percolation tests and soil survey maps if available.

2. Soil survey reports. During a site analysis and investigation, maximum use should be made of soil survey reports, which are available from USDA Natural Resources Conservation Service. A general identification of the percolation potential can be made from soil map units in Iowa.
3. Permits are issued specifically to the property described. Permits shall expire eighteen (18) months from the date of receipt of Permit fees. Permits are not transferable.
4. No onsite waste water treatment and disposal system shall be covered or so constructed so as to deny final inspection by the Health Officer.
5. Septic Tank Abandonment Permits shall remain valid for sixty (60) days from the date of issuance.
6. The owner of any onsite wastewater treatment and disposal system installed after the effective date of this Chapter, which is designed to discharge final effluent, shall apply for and receive an Annual Onsite Wastewater Operational Permit from the Health Officer. Said permit shall be renewed and paid for annually on a calendar year basis.

SEC. 23-7. FEES

- A. The fee for a Permit to construct or reconstruct an onsite wastewater treatment and disposal system shall be payable to the Scott County Treasurer at the time of application. The fees are:
 1. \$135.00 for a Permit to construct an onsite wastewater treatment and disposal system.
 2. \$40.00 for a Permit to install or replace pipes, septic tank, or distribution box.
 3. \$35.00 for effluent sampling.

WASTE WATER TREATMENT AND DISPOSAL

4. \$30.00 for a septic tank abandonment permit.

SEC. 23-8. PLATS AND LOT SIZES HEREINAFTER ESTABLISHED

- A. All new plats and subdivisions shall have the recommendation of the Health Officer. All new plats not served by a public sewer shall be certified by a Registered Professional Engineer that all lots within the platted area are capable of being served by an onsite wastewater treatment and disposal system.
- B. All new plats and subdivisions shall be two-percolation tests performed on each lot.
- C. Lot sizes of less than 15,000 useable square feet per dwelling unit may have to comply with the requirements of Section 23-33 of this chapter.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-9. MINIMUM DISTANCES

- A. All on-site wastewater treatment and disposal systems shall be located in accordance with the minimum distances shown in Table I.

TABLE I

Minimum distance (in feet) from:	Closed portion of treatment system (1)	Open portion of treatment system (2)
Private water supply well	50	100
Public water supply well	200	200
Groundwater heat pump borehole	50	100
Lake or reservoir	50	100
Stream or pond	25	25
Edge of drainage ditch	10	10
Dwelling or other structure	10	10
Property lines (unless a mutual easement is signed and recorded)	5	10
Other type subsurface treatment system	5	10
Water lines continually under pressure	10	10
Suction water lines	50	100
Foundation drains or subsurface tiles	10	10

(1) Includes septic tanks, mechanical aeration tanks, lind sand filter, and impervious vault toilets.

(2) Includes subsurface absorption systems, mound systems, intermittent sand filters, individual mechanical aerobic wastewater treatment systems, constructed wetlands or waste stabilization ponds.

- B. On reconstruction of existing facilities or in cases of undeveloped lots of record prior to 1978, variances may be approved by the Health Officer.

SEC. 23-10. REQUIREMENTS FOR SEWAGE DISCHARGE

- A. All discharges from on-site wastewater treatment and disposal systems which are discharged into any surface water shall be treated in a manner that will conform with the requirements of NPDES General Permit No.4 issued by the Iowa Department of Natural Resources, as referenced in 567-Chapter 64. Prior to the installation of any system discharging to waters of the state, a notice of intent to be covered by NPDES General Permit No. 4 shall be

submitted to the Iowa Department of Natural Resources. Systems covered by this permit must meet all applicable

WASTE WATER TREATMENT AND DISPOSAL requirements listed in the NPDES permit. The health authority shall provide the appropriate form to the homeowner.

- B. No septage or wastewater shall be discharged into the soil except in compliance with the requirements contained in this Chapter and approved by the Health Officer.

SEC. 23-11. BUILDING SEWERS LOCATION AND CONSTRUCTION

- A. The types of construction and distances shown in Table II shall be maintained for the protection of water supplies. The distances shall be considered minimum and increased where possible to provide better protection.

TABLE II

Sewer Construction	Distance from well water supply	
	Private	Private
Schedule 40 plastic pipe (or SDR26 or stronger) with approved type joints or cast-iron soil pipe (extra heavy or centrifugal cast) with joints of performed gaskets	10	25
Sewer pipe installed to remain watertight and root-proof	50	75
Under no circumstances shall a well suction line pass under a building sewer line.		

SEC. 23-12. REQUIREMENTS FOR BUILDING SEWERS

- A. Type. Building sewers used to conduct wastewater from a building to the primary treatment unit of an onsite wastewater treatment and disposal system shall be constructed of Schedule 40 plastic pipe (or SDR 26 or stronger) with solvent-weld or bell-and-gasket type joints, or cast iron with integral bell-and-gasket type joints.
- B. Size. Such building sewers shall not be less than four (4) inches in diameter.

WASTE WATER TREATMENT AND DISPOSAL

- C. Grade. Such building sewers shall be laid to the following minimum grades:
 - 4-inch sewer.12 inches per 100 feet
 - 6 inch sewer.8 inches per 100 feet

- D. Cleanouts.

- 1. Spacing. A cleanout shall be provided where the building sewer leaves the house and at least every 100 feet allowing rodding downstream.
- 2. A Change of direction. An accessible cleanout shall be provided at each change in direction or grade, if the change exceeds 45 degrees.
- 3. All cleanouts shall be brought to grade.

SEC. 23-13. PRIMARY TREATMENT-SEPTIC TANKS

- A. General Requirements.

- 1. Septic tank required. Every on-site wastewater treatment and disposal system, except mechanical-aerobic systems, shall have as a primary treatment unit a septic tank as described in this rule. All wastewater from the facility serviced shall discharge into the septic tank (except as noted in "4" below).
- 2. Easements. No septic tank shall be located upon property under ownership different from the ownership of that property or lot upon which the wastewater originates unless easements to that effect are legally recorded and approved by the proper administrative authority.
- 3. Effluent discharge requirements. All septic tank effluent shall discharge into a secondary treatment system in compliance with this chapter or other system approved by the administrative authority.
- 4. Prohibited wastes. Septic tanks shall not be used for the disposal of chemical wastes or grease in quantities which might be detrimental to the bacterial action in the tank or for the disposal of drainage from roof drains, foundation drains, or area drains.

WASTE WATER TREATMENT AND DISPOSAL

B. Capacity.

1. Minimum capacity. The minimum liquid holding capacity shall be as specified in the following table (capacity may be obtained by using one or more tanks):

Up to and including 3-bedroom homes	1,000 gallons
4-bedroom homes	1,250 gallons
5-bedroom homes	1,500 gallons
6-bedroom homes	1,750 gallons

Two hundred fifty (250) gallons of capacity shall be added to each of these tank volumes: for each additional bedroom, a kitchen garbage disposal unit, water softener, or a high volume water use fixture such as a whirlpool bath is to be used.

2. Other domestic waste systems. In the event that any installation serves more than a 6-bedroom home or its equivalent, or serves a facility other than a house and serves the equivalent of 15 persons or less (1,500 gallon/day), approval of septic tank capacity and design must be obtained from the administrative authority. Minimum septic tank liquid holding volume shall be two times the estimated daily sewage flow or for a twenty-four hour period whichever is greater.
3. For wastewater flow rates for non-residential and commercial domestic waste applications under 1,500 gal/day, refer to Appendix A.
4. Minimum depth. Minimum liquid holding depth in any compartment shall be 48 inches.
5. Maximum depth. Maximum liquid holding depth for calculating capacity of the tank shall not exceed 6-1/2 feet.
6. Dimensions. The interior length of a septic tank should not be less than 5 feet and shall be at least 1-1/2 times the width (larger length-to-width ratios are preferred). No tank or compartment shall have an inside width of less than 2 feet. The minimum inside diameter of a vertical cylindrical septic tank shall be 5 feet.

C. Construction Details.

WASTE WATER TREATMENT AND DISPOSAL

1. Fill soil. Any septic tank placed in fill soil shall be placed upon a level, stable base that will not settle.
2. Compartmentalization. Every septic tank shall be divided into two compartments as follows (compartmentalization may be obtained by using more than one tank):
 - a. The capacity of the influent compartment shall not be less than $1/2$ nor more than $2/3$ of the total tank capacity.
 - b. The capacity of the effluent compartment shall not be less than $1/3$ nor more than $1/2$ of the total tank capacity.
3. Inlet/outlet. The invert of the inlet pipe shall be a minimum of 2 inches and a maximum of 4 inches higher than the invert of the outlet pipe.
4. Baffles. Four-inch diameter schedule 40 plastic pipe tees shall be used as inlet and outlet baffles. Inlet tees shall extend at least 6 inches above and 8 inches below the liquid level of the tank. The inlet tee shall extend below the liquid level no more than 20 percent of the liquid depth. The outlet tee shall extend above the liquid level a distance of at least 10 inches but no more than 25 percent of the liquid depth. A minimum clearance between the top of the inlet and outlet tees and the bottom of the tank lid of 2 inches shall be provided. A horizontal separation of at least 36 inches shall be provided between the inlet baffle and the outlet baffle in each compartment. A horizontal slot 4 inches by 6 inches, or two suitably spaced 4-inch diameter holes in the tank partition, may be used instead of a tee or baffle, the top of the slot or holes to be located below the water level a distance of one-third the liquid depth. A ventilation hole or slot shall be provided in the partition, at least 8 inches above the liquid level.
5. Access. Access must be provided to all parts of septic tanks necessary for adequate inspection, operation, and maintenance. An access opening shall be provided at each end of the tank over the inlet

WASTE WATER TREATMENT AND DISPOSAL

6. and outlet. These openings shall be at least 18 inches in the smallest dimension if the tank has no other openings. Alternatively, a single opening at least 24 inches in diameter may be provided at the center of the tank allowing access to both compartments, with two smaller openings at least 6 inches in diameter over both inlet and outlet. If the top of the tank is to be greater than 12 inches below the finished ground surface, a riser at least 24 inches in diameter must be installed over each manhole of 18 inches in diameter or more to bring the top of the manhole lid to within 6 inches of the finished ground surface.

