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Notice of Rulemaking Hearing

Hearings will be conducted in the manner prescribed by the Uniform Administrative Procedures Act, Tennessee Code Annotated, Section 4-5-204. For questions and copies of the notice, contact the person listed below.

Agency/Board/Commission:	Environment and Conservation
Division:	Water Resources
Contact Person:	Bob O'Dette
Address:	6th Floor, L&C Tower 401 Church Street Nashville, TN 37243
Phone:	(615) 253-5319
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Any Individuals with disabilities who wish to participate in these proceedings (to review these filings) and may require aid to facilitate such participation should contact the following at least 10 days prior to the hearing:

ADA Contact:	ADA Coordinator
Address:	12th Floor, L&C Tower 401 Church Street Nashville, TN 37243
Phone:	1-866-253-5827 (toll free) or (615 532-0200 Hearing impaired callers may use the TN Relay Service at 1-800-848-0298.
Email:	Beverly.Evans@tn.gov

Hearing Location(s) (for additional locations, copy and paste table)

Address 1:	17th Floor Conference Room A, L & C Tower	
Address 2:	401 Church Street	
City:	Nashville, Tennessee	
Zip:	37243	
Hearing Date :	04/09/13	
Hearing Time:	9:00 a.m.	X CST/CDT ___EST/EDT

Additional Hearing Information:

This rulemaking is intended to move the rules from Chapter 1200-01-06 to Chapter 0400-48-01, to repeal Chapter 05-05, which is no longer needed, and to edit the document to correct typos and incorrect references.

Oral or written comments are invited at the hearing. In addition, written comments may be submitted prior to or after the public hearing to: Tennessee Department of Environment and Conservation, Water Resources Division; Attention: Mr. Bob O'Dette, 6th Floor, L & C Annex; 401 Church Street; Nashville, Tennessee 37243; telephone 615-532-0445 or fax 615-532-0199. However, such written comments must be received by 4:30 PM CDT, April 9, 2013, in order to assure consideration. For further information, please contact Mr. Bob O'Dette at the above address or telephone number or by e-mail at Robert.Odette@tn.gov.

Revision Type (check all that apply):

___ Amendment
X New

X Repeal

Rule(s) (**ALL** chapters and rules contained in filing must be listed. If needed, copy and paste additional tables to accommodate more than one chapter. Please enter only **ONE** Rule Number/Rule Title per row.)

Chapter Number	**Chapter Title**
0400-48-01	Regulations to Govern Subsurface Sewage Disposal Systems
Rule Number	**Rule Title**
0400-48-01-.01	Subsurface Sewage Disposal Systems – General
0400-48-01-.02	Definitions
0400-48-01-.03	Subdivisions
0400-48-01-.04	Additional Site Requirements and Limitations for Subdivision Approval and Individual Lots and Issuance of Construction Permit
0400-48-01-.05	Percolation Test Procedures
0400-48-01-.06	Construction Permit
0400-48-01-.07	Design of the Conventional Disposal Field
0400-48-01-.08	Septic Tank Capacity
0400-48-01-.09	Design of Septic Tanks
0400-48-01-.10	Effluent Treatment Devices / Systems
0400-48-01-.11	Location of Septic Tanks, Dosing Chambers and Absorption Fields
0400-48-01-.12	Design of Dosing Systems
0400-48-01-.13	Maintenance of Subsurface Sewage Disposal Systems
0400-48-01-.14	Grease Traps
0400-48-01-.15	Alternative Methods of Subsurface Sewage Disposal
0400-48-01-.16	Experimental Methods of Treatment and Disposal Other Than Those Provided in These Regulations
0400-48-01-.17	Privies and Composting Toilets
0400-48-01-.18	Approved Soil Consultants
0400-48-01-.19	Installer of Subsurface Sewage Disposal Systems
0400-48-01-.20	Septic Tank Pumping Contractor
0400-48-01-.21	Fees for Services
0400-48-01-.22	Domestic Septage Disposal
0400-48-01-.23	Maintenance Provider for Advanced Treatment Systems and Subsurface Drip Disposal Systems
0400-48-01-.24	Severability

Chapter Number	**Chapter Title**
1200-01-06	Regulations to Govern Subsurface Sewage Disposal Systems
Rule Number	**Rule Title**
1200-01-06-.01	Subsurface Sewage Disposal Systems – General
1200-01-06-.02	Definitions
1200-01-06-.03	Subdivisions
1200-01-06-.04	Additional Site Requirements and Limitations for Subdivision Approval and Individual Lots and Issuance of Construction Permit
1200-01-06-.05	Percolation Test Procedures
1200-01-06-.06	Construction Permit
1200-01-06-.07	Design of the Conventional Disposal Field
1200-01-06-.08	Septic Tank Capacity
1200-01-06-.09	Design of Septic Tanks
1200-01-06-.10	Effluent Treatment Devices / Systems
1200-01-06-.11	Location of Septic Tanks, Dosing Chambers and Absorption Fields
1200-01-06-.12	Design of Dosing Systems
1200-01-06-.13	Maintenance of Subsurface Sewage Disposal Systems
1200-01-06-.14	Grease Traps
1200-01-06-.15	Alternative Methods of Subsurface Sewage Disposal
1200-01-06-.16	Experimental Methods of Treatment and Disposal Other Than Those Provided in These Regulations

1200-01-06-.17	Privies and Composting Toilets
1200-01-06-.18	Approved Soil Consultants
1200-01-06-.19	Installer of Subsurface Sewage Disposal Systems
1200-01-06-.20	Septic Tank Pumping Contractor
1200-01-06-.21	Fees for Services
1200-01-06-.22	Domestic Septage Disposal
1200-01-06-.23	Maintenance Provider for Advanced Treatment Systems and Subsurface Drip Disposal Systems
1200-01-06-.24	Severability

Chapter Number	**Chapter Title**
1200-05-05	Sewage Disposal for Proposed Subdivisions
Rule Number	**Rule Title**
1200-05-05-.01	Regulation I: Definition
1200-05-05-.02	Regulation II: Subdivision of a Plat Plan
1200-05-05-.03	Regulation III: Soil Absorption Tests
1200-05-05-.04	Regulation IV: Review of Plat and Data
1200-05-05-.05	Regulation V: Reapplication for Subdivision Plan
1200-05-05-.06	Regulation VI: Subdivision Plan Approval

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to http://tn.gov/sos/rules/1360/1360.htm)

Repeals

Chapter 1200-01-06 Regulations to Govern Subsurface Sewage Disposal Systems is repealed.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

Chapter 1200-05-05 Sewage Disposal for Proposed Subdivisions is repealed.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

New Rules

Chapter 0400-48-01
Regulations to Govern Subsurface Sewage Disposal Systems

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0400-48-01-.01 Subsurface Sewage Disposal Systems - General.

(1) General

(a) Purpose, Scope and Applicability

The purpose of these regulations is to provide for the implementation of T.C.A. Title 68 Health, Safety and Environmental Protection, Chapter 221 Water and Sewerage, Part 4 Subsurface Sewage Disposal Systems.

(b) Use of Number and Gender

As used in these rules:

1. Words in the masculine gender also include the feminine and neuter genders; and

2. Words in the singular include the plural; and

3. Words in the plural include the singular.

(c) Rule Structure

These rules are organized, numbered, and referenced according to the following outline form:

(1) paragraph

(a) subparagraph

1. part

(i) subpart

(I) item

I. subitem

A. section

(A) subsection

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.02 Definitions.

"Accessible Community Sewer" means a public sewerage system where its utilization by a given piece of property is not limited because of physical or other features as determined by the Commissioner.

"Advanced Treatment System (ATS)" means an approved treatment device in compliance with Rule 0400-48-01-.10 that is separate and distinct from the disposal field and is used to improve the quality of septic tank effluent to secondary levels.

"Agency of Government," in the context of public sewerage systems, means state, county, and municipal government agencies including their subdivisions and utility districts, but does not include entities regulated by the Tennessee Regulatory Authority.

"Air/Vacuum Release Valves" means a device that allows the air in a distribution system to escape during pressurized flow, and allows air to enter the system during depressurized flow.

"Alternative Methods of Disposal" means a subsurface sewage disposal system, the construction, installation, and operation of which varies from that of a conventional subsurface sewage disposal system.

"Blockout" means a potential access hole which is a thin section of concrete preformed in a septic tank which can be removed to allow insertion of a four (4) to six (6) inch diameter pipe.

"Boundary Outline" means a map or chart with lines delineating the boundaries of the proposed area or parcel of land.

"Buffer Zone" means the distance between subsurface sewage disposal systems or subsystems required to alleviate the impact of hydraulic overloading from the adjacent system(s).

"Commissioner" means the Commissioner of Environment and Conservation, the commissioner's duly authorized representative, and in the event of the commissioner's absence or a vacancy in the Office of Commissioner, the Deputy Commissioner.

"Conventional Sand Filter" means a filter with two (2) feet or more of medium sand designed to chemically and biologically process septic tank or other treatment unit effluent from a pressure distribution system operated on an intermittent basis.

"Conventional Subsurface Sewage Disposal System" means a disposal system that pre-treats sewage by use of a septic tank and applies effluent to the soil as described in Rule 0400-48-01-.07.

"Department" means the Department of Environment and Conservation.

"Disposal Field" means the part of a subsurface sewage disposal system that utilizes the soil for absorption and treatment of septic tank effluent.

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

"Dosing Chamber" means a watertight receptacle which houses a sewage effluent pump or siphon and stores sewage effluent from a septic tank until it is pumped or dosed to a disposal field.

"Drip Emitters" means a flow control device that is typically attached to the inside wall of drip line which allows the discharge of water at a predictable rate for a given pressure.

"Drip Line" means polyethylene tubing that has been certified for wastewater use that incorporates uniformly spaced drip emitters along its length.

"Effluent Filter" means an effluent treatment device installed on the outlet of a septic tank or dosing tank, which is designed to prevent the passage of large suspended matter.

"Filled Land" means areas to which more than two (2) feet of soil and/or debris have been added.

"Fragipan" means natural subsurface horizon with high bulk density and/or high mechanical strength relative to the solum above, seemingly cemented when dry, but when moist showing a moderate to weak brittleness.

"Graded Land" means areas from which soil has been removed and the remaining soil cannot be classified in any soil series.

"Grease" means animal fats or vegetable oils (resulting from food preparation) which are discharged to a sewage disposal system or accumulated in collection devices or traps that are associated with sewage disposal systems, conduits, sewers, plumbing fixtures and attachments. However, this definition shall exclude petroleum products, lubricants, silicones and greases of mineral or synthetic origin.

"Grease Trap" means a device designed to intercept and retain grease present in sewage or other wastewater.

"Gullied Land" means areas where gullies occupy nearly all of the surface area. Areas in which gullies occur within spatial intervals of less than one hundred (100) feet shall be classified as a soil gullied land complex. Gullies of more than one hundred (100) feet spatial intervals shall be located on the soil maps with the designated symbols.

"Gully" means a miniature valley (more than one (1) foot in depth) cut by running water and through which water generally runs during and shortly after rainfall.

"Installer of Subsurface Sewage Disposal Systems" means a person who contracts or otherwise installs, constructs, alters, or extends a subsurface sewage disposal system.

"Lot" means a part of a subdivision or a parcel of land intended for the building of a single house, building or other development where a subsurface sewage disposal system is to be used.

"Maintenance Providers" means individuals who provide routine or periodic action to ensure proper system performance for systems authorized by these rules.

"Manufacturer" means the company or its authorized representative producing a proprietary product.

"Miscellaneous Land Types" means areas on the earth's surface that are non-soil (rocks, water etc.) and soils that are difficult or impossible to classify in soil series (filled land, graded land, gullied land, paved areas etc.).

"Packaged Subsurface Drip Disposal (SDD)" means a pre-engineered SDD system or ATS/SDD system that has been approved by this Department for a definite set of site criteria.

"Percolation Rate" means the rate at which water moves into the soil as determined by a percolation test.

"Percolation Test" means a method of determining the usability of an area for subsurface sewage disposal by testing for the rate at which the undisturbed soil in a series of test holes of standard size will absorb water per unit of surface area.

"Person" means any and all persons, including individuals, firms, partnerships, associations, public or private institutions, municipalities, or political subdivisions or officers thereof, departments, agencies, or instrumentalities, or public or private corporation or officers thereof, organized or existing under the laws of this or any other state or country.

"Permit" means a written authorization issued by the Commissioner licensing one of the following: the construction, alteration, extension, or repair of a subsurface sewage disposal system, or the removal and disposal of accumulated wastes from subsurface sewage disposal systems, and including those engaged in such businesses.

"Plans" means any documents required by the Commissioner in the process of carrying out these regulations. Plans may include, but not be limited to: applications, boundary outlines, plats, soil, and topographic maps.

"Plat" means a map or other graphic representation drawn to scale, of a piece of land subdivided into lots, showing streets, waterlines, lot lines, etc.

"Positive Drainage Plan" means a plan by which all free water, both surface and subsurface, is removed from an area (lot, subdivision, etc.) by gravity (even acquiring off-site easements where necessary).

"Pressure Compensating Drip Emitters" means drip emitters that discharge water out of an orifice at a constant rate over a range of operating pressures.