D. Construction.

1. Materials. Tanks shall be constructed of poured concrete or plastic resistant to corrosion or decay and designed so that they will not collapse or rupture when subjected to anticipated earth and hydrostatic pressures when the tanks are either full or empty. Metal tanks are prohibited.
2. Dividers. Tank divider walls and divider wall supports shall be constructed of heavy, durable plastic; fiberglass, concrete or other similar approved corrosion-resistant materials approved by the administrative authority.
3. Inlet and outlet ports. Inlet and outlet ports of pipe shall be constructed of heavy, durable schedule 40 PVC plastic sanitary tees or other similar approved corrosion-resistant material.
4. Wall thickness. Minimum wall thickness for tanks shall conform to the following specifications:

Poured concrete -----	6 inches thick
Poured concrete, reinforced -----	4 inches thick
Special concrete mix, vibrated and reinforced -----	2.5 inches thick
Fiberglass or plastic -----	.25 inch thick

E. Concrete specifications:

1. Concrete used in precast septic tank construction shall have a maximum water-to-cement ratio of 0.45. Cement content shall be at least 650 pounds per cubic yard. Minimum compressive strength (f'c) shall be

WASTE WATER TREATMENT AND DISPOSAL
4,000 psi (28 Mpa) at 28 days of age. The use of
ASTM C150 Type Ii cement or the addition of silica
fume or Class F fly ash is recommended.

2. Tank bottoms. Septic tank bottoms shall conform to the specifications set forth for septic tank walls except special mix concrete shall be at least 3 inches thick.
3. Tank tops. Concrete or masonry septic tank tops shall be a minimum of 4 inches in thickness and reinforced with 3/8-inch reinforcing rods in a 6-inch grid or equivalent. Fiberglass or plastic tank tops shall be a minimum of 1/4 inch in thickness and shall have reinforcing and be of ribbed construction.
4. Reinforcing steel placement. The concrete cover for reinforcing bars, mats, or fabric shall not be less than 1 inch.
5. Bedding. Fiberglass or plastic tanks shall be bedded according to manufacturer's specifications. Provisions should be made to prevent flotation when the tanks are empty.

F. Connecting pipes.

1. Minimum diameter. The pipes connecting septic tanks installed in series and at least the first 5 feet on the effluent side of the last tank shall be a minimum of 4-inch diameter schedule 40 plastic pipe or cast iron pipe.
2. Tank connections. All inlet and outlet connections at the septic tanks shall be made by self-sealing gaskets cast into the concrete or formed into the plastic or fiberglass.
3. Joints. All joints in connecting schedule 40 plastic pipe or cast iron pipe shall be approved plastic pipe connections such as solvent welded or compression-type gaskets.
4. Pipe in unstable ground. Schedule 40 plastic or cast iron pipe shall be used extending across excavations or unstable ground to at least 2 feet beyond the point where the original ground has not been disturbed in septic tank installations. If the excavation spanned is more than 2 feet, it must be filled with sand or

WASTE WATER TREATMENT AND DISPOSAL
compacted fill to provide a firm bed for the pipe.
The first twelve inches of backfill over the pipe
shall be applied in thin layers using material free
from stones, boulders, large frozen chunks of earth or
any similar material that would damage or break the
pipe.

SEC. 23-14. SECONDARY TREATMENT

- A. Soil absorption systems are the best available treatment technology and shall always be used where possible.
- B. General requirements.
1. Locations. All subsurface absorption systems shall be located on the property to maximize the vertical separation distance from the bottom of the absorption trench to the seasonal high groundwater level, bedrock, hardpan or other confining layer, but under no circumstances shall this vertical separation be less than 3 feet.
 2. Soil evaluation. A percolation test or professional soil analysis is required before any soil absorption system is installed.
 - a. Percolation test. All percolation test shall be conducted in accordance with procedures approved in Appendix B. The results of all percolation test holes, including those holes, which may indicate that the area is unsuitable for soil absorption, shall be provided to the Scott County Health Department. The complete percolation testing procedure shall be done under the supervision of a Registered Professional Engineer.
 - b. Soil analysis. All soil analysis shall be conducted by a Certified Professional Soil Classifier. Soil factors such as soil content, color, texture, and structure shall be used to determine soil loading rate.
 - c. Acceptable percolation rate. An area is deemed suitable for conventional soil absorption if the average percolation test rate is 60 minutes per inch or less and greater than 1 minute per inch. However, if an alternative type system is proposed (e.g., mound), than the percolation test should be extended to determine whether a percolation rate of 120 minutes per inch is achieved.

WASTE WATER TREATMENT AND DISPOSAL

- d. Confining layer determination. An additional test hole 6 feet in depth or to rock, whichever occurs first, shall be provided in the center of the proposed absorption area to determine the location of groundwater, rock formations or other confining layers. This 6-foot test hole may be augered the same size as the percolation test holes or may be made with a soil probe.
3. Groundwater. If seasonal high groundwater level is present within 3 feet from the trench bottom final grade and cannot be successfully lowered by subsurface tile drainage, the area shall be classified as unsuitable for the installation of a standard subsurface absorption system. Consult the administrative authority for an acceptable alternative method of wastewater treatment.
4. Site limitations. In situations where specific location or site characteristics would appear to prohibit normal installation of a soil absorption system, design modifications may be approved by the administrative authority which could overcome such limitations. Examples of such modifications could be the installation of subsurface drainage, use of shallow or at-grade trenches, use of dual soil treatment areas, mound system or water conservation plans.
5. Prohibited drainage. Roof, foundation and storm drains shall not discharge into or upon subsurface absorption systems. Nothing shall enter the subsurface absorption system, which does not first pass through the septic tank.
6. Prohibited construction. There shall be no construction of any kind, including driveways, covering the septic tank, distribution box or absorption field of an on-site wastewater treatment and disposal system. Vehicle access should be infrequent, primarily limited to vegetation maintenance.
7. Driveway crossings. Connecting lines under driveways shall be constructed of schedule 40 plastic, cast iron pipe or equivalent, and shall be protected from freezing.

WASTE WATER TREATMENT AND DISPOSAL

8. Easements. No wastewater shall be discharged upon any property under ownership different from the ownership of the property or lot upon which it originates unless easements to that effect are legally recorded in the abstract of the property and approved by the administrative authority.

C. Trench length requirements.

1. Percolation charts. Table IIIa specifies lineal feet of lateral trenches required in accordance with the results of the standard percolation tests. Tables IIIb list an optional method for determining length of lateral trenches or sizing of absorption beds. Absorption beds (Table IIIb) shall not be used except when the lot size limitations preclude the installation of a lateral trench system.
2. Unsuitable absorption. Conventional subsurface soil absorption trenches shall not be installed in soils that have a percolation rate less than 1 minute per inch or greater than 60 minutes per inch. Plans for an alternative method of wastewater treatment shall be submitted to the administrative authority for approval prior to construction.
3. Soil Analysis Charts. Table IIIc specifies lineal feet of lateral trenches required in accordance with the results of the soil analysis.

WASTE WATER TREATMENT AND DISPOSAL

TABLE IIIa
Soil Absorption System Sizing Chart⁽¹⁾⁽²⁾
(Lineal feet of absorption trench)

BEDROOMS	ROCK UNDER PIPE (INCHES)	PERCOLATION RATE (MIN/INCH)				
		1-5	6-15	16-30	31-45	46-60
2	6	160	200	300	400	500
	12	128	160	240	320	400
	18	107	134	201	268	335
	24	96	120	180	240	300
3	6	200	300	400	500	600
	12	160	240	320	400	480
	18	134	201	268	335	402
	24	120	180	240	300	360
4	6	260	400	500	600	700
	12	208	320	400	480	560
	18	174	568	335	402	469
	24	156	240	300	360	420
5	6	340	500	600	800	900
	12	272	400	480	640	720
	18	228	335	402	536	603
	24	204	300	360	480	540
6	6	400	600	700	900	1,100
	12	320	480	560	720	880
	18	268	402	469	603	737
	24	240	360	420	540	660

⁽¹⁾For domestic, non-household wastewater flow rates refer, to Appendix A.

⁽²⁾For soils having more than 50 percent of very fine sand by weight, plus fine sand having a particle size range of 0.05 millimeters (sieve size 60), the 16-30 min. per inch values shall be used when gravelless pipe is installed.

TABLE IIIB
Alternative Option for Use of Absorption Bed⁽¹⁾

Percolation Rate Min./Inch	Absorption Area/Bedroom Sq.Ft.	Loading Rate/Day Gal./Sq.Ft.
1-5	300	.5
6-15	400	.375
16-30	600	.25

⁽¹⁾Absorption beds may only be used when site space restrictions require and shall not be used when the soil percolation rate exceeds 30 min./inch.

WASTE WATER TREATMENT AND DISPOSAL

SOIL ABSORPTION SYSTEM SIZING CHART ⁽¹⁾
(Lineal Feet of Absorption Trench)

SOILS ANALYSIS LOADING RATE (Gallons/Day/Square Foot)									
BEDROOMS	ROCK UNDER PIPE (INCHES)	1.0	.95	.85	.75	.69	.62	.57	.52
2	6	190	200	220	250	270	300	330	360
	12	150	160	175	200	220	240	265	290
	18	130	135	150	170	180	200	220	240
	24	115	120	130	150	160	180	200	220
3	6	280	300	330	375	410	455	495	540
	12	225	240	265	300	330	365	400	435
	18	190	200	220	250	275	305	330	360
	24	170	180	200	225	250	275	300	325
4	6	375	395	440	500	545	605	660	720
	12	300	315	350	400	435	485	530	575
	18	250	265	295	335	365	405	440	480
	24	225	240	265	300	330	365	400	435
5	6	470	495	550	625	680	760	825	900
	12	375	395	440	500	545	610	660	720
	18	315	330	370	420	455	510	550	605
	24	280	300	330	375	410	455	495	540
6	6	560	590	660	750	815	910	990	1080
	12	450	475	530	600	650	730	790	865
	18	375	395	440	500	545	610	665	725
	24	335	355	400	450	490	545	595	650

(1) This sizing is for a two foot wide trench. Use of a three foot wide trench would reduce the size by 25%.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-15. CONSTRUCTION DETAILS(All soil absorption trenches)

- A. Depth. Lateral trenches shall not exceed 36 inches in depth unless authorized by the administrative authority, but a shallower trench bottom depth of 18 to 24 inches is recommended. Not less than 6 inches of porous soil shall be provided over the laterals. Minimum separation between trench bottom and groundwater, rock formation or other confining layers shall be 36 inches even if extra rock is used under the pipe.
- B. Length. No lateral absorption trench installed with a distribution box shall be greater than 100 feet long. A series (rollover) trench system shall not be greater than 150 feet, provided the area beyond the one hundred-foot area was included in the percolation test.
- C. Separation distance. At least 6 feet of undisturbed soil shall be left between each trench edge on level sites. The steeper the slope of the ground, the greater the separation distance should be. Two feet of separation distance should be added for each 5 percent increase in slope from level.
- D. Grade. Trench bottom should be constructed level from end to end. On sloping ground, the trench shall follow a uniform land contour to maintain a minimum soil cover of 6 inches while ensuring a level trench bottom.
- E. Compaction. There shall be minimum use or traffic of heavy equipment on the area proposed for soil absorption. In addition, it is prohibited to use heavy equipment on the bottom of the trenches in the absorption area.
- F. Fill soil. Soil absorption systems shall not be installed in fill soil. Disturbed soils, which have stabilized for at least one year would require a recent percolation test.
- G. Bearing strength. Soil absorption systems shall be designed to carry loadings to meet AASHTO H-10 standards.
- H. Soil smearing. Soils with significant clay content should not be worked when wet. If soil moisture causes sidewall smearing, the trench bottom and sidewalls shall be scarified.

WASTE WATER TREATMENT AND DISPOSAL

- I. Effluent lines. All distribution boxes shall discharge into a subsurface absorption field except where written permission is obtained from the Health Officer to discharge into a subsurface sandfilter followed by an approved receiving waterway.

SEC. 23-16. GRAVITY DISTRIBUTION

- A. Dosing is always recommended and preferred to improve distribution, improve treatment and extend the life of the system.
- B. On a hillside, septic tank effluent may be serially loaded to the soil absorption trenches by drop boxes or overflow piping (rigid sewer pipe). Otherwise, effluent shall be distributed evenly to all trenches by use of a distribution box or commercial distribution regulator approved by the administrative authority.
- C. Design. When a distribution box is used, it shall be of proper design and installed with separate watertight headers leading from the distribution box a minimum of five (5) to each lateral. Header pipes shall be rigid PVC plastic pipe meeting ASTM Standard 2729 or equivalent.
- D. Outlet height. The distribution box shall have outlets at the same level at least 4 inches above the bottom of the box to provide a minimum of 4 inches of water retention in the box.
- E. Baffles. There shall be a pipe tee or baffle at the inlet to break the water flow.
- F. Unused outlets. All unused outlet holes in the box shall be securely closed.
- G. Interior coating. All distribution boxes shall be constructed of corrosion-resistant materials, or other corrosion-resistant material approved by the administrative authority.
- H. Outlets level. All outlets of the distribution box shall be made level. A 4-inch cap with an offset hole approximately 2-1/2 inches in diameter shall be installed on each outlet pipe. These caps shall be rotated until all outlets discharge at the same elevation. Equivalent leveling devices may be approved by the local authority.

WASTE WATER TREATMENT AND DISPOSAL

- I. Equal length requirements. The soil absorption area serviced by each outlet of the distribution box shall be equal.
- J. Water shall be provided on site by the contractor to enable proper leveling of the distribution box.

SEC. 23-17. SUBSURFACE SYSTEMS

- A. Aggregate, septic stone or gravel. A minimum of 6 inches of aggregate, which is free of dirt and fines, shall be laid below the distribution pipe, and shall have a two (2) inch cover over the pipe. This aggregate shall be of such size that 100 percent will pass a 2-1/2 inch screen and 100 percent will be retained on a 3/4 inch screen. Limestone crushed septic stone if used it shall meet the following criteria:
 - 1. Abrasion loss. The percent wear, as determined in accordance with the AASHTO T 96, Grading C, shall not exceed 40 percent.
 - 2. Freeze and thaw loss. When subjected to the freezing and thawing test, Iowa DOT Materials Laboratory Test Method 211, Method A, the percentage loss shall not exceed 10 percent.
 - 3. Absorption. The percent absorption, determined in accordance with Iowa DOT Materials Laboratory Test Method 202, shall not exceed 3 percent.
 - 4. Graduation. The aggregate shall have not more than 1.5 percent by weight pass a No. 16 sieve.
- B. Trench width. Lateral trenches for aggregate systems shall be a minimum of 24 inches and a maximum of 36 inches in width at the bottom of the trench.
- C. Grade. The distribution pipes shall be laid with a minimum grade of 2 inches per 100 feet of run and a maximum grade of 6 inches per 100 feet of run, with a preference given to the lesser slope.
- D. Pipe. Distribution pipe shall be PVC rigid plastic meeting ASTM Standard 2729, or other suitable material approved by the administrative authority. The inside diameter shall be not less than 4 inches, with perforations at least 1/2 inch and no more than 3/4 inch

WASTE WATER TREATMENT AND DISPOSAL

in diameter spaced no more than 40 inches apart. Two rows of perforations shall be provided located 120 degrees apart along the bottom half of the tubing (each 60 degrees up from the bottom centerline). The end of the pipe in each trench shall be sealed with a watertight cap unless, on a level site, a footer is installed connecting the trenches together. Coiled perforated plastic pipe shall not be used when installing absorption systems.

- E. Aggregate cover. Unbacked, rolled, 3-1/2 inch thick fiberglass insulation, untreated building paper, synthetic drainage fabric, four to six inches of marsh hay or straw, or other approved material shall be laid so as to separate the aggregate from the soil backfill.
- F. When a serial distribution system (rollover) is installed, the invert of the overflow pipe shall be a minimum of two (2) inches above the dispersal line but not higher than the top of the aggregate. Care shall be exercised in constructing rollover lines to insure an undisturbed block of earth between trenches. The trench for the relief pipe shall be dug no deeper than the top of the gravel. The rollover line should rest on undisturbed earth and backfill should be carefully tamped. The rollover line connecting individual trenches shall be as far from each other as practicable.

SEC. 23-18. GRAVELLESS PIPE SYSTEMS

- A. Application. Gravelless subsurface absorption systems may be used as an alternative to conventional 4-inch pipe placed in gravel-filled trenches. However, they cannot be used in areas where conventional systems would not be allowed due to poor permeability, high groundwater, or insufficient depth to bedrock.
- B. Installation. Design approval for these systems must be obtained from the administrative authority prior to installation. Manufacturer's specifications and installation procedures shall be closely adhered to.
- C. Material. The 8 and 10-inch I.D. corrugated polyethylene tubing used in gravelless systems shall meet the requirements of ASTM F667, Standard Specification for Large Diameter Corrugated Polyethylene Tubing.
- D. Perforations. Two rows of perforations shall be located 120 degrees apart along the bottom half of the tubing

WASTE WATER TREATMENT AND DISPOSAL

(each 60 degrees up from the bottom centerline).