"Privy" means a structure and /or excavation for the disposal of human excreta by non-water carriage methods.

"Public Sewerage System" means the conduits, sewers, and all devices and appurtenances by means of which sewage is collected, pumped, treated, and ultimately disposed of at a wastewater treatment plant; all of which are owned and operated by a municipality, utility district, or other legally constituted agency of government. Systems permitted through T.C.A. Title 68, Chapter 221, Part 4 are not public sewerage systems.

"Recirculating Gravel Filter (RGF)" means a type of gravel filter wastewater treatment system that utilizes an effluent recycle system where a portion of the filtered effluent is mixed with septic tank effluent in a recirculation/dilution tank and redistributed to the filter.

"Relief Line" means a closed pipe laid on an undisturbed section of ground that conveys septic tank effluent from one trench to a subsequent trench on a lower elevation.

"Restriction" means a limitation on the use of properties where subsurface sewage disposal systems are proposed.

"Restrictive Covenant" means that document which restricts the use of property by its owner and specifies the obligations and responsibility of the owner regarding the property.

"Rill" means a small shallow, (one (1) foot or less in depth), ephemeral channel that carries water only during and for a few minutes after rainfall. Rills can be obliterated with conventional farm tillage implements.

"Secondary Effluent Treatment Standards" are U.S. Environmental Protection Agency secondary effluent treatment requirements for municipal treatment facilities.

"Septage" means a combination of organic sludge, liquid and scum, which accumulates in septic tanks.

"Septic Tank" means a watertight receptacle, which receives the discharge of sewage and is designed and so constructed so as to permit settling of solids from the liquid, digestion of organic matter by detention, retention of the floating solids and discharge of the liquid portion.

"Septic Tank Effluent" means partially treated sewage, which is discharged from a septic tank.

"Septic Tank Pumping Contractor" means any person engaged in the business of removing or disposing of the sludge and liquid contents of septic tanks or holding tanks.

"Sewage" means human excreta; all water carried wastes, and household wastes from residences, buildings or commercial and industrial establishments.

"Sink" means a closed depression in an area of karst topography, that is formed either by the solution of the surficial limestone or by the collapse of underlying caves. Its form varies from basin-like to funnel shaped and its size varies from only a few feet across to several hundred feet across. The bottom of a sink most commonly consists of soil formed of materials that rolled or washed from the surrounding area and has slopes, which are generally, nearly level to undulating.

"Slope or Grade" means the rate of fall or rise of a pipeline or of the ground surface in reference to the horizontal plane.

"Soil Absorption Rate" means the rate, in minutes per inch, that clean water is absorbed by or drains through a soil during least favorable climatic conditions when soils are at or near field capacity. Estimated absorption rates are established in Appendix I for soil series and phases of soil series that have been recognized in Tennessee. For soil series and phases that have been recognized but not listed in Appendix I, the Department shall establish the absorption rate. Estimated soil absorption rates for variants of soil series and miscellaneous land types may be proposed by an approved soil consultant; however, those rates will be evaluated by the Department.

"Soil Evaluation" means the systematic examination of soils in the field and/or in laboratories, their description and classification, the mapping of kinds of soils or miscellaneous areas showing the distribution of soils in relation to the physical, cultural and special features of the earth's surface and the interpretation of the soils and site characteristics for their suitability for subsurface sewage disposal or to determine if the areas are eligible for percolation tests. The mapping is either general, high intensity or extra-high intensity.

"Soil Incorporation" means the disking or plowing of the soil at a domestic septage disposal site, within six (6) hours of land application of domestic septage, so that no domestic septage is present on the surface of the soil.

"Soil Injection" means the injection of domestic septage below the surface of the soil.

"Soil Map" means a map showing the size, shape and distribution of the various kinds of soil in relation to other physical and cultural features on the earth's surface. There are three (3) kinds of soil maps. They are general, high intensity and extra-high intensity. They are defined as follows:

(a) General - A general soil map is a second order survey as defined in the "Soil Survey Manual," United States Department of Agriculture, October 1993. These surveys are made for intensive land use that requires detailed information. Map units shall be named at a categorical level above the soil series. Miscellaneous land types or interpretative groupings of soils such as those in which percolation tests are allowed for subsurface sewage disposal site evaluation shall be delineated. Map scale shall be one (1) inch equals one hundred (100) feet. Minimum size map unit delineations shall be twenty-five hundred (2500) square feet. The mapping legend shall be provided by the Department.

(b) High Intensity - A first order survey as defined in the "Soil Survey Manual," United States Department of Agriculture, October 1993. These surveys are made for very intensive land use that requires very detailed soils information that requires very precise knowledge of soils and their variability such as individual building sites. Field procedures require observation of soil boundaries throughout their length. Map units are mostly soil series, phases of soil series with some complexes and miscellaneous land areas. Some map units named at categorical level above the series are allowed. Map scale shall be one (1) inch equals one hundred (100) feet. Minimum size delineation shall be six hundred twenty-five (625) square feet.

(c) Extra-High Intensity - A soil map that is the same as a high intensity soil map except the scale may be one (1) inch equals one hundred (100) feet or one (1) inch equals fifty (50) feet. The minimum size delineation shall be one hundred (100) square feet. These maps have more cartographic detail than high intensity maps.

"Soil Map Unit" means an abstract model of a soil taxonomic unit or miscellaneous land type that has a set of distinguishing soil characteristics that set it apart from all other soil map units.

"Soil Map Unit Delineation" means an area on a soil map that represents a kind of soil or miscellaneous land type that occupies an area on the earth's surface. There may be several map unit delineations of one soil map unit.

"Soil Series" means a group of very similar soils that have one or more soil characteristics that distinguishes that soil from all other soil series. As used in these regulations, a soil series is one that has been recognized by the Natural Resource Conservation Service in Tennessee.

"Soil Variant" means a soil that has one or more distinguishing soil characteristics and soil properties that prevent that soil from being classified in any soil series that has been recognized by the Natural Resource Conservation Service in Tennessee. A soil variant requires use and management significantly different from the soil from which the variant is named. Also, behavior different from the soil series for which the variant is named can be expected.

"Spring" means a point where water naturally issues from the ground surface.

"Storage Facility" means a receptacle, which is designed to receive and retain septage prior to disposal, when the disposal site is not accessible.

"Subdivision" means any tract or parcel of land divided into two (2) or more lots, sites or other division for the purpose of immediate or future building of houses, buildings or other development where subsurface sewage disposal systems are to be used. Subdivision does not include a division of any tract or parcel of land into two (2) or more tracts or parcels when such parts are five (5) acres or larger in size. Other development constitutes all other types of habitation or occupation of buildings including, but not limited to, mobile, modular, and prefabricated structures.

"Subsurface Drip Disposal (SDD) System" means a subsurface disposal system that utilizes pressurized drip irrigation line for the uniform application of wastewater.

"Subsurface Sewage Disposal (SSD) System" means a system, other than a public or community system, which receives sewage. Included within the scope of this definition are: septic tank absorption systems, privies, chemical toilets and other similar systems. However, a subsurface sewage disposal system does not include a sewerage system regulated under T.C.A. §§ 68-221-101 et seq. and 68-3-101 et seq.

"Swelling" means a condition caused by the intrusion of water into the individual clay particles.

"Topographic Map" means a map showing existing physical features, with contour lines at sufficient intervals to permit determination of proposed grades and drainage.

"Vicinity Map" means a map, which indicates the region near or about a place and the proximity to prominent and established landmarks.

"Water Table" means that level below which the soil or rock is saturated with water.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.03 Subdivisions.

(1) Approval by Other Agencies - No proposed subdivision shall be approved by the State Planning Office, a local or regional planning commission or other agency authorized to approve subdivisions until the plans for such subdivisions have been approved by the Commissioner.

(2) Lot Size - Lots shall be large enough to construct the original subsurface sewage disposal system and to provide an area for duplication of that system. The area(s) for both original and duplicate systems shall meet the provisions of these rules and be of sufficient size to accommodate a conventional subsurface sewage disposal system with thirty-six (36) inch wide trenches except where alternative subsurface sewage disposal systems are utilized.

(3) Evaluation and Lot Design - Either a High-Intensity or a General Soil Evaluation shall be conducted as described below:

(a) Soils Evaluation

1. Mapping Procedures

(i) A high-intensity soil evaluation shall be made of the entire subdivision, the entire lot or a minimum of twenty thousand (20,000) square feet (contiguous to usable soil area, if any) per lot. Each soil delineation shall be drawn and plotted using a scale of one (1) inch to one hundred (100) feet. The soil mapping shall be done by a soil consultant approved by the Department pursuant to the requirements of Rule 0400-48-01-.18. Two (2) copies of such map shall be submitted to the Commissioner.

(ii) A general soil evaluation map shall be made of the entire subdivision using a standard mapping legend provided by the Department and each soil delineation shall be drawn and plotted using a scale of one (1) inch to one hundred (100) feet. The soil mapping shall be done by a soil consultant approved by the Department pursuant to the requirements of Rule 0400-48-01-.18. Two (2) copies of such map shall be submitted to the Commissioner. Soil delineations based on slopes, soil depth to rock and water problems shall be identified on the map. Each delineation appearing on the plat through soil evaluation shall be interpreted by the soil consultants in terms of eligibility for percolation tests.

2. When the services of a soil consultant are provided by the Department, three (3) copies of a plat of the site drawn to a scale of one (1) inch equals one hundred (100) feet shall be submitted to the Commissioner. The site shall be either grid staked or lots staked as follows:

(i) A one hundred (100) feet master-grid system with surveyed control stakes numbered at not more than five hundred (500) feet intervals and the location of the same on the plat. The ratio of precision of the unadjusted survey shall be a minimum of 1:1000. The plat shall show the seal and signature of the surveyor and show a bar scale. Intermediate grid stakes with numbers at not more than one hundred (100) feet intervals shall be numbered and shown on the plat. The intermediate stakes may be set by rough chaining or other methods to a lesser degree of accuracy, however, said intermediate stakes shall be within two (2) feet of the distance shown. The Commissioner may require the removal of vegetative growth such as weeds, vines and briars to permit access to all parts of the property. In wooded areas cut/flagged lines shall be maintained until the property is evaluated.

(ii) Staked lots must have a numbered surveyed stake at each corner. The ratio of precision of the unadjusted survey shall be a minimum of 1:1000. The plat shall show the seal and signature of the surveyor and show a bar scale. Intermediate ground control stakes shall be numbered and set in areas where lot corners are not visible from any point on the lot. The intermediate stakes must be set no more than two hundred (200) feet apart, and said intermediate stakes may be set by rough chaining or other methods to a lesser degree of accuracy, however, said stakes shall be within two (2) feet of the distance shown on the plat. The Commissioner may require the removal of vegetative growth such as weeds, vines, and briars to permit access to all parts of the property. In wooded areas cut/flagged lines shall be maintained until property is mapped.

3. When the service of a private soil consultant is utilized, then the requirements in subparts 2(i) or (ii) of this subparagraph shall apply.

(b) Percolation Test

1. Under authority of T.C.A. § 68-221-403(c), after a general or high intensity soil evaluation has been conducted by an approved soil consultant and the soils are found to have the

following characteristics, then a percolation test may be conducted pursuant to Rule 0400-48-01-.05.

(i) There shall be a minimum depth of twenty-four (24) inches of undisturbed soil.

(ii) Slopes of more than thirty (30) percent do not qualify for percolation tests unless provisions of subparagraph (4)(d) of Rule 0400-48-01-.04 are met.

(iii) No water problem shall exist. A water problem shall be considered to exist if any of the conditions are present as listed in the "Soils Handbook of Tennessee."

2. Where a percolation test is required to determine the percolation rate for a conventional system, the percolation holes used to determine this rate must be located at the intersection of lines in a grid pattern with maximum perpendicular distances of fifty (50) feet between the lines of the grid. Each hole shall be considered reasonably representative of a square area of two thousand five hundred (2,500) square feet which includes that hole in the approximate center of the square; or

Where a percolation test is required to determine the percolation rate for an alternative system, the percolation holes used to determine this rate must be located at the intersection of lines in a grid pattern with maximum perpendicular distances of twenty-five (25) feet between the lines of the grid. Each hole shall be considered reasonably representative of a square area of six hundred twenty-five (625) square feet, which includes that hole in the approximate center of the square.

Where percolation tests are used to determine the rate at which water moves through the soil, the minimum lot size shall be twenty thousand (20,000) square feet where a public water supply is used or a minimum of twenty-five thousand (25,000) square feet where a private water supply is used. The Department shall be notified at least three (3) days prior to the day that the percolation test will be conducted. Percolation test procedures may be monitored when deemed necessary.

(i) Two (2) copies of the subdivision plat at a scale of one (1) inch equals one hundred (100) feet shall be submitted to the Commissioner. Such plat shall show percolation test holes identified by number and plotted to scale, subdivision boundaries and other pertinent topographic features. All lot and grid lines shall be drawn with appropriate numbers shown on the plat corresponding with survey stakes on the ground.

(ii) Tabulated results of percolation test holes shall be reported on a form provided by the Department.

(iii) The actual average percolation rate shall be determined by averaging only the test results from the area actually to be covered by the permit, which includes both initial and duplicate area. Areas in which percolation test results were unfavorable shall be excluded. The average percolation rate shall be calculated on a weighted basis.