Perforations shall be cleanly cut and uniformly spaced into each inner corrugation along the length of the tubing and should be staggered so that there is only one hole in each corrugation.

- E. Top marking. The tubing should be visibly marked to indicate the top of the pipe.
- F. Filter wrap. All gravelless drainfield pipe shall be encased, at the point of manufacture, with a geotextile filter wrap specific to this purpose.
- G. Trench width. The minimum trench width for the gravelless system shall be 18 inches in sandy loam soil to ensure proper backfill around the bottom half of the pipe. In clay soils, the minimum trench width shall be 24 inches. On sloping ground the trenches should follow the contour to maintain a level trench bottom and to ensure a minimum backfill of six (6) inches.
- H. Length of trench. The total length of absorption trench for a 10-inch gravelless tubing installation shall be the same as given in Table IIIa for a conventional absorption trench, except for fine sandy soils as noted in Table IIIa footnote. An increase of at least 20 percent in total trench length shall be required if 8-inch tubing is used rather than 10-inch.
- I. To promote equal effluent and suspended solids distribution, the slope of the drainpipe should be 0 to 0.5 inches per 100 feet.

SEC. 23-19. CHAMBER SYSTEMS

- A. Application. Chamber systems may be used as an alternative to conventional 4-inch pipe placed in gravel-filled trenches. However, they cannot be used in areas where conventional systems would not be allowed due to poor permeability, high groundwater, or insufficient depth to bedrock.
- B. Installation. Manufacturer's specifications and installation procedures shall be closely adhered to.
- C. Length of trench. The total length of absorption trench for chambers 24 inches or less bottom width shall be the same as given in Table IIIa for a conventional absorption

WASTE WATER TREATMENT AND DISPOSAL

trench. For chambers greater than 33 inches in width a reduction of 25 percent from the length given in Table IIIa may be used.

- D. Sidewall. The chambers shall have at least 6 inches of sidewall effluent soil exposure height.

SEC. 23-20. DOSING SYSTEMS

A. Pump settings.

1. Pump and pit requirements. In the event the effluent from the septic tank outlet cannot be discharged by gravity and still maintain proper lateral depths, the effluent shall discharge into a watertight vented pump pit with an inside diameter of not less than 24 inches, equipped with a tight-fitting manhole cover at grade level. The sump vent shall extend a minimum of 6 inches above grade level and shall be a minimum size of 1-1/4 inches fitted with a return bend. The pump pit will be considered vented when piping from the structure is vented in accordance with applicable plumbing code. The pump shall be of a submersible type of corrosion-resistant material.
2. Pump settings. The pump shall be installed in the pump pit in a manner that ensures ease of service and protection from frost and settled sludge. The pump shall be set to provide a dosing frequency of approximately twice a day based on the maximum design flow with a minimum of 75 gallons per cycle. No on-site electrical connections shall be made in the pump pit. These connections shall be made in an exterior weatherproof box.
3. Pressure line size. The pressure line from the pump to the point of discharge shall not be smaller than the outlet of the pump it serves.
4. Drainage. Pressure lines shall be installed to provide total drainage between dosing to prevent freezing or be buried below frost
5. High water alarm. Pump pits shall be equipped with a sensor set to detect if the water level rises above the design high water level when the pump fails. This sensor shall activate an auditory or visual alarm to alert the homeowner that repairs are required.

WASTE WATER TREATMENT AND DISPOSAL

6. Discharge point. The effluent shall discharge under pressure into a distribution box or may be distributed by small diameter pipes throughout the entire absorption field.

B. Dosing siphons. Dosing siphons may also be used. Manufacturer's specifications shall be adhered to for installation. Similar dosing volumes and frequencies are recommended. Dosing siphons require periodic cleaning to ensure their continued proper operation.

SEC. 23-21. MOUND SYSTEM

A. General requirements.

1. Mound systems shall be permitted only after a thorough site evaluation has been made and landscaping, dwelling placement, effect on surface drainage and general topography have been considered.
2. Mound systems shall not be utilized on sites, which are subject to flooding with a 10-year or greater frequency.
3. Mound systems shall not be utilized on soils where the high ground water level, impermeable bedrock or creviced limestone occurs within 20 inches of natural grade or soil strata having a percolation rate exceeding 120 minutes per inch occur within 12 inches of natural grade.
4. Mound systems shall be constructed only upon undisturbed naturally occurring soils.
5. Mound systems shall be located in accordance with the distances specified in Table I as measured from the outer edge of the mound.
6. No buildings, driveways or other surface or subsurface obstructions shall be permitted within 50 feet on the down gradient side of the mound when the mound is constructed on a slope greater than 5 percent. No future construction shall be permitted in this effluent disposal area as long as the mound is in use.

WASTE WATER TREATMENT AND DISPOSAL

7. Specifications given in these rules for mounds are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other design

information beyond the scope of these rules may be necessary to properly design a mound system.

B. Material for mound fills.

1. The mound shall be constructed using clean, medium-textured sand, sometimes referred to as concrete sand. The sand size shall be such that at least 25 percent by weight shall have a diameter between 2.0 and 0.25 mm, less than 35 percent with a diameter between 0.25 and 0.05 mm and less than 5 percent with a diameter between 0.002 and 0.05 mm.
2. Rock fragments larger than 1/16 inch (2.0 mm) shall not exceed 15 percent by weight of the material used for sandy fill.

C. Construction details.

1. There shall be a minimum of 3 feet of fill material and undisturbed naturally occurring soils between the bottom of the washed gravel or septic stone and the highest elevation of the limiting conditions defined in SEC. 23-20.C.,3.
2. Gravel or septic stone shall be washed and shall range in size from 3/4 to 2-1/2 inches.
3. From 1 to 2 feet of medium-textured sand (depending upon the underlying soil depth, Sec Section 23-22, C.,1.,) must be placed between the bottom of the gravel and the top of the plowed surface of the naturally occurring soil.
4. Mound systems shall utilize absorption bed distribution piping design and shall not be installed on land with a slope greater than six percent. The bed shall be installed with the long dimension parallel to the land contour. Systems on steep slopes with slowly permeable soils should be narrow to reduce the possibility of toe seepage.

WASTE WATER TREATMENT AND DISPOSAL

5. Minimum spacing between distribution pipes shall be 4 feet, and a minimum of 3 feet shall be maintained between any trench and the sidewall of the mound.
6. No soil under or up to 50 feet down gradient of the mound may be removed or disturbed except as specified
7. Construction equipment, which would cause undesirable compaction of the soil, shall be kept off the base area. Construction or plowing shall not be initiated when the soil moisture content is high. If a sample of soil from approximately 9 inches below the surface can be easily rolled into a 1/8 to 1/4 inch diameter wire, the soil moisture content is too high for construction purposes.
8. Above-ground vegetation shall be closely cut and removed from the ground surface throughout the area to be utilized for the placement of the fill material.
9. The area shall be plowed to a depth of 7 to 8 inches, parallel to the land contour with the plow throwing the soil up slope to provide a proper interface between the fill and the natural soil. Tree stumps should be cut flush with the surface of the ground, and roots should not be pulled.
10. The base area of the mound is to be calculated on the results of percolation rate as indicated in Table IV. The base area of the mound below and downslope from the trenches, excluding the area under the end slopes, must be large enough for the natural soil to absorb the estimated daily wastewater flow.

11. Table IV

Percolation Rate (Min/Inch)	Application Rate (Gal/Square Foot/Day)
Less than 1	Not Suitable
1-5	1.25
6-15	1.00
16-30	.75
31-45	.50
46-60	.40
61-90	.20
91-120	.10
Over 120	Not Suitable

12. The area of the fill material shall be sufficient to

WASTE WATER TREATMENT AND DISPOSAL

extend 3 feet beyond the edge of the gravel area before the sides are shaped to a 4:1 slope (preferably 5:1).

13. Distribution system.
 - a. The distribution pipe shall be rigid plastic pipe, schedule 40 or 80 with 1-inch nominal diameter.
 - b. The distribution pipe shall be provided with a single row of 1/4-inch perforations in a straight line 30 inches on center along the length of the pipe or an equivalent design that assures uniform distribution. All joints and connections shall be solvent-cemented.
 - c. The distribution pipe shall be placed in the clean, washed gravel (or crushed limestone as described in 23-15.A.) with holes downward. The gravel or septic stone shall be a minimum of 9 inches in depth below and 3 inches in depth above the pipe.
 - d. No perforations shall be permitted within 3 inches of the outer ends of any distribution pipes.
 - e. The outer ends of all pressure distribution lines shall be securely capped.
 - f. The central pressure manifold should consist of 1-1/2 inch or 2-inch solid plastic pipe using a tee or cross for connecting the distribution lines.
14. Construction should be initiated immediately after preparation of the soil interface by placing all of the sandy fill material needed for the mound (to the top of the trench) to a minimum depth of 21 inches above the plowed surface. This depth will permit excavation of the trenches to accommodate the 9 inches of washed gravel or crushed stone necessary for the distribution piping.
15. The absorption trench or trenches shall be hand excavated to a depth of 9 inches, the bottoms of the trenches made certain to be level.