(iv) Percolation test results shall not be conclusive evidence as to the suitability of an area. Such tests shall be considered and analyzed as one of the many criteria in determining site suitability.

3. All percolation test locations shall adhere to the requirements of paragraph (1) of Rule 0400-48-01-.11.

(4) Construction Design

(a) Each lot shall be accurately surveyed and lot boundaries designated by survey stakes with lot numbers shown on said stakes.

(b) Three (3) copies of a subdivision plat at a scale of one (1) inch equals one hundred (100) feet shall be submitted to the Commissioner, which shall indicate:

1. Lot dimensions with all lots numbered.

2. Easements for any purpose.

3. Surface and underground drainage designed so as not to interfere with subsurface sewage disposal systems.

4. Positive drainage plan, where needed. A positive drainage outlet must be available for each lot requiring soil improvement practices before the final plat is signed. If construction of a positive outlet is necessary, all construction shall be done before final plat approval is given. Off property easements may be necessary.

5. Seal and signature of registered surveyor. (In order to survey and plat subdivisions an engineer, by law, must be a registered surveyor).

6. Precision of the unadjusted survey. A minimum ratio of precision of the unadjusted survey of 1:7,500 is required.

7. Vicinity map.

8. North arrow indicating magnetic north or otherwise and indicate the scale of the plat.

9. All final plats shall have distances on all lines and shall indicate the identity of all corners such as steel post, concrete or iron pin.

(c) The submittals required by paragraphs (3) and (4) of this rule may be combined into one (1) submittal to the Commissioner.

(d) After review of the site and information submitted, the Commissioner shall:

1. Approve in writing the subdivision as proposed, or

2. Recommend in writing the corrections needed to receive approval, or

3. Indicate in writing that the proposed subdivision or areas therein are not suitable with reasons therefore.

(e) Where revisions are made to the construction design, revised plats shall be submitted to the Commissioner.

(5) Additional Data

Whenever the data required in these rules are insufficient to determine suitability of an individual lot or subdivision, the Commissioner may require additional data.

(6) Final Approval

(a) Two (2) copies of the final plat shall be submitted to the Commissioner with permanent lot lines drawn and the information required by subparagraph (3)(a), subparagraph (3)(b), and paragraph (4) of this rule. Additional plats for recording purposes without soil delineation, contour lines and percolation test hole locations may be submitted for approval.

(b) The estimated wastewater flow or number of bedrooms for each lot shall be shown on the plat.

(c) Any subdivision plat may be subject to restrictions as determined by the Commissioner and such restrictions shall be recorded on the plat. This may include designation of primary and duplicate areas or soil area to be reserved for subsurface sewage disposal systems.

(d) The Commissioner may approve a plat by attaching an appropriate signature after all provisions of these rules are met.

(e) Before any changes or restrictions can be made or removed, a revised plat must be submitted to the Commissioner in order to maintain plat approval.

(7) Individually owned lots in unapproved subdivisions shall meet the requirements of this rule with the exception that only one copy of each plat shall be submitted to the Commissioner, with the plat representing only the individual lot. Where a plat of the unapproved subdivision has been recorded, this rule shall only apply to those subdivisions recorded after June 30, 1995.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.04 Additional Site Requirements and Limitations for Subdivision Approval and Individual Lots and Issuance of Construction Permits.

(1) Suitability of Site - Prior to the design of subsurface sewage disposal systems, the suitability of the site must be demonstrated through acceptable soil absorption rates, acceptable soil conditions, freedom from groundwater interference or slowly permeable strata below the level of the disposal field and other topographic characteristics. For lots that are not part of a subdivision as defined herein, the Commissioner may determine site suitability, acceptable soil absorption rates, acceptable soil conditions, freedom from groundwater interference or impervious strata below the level of the disposal field and other topographic characteristics. For lots that are not part of a subdivision as defined herein, where the services of a soil consultant are utilized, then the requirements established in subparagraph (3)(a) of Rule 0400-48-01-.03 may apply as deemed necessary by the Department either on an area basis or site specific basis.

(2) Water Table- The water table shall be at least four (4) feet below the bottom of the disposal field, except that a lesser depth may be permitted where soil conditions provide adequate protection for groundwater.

(a) Borings for determination of perched groundwater and the water table may be required by the Commissioner. In such cases, borings shall be made to a minimum depth of six (6) feet or as site conditions so warrant. Sufficient time shall be provided for stabilization of groundwater before water table elevations are recorded. In sandy soil this may require as little as thirty (30) minutes, while clay soil may require several hours or overnight. Borings shall be located by number on the plat. Borings shall be conducted during the wettest part of the year and at a time approved by the Commissioner.

(3) Rock - At sites where surface rock or subsurface rock formations exist to such degree as to affect operational effectiveness of subsurface sewage disposal systems, a sufficient number of borings to a minimum depth of six (6) feet may be required by the Commissioner to determine whether subsurface sewage disposal systems can be expected to give satisfactory service. Such borings shall be located by number on the plat and the results recorded.

(a) Rock formations shall be at a depth greater than four (4) feet below the bottom of the disposal field trenches, provided a lesser depth may be permitted where soil conditions so warrant.

(b) Rock may be removed in the septic tank excavation if a smooth, firm, level bedding is provided.

(4) Other Site Considerations:

(a) Areas consisting of fill shall be excluded from the area considered for installation of the disposal fields unless soil conditions provide for adequate filtration and will prevent outcropping of sewage effluent.

(b) Gullies, ravines, dry stream beds, natural drainage ways, sinkholes, wells, springs, cisterns, streams and caves shall be excluded from consideration as usable areas for subsurface sewage disposal systems.

(c) Sinks shall be considered unsuitable for subsurface sewage disposal unless the following requirements are met:

1. Depth to rock formations must be a minimum of four (4) feet from the surface of the ground and trench depth shall not exceed thirty (30) inches.

2. Slopes must be thirty (30) percent or less.

3. The area must not be subject to flooding.

4. All other site suitability criteria must be met.

(d) Maximum slope permitted for the area to be used for the disposal field shall be determined by the consideration of lateral flow of effluent to the surface of the slope. Slopes of more than thirty (30) percent shall be considered unsuitable unless soil conditions will prevent lateral movement of sewage effluent to the ground surface. Slopes exceeding fifty (50) percent shall be considered unsuitable.

(e) Lot Grading - The area to be used for the disposal field shall not be disturbed when grading the lot. However, where this is unavoidable, a re-evaluation shall be made after grading has been completed. After the suitability of any area to be used for subsurface sewage disposal has been evaluated and approved for construction, no change shall be made to this area unless the Commissioner is notified and a re-evaluation of the area's suitability is made prior to the initiation of construction.

(f) When soils evaluations indicate the soil absorption rate to be less than ten (10) minutes per inch, a conventional subsurface sewage disposal system shall not be used.

(5) Soil Improvements

(a) Site Requirements

1. Sites where soil improvement is necessary to change soil absorption rates to the acceptable range shall be considered unsuitable for subsurface sewage disposal until the improvement is adequately noted on the recorded final plat and in addition, noted on the permit at the time of issuance.

2. Sites where soil protection practices are necessary to maintain soil absorption rates within the acceptable range shall be considered unsuitable for subsurface sewage disposal until the protection practice is adequately noted on the recorded final plat and in addition, noted on the permit at the time of issuance.

(b) Design

1. The improvement and/or protection practices shall be of such location, configuration and construction to adequately collect, remove and discharge by gravity all interfering surface and subsurface water and not to collect sewage or any effluent from a subsurface sewage disposal system.

2. The minimum trench width of the soil improvement and/or protection practice shall be twelve (12) inches.

(c) Material Specifications

1. The gravel in the improvement and/or protection practices must be of sufficient amount, size and quality to allow storage and free movement of the collected water.

2. If an impermeable barrier is necessary for proper performance of the improvement and/or protection practice, the barrier must be of sufficient strength and durability to withstand the conditions under which it must perform.

3. The collection pipe must have a minimum diameter of four (4) inches, or equivalent, and must be designed to collect groundwater. It must be constructed to withstand the conditions and weights under which it must perform.

4. The outlet pipe must be at least ten (10) feet in length and have a minimum diameter of three (3) inches, unless otherwise specified on an engineered drainage plan, and be a minimum of Schedule 40 PVC. The outlet pipe must be of sufficient length to extend into the corrugated pipe in order to allow for a suitable connection. The outlet pipe must be fixed to the corrugated pipe as to not allow for easy removal. The outlet pipe must extend to the surface and the end must be modified to not allow entry of animals, but will allow sediment to exit.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.05 Percolation Test Procedures.

(1) Type of Test Holes - The holes shall be dug or bored, with horizontal dimensions from six (6) to twelve (12) inches and vertical sides to the depth as appropriate for the type of system to be installed and the house that is to be constructed.

(2) Preparation of Test Holes - Carefully scratch the bottom and sides of the holes with a knife blade or sharp pointed instrument in order to remove any smeared soil surfaces, and to provide a natural soil interface into which water may percolate. Remove all loose material from the holes. Add two (2) inches of coarse sand or fine gravel to protect the bottom from scouring and sediment.

(3) Conducting the Test - Carefully fill the holes with clear water to a minimum depth of twelve (12) inches over the gravel. No additives shall be used at any time during the percolation test procedures. In most soils, it is necessary to refill the holes by supplying a surplus reservoir of water, possibly by means of an automatic siphon, to keep water in the holes at least four (4) hours and preferably overnight. The measurement period of the test shall begin twenty-four (24) to thirty (30) hours after initial filling.

(4) Percolation Rate Measurement - Percolation rate measurement shall be made on the day following the procedure described under item (3) of the percolation test form and calculations of area required for disposal fields shall be based on Appendix II.

(5) If greater than six (6) inches of water remains in the test holes after the overnight presoaking period, adjust the depth to approximately six (6) inches over the gravel. From a fixed reference point, measure the drop in water level over a thirty (30) minute period. This drop is used to calculate the percolation rate.

(6) If six (6) inches, or less, of water remains in the holes after the overnight presoaking period, add clear water to bring the depth of water in the holes to approximately six (6) inches over the gravel. From a fixed reference point measure the drop in the water level at approximately thirty (30) minute intervals for four (4) hours, refilling to approximately six (6) inches over the gravel after each reading. The drop that occurs during the final thirty (30) minute period is used to calculate the percolation rate. The drop that occurs during prior periods provides information for possible modification of the procedure to suit local circumstances.

(7) Only percolation rates generated as the result of the complete four (4) hour measurement period will be considered valid for plat approval or permit issuance.

(8) Tests shall be conducted by an engineer or surveyor licensed in the State of Tennessee. An approved soil consultant or a registered professional environmentalist registered in the State of Tennessee may conduct percolation tests if they are not employed by a State, Regional, District, County or Municipal Department of Environment and Conservation.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.06 Construction Permit.

(1) No property owner or installer of a subsurface sewage disposal system shall construct, alter, extend or repair subsurface sewage disposal systems within the State of Tennessee unless he holds a valid construction permit issued by the Commissioner.

(2) The Commissioner shall refuse to grant a permit for the construction of a subsurface sewage disposal system where there is an accessible public sewerage system. The recipient of a permit for construction of a subsurface sewage disposal system shall be the responsible person(s) for adhering to the construction requirements of these regulations.

(3) These rules also apply in correcting existing failures; however, the Commissioner may allow repairs if the site does not meet the soil suitability, disposal field length and reserve area requirements. Repair permits are necessary when installing tanks (septic or dosing) and/or installing absorption field line in order to correct an existing failure.

(4) The construction permit shall have an expiration date effective three (3) years from the date of issuance. All construction permits issued prior to February 4, 1990 shall expire on June 30, 1996.

(5) Electrical Inspector Notification

(a) Any person who intends to construct or locate a house or establishment, mobile or permanent, after June 30, 1994, shall furnish evidence to the official electrical inspector that:

1. An application for a subsurface sewage disposal system construction permit has been made (on a form provided by the Division of Water Resources), or

2. The house or establishment is served by a public sewerage system.

(b) Provided however, this shall not apply to farm buildings or other buildings which are not connected to a public sewerage system or a subsurface sewage disposal system.

(c) Where an existing subsurface sewage disposal system is to be utilized, a statement shall be provided by the Division of Water Resources (upon notification by the landowner or their agent) that will serve as evidence that the requirements of T.C.A. § 68-221-414(a) have been met.

(d) Where there is an established countywide building permit program, as determined by the Commissioner, or where power is being restored, the provisions of this rule shall not apply.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.07 Design of the Conventional Disposal Field.

(1) The size of the conventional subsurface sewage disposal system shall be determined by the following:

(a) The suitability of the site shall be determined by a high or extra-high intensity soil map completed by an approved soil consultant and other criteria established by these regulations. The soil absorption rates that range from ten (10) through seventy-five (75) minutes per inch are acceptable. Soil absorption rates for soil series and phases of soil series that are established in Appendix I shall apply. The absorption rates for soil series and phases that have been recognized by the Natural Resource Conservation Service in Tennessee, but not listed in Appendix I shall be established by the Department. Rates for soil variants and miscellaneous land types may be established by an approved soil consultant, but may require approval by the Department.