WASTE WATER TREATMENT AND DISPOSAL

16. Twelve inches of gravel shall be placed in the trench and hand leveled, and then remove 3 inches of the gravel with a shovel in the location where the distribution pipe will be placed. After the distribution pipe is placed the pipe shall be covered with 2 inches of gravel septic stone.
17. The top of the gravel shall be covered with synthetic drainage fabric. Unbacked, rolled 3-1/2 inch thick fiberglass insulation, untreated building paper, marsh hay or straw ,or other suitable material may be used with approval of the administrative authority. Plastic or treated building paper shall not be used.
18. After installation of the distribution system, gravel and material over the gravel, the entire mound is to be covered with topsoil native to the site or of similar characteristics to support vegetation found in the area. The entire mound shall be crowned by providing 12 inches of topsoil on the side slopes with a minimum of 18 inches over the center of the mound. The entire mound shall be seeded, sodded or otherwise provided with a grass cover to assure stability of the installation.
19. The area surrounding the mound shall be graded to provide for diversion of surface runoff water.
20. Dosing.
 - a. Dosing shall be required for mound systems.
 - b. The mound system shall be dosed not more than two times per day.
 - c. The size of the dosing pump or siphon shall be capable of maintaining an approximate pressure of one psi at the outer ends of the distribution lines.

SEC. 23-22. DRIP IRRIGATION

A. General design.

1. Pretreatment required. These systems must be preceded by a secondary treatment system discharging a treated, filtered effluent with CBOD and TSS values less than 20 mg/l.

WASTE WATER TREATMENT AND DISPOSAL

2. Separation from groundwater. Drip irrigation systems shall have a minimum vertical separation distance to high groundwater level or bedrock of 20 inches.
 3. Maximum hillside slope. Drip irrigation systems shall not be installed on slopes of more than 25 percent.
 4. Specifications given in these rules for drip irrigation are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other design information beyond the scope of these rules may be necessary to properly design a drip irrigation system.
- B. Emitter layout.
1. Discharge rate Systems shall be designed so that emitters discharge approximately 1 gpm 12 psi or other rates suggested by the manufacturer and approved by the administrative authority.
 2. Grid size. Dip lines shall be run in parallel lines 2 feet apart. Emitters shall be placed in the drip lines on 2-foot intervals with emitters offset 1 foot between adjacent lines. Each emitter shall cover 4 square feet of absorption area.
 3. Field size. The field shall be sized according to the application rate given in Table V.
 4. Depth of drip lines. Drip lines shall be laid on the contour 6 to 12 inches deep with a maximum line length of 100 feet. Lines may be of unequal length.
 5. Interconnection. Drip lines shall all be connected to supply and return headers such that the entire system will automatically drain back to the dosing tank or pump pit upon completion of the pumping cycle. Vacuum breakers shall be positioned at the high point of the supply and return headers.
 6. The dosing tank shall have a high water audio/visual alarm.

WASTE WATER TREATMENT AND DISPOSAL

TABLE V. Length of Drip Line Required Per Bedroom

Percolation Rate (min/inch)	Hydraulic Loading (gpd/sq ft)	Length of Drip Line (feet/bedroom)
1-5	2.0	40
6-15	1.3	60
16-30	0.9	90
31-45	0.6	150
46-60	0.4	200
61-90	0.2	400
91-120	0.1	800

SEC. 23-23. SANDFILTERS

A. General requirements.

1. Sand filters may be used when the administrative authority determines the site is unacceptable for a full-sized soil absorption system.
2. Sand filters shall be located in accordance with the distances specified in Table I.
3. A sampling port shall be available at the discharge point of the filter or shall be installed in the discharge line. Monitoring and effluent sampling of sand filters must meet the requirements of the NPDES permit as specified in this regulation. Such sampling shall be performed annually or as directed by the administrative authority. The maximum carbonaceous BOD₅, total suspended solids and fecal coliform count requirements are as follows: (fecal coliform tests shall only be required where waste discharge is into a watershed within one mile upstream of a "Class A" water).

Effluent discharging to	Fecal Coliform/100mi	CBOD ₅	TSS
Class "A" waters: Primary contact water use ⁽¹⁾	200	25	25
All other water use classifications	No limit	25	25

⁽¹⁾ A separation distance of 750 feet shall be maintained between any point of discharge and a primary recreational area as specified in the "Recommended Standards for Bathing Beaches" of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers.

WASTE WATER TREATMENT AND DISPOSAL

3. Prohibited construction. There shall be no construction, such as buildings or concrete driveways, covering any part of a sandfilter.

B. Construction.

1. Number. A sandfilter shall consist of one filtering bed or two or more filtering beds connected in series and separated by a minimum of 6 feet of undisturbed earth.
2. Pipelines. Each bed shall contain a horizontal set of collector lines. The collector lines shall be equivalent to SDR 35 PVC pipe, 8 inch diameter gravelless drainpipe or other suitable materials.
 - a. One collector line shall be provided for each 6 feet of width or fraction thereof. A minimum of two collector lines shall be provided. The upper end shall be sealed or plugged.
 - b. The collector lines shall be laid to a grade of 1 inch in 10 feet (or 0.5 to 1.0 percent).
 - c. Each collector line shall be vented or connected to a common vent. Vents shall extend at least 12 inches above the ground surface with the outlet screened, or provided with a perforated cap.
 - d. Gravelless drainfield pipe with fiber wrap may be used for the collector lines. If so, no gravel or pea gravel is required covering the collector lines. The pipe shall be bedded in filter sand.
 - e. If 4-inch plastic pipe with perforations is used for the collector lines, they shall be covered as follows.
 - 1) Gravel 3/4 inch to 2-1/2 inches in size shall be placed around and over the lower collector lines until there is a minimum of 4 inches of gravel over the pipes.
 - 2) The gravel shall be overlain with a minimum of 3 inches of washed pea gravel 1/8 to 3/8 inch size interfacing with the filter media. A layer of fabric filter may be used in place

WASTE WATER TREATMENT AND DISPOSAL

of the pea gravel. Fabric filters must be 30 by 50 mesh with a percolation rate of at least 5 gal/sq.ft.

- f. A minimum of 24 inches of coarse washed sand shall be placed over the pea gravel or above the gravelless drainfield pipe. The sand shall meet the Iowa DOT standards for concrete sand: 100 percent shall pass a 2.36 mm screen, 10 to 60 percent shall pass a 600Tm screen, and 0 to 1.5 percent shall pass a 75Tm screen.

C. Distribution system and cover.

1. Gravel base. Six inches of gravel 3/4 inch to 2-1/2 inches in size shall be placed upon the sand in the bed.
2. Distribution lines. Distribution lines shall be level and shall be horizontally spaced a maximum of 3 feet apart, center to center. Distribution lines shall be rigid perforated PVC pipe.
3. Venting. Venting shall be placed on the downstream end of the distribution lines with each distribution line being vented or connected to a common vent. Vents shall extend at least 12 inches above the ground surface with the outlet screened, or provided with a perforated cap.
4. Gravel cover. Enough gravel shall be carefully placed to cover the distributors.
5. Separation layer. A layer of material such as unbacked, rolled 3-1/2 inch thick fiberglass insulation, untreated building paper of 40 to 60 pound weight, synthetic drainage fabric or 4 to 6 inches of marsh hay or straw shall be placed upon the top of the upper layer of gravel. In dry sandy soils, a 4 inch layer of hay or straw covered with untreated building paper is suggested to prevent the backfill from filtering down into the rock unless fiberglass or drainage fabric is used.
6. Soil cover. A minimum of 12 inches of soil backfill shall be provided over the beds.