(b) Where percolation tests are conducted the size of the subsurface sewage disposal system shall be determined by the rate found in Appendix II. The minimum square footage of trench bottom installed per bedroom shall be three hundred seventy (370).

(c) On individual lots where the Commissioner determines site suitability, an estimated soil absorption rate up to and including seventy-five (75) minutes per inch may be established. The size of the conventional subsurface sewage disposal system shall be determined by the rate found in Appendix II.

(d) Soils with absorption rates greater than seventy-five (75) minutes per inch as determined by a soil evaluation shall be considered unsuitable for conventional subsurface sewage disposal. Soils with percolation rates less than one hundred six (106) minutes per inch may be used for conventional systems under authority of T.C.A. § 68-221-403(c)(1).

(2) Where conventional subsurface sewage disposal systems are installed, sufficient additional area must be available for the expansion of the disposal field in an amount large enough to install a secondary subsurface sewage disposal field as defined by these regulations.

(3) Design of the disposal field shall be of the recirculating (level lot) or serial distribution type or a modification of either, depending on the characteristics of the site.

(a) Recirculating Design - A recirculating design provides equal distribution of the effluent throughout the entire system by connecting successive trenches on both ends and by maintaining the grade in the bottom of these trenches from level to no more than four (4) inches. In this manner, the entire absorption area within the sewage system is utilized concurrently.

(b) Serial Distribution - In serial distribution, each adjacent trench is connected to the next by a closed pipe laid on an undisturbed section of ground. The arrangement is such that all effluent is discharged to the first trench until it is filled. Excess liquid is then carried by means of a closed line (relief line) to the next trench. In this manner, each portion of the subsurface system is used in succession.

(c) Large Conventional Systems - Those exceeding seven hundred fifty (750) gallons of estimated daily flow volume.

1. When the estimated daily flow volume exceeds seven hundred fifty (750) gallons for a single system, a properly designed dosing system shall be used for discharging septic tank effluent into the disposal field. The Commissioner shall require design plans by a licensed engineer. The Commissioner may also require:

(i) Prior to design approval, a licensed engineer must agree, in writing, to monitor the installation and construction of the system and upon completion, provide a final set of construction as-built plans encompassing all components of the system and certification that the installation is in accordance with the design specifications.

(ii) Prior to design approval, it shall be the responsibility of the Department to review the aforementioned design and notify the engineer, in writing, of approval of the plans, denial of the plans or needed modifications to the plans.

2. When the design daily flow from a single source exceeds three thousand (3,000) gallons per day, siphons or pumps shall be used which shall discharge to separate disposal fields. Each system shall not exceed a design capacity of three thousand (3,000) gallons per day.

3. Discharges from dosing systems shall be designed to maximize the distribution of the effluent throughout the system.

4. Buffer zones shall be required at a frequency and size as determined by a detailed soil/site evaluation.

(4) Construction Procedure for Disposal Field

(a) The pipe size from the septic tank to the disposal field or to the dosing chamber shall not be less than three (3) inches in diameter (inside measurement) and shall be functionally equivalent to Schedule 40 PVC except when Rule 0400-48-01-.15 applies. The pipe from the septic tank to the disposal field shall be of sufficient length to rest on undisturbed earth.

(b) Materials and equipment used in subsurface sewage disposal systems shall be those which have specifications outlined in these regulations.

(c) The disposal field trenches shall follow the ground surface contours so that variations in trench depth will be minimized.

(d) A minimum of six (6) feet of undisturbed earth between adjacent trench walls shall be required.

(e) Adjacent trenches in a serial distribution system shall be connected with a relief line in such a manner that each trench is completely filled with septic tank effluent to the full depth of the media before effluent flows to a succeeding trench.

(f) In constructing relief lines, care must be exercised to insure that an undisturbed block of earth remains between trenches. The trench for the relief pipe, where it connects with the preceding absorption trench, shall be dug no deeper than the top of the media. The relief line shall rest on undisturbed earth and backfill must be carefully tamped. This section pertains primarily to a serial distribution system. Pipe for relief lines shall have no perforations and shall have a minimum inside diameter of three (3) inches and shall be Schedule 40 PVC or functionally equivalent. All couplings and/or connections must be accomplished with materials/fittings manufactured specifically for Schedule 40 PVC or functionally equivalent to the point of connection with the pipe in the disposal field and shall provide a secure connection. The lengths of pipe used for relief lines shall not be considered part of the required absorption area.

(g) The influent and effluent relief lines in each individual trench shall be as far from each other as practical in order to prevent short circuiting.

(h) Invert of the overflow pipe in the first relief line shall be at least four (4) inches lower than the invert of the septic tank outlet.

(i) Trenches shall not be excavated when the soil is wet enough to smear or compact easily.

(j) Media for the disposal fields shall consist of crushed rock, gravel or other suitable material as approved by the Department, and shall be size number 2, 3, 4 or 24 coarse aggregate, as defined by ASTM D-448-86. The material shall be free from dust, sand, clay or excessive fines. At least ninety (90) percent of the material must pass a two and one-half (2 1/2) inch screen and not more than five (5) percent may pass a one-half (1/2) inch screen.

(k) Media for the disposal fields shall extend from at least two (2) inches above the top of the perforated field line pipe to at least six (6) inches below the bottom of the perforated field line pipe to achieve a minimum of twelve (12) inches total, except for systems designed pursuant to T.C.A. § 68-221-403(i).

(l) The top of the disposal field media shall be below the invert of the septic tank outlet.

(m) The media for the disposal fields shall be covered with untreated building paper, a layer of straw at least two (2) inches thick or other material determined to be equivalent by the Commissioner.

(n) Soil material excavated from trenches should be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

(o) There shall be a minimum of twelve (12) inches of ground cover over the disposal field media and the maximum shall be thirty-six (36) inches of fill, except for systems designed pursuant to T.C.A. § 68-221-403(i).

(p) The bottom of the trenches and the distribution lines shall have a grade from level to no greater than four (4) inches.

(q) All pipes (tight lines) under paved areas or under driveways shall be Schedule 40 PVC or functionally equivalent and have a minimum inside diameter of three (3) inches. The lengths of pipe used for relief lines and tight lines shall not be considered part of the required absorption area.

(r) The pipe used in the disposal field trenches shall have a minimum diameter of four (4) inches, be perforated with one-half (1/2) inch holes and conform to or exceed the standards of the most current version of ASTM F-405.

(s) The area of the disposal field shall not be used for vehicular traffic or vehicular parking. Dozers, trucks and other heavy vehicles shall not be allowed to run over the septic tank, field lines or other parts of the system.

(t) Systems with electrical components must obtain an electrical inspector's approval associated with the subsurface sewage disposal system electrical component(s) prior to being considered for construction inspection.

(u) The maximum depth of a trench shall be forty-eight (48) inches. The minimum depth shall be twenty-four (24) inches, except for systems designed pursuant to T.C.A. § 68-221-403(i).

(v) The area of the disposal field shall not be used for any underground utilities.

(w) A septic tank must not be bypassed by direct line (laundry, grease, etc.) to field line.

(x) Down-spouts shall not be connected to the subsurface sewage disposal system. Down-spouts or other surface water shall be diverted away from the subsurface sewage disposal system.

(y) Water lines shall not cross, pass through, or go under the subsurface sewage disposal field. Water lines may cross, but not be located in the same trench with, a tight line leading from a septic tank or dosing tank to a disposal field provided the water line is sleeved in a continuous twenty (20) feet section of Schedule 40 PVC pipe or equivalent (a minimum of ten (10) feet on either side of the tight line) and the water line is a minimum of one (1) foot vertically above the tight line.

(5) No system shall be covered without the inspection and authorization of the Commissioner.

(6) Conventional Substitute Products

(a) A Large Diameter Gravelless Pipe (LDGP) System is a subsurface sewage disposal system that has one (1) basic design principle different from conventional subsurface sewage disposal systems, which is that an eight (8) or ten (10) inch inside diameter corrugated polyethylene perforated pipe is used for the storage and distribution of effluent in a trench in lieu of a four (4) inch diameter pipe and gravel. A filter, fabric wrap around the pipe prevents soil infiltration into the pipe; and prevents small, suspended solids from moving out of the pipe.

LDGP systems exceeding seven hundred fifty (750) gallons of estimated daily flow volume shall meet the minimum requirements established in subparagraph (3)(c) of this rule.

1. Site and Soil Requirements

(i) The site and soil requirements are the same as for a conventional subsurface sewage disposal system. Where the soil absorption rate exceeds sixty (60) minutes per inch, gravel backfill, leveled with the top of the LDGP, shall be required in accordance with subparagraphs (4)(j) and (m) of this rule and a trench width of twenty-four (24) inches.

(ii) An area of suitable soil must be available equivalent in size to that necessary to install and duplicate a conventional subsurface sewage disposal system.

(iii) The size of the LDGP system shall be determined by the following:

(I) The suitability of the site shall be determined by a high or extra-high intensity soil map completed by an approved soil consultant and other criteria established by these regulations. The soil absorption rates that range from ten (10) through seventy-five (75) minutes per inch are

acceptable. Soil absorption rates for soil series and phases of soil series that are established in Appendix I shall apply. The absorption rates for soil series and phases that have been recognized by the Natural Resource Conservation Service in Tennessee, but not listed in Appendix I shall be established by the Department. Rates for soil variants and miscellaneous land types may be established by an approved soil consultant, but may require approval by the Department. The rate found in Table I shall determine the size of the LDGP system.

(II) On individual lots where the Commissioner determines site suitability, an established soil absorption rate up to and including seventy-five (75) minutes per inch may be established. The size of the LDGP system shall be determined by the rate found in Table I.

(III) Where percolation tests are required to determine the absorption rate, the size of the LDGP system shall be determined by the rate found in Table I (370 linear foot minimum).

Table I
Soil Absorption Rates and Corresponding Trench Length Requirements for LDGP Systems

Absorption Rate (mpi)	Trench Length (ft/gal) 8 in Pipe	Trench Length (ft/gal) 10 in Pipe	Trench Length (ft/bedroom) 8 in Pipe	Trench Length (ft/bedroom) 10 in Pipe
10	0.600	0.400	83	55
15	0.700	0.467	95	64
30	1.000	0.667	125	84
45	1.250	0.834	150	100
60	1.450	0.967	165	110
75	1.600	1.067	185	124
80	1.650	1.100	190	126
85	1.700	1.134	195	130
90	1.750	1.167	200	134
95	1.800	1.200	208	139
100	1.850	1.234	215	144
105	1.900	1.267	223	149

Examples:

The soil absorption rate is thirty (30) minutes per inch. A three (3) bedroom home is to be located on this site. If an eight (8) inch inside diameter pipe is used:

$$(3 \text{ Bedrooms})\left(\frac{125 \text{ ft}}{\text{Bedroom}}\right) = 375 \text{ ft}$$

The soil absorption rate is ninety-five (95) minutes per inch. A four (4) bedroom house is to be located on this site. If a ten (10) inch inside diameter pipe is used:

$$(4 \text{ Bedrooms})\left(\frac{139 \text{ ft}}{\text{Bedroom}}\right) = 556 \text{ ft}$$

The soil absorption rate is forty-five (45) minutes per inch. A commercial building generating five hundred (500) gallons of wastewater per day is to be located on this site. If a ten (10) inch inside diameter pipe is used:

$$(500 \text{ gallons})\left(\frac{0.834 \text{ ft}}{\text{gallon}}\right) = 417 \text{ ft}$$

The soil absorption rate is eighty-five (85) minutes per inch. An industrial plant generating three hundred seventy-five (375) gallons of wastewater per day is to be located on this site. If an eight (8) inch inside diameter pipe is used:

$$(375\,\text{gallons})\left(\frac{1.700\,\text{ft}}{\text{gallon}}\right)=638\,\text{ft}$$

2. Layout of the LDGP System

   (i) The linear footage required is determined from Table I.

   (ii) The location of the septic tank and the disposal field shall be in accordance with Rule 0400-48-01-.11.

   (iii) The lateral lines shall be placed on contour. The maximum length of a single line should not exceed one hundred (100) feet unless conditions require a longer line.

   (iv) The trench bottom of each lateral shall have a grade from level to no greater than two (2) inches per one hundred (100) feet.

   (v) A minimum of six (6) feet of undisturbed earth between adjacent trench walls shall be required.

   (vi) Trench width shall be a maximum of eighteen (18) inches when the soil absorption rate is sixty (60) minutes per inch or less. Trench width shall be a minimum of twenty-four (24) inches with gravel backfill when the soil absorption rate exceeds sixty (60) minutes per inch.

   (vii) Trench depth shall range between twenty-two (22) and forty-eight (48) inches for eight (8) inch pipe and twenty-four (24) and forty-eight (48) inches for ten (10) inch pipe.

   (viii) The large diameter pipe shall be positioned in the trench so that the top location stripe is on top. Sections of pipe shall be securely joined and the filter wrap must cover all joints and the ends of each line. All couplings and/or connections must be accomplished with material/fittings manufactured specifically for large diameter gravelless pipe. Where a supply or tight line ties into the side of a large diameter gravelless pipe, the supply line or tight line shall not penetrate the pipe more than two (2) inches.