WASTE WATER TREATMENT AND DISPOSAL

7. Distribution boxes. A distribution box shall be provided for each filter bed where gravity distribution is used. The distribution boxes shall be placed upon undisturbed earth outside the filter bed. Separate watertight lines shall be provided leading from the distribution boxes to each of the distributor lines in the beds.
- D. Sizing of subsurface sand filters.
1. Gravity flow.
 - a. For residential systems, single bed subsurface sand filters shall be sized at a rate of 240 square feet of surface area per bedroom.
 - b. Dual subsurface sand filters, constructed in series, shall be sized at the rate of 160 square feet of surface per bedroom in the first filter and 80 square feet of surface area per bedroom in the second filter in the series.
 2. Pressure dosed.
 - a. For residential systems, single bed subsurface sand filters dosed pump or dosing siphon may be sized at a rate of 180 square feet of surface area per bedroom.
 - b. Dual subsurface sand filters, constructed in series, may be sized at the rate of 120 square feet of surface per bedroom in the first filter and 60 square feet of surface area per bedroom in the second filter in series.
 - c. Non-household. Effluent application rates for commercial systems treating domestic waste shall not exceed the following:
 - 1) 1.5 gallon/square feet/day for double bed sand filters.
 - 2) 1.0 gallon/square feet/day for single bed sand filters.
 - 3) Total surface area for any subsurface sand filter system shall not be less than 200 square feet.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-24. FREE ACCESS SANDFILTERS

- A. Description. Media characteristics and underdrain systems for free access filters are similar to those for subsurface filters. Distribution is often provided through pipelines and directed on splash plates located at the center or corners of the sand surface. Occasionally, troughs or spray nozzles are employed as well, and ride and furrow application has been successful during winter operation in severe climatic conditions. Dosing of the filter should provide for flooding the bed to a depth of approximately 2 inches. Dosing frequency is usually greater than two times per day. For coarser media (greater than 0.5 mm) a dosing frequency greater than four times per day is desirable. Higher acceptable loading on these filters as compared to subsurface filters relate primarily to the accessibility of the filter surface for maintenance. Gravel is not used on top of the sand media, and the distribution pipes are exposed above the surface.
- B. Distribution. Distribution to the filter may be by means of troughs laid on the surface, pipelines, discharging to splash plates located at the center or corners of the filter, or spray distributors. Care must be taken to ensure that lines discharging directly to the filter surface do not erode the sand surface. The use of curbs

SEC. 23-24. FREE ACCESS SANDFILTERS (con't)

around the splash plates or large stones placed around the periphery of the place will reduce the scour. A layer of washed pea gravel placed over the filter media may also be employed to avoid surface erosion. This practice will create maintenance difficulties, however, when it is time to rake or remove a portion of the media surface.

- C. Covers. Free access filters may be covered to protect against severe weather conditions and to avoid encroachment of weeds or animals. The cover also serves to reduce odor conditions. Covers may be constructed of treated wooden planks, galvanized metal, or other suitable material. Screens or hardware cloth mounted on wooden frames may also serve to protect filter surfaces. Where weather conditions dictate, covers should be insulated. A space of 12 to 24 inches should be allowed between the insulated cover and sand surface. Free access filters may not be buried by soil or sod.

WASTE WATER TREATMENT AND DISPOSAL

- D. Loading. The hydraulic loading for free access sand filters and mechanical aerobic wastewater treatment facilities should be from 2.0 to 4.0 gpd/sq.ft. when treating septic tank effluent.
- E. Number of filters. Dual filters each sized for the design flow are recommended for loading rates in excess of 3-1/2 gpd/sq.ft. for treating septic tank effluent.

SEC. 23-25. DOSING

- A. Dosing for sand filters is strongly advised. Without dosing, the entire area of the sand filter is never effectively used. Dosing not only improves treatment effectiveness but also decreases the chance of premature failure.
- B. Pumps. A pump shall be installed when adequate elevation is not available for the system to operate by gravity.
 - 1. The pump shall be of corrosion-resistant material
 - 2. The pump shall be installed in a watertight pit.
 - 3. The dosing system shall be designed to flood the entire filter during the dosing cycle. A dosing frequency of greater than two times per day is recommended.
 - 4. A high water alarm shall be installed.
- C. Dosing siphons. When a dosing siphon is used where elevations permit, such siphon shall be installed as follows:
 - 1. Dosing siphons shall be installed between the septic tank and the first filter bed.
 - 2. Dosing siphons shall be installed with strict adherence to the manufacturer's instructions.
- D. Dosing tanks. The dosing tank shall be of such size that the siphon will flood the entire filter during the dosing cycle. A dosing frequency of greater than two times per day is recommended.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-26. INDIVIDUAL MECHANICAL AEROBIC WASTEWATER
TREATMENT AND DISPOSAL SYSTEM

- A. Individual mechanical aerobic wastewater treatment systems. General requirements for individual mechanical aerobic wastewater treatment systems are as follows.
- B. These types of systems are allowed only when site conditions preclude any other type of individual private wastewater disposal system as described in this Chapter.
- C. Certification. All individual mechanical aerobic wastewater treatment plants shall be certified by an ANSI-accredited third-party certifier to meet National Sanitation Foundation Standard 40, Class I, including appendices (May 1996).
- D. Installation and operation. All individual mechanical aerobic wastewater treatment plants shall be installed, operated and maintained in accordance with the manufacturer's instructions and the requirements of the administrative authority. The aerobic plants shall have a minimum treatment capacity of 150 gallons per bedroom per day or 500 gallons, whichever is greater.
- E. Effluent treatment. The effluent from individual mechanical aerobic wastewater treatment plants shall receive additional treatment through the use of intermittent sand filters, mound systems or subsurface absorption systems of a magnitude of half that prescribed in this Chapter or by discharge to a drip irrigation system as sized in Section 23-21.
- F. Maintenance contracts. A maintenance contract with a manufacturer-certified technician shall be maintained at all times. Maintenance agreements and responsibility waivers shall be recorded with the County Recorder and in the abstract of title for the premises on which mechanical aerobic treatment systems are installed. A copy shall be provided to the administrative authority. Mechanical aerobic units shall be inspected for proper operation at least twice a year on six-month intervals.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-27. CONSTRUCTED WETLANDS

A. General site design.

1. Application. Constructed wetlands shall only be used where soil percolation rates at the site exceed 120 minutes per inch. Because the higher maintenance requirements of constructed wetland systems, preference should be given to sand filters, where conditions allow.
2. Effluent treatment. The effluent from a constructed wetland shall receive additional treatment through the use of intermittent sand filters of a magnitude of half that prescribed in rule SEC. 23-22.
3. Effluent sampling. Effluent sampling of constructed wetlands shall be performed twice a year or as directed by the administrative authority. Tests shall be run on all parameters as required in SEC. 23-22 A.
4. Specifications given in these rules for constructed wetlands are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other design information beyond the scope of these rules may be necessary to properly design a constructed wetland system.

B. Wetland design.

1. Depth. The wetland shall be of a subsurface flow construction with a rock depth of 18 inches and a liquid depth of 12 inches.
2. Materials. Substrate shall be washed river gravel with a diameter of 3/4 inch to 2-1/2 inches. If crushed quarried stone is used, it must meet the criteria listed in Section 23-15,A,1-4.
3. Sizing and configuration. Detention time shall be a minimum of seven days.
 - a. Dimensions. This may be accomplished with trenches 16 to 18 inches deep (12 inches of liquid), 3 feet wide with 100 feet of length per

WASTE WATER TREATMENT AND DISPOSAL

bedroom. This may also be done with beds 16 to 18 inches deep with at least 300 square feet of surface area per bedroom. The bottom of each trench or bed must be level within 1/2 inch.

- b. Configuration. Multiple trenches or beds in series should be used. Beds or trenches in series may be stepped down in elevation to fit a hillside application. If the system is on one elevation, it should still be divided into units by earthen berms at about 50 and 75 percent of the total length.
 - c. Unit connections. Each subunit shall be connected to the next with an overflow pipe (rigid sewer pipe) that maintains the water level in the first section. Protection from freezing may be necessary.
4. Liner. Wetlands shall be lined with a synthetic PVC or PE plastic liner 30 mils thick.
 5. Inlet pipe. Effluent shall enter the wetland by a 4-inch pipe sealed into the liner. With beds, a header pipe shall be installed along the inlet side to distribute the waste
 6. Protective berms. Wetland system sites shall be bermed to prevent surface water from entering the trenches or beds.

C. Vegetation.

1. Setting plants. Vegetation shall be established on the wetlands at time of construction. Twelve inches of rock is placed in each unit, the plants are set, then the final 4 to 6 inches of rock is placed.
2. Plant species. Only indigenous plant species shall be used, preferably collected within a 100-mile radius of the site. Multiple species in each system are recommended. Preferred species include, but are not limited to:
 - a. *Typha Latifolia* - Common cattail
 - b. *Typha Angustifolia* - Narrow leaf cattail
 - c. *Scirpus spp.* - Bullrush
 - d. *Phragmites communis* - Reed

WASTE WATER TREATMENT AND DISPOSAL

3. Plant establishment. Transplantation is the recommended method of vegetation establishment. For transplanting, the propagule should be transplanted, at a minimum, on a 2-foot grid. The transplants should be fertilized, preferably with a controlled release fertilizer such as Osmocote 18-5-11 for fall and winter planting, 18-6-12 for spring planting, and 19-6-12 for summer planting. Trenches or beds should be filled with fresh water immediately.
4. Plant management. In the late fall the vegetation shall be mown and the detritus left on the wetland surface as a temperature mulch. In the early spring the mulch shall be removed and disposed of to allow the adequate bed aeration.

SEC. 23-28. WASTE STABILIZATION PONDS

- A. General requirements. Waste stabilization ponds may be used if designed and constructed in accordance with the following criteria and provided the effluent is discharged in accordance with the requirements of the general NPDES permit listed in Section 23-10. A septic tank sized according to Section 23-12 shall precede waste stabilization pond.
- B. Location. Waste stabilization ponds must meet the following separation distances:
 1. 1,000 feet from the nearest inhabitable residence, commercial building, or other inhabitable structure.
If the inhabitable or commercial building is the property of the owner of the proposed treatment facility, or there is written agreement with the owner of the building, this separation criterion shall not apply. Any such written agreement shall be filed with the County Recorder and recorded for abstract of title purposes, and a copy submitted to the department.
 2. 1,000 feet from public shallow wells.
 3. 400 feet from public deep wells.
 4. 400 feet from private wells.
 5. 400 feet from lakes and public impoundments.