   (ix) Soil material excavated from trenches should be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

   (x) The invert of the overflow pipe in the first relief line shall be at least four (4) inches lower than the invert of the septic tank outlet. The trench for the relief line, where it connects with the preceding LDGP, shall be dug no deeper than the top of the LDGP. In a recirculating design, the top of the LDGP must be a minimum of one (1) inch below the invert of the septic tank outlet.

3. Equipment and Material Specifications

   (i) Septic Tank - Rules 0400-48-01-.08 and 0400-48-01-.09 shall apply.

   (ii) Pipe –

      (I) The eight (8) and ten (10) inch inside diameter tubing shall be corrugated polyethylene, meeting the requirements of ASTM F667, Standard Specification for Large Diameter Corrugated Polyethylene Tubing.

(II) Perforations shall be cleanly cut and uniformly spaced along the length of the tubing as follows: two (2) rows of three-eighths (3/8) to one-half (1/2) inch diameter holes located 115° - 125° apart along the bottom half of the tubing with each row of holes 57.5° - 62.5° up from the bottom centerline. These perforations should be staggered so that there is only one (1) hole in each corrugation. Perforations must be located in the minimum diameter portions of the pipe.

(III) The tubing shall be marked with an easily visible top location stripe.

(iii) Filter Wrap - All large diameter pipe shall be encased with a spun bonded nylon, or other material of similar strength and durability. If the filter wrap is installed at the point of manufacture, then the corrugated pipe and filter wrap shall be shipped in a protective covering that will prevent damage to the filter wrap. This wrap shall meet or exceed the following general qualities:

Physical Properties	Minimum Values
Weight	0.75 oz/yd^2
Thickness	4.4 mm
Grab Strength Machine Direction	19 lbs
Transverse Direction	11 lbs
Burst strength	26 psi
Air Permeability	500 cfm/ft^2
Water Flow Rate (3 ft head pressure)	200 gpm/ft^2

(b) A Chamber System is a media replacement system consisting of a plastic arch-shaped open bottomed chamber. Chamber systems that exceed seven hundred fifty (750) gallons of estimated daily flow volume shall meet the minimum requirements established in subparagraph (3)(c) of this rule.

1. Site and Soil Requirements

(i) The site and soil requirements are the same as for a conventional subsurface sewage disposal system.

(ii) An area of suitable soil must be available equivalent in size to that necessary to install and duplicate a conventional subsurface sewage disposal system.

2. Layout of the Chamber System

(i) The size of a chamber system shall be equivalent to the total linear footage required for a three (3) feet wide conventional subsurface sewage disposal system. However, where the soil absorption rate is from ten (10) to sixty (60) minutes per inch, the total linear footage may be reduced by thirty (30) percent. If a portion of a unit is left over after determining the total linear footage required, round up to the nearest whole unit.

(ii) The location of the septic tank and the disposal field shall be in accordance with Rule 0400-48-01-.11.

(iii) The lateral lines shall be placed on contour. The maximum length of a single line should not exceed one hundred (100) feet unless conditions require a longer line.

(iv) The trench bottom of each lateral shall have a grade from level to no greater than two (2) inches per lateral line.

(v) A minimum of six (6) feet of undisturbed earth between adjacent trench walls shall be required.

(vi) Trench width shall be no more than six (6) inches wider than the product width, with the maximum trench width being thirty-six (36) inches.

(vii) Trench depth shall range from twenty-four (24) to forty-eight (48) inches.

(viii) Soil material excavated from trenches should be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

(ix) The top of the chambers shall be below the invert of the septic tank outlet.

(x) The trench for the relief pipe, where it connects with the preceding absorption trench, shall be dug no deeper than the invert of the opening in the end plate.

3. Equipment and Material Specifications

(i) Septic Tank - Rules 0400-48-01-.08 and 0400-48-01-.09 shall apply.

(ii) Chamber –

(I) Chambers of varying heights and widths may be approved on an individual basis by the Director of the Division of Water Resources.

(II) Each chamber must be designed to interlock with adjacent chambers, inlet plate or end plate forming a complete disposal trench that consists of an inlet plate and a solid end plate to be located at the distal end of each terminal trench.

(III) The chamber sidewall must be designed to allow effluent to pass laterally into the soil.

(IV) Chambers shall be constructed of materials meeting the material property requirements of the International Plumbing and Mechanical Officials (IAPMO) Property Standard 63-2005.

(c) Expanded Polystyrene

Expanded polystyrene (EPS) synthetic aggregate systems are cylinders comprised of EPS aggregate contained in high strength polyethylene netting. Cylinders may vary in diameter and are produced both with and without a distribution pipe.

1. Site and Soil Requirements

(i) The site and soil requirements are the same as for a conventional subsurface sewage disposal system.

(ii) An area of suitable soil must be available equivalent in size to that necessary to install and duplicate a conventional subsurface sewage disposal system.

2. Layout of the EPS System

(i) The size of an EPS system shall be equivalent to the total linear footage required for a three (3) feet wide conventional subsurface sewage disposal system. However, where the soil absorption rate is from ten (10) to sixty (60) minutes per inch, the total linear footage may be reduced by thirty (30) percent for approved EPS product configuration totaling 36 inches in width. If a portion of a unit is left over after determining the total linear footage required, round up to the nearest whole unit.

(ii) The location of the septic tank and the disposal field shall be in accordance with Rule 0400-48-01-.11.

(iii) The lateral lines shall be placed on contour. The maximum length of a single line should not exceed one hundred (100) feet unless conditions require a longer line.

(iv) The trench bottom of each lateral shall have a grade from level to no greater than two (2) inches per lateral line.

(v) A minimum of six (6) feet of undisturbed earth between adjacent trench walls shall be required.

(vi) Trench width shall be no more than six (6) inches wider than the product width, with the maximum trench width being thirty-six (36) inches.

(vii) Trench depth shall range from twenty-four (24) to forty-eight (48) inches.

(viii) Soil material excavated from trenches should be used in backfilling and should be left mounded over the trenches until initial settling has taken place.

(ix) The top of the EPS bundles shall be below the invert of the septic tank outlet.

(x) The trench for the relief pipe, where it connects with the preceding absorption trench, shall be dug no deeper than the top of the EPS bundles.

(xi) All couplings and/or connections must be accomplished with material/fittings manufactured specifically for EPS products.

(xii) The EPS bundles shall be covered with untreated building paper or other material determined to be equivalent by the Commissioner.

3. Equipment and Material Specifications

(i) Septic Tank - Rules 0400-48-01-.08 and 0400-48-01-.09 shall apply.

(ii) EPS Product –

(I) Each EPS product configuration shall be approved independently.

(II) Each EPS bundle responsible for assuring effluent distribution must be designed to connect to adjacent bundles.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.08 Septic Tank Capacity.

(1) For residences, the liquid capacity of the septic tank shall be based on the following:

Number of Bedrooms	Septic Tank Capacity
2 or less	750 gallons
3	900 gallons
4[a]	1000 gallons

[a] For each additional bedroom, add two hundred fifty (250) gallons

(2) For facilities other than residences, the net volume or effective liquid capacity below the flowline of a septic tank for flows up to five hundred (500) gallons per day shall be at least seven hundred fifty (750) gallons. For flows between five hundred (500) and fifteen hundred (1500) gallons per day, the capacity of the tank shall be equal to at least one and one-half (1 1/2) days' liquid sewage flow. With flows greater than fifteen hundred (1500) gallons per day the minimum effective tank liquid capacity shall equal one thousand one hundred twenty-five (1125) gallons plus seventy-five (75) percent of the daily sewage flow; or $V=1125+0.75Q$ where V is the volume of the tank in gallons and Q is the daily sewage flow in gallons.

Additional tank volume may be necessary where unusual waste water characteristics are expected from a facility. Expected normal sewage flows may be determined from a list as provided by the Department or actual known water usage data for any facility to be served may be used if available.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.09 Design of Septic Tanks.

(1) A septic tank shall be watertight, structurally sound, and not subject to excessive corrosion or decay. Septic tanks installed after January 1, 1991 shall be of two (2) compartment design. The inlet compartment of a two (2) compartment tank shall be between two-thirds (2/3) and three-fourths (3/4) of the total tank capacity.

(2) Minimum standards of design and construction of precast reinforced concrete septic tanks:

(a) The liquid depth may range from thirty (30) to sixty (60) inches for septic tanks of less than three thousand (3000) gallons capacity and may not exceed seventy-eight (78) inches for septic tanks with a capacity of three thousand (3000) gallons or greater.

(b) All tanks shall be manufactured with a partition so that the tank contains two (2) compartments. The partition shall be located at a point not less than two-thirds (2/3) nor more than three-fourths (3/4) the length of the tank from the inlet end. The tank wall thickness must remain not less than two and one-half (2 1/2) inches thick throughout the tank except for blockouts or the groove for a slide-in partition. The groove for the slide-in partition shall leave a concrete thickness of not less than two and one-fourth (2 1/4) inches in the tank walls. The partition shall be structurally sound and not subject to excessive corrosion or decay.

(c) There shall be three (3) blockouts in the inlet compartment, one (1) on the tank end and one (1) on each sidewall, and a blockout in the partition and the outlet end of the tank. The blockouts for these openings shall leave a concrete thickness of not less than one (1) inch in the tank wall. The blockouts shall be made for a minimum of four (4) inch pipe or a maximum of six (6) inch pipe. In lieu of the partition wall blockout, a four (4) to six (6) inch slot extending at least half way across the width of the tank may be used. The top of the slot shall be located no closer than twelve (12) inches to the liquid level and the bottom of the slot shall be no lower than four (4) inches below the midpoint of the liquid depth. A four (4) inch diameter, or equivalent, air passage opening in the partition shall be provided above the liquid level of the tank.

(d) The tees or baffles shall be a minimum diameter of either three (3) inch cast iron soil pipe tee branch, three (3) inch cast iron sanitary tee branch, three (3) inch cast-in-place baffle, or three (3) inch PVC tee branch or equivalent in durability and performance as determined by the Director of the Division of Water Resources.

(e) The inlet invert shall enter the tank at least one (1) inch, preferably three (3) inches, above the liquid level of the tank.

(f) An inlet tee or baffle shall be provided to divert the incoming sewage downward and extend at least twelve (12) inches below the liquid level.

(g) The partition tees or baffles and outlet tee or baffle shall extend eighteen (18) inches or one-third (1/3) the liquid depth, whichever is the lesser, below the liquid level of the tank. A tee or baffle shall be provided on the first compartment side of the partition at the same elevation as the outlet tee or baffle unless an intercompartmental connecting slot is utilized as described in subparagraph (c) of this paragraph.

(h) Air space equal to at least twenty (20) percent of the liquid depth shall be provided between the top of the tank and the liquid level.

(i) Adequate access openings above each tee or baffle must be provided in the tank top. Access shall be provided for cleaning or rodding out of the inlet pipe, and the interconnecting tees or baffles in the partition, for inserting the suction hose for tank pumping, and for entrance of a person if internal repairs are needed after pumping. If the knockouts on the inlet compartment

sides of the tank are to be used access to these tees or baffles shall also be provided for cleaning and rodding of the inlet pipe. To accomplish this, it may be necessary to extend the tee so they will be located under an access port or a cleanout must be provided on the inlet line immediately outside the septic tank. A manhole opening shall be provided to each compartment with each having a minimum opening of eighteen (18) inches by eighteen (18) inches as the opening cuts the plane of the bottom side of the top of the tank. All circular shaped manholes shall have a minimum diameter of twenty (20) inches as the opening cuts the plane of the bottom side of the top of the tank. The manhole covers shall be beveled on all sides in such manner as to accommodate a uniform load of one hundred fifty (150) pounds per square foot without damage to the cover or the top of the tank. If the top of the tank is to be multislab construction, the slabs over the inlet of the tank, partition, and outlet of the tank must not weigh in excess of one hundred fifty (150) pounds each. Multislab construction must allow for a minimum access hole size of six (6) inches by six (6) inches to each compartment. Manhole covers, opening covers, or slabs shall have a handle of steel or other corrosion resistant material equivalent in strength to a No. 3 reinforcing rod (rebar).

(j) The tank shall be properly vibrated and rodded prior to curing to eliminate honeycomb.

(k) The top, bottom, ends, and sides of the tank must have a minimum thickness of two and one-half (2 1/2) inches except for blockouts or the slide in partition groove.

(l) After curing, tanks manufactured in two (2) sections shall be joined and sealed at the joint by the manufacturer by using a mastic sealant and/or pliable sealant that is both waterproof and corrosion resistant.

(m) Tank Labeling - Precast septic tanks shall be provided with a suitable legend, cast or etched in the wall at the outlet end and within six (6) inches of the top of the tank, identifying the manufacturer by name and address or registered trademark and indicating the liquid capacity of the tank in gallons.

(3) Plans for prefabricated tanks, other than those for precast reinforced concrete tanks, shall be approved by the Department on an individual basis as determined by the information furnished by the designer which indicates the tank will provide equivalent effectiveness as those designed in accordance with the provisions of paragraph (2) of this rule.

(4) Septic tanks other than approved prefabricated tanks shall be constructed consistent with the provisions of paragraph (2) of this rule except as follows:

(a) Cast-in-place concrete septic tanks shall have a minimum wall thickness of six (6) inches.

(b) Cast-in-place septic tanks of one thousand (1000) gallons or less shall have a minimum top and bottom thickness of four (4) inches.

(c) Cast-in-place concrete septic tanks with a capacity of greater than one thousand (1000) gallons shall have a minimum top and bottom thickness of six (6) inches.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.10 Effluent Treatment Devices / Systems.

(1) Septic Tank and/or Dosing Tank Filters, Conventional Sand Filters, Recirculating Gravel Filters and other devices may be used to improve the quality of septic tank effluent in an approved subsurface sewage disposal system.

(a) Sand Filters and Recirculating Gravel Filters shall be designed by a licensed engineer and shall be submitted to the Department for review.

(b) Treatment devices other than those listed in this section may only be used if approved by the Department as meeting accepted engineering practices.

(c) Maintenance requirements for devices or systems in this section shall be applied as deemed necessary by the Commissioner.

(2) An Advanced Treatment System (ATS) is a secondary treatment device that is used to improve the quality of septic tank effluent for residential wastewater flows. Only those ATS devices that have been tested and meet the requirements of NSF (National Sanitation Foundation) Standard 40 may be considered for approval in Tennessee.

(a) System Approval

1. Any manufacturer intending to market an ATS model in Tennessee shall submit evidence to the Department showing that the model has been tested and meets the provisions of the NSF Standard 40. All testing of ATS models must be performed by a certifier that has been accredited by the American National Standards Institute (ANSI). All ATS models marketed in Tennessee shall be listed by NSF as meeting the provisions of Standard 40 for Class I systems.

2. All pertinent data regarding the ATS unit including; installation guidelines, owner's manuals, maintenance requirements, authorized dealers, warranty information and unit design and configuration shall be submitted to the Department for consideration. If the Commissioner determines that the ATS model meets the requirements of this rule, he will inform the manufacturer in writing.

3. The Department will maintain a list of approved ATS models that have submitted the required information and are compliant with the requirements in these regulations. The department may remove any ATS model if the model fails to meet the requirements of this section or if the performance of an ATS is deemed to endanger public health.

4. To maintain ATS model approval, all manufacturers shall maintain an adequate level of replacement parts and service.

(b) Operation and Maintenance

1. After December 31, 2009, only an individual certified by the manufacturer and approved by this Department in accordance with Rule 0400-48-01-.19 shall install or personally supervise the installation of each ATS. Once an ATS is installed pursuant to this section, the owner of the property shall perpetually operate and maintain it properly. This requirement shall run with the land and be binding upon all future owners of the property. A maintenance provider approved by this department in accordance with Rule 0400-48-01-.23 shall perform this operation and maintenance on the ATS.

2. Routine operation and maintenance shall be performed at three-month intervals. However, the frequency of system visits may be adjusted by the Commissioner depending upon the ATS's complexity, system performance and manufacturer's recommendations.

3. The manufacturer shall execute a four (4) year operation and maintenance contract with the owner of each ATS sold and installed. The costs of such contract shall be included in the original price of the installed ATS. The contract shall require that the manufacturer provide the following services, unless the damage or failure is caused by abuse by the homeowner or a third party outside the control of the manufacturer or technician.

(i) All manufacturer's required or recommended mechanical and physical inspections and adjustments;

(ii) The inspecting, repair and cleaning or replacement of any filters or mechanical components, as required or as may be necessary;

(iii) Service calls at request of owner to inspect, adjust, repair or replace components;

(iv) Any necessary repairs to the effluent disposal system associated with the ATS; and

(v) Measure the sludge and have it pumped out and properly dispose of it, when necessary.

(c) General Requirements

1. An ATS will be considered for residential wastewater applications up to fifteen hundred (1500) gallons per day. However, commercial applications may be considered by the department on an individual basis.

2. A deed restriction must be recorded with the deed of the property providing notification to all future owners that the property is served by an ATS and subject to the operation and maintenance requirements of these regulations. Proof of that recording must be provided to this office before any permit is issued for an ATS.

3. The property owner at the time of initial installation of the ATS and any subsequent owner, for the life of the system, shall have in effect a contract for operation and maintenance of the ATS with an approved maintenance provider under Rule 0400-48-01-.23. These contracts will be reviewed by this department on an annual basis. Failure of a property owner to maintain such a contract will be considered a Class C misdemeanor and subject to civil penalties for each violation or day that the violation continues.

4. Any ATS permitted for installation shall be properly equipped to participate in NSF's web-based onsite monitoring program, or such other program deemed by the Department to be substantially similar, to assure that the system is maintained in perpetuity. The manufacturer shall provide the necessary equipment and include the cost for participation for the first four years in the price of the ATS after which time the maintenance provider contracted to operate and maintain the system will be responsible for participation. Participation in the NSF monitoring program is required for the life of the system or until cessation of the program by NSF or the Commissioner.

5. An ATS used as part of a packaged Subsurface Drip Disposal (SDD) system must maintain approval from this department.

6. All ATS shall incorporate or be preceded by a septic or trash tank. ATS units that have a trash tank size specified in their NSF listing shall have trash tanks sized accordingly. ATS units that do not have trash tank requirements in their NSF listing shall be preceded by a septic tank sized in accordance with Rule 0400-48-01-.08.

7. All ATS shall incorporate appropriate sensors and telemetric alarms that are capable of immediately notifying the maintenance provider and this Department of a critical malfunction as determined by the Commissioner.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.11 Location of Septic Tanks, Dosing Chambers and Absorption Fields.

(1) The location of septic tank, dosing chamber, advanced treatment system and disposal field shall be selected in accordance with the following minimum distances in feet, bearing in mind that local conditions may require increased distances of separation.

	Septic and Dosing Tanks and / or ATS	Disposal Field
Water Supply	50	50
Dwellings	5	10
Property Lines	10	10
Easements Boundaries	10	10
*Gullies, Ravines, Dry Stream	15	25

Beds, Natural Drainageways, Sinkholes, Streams and Cut Banks		
Water Lines	10	10
House to Tank Connections	--	10
Septic and Dosing Tanks	--	5

*These distances may increase or decrease as soil conditions so warrant as determined by the Commissioner after a special investigation by an approved soil consultant.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.12 Design of Dosing Systems.

(1) Dosing Chamber

The dosing chamber, access riser and riser cover shall be watertight, structurally sound and not subject to excessive corrosion or decay. The dosing chamber shall be of one (1) compartment design. They shall be of such construction and size as specified in paragraphs (2), (3), and (4) of Rule 0400-48-01-.09, excluding those requirements strictly relating to two (2) compartments.

(a) The access riser shall have a minimum diameter of twenty-four (24) inches and extend to the finished grade or above. Rectangular or square risers may be allowed provided the size of the opening provides the equivalent access as a circular riser. An access riser with a minimum diameter of sixteen (16) inches may be used provided the threaded union on the pump outlet pipe is located within two (2) feet of the top of the access riser. The access riser shall be located near the outlet end of the tank, directly above the pump or siphon, supply line, switches and other fixtures.

(b) The dosing chamber volume shall be a minimum of two (2) times daily wastewater flow except when an alternate pump equipped with an in-tank supply line and switch assembly is on-site and ready for use. If the alternate pump, in-tank supply line and switch assembly is on-site and ready for use, the minimum dosing chamber volume shall be a total of the volume of water below the static level plus the designed dosing volume plus one-half (1/2) the daily flow.

(2) Design of Pumps, Pipes and Controls

(a) The gallons per minute (gpm) flow in a dosing system shall be determined by the distribution network it doses. If the distribution network is of such design that the gpm flow is not confined to specific amounts, the minimum flow shall be ten (10) gpm.

(b) Total dynamic head (TDH) shall be determined by adding the following:

1. Elevation head is the difference in elevation between the bottom of the pump and the highest ground elevation at the disposal field. The minimum assigned elevation head shall be five (5) feet.

2. Friction head shall be determined from Appendix III plus fittings loss.

3. Pressure head is the amount of pressure desired at the distribution network and shall be a minimum of one (1) foot.

(c) When pumping uphill, a check valve must be utilized if the volume of effluent which will flow back into the tank exceeds one-fourth (1/4) daily flow.

(d) The dosing volume shall be between one-fourth (1/4) and one-half (1/2) daily flow, except in those situations where the minimum dose exceeds one-half (1/2) daily flow, then the calculated minimum dose shall be the dosing volume.

(e) Pipe and Fittings

1. All pipe materials shall be a minimum of Schedule 40 PVC.

2. All fittings shall be pressure fittings.

3. All connections shall be adequately cleaned with cleaning solvent and glued with PVC solvent cement.

4. If used, the gate or globe valve(s) and check valve shall be either bronze or PVC.

5. The supply line shall be designed and installed to drain after each use unless system design requires a check valve.

(f) Pump, Float Controls and Alarm System

1. The pump shall be a good quality, effluent pump and be of sufficient size to meet or exceed the gallons flow requirement and the total dynamic head requirement set forth by the system.

2. The pump float controls must be adjustable.

   (i) The controls must be sealed against entry of effluent or gases.

3. The alarm system.

   (i) The high water alarm shall be required and consist of an audible and visible alarm located in a visible place and clearly marked "wastewater system alarm".

   (ii) The alarm and alarm switches shall be placed on a separate electrical circuit from the pump power line.

   (iii) The alarm float control shall be placed so as to be activated when the pump chamber water level rises above the "pump on" float control.

(g) Pump and Controls

1. The pump must be placed so that the intake is a minimum of eight (8) inches above the bottom of the pump chamber.

2. As a means to remove the pump from the pump chamber, a material of sufficient strength and durability must be secured to the pump and access riser.

3. The pump control must be positioned so the "pump off" switch is slightly above the top of the pump and the "pump on" switch is at the desired dosing depth. The "pump off" switch for pumps specifically designed to operate with the pump motor casing exposed to air, may be located at a lower elevation provided an adequate depth of wastewater is maintained above the pump intake to insure that the pump intake will not draw in air.

4. The pump outlet pipe must be connected to the supply manifold with a threaded union or similar device.

5. When a disposal system requires a specific pressure head, a PVC or bronze, gate or globe valve shall be placed in the supply line.

6. If the effluent is pumped downhill, a five-thirty seconds (5/32) inch siphon breaker hole must be drilled in the bottom of the supply line inside the pump tank, above the liquid level.

7. All electrical installations shall be installed to meet the current wiring methods of the current edition of the "National Electric Code" (*NEC*) adopted by the State Fire Marshall's office.

(3) Where a dosing system is required in accordance with part (3)(c)1 of Rule 0400-48-01-.07, and where elevation permits gravity flow to be utilized, dosing siphons may be used in lieu of pumps to distribute septic tank effluent to the disposal field.

(a) Dosing Siphons

1. The single dose volume for siphons shall not exceed a total of one-fourth (¼) of the daily flow. In the case of dual siphons, this limit shall apply to the single dose volume for each individual siphon.

2. If the absorption field is of divided design, dual siphons designed for automatic alternating operation may be installed within a single dosing chamber.

3. Dosing siphons shall be fabricated of materials that are non-corrosive, and are of adequate structural strength and durability. Siphons shall be mounted and installed to the precise elevations required to ensure proper operation.

(b) Dosing Siphon Chambers

1. The dosing siphon chamber size and volume, and selected siphon drawdown, shall be coordinated in the design so as to produce the desired single dose volume.

2. Dosing siphon chambers shall be watertight single compartment round or rectangular precast reinforced concrete structures with an access riser of twenty-four (24) inch minimum diameter.

3. Dosing siphon chambers shall be of large enough dimension to allow working room for repair and replacement as required.

(c) Splash boxes shall be installed at the head of each absorption field in order to reduce the entry velocity of the dosing chamber effluent. The access riser and cover shall be watertight and have a minimum diameter of twenty-four (24) inches, extending to the finished grade or above, shall be installed on each splash box to allow for inspection and flow verification. Splash box volume and exit pipe dimension shall be adequate to prevent splash box overflow and/or siphon interruption.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.13 Maintenance of Subsurface Sewage Disposal System.

(1) It is the property owner's responsibility to maintain the system in a safe and sanitary manner.

(2) Should the system malfunction, the Commissioner shall issue, in writing, a maximum thirty (30) day notice to the owner requiring repair, replacement or improvement of the system.

(3) Any ATS system permitted under paragraph (2) of Rule 0400-48-01-.10 must be maintained in accordance with paragraph (2) of Rule 0400-48-01-.10.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.14 Grease Traps.

(1) Grease Traps in Commercial Buildings - Kitchen drain lines from institutions, hotels, restaurants, schools, lunchrooms and other establishments from which flow a relatively high volume of grease may be discharged to a grease trap. Grease trap effluent shall also be treated in the septic tank before being discharged into the disposal field.

(2) Grease traps shall be constructed to insure that both the inlet and outlet are properly submerged to trap grease and that the distance between inlet and outlet is sufficient to allow separation of the grease so that grease solids will not escape through the outlet.

(3) Grease traps shall be vented so they will not become airbound. A cover shall be provided and located so as to be conveniently accessible for servicing and cleaning. The cover shall be designed to prevent odor and exclude insects and vermin.

(4) Garbage Grinder Waste - Waste from garbage grinders shall not pass through any grease trap before being discharged to a septic tank.