WASTE WATER TREATMENT AND DISPOSAL

6. 25 feet from property lines and rights-of-way.

C. Size.

1. Dimensions. Ponds shall have a length not exceeding three times the width.
2. Capacity. When domestic sewage from a septic tank is to be discharged to a waste stabilization pond, the capacity of the pond shall be equivalent to 180 times the average daily design flow.
3. Depth. The wastewater depth for a waste stabilization pond shall be uniform and 3 feet to 5 feet.
4. Freeboard. A minimum freeboard of 2 feet shall be maintained at all times.

D. Embankments.

1. Seal. Embankments shall be constructed of impermeable materials and shall be compacted. The bottom of the waste stabilization pond shall be cleared and leveled to the required elevation and shall be lined with an impermeable natural or man-made material. Seepage loss through the sides and bottom shall be less than 1/16 inch per day.
2. Slopes. Inside embankment slopes shall be 3 horizontal to 1 vertical. Outside embankments shall be at least 3:1.
3. Berm top. Berm tops shall be at least 4 feet wide.
4. Cover. Embankments shall be seeded from the outside toe to the inside high water line. From the high water line down the embankment diagonally about 5 feet shall be rip-rapped for erosion and vegetation control.

E. Inlet and outlet structures.

1. Inlet. The inlet shall be placed no higher than 12 inches above the bottom of the pond. It shall discharge near the middle of the pond at a point opposite the overflow structure and onto a concrete splash plate at least 2 feet square.
2. Outlet. The outlet pipe shall withdraw water from a

WASTE WATER TREATMENT AND DISPOSAL

submerged depth of at least 1-foot. The intake for the outlet pipe shall be 3 to 5 feet from the embankment.

3. Separation. The inlet and outlet should be separated to the maximum extent possible, ideally by a berm or baffle constructed in the lagoon to prevent short-circuiting.
- F. Drainage. All surface water shall be diverted away from the waste stabilization pond.
- G. Discharge.
1. Controlled discharge. If the pond is designed for open discharge, it must be discharged under controlled conditions. The effluent must be tested before discharge, and effluent quality must be less than 25 mg/l of CBOD₅ and less than 25 mg/l of TSS. Another test must be taken during discharge with the same results. Pond discharge is permitted only in spring and fall when stream flows are highest.
 2. Continuous discharge. If the pond is to have an unlimited continuous discharge, the effluent shall receive additional treatment through the use of intermittent sand filters, mound systems or subsurface absorption systems of a magnitude of half that prescribed in Section 23-13, Section 23-18, and Section 23-22. Under continuous discharge, effluent sampling shall be as required for constructed wetlands as outlined in SEC.23-27,A.,3.
- H. Maintenance.
1. Fencing. All waste stabilization ponds are to be fenced adequately to prevent entrance of livestock and to discourage entrance by people into the area. Signs shall be posted warning of possible health and safety hazards.
 2. Vegetation. Vegetation on the top and sides of the berm shall be kept mown. No trees shall be allowed to become established.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-29. REQUIREMENTS FOR IMPERVIOUS VAULT TOILETS

All impervious vault toilets hereafter constructed or required by the administrative authority to be reconstructed shall comply with the following requirements.

- A. Location. Impervious vault toilets shall be located in accordance with the distances given in Table I, Section 23-9, for the closed portion of the treatment system.
- B. Construction. The vault shall be constructed of reinforced, impervious concrete at least 4 inches thick. The superstructure including floor slab, seat, seat cover, riser and building shall comply with good design and construction practices to provide permanent safe, sanitary facilities. The vault shall be provided with a cleanout opening fitted with a fly-tight cover.
- C. Disposal. Wastewater from impervious vault toilets shall be disposed of at a public sewage treatment facility.

SEC. 23-30. REQUIREMENTS FOR PORTABLE TOILETS

All portable toilets shall be designed to receive and retain the wastes deposited in them and shall be located and maintained in a manner that will prevent the creation of any nuisance condition. Disposal of waste from portable toilets shall be at a public sewage treatment facility.

SEC. 23-31. REQUIREMENTS FOR CHEMICAL TOILETS

- A. Tank. Chemical toilets for use in isolated residences shall have a receptacle of smooth, impervious material that is resistant to chemicals and easily cleanable.
- B. Vent. When vents are required for chemical toilets, they shall be of durable corrosion-resistant material installed in a professional manner.
- C. Mixing and chemical charge. The fixture shall be equipped with a mixing device and shall be charged with the proper concentration of bactericidal chemical or chemicals. Chemical recharges shall be added and mixed with the contents when necessary to maintain sufficient solution strength and to suppress odors.

WASTE WATER TREATMENT AND DISPOSAL

- D. Toilet rooms. Chemical toilets shall be located in toilet rooms, which are well lighted, ventilated and maintained in a nuisance-free condition.
- E. Final disposal of receptacle contents. The receptacle contents shall be disposed of in accordance with the requirements of 567-Chapter 68. The recommended method of disposal is discharging to a municipal sewage treatment facility.
- F. Other methods of wastewater disposal. Other methods or types of private wastewater treatment and disposal systems shall be installed only after plans and specifications for each project have been approved by the administrative authority.

SEC. 23-32. SEPTAGE COLLECTION, STORAGE, TRANSPORTATION AND DISPOSAL

Refer to Iowa Administrative Code, Chapter 68(455B).

SEC. 23-33. ALTERNATIVE OR INNOVATIVE ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

- A. Design requirements. Alternative or innovative systems are to be designed and operated in accordance with approved standards and operating procedures established by individual administrative authorities.
 - 1. Plans and specifications, meeting all applicable rule requirements, should be prepared and submitted to the administrative authorities by a licensed professional engineer. Included with the engineering submittal should be adequate supporting data relating to the effectiveness of the proposed system.
 - 2. For systems designed to discharge treated effluent into waters of the state, it will be necessary to obtain a Notice of Intent to fall under the requirements of NPDES General Permit No. 4. The effluent discharge shall comply with the provisions of this Chapter.
 - 3. A written agreement between the Scott County Health Department and the property owner utilizing said system shall be provided.

WASTE WATER TREATMENT AND DISPOSAL

- a. Said written agreement shall state that in the event the system does not meet performance requirements or should said system violate any federal, state or local laws or regulations that it shall be replaced with an approved onsite wastewater treatment and disposal system.
 - b. An instrument stating that the property involved is served by an innovative or alternate onsite wastewater treatment and disposal system shall be recorded on the abstract of said property with a copy provided to the Health Officer.
 - c. The Scott County Health Department shall advise the owners of all onsite wastewater treatment and disposal system of the criteria established by the State of Iowa dealing with discharge into the waters of the State.
4. In all cases such alternate or innovative onsite wastewater treatment and disposal systems shall comply with all sections of this Chapter.
 5. Wastewater management districts may be formed for the purpose of providing specialized control of on-site wastewater treatment and disposal systems located in certain problem areas or in intensive development areas. Formation of such wastewater management districts shall be coordinated under the guidance of the administrative authority and shall meet all applicable rule requirements.

SEC. 23-34. VARIANCES

Variations to this Chapter may be granted by the administrative authority provided sufficient information is submitted to substantiate the need and propriety for such action. Requests for variances to this Chapter and justification shall be submitted in writing to the Board of Health.

SEC. 23-35. INSPECTIONS

Prior to approval of the construction of an onsite wastewater treatment and disposal system, the Health Officer shall make a final inspection of the installation.

WASTE WATER TREATMENT AND DISPOSAL

Whenever the Health Officer has reasonable grounds to believe that a violation of this Chapter exists, he may enter upon and make an inspection of such premises, dwelling or other building, and to gather other necessary information, including water samples or other necessary specimens for the purpose of laboratory analysis, or to introduce into the system necessary testing materials for tracing the source of any apparent wastewater discharge to the surface of the ground. The owner or occupant of such premise shall permit the Health Officer to enter such premises and to make such inspection, and to obtain such samples, at the request of the Health Officer. Such inspection shall be made between the hours of 7:30 a.m., and 5:00 p.m., Monday through Friday, and at other times with the consent of the occupant or in case of emergency. The provisions of this Section shall apply to all premises, buildings, or dwellings, vacant or occupied. The Health Officer may make additional inspections of such premises as are deemed necessary. Every occupant of a dwelling or dwelling unit shall give the owner thereof, or his agent or employee access to any part of such dwelling or dwelling unit, or its premises, at all reasonable times for the purpose of making such repairs or alterations as are necessary to effect compliance with the provisions of this Chapter or with any lawful Rule adopted or any lawful order issued pursuant to the provisions of this Chapter.

SEC. 23-36. REFUSAL OF ADMITTANCE

In the event the Health Officer, in proceeding to enter any premises for the purpose of making an inspection to carry out the provisions of this Chapter, shall be refused entry, a complaint may be made under oath to any magistrate of the county and said magistrate shall thereupon issue his warrant directed to some peace officer of the county commanding him between sunrise and sunset, accompanied by the Health Officer, to enter upon such premises and to make such inspection, and to obtain such samples as may be required to carry out the provisions of this Chapter, which order shall be executed by said officer under the direction of the Health Officer.

SEC. 23-37. NOTICE

A. Whenever the Health Officer determines that there are reasonable grounds to believe that there has been a violation of any provision of this Chapter or any Rule adopted pursuant thereof, he shall give notice of such alleged violation to the person or persons responsible therefore, as hereinafter provided. Such notice shall:

1. Be in writing.

WASTE WATER TREATMENT AND DISPOSAL

2. Include a statement of the reasons why it is being issued.
3. Allow a reasonable time for the performance of any act it requires.
4. Be served upon the owner or his agent or the occupant, as the case may require, provided that such notice shall be deemed to be properly served upon such owner or agent, or upon such occupant, if a copy thereof is served upon him personally; or if a copy thereof is sent by certified mail to his last known address; or if a copy thereof is posted in a conspicuous place in or about the premises affected by the notice, or if he is served with such notice by any other method authorized or required under the laws of this state.

B. Such notice may contain an outline of remedial action which, if taken, will effect compliance with the provisions of this Chapter, and with Rules adopted pursuant thereto.

SEC. 23-38. HEARINGS

In the event any person is aggrieved by any order made by the Health Officer, he may within twenty (20) days of the date of such order appeal to the Board of Health and in writing state his reason(s) for requesting such order to be rescinded or modified. The Board of Health shall review the action of the Health Officer, and if reasonable grounds exist, shall modify, withdraw or order compliance with the said order. Appeal from any order of the Board of Health may be taken within twenty (20) days to the District Court of Scott County, Iowa.

SEC. 23-39. JURISDICTION

The provisions of this Chapter shall apply throughout Scott County, Iowa including cities and towns therein.

SEC. 23-40. ENFORCEMENT

It shall be the duty of the Health Officer to enforce the provisions of this Chapter.

WASTE WATER TREATMENT AND DISPOSAL

SEC. 23-41. MUNICIPAL INFRACTION

Any person, persons, firm, partnerships or corporations, whether acting alone or in concert with any other, who violates this ordinance shall be guilty of a municipal infraction and shall be penalized as set forth in Chapter 29 of the County Code of Scott County, Iowa.

SEC. 23-42. SEPARABILITY OF PROVISIONS

If any section, paragraph, clause or provision of this Chapter shall be held invalid, the invalidity of such section, paragraph, clause or provision shall not affect any of the remaining provisions of this Chapter.

APPENDIX A

Estimates on NonHousehold Domestic Sewage Flow Rates

Source of use for Sewage unit	(Units)	Gallons/Day/Unit Average (Secondary Treatment Unit Sizing)	Maximum (Septic tank)
<u>Dwelling Units</u>			
Hotels or luxury motels	(Each guest)	50	60
	(Add per employee)	11	13
Or	(Per square foot)	0.26	0.3
Discount motels	(Each guest)	30	40
	(Add per employee)	11	13
Or	(Per square foot)	0.22	0.46
Rooming house	(Each resident)	40	50
	(Add per nonresident meal)	2.54	4.0
<u>Commercial/Industrial</u>			
Retail stores	(Per square foot of sales area)	0.1	0.15
Or	(Each customer)	2.54	5
	(Plus each employee)	11	15
Or	(Each toilet room)	530	630
Offices	(Each employee)	15	18
Or	(Per square foot)	0.1	0.25
Medical offices	(Per square foot)	0.6	1.6
Industrial buildings	(Each employee)	15	20
	(Does not include process ware or cafeteria)		
Construction camp	(Each employee)	15	20
Visitor center	(Each visitor)	5	20
Laundromat	(Each machine)	580	690
Or	(Each load)	50	50
Or	(Per square foot)	2.2	2.9

WASTE WATER TREATMENT AND DISPOSAL

Barber shops	(Per chair)	55	80
Beauty shops	(Per station)	270	300
Car washes	(Per inside square foot)	5	10
	(Does not include car wash water)		

Eating & Drinking

Establishments

Restaurant	(Per meal)	2.5	4.0
	(Does not include bar/lounge)		
Or	(Each seat)	24	40
	(Plus add for each employee)	11	13
Dining hall	(Per meal)	2.5	4.0
Coffee shop	(Each customer)	2.0	2.5
	(Add per employee)	11	13
Cafeteria	(Each customer)	2	2.5
	(Add per employee)	11	1.3
Drive-in	(Per car stall)	110	145
Bar or Lounge	(Each customer)	2	5.5
	(Add per employee)	13	16
Or	(Per seat)	32	40
Country clubs(no meals)	(Per member)	22	22
Or	(Per member)(Meals & Showers)	105	130
Or	(Per member in residence)	75	100

Resorts

Housekeeping cabin	(Per person)	42	50
Lodge	(Per person)	53	74
Parks/swimming pools	(Per guest)	10	13
Picnic parks/toilet	(Per guest)	5	10
Movie theaters	(Per guest)	2.5	4
Drive-in theaters	(Per space)	3	5
Skating rink/dance hall	(Per customer)	7	10
Bowling lanes	(Per lane)	133	200

Transportation

Airport, bus/rail depot	(Per passenger)	2.5	4
Or	(Per square foot)	3.33	6.5
Or	(Per public restroom)	500	630
Auto service station	(Each vehicle served)	11	13
	(Add per employee)	13	16
Or	(Per inside square foot)	0.25	0.6
Or	(Per public restroom)	500	630

Institutional

Hospitals	(Each medical bed)	175	250
	(Add per employee)	10	16
Mental institution	(Each bed)	105	175

WASTE WATER TREATMENT AND DISPOSAL

	(Add per employee)	10	16
Prison or jail	(Each inmate)	120	160
	(Add per employee)	10	16
Nursing home	(Each resident)	93	145
	(Add per employee)	10	16
<u>Schools & Churches</u>			
School	(Per student-no gym, cafeteria or showers)	10	17
	(Per student-cafeteria only)	16	17
	(Per student-cafeteria, gym & showers)	20	30
Boarding school	(Per student)	75	115
Churches	(Per member)	0.14	0.86
	(Add for each kitchen meal)	1	1
	(Add per Sunday school student)	0.14	0.86
<u>Recreational</u>			
Campgrounds w/hookups	(Per person)	32	40
Or	(Per site w/central bath)	100	100
	(Per site)	50	75
	(Add for dump station w/hookup)	13	16
Day camp (no meals)	(Per person)	13	16
Weekly overnight camp	(Per member)	33	33

APPENDIX B
Percolation Test Procedure

1. A minimum of four test holes distributed evenly over the proposed lateral filed are required.
2. Percolation test holes shall be 4 to 12 inches in diameter and to the same depth as the proposed absorption trenches (not to exceed 36 inches in depth).
3. Sides and bottoms of the test holes shall be scratch or roughened to provide a natural surface. All loose material shall be removed from each hole.

WASTE WATER TREATMENT AND DISPOSAL

4. The bottoms of the test holes shall be covered with approximately 2 inches of rock to protect the bottom from scouring action when the water is added.
5. The hole shall be filled with at least 12 inches of clean water and this depth shall be maintained for at least 4 hours and preferably overnight if clay soils are present. It is important that the soil be allowed to soak for a sufficiently long period of time to allow the soils to swell if accurate results are to be obtained.
6. In sandy soils with little or no clay, soaking is not necessary. If, after filling the hole twice with 12 inches of water, the water seeps completely away in less than 10 minutes, the test can proceed immediately.
7. Except for sandy soils, percolation rate measurements should be made at least 4 hours but no more than 24 hours after the soaking period began. Any soil that sloughed into the hole during the soaking period is removed and the water level is adjusted to 6 inches above the gravel (or 8 inches above the bottom of the hole). At no time during the test is the water level allowed to rise more than 6 inches above the gravel.
8. Immediately after adjustment, the water level is measured from a fixed reference point to the nearest 1/8 inch at 30 minute intervals. The test is continued until two successive water level drops do not vary by more than 1/8 inch. At least three measurements are made.
9. After each measurement, the water level is readjusted to the 6 inch level. The last water level drop is used to calculate the percolation rate.
10. In sandy soils or soils in which the first 6 inches of water added after the soaking period seeps away in less than 30 minutes, water level measurements are made at 10 minute intervals for a 1 hour period. The last water level drop is used to calculate percolation rate.
11. The percolation rate is calculated for each test hole by dividing the time interval used between measurements by the magnitude of the last water level drop. This calculation results in a percolation rate in terms of minutes per inch. To determine the percolation rate for the area, the rates obtained from each hole are average. (If tests in the area vary by more than 20 minutes per

WASTE WATER TREATMENT AND DISPOSAL

inch, variations in soil type are indicated. Under these circumstances, percolation rates should not be averaged.)

Example: If the last measured drop in water level after 30 minutes is 5/8 inch, the percolation rate - $(30 \text{ minutes}) / (5/8 \text{ inch}) = 48 \text{ minutes/inch}$.