(5) Sizing the Grease Trap - Proper sizing of the grease trap should be based on efficiency ratings and flow capacities, which are determined by the number and kinds of sinks or fixtures discharging into the trap.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.15 Alternative Methods of Subsurface Sewage Disposal.

(1) Regarding alternative methods of subsurface sewage disposal, if a conflict occurs between this rule and other rules of these regulations, the items of this rule shall apply. However, the Commissioner may allow repairs if the site does not meet soil suitability and reserve area requirements. The wastewater flow for residences or other similar establishments served by alternative methods of subsurface sewage disposal shall be based upon one hundred fifty (150) gallons per bedroom per day.

(2) Large Alternative Subsurface Methods of Sewage Disposal - Any alternative subsurface sewage disposal system that has a wastewater flow greater than seven hundred fifty (750) gallons per day shall be considered a large alternative subsurface sewage disposal system.

(a) A site specific design for each large alternative subsurface sewage disposal system shall be submitted to the department for review.

(b) The design shall be stamped with the seal of a licensed engineer.

(c) Prior to design approval, a licensed engineer must agree, in writing, to monitor the installation and construction of the system and upon completion, provide a final set of as built plans encompassing all components of the system and certification that the installation is in accordance with the design specifications.

(d) It shall be the responsibility of the department to review the aforementioned design and notify the engineer, in writing, of approval of the plans, denial of the plans or needed modifications to the plans.

(3) A Low Pressure Pipe (LPP) system is a subsurface sewage disposal system, which has three (3) basic design principles different from conventional subsurface sewage disposal systems. They are: (1) uniform distribution of effluent, (2) dosing and resting cycles, and (3) shallow placement of trenches. When lots that are less than twenty thousand (20,000) square feet are proposed, the department shall determine the necessity, location and design of buffer zones. LPP systems shall not be used to dispose of wastewater wherein the average concentration of grease exceeds one hundred fifty (150) milligrams per liter (mg/L) because of the clogging potential of the distribution network.

LPP systems designed to accommodate wastewater flows in excess of seven hundred fifty (750) gallons per day must be designed by a licensed engineer. The design shall be reviewed by the department applying the requirements of paragraph (2) of this rule.

(a) Site and Soil Requirements

1. Prior to the design of the LPP system, the suitability of the site must be demonstrated through acceptable soil absorption rates, acceptable soil conditions and other topographic characteristics. The acceptable soil absorption rate range shall be from ten (10) minutes per inch through seventy-five (75) minutes per inch as determined by an extra-high intensity soil map prepared by an approved soil consultant. If the soil absorption rate is determined to be greater than seventy-five (75) minutes per inch based upon the extra-high intensity soil map, then percolation tests may be conducted. However, soils with absorption rates in excess of seventy-five (75) minutes per inch due to wetness that cannot be corrected by drainage shall not be eligible for percolation tests.

Percolation rates from seventy-six (76) minutes per inch through one hundred twenty (120) minutes per inch are acceptable if no water problems exist.

2. A minimum soil depth of thirty (30) inches over any underlying restrictive horizon is required. However, a modified LPP system may utilize a maximum of six (6) inches of compatible fill, as determined by an approved soil consultant, to obtain the required thirty (30) inches of depth.

3. Slopes of more than thirty (30) percent shall be considered unsuitable.

4. An area of suitable soil must be available to install the initial system and maintain a suitable area of adequate size for one hundred (100) percent duplication.

5. The size of the LPP system shall be determined by the following:

   (i) An extra-high intensity soil map, provided by a soil consultant approved by the department, shall establish the soil absorption rate.

   (ii) If the extra-high intensity soil map determines that a percolation test is necessary to establish a rate, the percolation holes shall be located in a grid pattern with maximum perpendicular distances between holes of twenty-five (25) feet and the gridded portion shall encompass the entire area to be utilized for the system and duplicate area. Greater distances may be allowed as determined by the Commissioner. The percolation test procedure in Rule 0400-48-01-.05 shall apply.

   (iii) The daily wastewater flow divided by the loading rate (Table II) shall determine the area (ft^2) required for the initial system.

   (iv) Hydraulic overloading of the disposal field may occur when excessive amounts of effluent are distributed over a continuous common slope. Therefore, buffer zones are required if there is more than six (6) feet of elevation difference between the upper and lower laterals or if the distance between the upper and lower laterals exceeds fifty (50) feet. The buffer zone size and the use of soil improvement or soil protection practices are site specific and shall be determined by the Commissioner based on the recommendation of an approved soil consultant. The buffer zone shall not be included as part of the reserve area.

Table II.
Maximum Loading Rate

Established Rate (mpi)	Loading Rate (gpd/ft^2)
10	0.400
20	0.400
30	0.350
40	0.300
45	0.275
50	0.250
60	0.200
75	0.150
90	0.100
120	0.050

(b) Layout of the LPP System

1. The required linear footage is determined by dividing the amount of required square footage of suitable soil area by five (5).

2. The location of the septic tank, dosing chamber and the disposal field shall be in accordance with Rule 0400-48-01-.11.

3. The lateral lines shall be placed on contour and lengths shall not exceed those specified as follows:

5/32 in. Orifice	**Maximum Lateral Length (ft)**			
	Pipe Size (in)			
Hole Spacing (ft)	**1**	**1.25**	**1.5**	**2**
3	50	75	100	140
4	55	80	110	150
5	60	90	120	N/A
6	65	100	125	N/A
7	70	110	135	N/A
8	75	120	145	N/A

3/16 in. Orifice	**Maximum Lateral Length (ft)**			
	Pipe Size (in)			
Hole Spacing (ft)	**1**	**1.25**	**1.5**	**2**
3	30	55	75	115
4	35	60	85	130
5	40	65	100	145
6	45	75	110	150
7	50	80	115	N/A
8	55	85	125	N/A

7/32 in. Orifice	**Maximum Lateral Length (ft)**			
	Pipe Size (in)			
Hole Spacing (ft)	**1**	**1.25**	**1.5**	**2**
3	30	50	65	90
4	35	55	70	105
5	40	60	80	115
6	45	65	85	130
7	50	70	95	140
8	55	80	105	150

1/4 in. Orifice	**Maximum Lateral Length (ft)**			
	Pipe Size (in)			
Hole Spacing (ft)	**1**	**1.25**	**1.5**	**2**
3	30	40	60	80
4	35	45	65	90
5	35	55	70	100
6	40	60	75	110
7	40	65	80	120
8	45	70	85	130

4. The trench bottom of each lateral shall be at the same elevation throughout that lateral.

5. The distance between laterals (center to center) shall not be less than five (5) feet.

6. Trench width shall be a minimum of twelve (12) inches.

7. Trench depth shall range between eighteen (18) and twenty-two (22) inches.

8. A minimum of twelve (12) inches of soil material shall be present between the bottom of the trenches and the restrictive layer.

9. Individual lateral lines shall be a maximum of one hundred (100) feet in length, unless supported by an engineered design.

(c) Dosing and Distribution System Design

1. The dosing rate per linear foot of disposal trench shall be uniform over the entire system. This may be accomplished by varying the hole spacing, hole sizing or placement of valves in the manifold or laterals to compensate for changes in ground elevation. Table III shall be used to calculate dosing rates.

Table III.
Pressure Head vs. gpm Flow Per Hole

Pressure Head		Hole Diameter (in)		
ft	psi	5/32	3/16	7/32
1	0.43	0.29	0.42	0.56
2	0.87	0.41	0.59	0.80
3	1.30	0.50	0.72	0.98
4	1.73	0.58	0.83	1.13
5	2.16	0.64	0.94	1.26

2. The first and last holes in a lateral shall be thirty (30) inches from the ends of the lateral. Hole spacing shall not exceed seven and one-half (71/2) feet.

3. Hole sizes shall be within the range of five thirty-seconds (5/32) inches through seven thirty-seconds (7/32) inches.

4. Calculation of gallons per minute (gpm) flow and total dynamic head.

   (i) The gallons per minute flow amount that the pump must provide shall be determined by adding the gallons per minute flows per hole over the system dosed by that pump.

   (ii) The total dynamic head (TDH) shall be determined by adding the following:

      (I) Elevation head is the difference in elevation between the bottom of the pump and the highest ground elevation at the disposal field. The minimum assigned elevation head shall be five (5) feet.

      (II) Friction head shall be determined from Appendix III plus fittings loss.

      (III) A pressure head average of three (3) feet shall be used for TDH calculations. The range shall be one (1) through five (5) feet.

5. When pumping uphill, a check valve must be utilized if the volume of the supply line, manifold and the volume of the laterals that drain back into the pump tank exceeds one-fourth (1/4) daily flow.

6. The minimum dosing volume shall be determined by adding the volume of the supply line, manifold and five (5) times the volume of the laterals. If a check valve is utilized, the minimum dosing volume shall be determined by adding the volume of the manifold and five (5) times the volume of the laterals.

7. The dosing volume shall be between one-fourth (1/4) and one-half (1/2) daily flow, except in those situations where the minimum dose exceeds one-half (1/2) daily flow, then the calculated minimum dose shall be the dosing volume.

(d) Equipment and Material Specifications

1. Septic Tank and Dosing Chamber

(i) The septic tanks shall conform to all design, construction and installation criteria set forth in Rules 0400-48-01-.08 and 0400-48-01-.09.

(ii) The dosing chamber shall conform to all design construction and installation criteria set forth in Rule 0400-48-01-.12.

2. Pipe and Fittings

(i) All pipe materials shall be PVC and have a minimum equivalent strength of Schedule 40.

(ii) All fittings shall be pressure fittings.

(iii) All connections shall be adequately cleaned with cleaning solvent and glued with PVC solvent cement.

(iv) The gate or globe valve(s) and check valve shall be either bronze or PVC.

(v) The lateral pipe diameter shall be a minimum of one (1) inch.

(vi) The distal end of each lateral shall be equipped with a capped turn-up that provides above-ground access.

3. Pump, Float Controls and Alarm System

(i) The pump shall be an effluent pump of sufficient quality and size to meet or exceed the flow requirement and the total dynamic head requirement of the system.

(ii) The pump float controls must be adjustable and must be sealed against entry of effluent or gases.

(iii) Alarm System

(I) A high water alarm shall be required and consist of an audible and visible alarm located in a visible place and clearly marked "wastewater system alarm".

(II) The alarm and alarm switches shall be placed on a separate electrical circuit from the pump power line.

(III) The alarm float control shall be placed so as to be activated when the pump chamber water level rises above the "pump on" float control.

4. Disposal Field Media

The disposal field media size shall be within the range of one-half (1/2) to one (1) inch. It must be washed and free of fines.

(e) Installation Procedures

1. Site Preparation and Imported Fill

(i) The soil area reserved for the initial and duplicate systems must not be cut, filled, compacted or disturbed in any manner prior to or after system installation.

(ii) No site preparation shall occur if the soil is wet. The designated person responsible for monitoring system installation shall determine when the soil is adequately dry.

(iii) If imported fill is used during installation it must be of compatible material, which shall be determined by the soil consultant approved by the department. The area to be filled must be disked prior to adding fill. The fill material must be applied with a minimum amount of wheeled traffic and must be incorporated to ensure even mixing.

2. Supply Line and Manifold

(i) The manifold and laterals shall be designed and installed to drain after each use.

(ii) The supply line shall be designed and installed to drain after each use unless system design requires a check valve.

(iii) A tee to tee connection between the manifold and laterals shall be used except in situations where the topographic, soil and other site conditions allow the manifold and laterals to be at right angles. If the manifold and laterals are at right angles then crosses or tee to tee connections may be utilized.

3. Distribution Laterals

(i) The distribution laterals shall be constructed with a minimum disposal field media depth of nine (9) inches, with three (3) inches above the lateral pipe invert.

(ii) The disposal field media must be covered with untreated building paper, straw or other acceptable material that will allow movement of water and restrict soil movement.

4. Pump and Controls

(i) The pump must be placed so that the intake is a minimum of eight (8) inches above the bottom of the pump chamber.

(ii) As a means to remove the pump from the pump chamber, a material of sufficient strength and durability must be secured to the pump and access riser.

(iii) The pump control must be positioned so the "pump off" switch is slightly above the top of the pump and the "pump on" switch is at the desired dosing depth.

(iv) The pump outlet pipe must be connected to the supply manifold with a threaded union or similar device.

(v) A PVC or bronze, gate or globe valve shall be placed in the supply line to adjust the specific pressure head.

(vi) If the effluent is pumped downhill, a five thirty-seconds (5/32) inch siphon breaker hole must be drilled in the bottom of the supply line above the water level inside the pump tank.

(vii) All electrical installations shall be installed to meet the current wiring methods of the current edition of the "National Electric Code" (NEC) adopted by the State Fire Marshall's office.

5. The completed landscape must be shaped to prevent water from ponding or flowing over the system.

(4) A Mound System is a soil absorption system that is located above the natural soil surface and constructed with suitable fill material. The system differs from the conventional subsurface sewage

disposal system in three (3) ways: (1) uniform distribution of effluent, (2) dosing and resting cycles and (3) above ground construction. When lots that are less than twenty thousand (20,000) square feet are proposed, the department shall determine the necessity, location and design of buffer zones. Mound systems shall not be used to dispose of wastewater wherein the average concentration of grease exceeds one hundred fifty (150) milligrams per liter (mg/L) because of the clogging potential of the distribution network.

Mound systems designed to accommodate wastewater flows in excess of seven hundred fifty (750) gallons per day must be designed by a licensed engineer in accordance with T.C.A. § 62-2-101 et seq. The design shall be reviewed by the department applying the requirements of paragraph (2) of this rule.

(a) Site and Soil Requirements

1. Prior to the design of the mound system, the suitability of the site must be demonstrated through acceptable soil absorption rates, acceptable soil conditions and other topographic characteristics.

2. The size of the mound system shall be determined by the following:

   (i) An extra-high intensity soil map, provided by a soil consultant approved by the department, shall establish the soil absorption rate.

   (ii) If the extra-high intensity soil map, determines that a percolation test is necessary to establish a rate, the percolation holes shall be located in a grid pattern with the maximum perpendicular distances between the holes being twenty-five (25) feet and the gridded portion shall encompass the entire area to be utilized for the system and duplicate area. Greater distances may be allowed as determined by the Commissioner. The percolation test procedure in Rule 0400-48-01-.05 shall apply.

   (iii) The daily wastewater flow divided by the infiltrative capacity of medium sand (1.2 gal/ft^2/day) shall determine the area (ft^2) required for the distribution bed.

3. The requirements relating to rock, groundwater and other site conditions established in paragraphs (2), (3) and (4) of Rule 0400-48-01-.04 shall apply. A minimum soil depth of twenty-four (24) inches over any underlying restrictive horizon is required. However, a modified mound system may utilize up to four (4) inches of additional sand backfill reducing the minimum depth of soil to any underlying restrictive horizon to twenty (20) inches.

4. The acceptable soil absorption rate range for the mound system shall be from ten (10) minutes per inch through seventy-five (75) minutes per inch as determined by an extra-high intensity soil map conducted by an approved soil consultant. If the soil absorption rate is determined to be greater than seventy-five (75) minutes per inch based upon a soils map prepared by an approved soil consultant, percolation tests may be conducted. However, soils with absorption rates in excess of seventy-five (75) minutes per inch due to wetness that cannot be corrected by drainage shall not be eligible for percolation tests. Percolation rates from seventy-six (76) minutes per inch through one hundred twenty (120) minutes per inch are acceptable if no water problems exist.

5. An area of suitable soil must be available to install the initial system and maintain a suitable area of adequate size for one hundred (100) percent duplication.

6. If tree stumps or boulders are present within the areas designated for the initial and duplicate systems, adequate area must be available to compensate for the area occupied by the boulders and tree stumps.

7. The basal area available for a mound must be equal to or greater than the basal area required for a given soil absorption rate.

(i) On sloping sites, the basal area available is that area directly below and downslope of the distribution bed. On level sites, the basal area available is that area below and on both sides of the distribution bed. That area below the end slopes shall not be included as available basal area.

(ii) The basal area required is determined by dividing the daily flow by infiltrative capacity of the soil. The infiltrative capacity for a given soil absorption rate can be found below:

Absorption Rate (mpi)	Infiltrative Capacity (gal/ft^2/day)
10 – 29	1.20
30 – 60	0.74
61 – 120	0.24

8. Slopes steeper than twelve (12) percent shall not be utilized. Sites with soil absorption rates of sixty-one (61) through one hundred twenty (120) minutes per inch shall not exceed a slope of six (6) percent.

9. When cluster mounds are used, buffer zones are required at a frequency and size as determined by an extra-high intensity soil map and site evaluation.

(b) Layout of the Mound System

1. The mound shall be located so as to insure that the distribution bed is situated parallel to slope contour.

2. The location of the septic tank, dosing tank and disposal mound shall be in accordance with Rule 0400-48-01-.11.

3. The distribution bed shall be constructed level and its thickness shall be constant. A layer of uncompacted straw six (6) inches thick, untreated building paper or acceptable synthetic fabric shall be placed between the distribution bed and the clay cap.

4. Configuration

(i) The end slope gradient of the mound shall not be steeper than three (3) horizontal to one (1) vertical. The distance from the gravel bed to the toe of the end slope is calculated by multiplying the average mound height by the horizontal slope figure.

(ii) The upslope and downslope gradient of the mound shall not be steeper than three (3) horizontal to one (1) vertical. The distance from the gravel bed to the toe of either the upslope or the downslope side is calculated by multiplying the mound height at the appropriate edge of the gravel bed by the horizontal slope figure and then by the slope correction factor found in Table IV.

Table IV.
Downslope and Upslope Width Corrections for Mounds on Sloping Sites

Slope Percent	Downslope Correction Factor	Upslope Correction Factor
0	1.00	1.00
2	1.06	0.94
4	1.14	0.89
6	1.22	0.86
8	1.32	0.80
10	1.44	0.77
12	1.57	0.73

(iii) The distribution bed thickness shall be a minimum of nine (9) inches with a minimum of six (6) inches of aggregate below the distribution network.

(iv) The bed width shall not exceed ten (10) feet.

(v) The sand fill thickness beneath the gravel bed shall be a minimum of one (1) foot.

(vi) The cap above the distribution bed shall consist of one (1) foot of clayey subsoil at its center tapering to one-half (1/2) foot at its edges.

(vii) The entire finished mound shall be covered with one-half (1/2) foot of soil material suitable for plant growth.

(c) Dosing and Distribution System Design

1. The dosing rate per linear foot of lateral shall be uniform throughout the entire distribution network.

2. Hole spacing and location shall be such so as to provide uniform distribution of effluent over the entire distribution bed. If the last hole is equal to or greater than one-half (1/2) of the hole spacing distance from the distal end of the lateral, a hole shall be placed in the end cap or adjacent to it.

3. Hole sizing, spacing, lateral length and diameter shall be derived from Table V. The hole diameter shall range from five thirty-seconds (5/32) through one-fourth (1/4) inch.

4. The system must be designed and placed so that the laterals and manifold drain after each dosing.

5. Calculation of gallons per minute (gpm) flow and total dynamic head (TDH).

(i) The gallons per minute flow, which the pump must provide, shall be determined by adding the combined gallons per minute flows of each hole.

(ii) The total dynamic head (TDH) shall be determined by adding the following:

(I) Elevation head is the difference in elevation between the bottom of the pump and the laterals in the distribution bed. The minimum assigned elevation head shall be five (5) feet.

(II) Friction head shall be determined from Appendix III plus fittings loss.

Table V.
Allowable Lateral Lengths (ft) for Three (3) Pipe Diameters, Three (3) Perforation Sizes and Two (2) Perforation Spacings

Perforation		Pipe Diameter (in)		
Spacing	Diameter	1	1 1/4	1 1/2
30 in	5/32 in	42 ft	68 ft	85 ft
30 in	3/16 in	34 ft	52 ft	70 ft
30 in	7/32 in	30 ft	45 ft	57 ft
30 in	1/4 in	25 ft	38 ft	50 ft
36 in	5/32 in	45 ft	70 ft	90 ft
36 in	3/16 in	36 ft	60 ft	75 ft
36 in	7/32 in	33 ft	51 ft	63 ft
36 in	1/4 in	27 ft	42 ft	54 ft

(III) A pressure head average of three (3) feet shall be used for TDH calculations. The range shall be one (1) through five (5) feet.

6. The minimum dosing volume shall be determined by adding the volume of the supply line, manifold and five (5) times the volume of the laterals.

7. The dosing volume shall be between one-fourth (1/4) and one-half (1/2) daily flow, except in those situations where the minimum dose exceeds one-half (1/2) daily flow, then the calculated minimum dose shall be the dosing volume.

8. When pumping uphill, a check valve must be utilized if the volume of the supply line, manifold and the volume of the laterals that drain back into the pump tank exceeds one-fourth (1/4) of the daily flow. If a check valve is utilized, the minimum dosing volume shall be determined by adding the volume of the manifold and five (5) times the volume of the laterals.

(d) Equipment and Material Specifications

1. Septic Tank and Dosing Tank

(i) The septic tank shall conform to all design, construction and installation criteria set forth in Rules 0400-48-01-.08 and 0400-48-01-.09.

(ii) The dosing chamber shall conform to all design, construction and installation criteria set forth in Rule 0400-48-01-.12.

2. Pipe and Fittings

(i) All pipe materials shall be PVC and have a minimum equivalent strength of Schedule 40.

(ii) All fittings shall be pressure fittings.

(iii) All connections shall be adequately cleaned with cleaning solvent and glued with PVC solvent cement.

(iv) The gate or globe valve(s) and check valve shall be either bronze or PVC.

(v) The lateral pipe diameter shall be a minimum of one (1) inch.

(vi) The distal end of at least one (1) lateral shall be equipped with a capped turn-up.

3. Pump, Float Controls and Alarm System

(i) The pump shall be an effluent pump of sufficient quality and size to meet or exceed the gallons flow requirement and the total dynamic head requirement of the system.

(ii) The pump float controls must be adjustable and must be sealed against entry of effluent or gases.

(iii) Alarm System

(I) A high water alarm shall be required and consist of an audible and visible alarm located in a visible place and clearly marked "wastewater system alarm."

(II) The alarm and alarm switches shall be placed on a separate electrical circuit from the pump power line.

(III) The alarm float control shall be placed so as to be activated when the pump chamber water level rises above the "pump on" float control.

4. Disposal Field Media

The media size shall be within the range of one-half (1/2) to one (1) inch. It must be washed and free of fines.

5. Sand

(i) The particle sizes shall be predominantly (fifty (50) percent or greater) medium sand (0.50 to 0.25 mm) with no more than twenty (20) percent fine sand (0.25 to 0.10 mm) and be free from silt and clay.

(ii) The sand shall be composed of stable materials and not subject to chemical deterioration.

6. Clay Cap Above the Distribution Bed - The cap shall be clayey subsoil.

7. Final Cover - The final cover shall consist of non-clayey, friable, fertile soil capable of supporting plant growth.

(e) Installation Procedures

1. Site Preparation and Imported Fill

(i) The soil area reserved for the initial and duplicate systems must not be cut, filled, compacted or disturbed in any manner prior to or after system installation.

(ii) No site preparation shall occur if the soil is wet. The designated person responsible for monitoring system installation shall determine when the soil is adequately dry.

(iii) All trees within the area designated for the mound shall be cut to ground level and all excess vegetation shall be removed.

(iv) The area designated for the mound shall be plowed to a minimum depth of eight (8) inches prior to addition of the sand fill. This area shall be plowed on contour.

(v) After any area is plowed there shall be no large equipment or wheeled traffic on or over said area. If a small tracked vehicle is used for construction there shall be a minimum of six (6) inches of sand between the track and plowed layer.

2. Supply Line and Manifold

(i) The manifold and laterals shall be designed and installed to drain after each use.

(ii) The supply line shall be designed and installed to drain after each use unless the system design requires a check valve.

(iii) The supply line shall be installed so as to prevent freezing and shall not enter from the downslope side.

3. Pump and Controls

(i) The pump must be placed so that the intake is a minimum of eight (8) inches above the bottom of the pump chamber.

(ii) As a means to remove the pump from the pump chamber, a material of sufficient strength and durability must be secured to the pump and access riser.

(iii) The pump control must be positioned so the "pump off" switch is slightly above the top of the pump and the "pump on" switch is at the desired dosing depth.

(iv) The pump outlet pipe must be connected to the supply manifold with a threaded union or similar device.

(v) Immediately after the union, a gate or globe valve shall be placed in the supply line. The valve may be either PVC or bronze and shall be used to adjust the pressure on the system to the desired head.

(vi) If the effluent is pumped downhill, a five thirty-seconds (5/32) inch siphon breaker hole must be drilled in the bottom of supply line above the water level in the pump tank.

(vii) All electrical installations shall be installed to meet the current wiring methods of the current edition of the "National Electric Code" (NEC) adopted by the State Fire Marshall's office.

4. The completed system must be shaped to prevent water from ponding or flowing over the system.

(5) A Waste Stabilization Lagoon may provide satisfactory sewage treatment for residences where soil conditions are not suited for absorption systems and flows are seven hundred fifty (750) gallons per day or less. Waste stabilization lagoons require a minimum tract of five (5) acres.

(a) Site and Soil Requirements

1. Prior to the design of the waste stabilization lagoon, the suitability of the site must be demonstrated through acceptable soil absorption rates, acceptable soil conditions and other topographic characteristics.

2. The soil characteristics shall be determined by the following:

(i) An extra-high intensity soil map shall establish the soil rate. The absorption rate may be estimated by an approved soil consultant but may require approval by the department.

(ii) A pit profile description to a depth of six (6) feet below ground surface shall be generated for each lagoon cell (primary and duplicate). Each description shall identify: soil structure, soil color, including mottles, texture including coarse fragments, plasticity and consistency for each distinct horizon in the soil profile.

(iii) The depth of the seasonal high water table shall be noted if it is located within six (6) feet of the soil surface.

3. The soil absorption rate must be a minimum of one hundred twenty (120) minutes per inch as estimated by an approved soil consultant.

4. An area of suitable soil must be available to install the initial system and maintain a suitable area of adequate size for one hundred (100) percent duplication.

5. The lagoon shall be located in soils where the vertical separation from the bottom of the lagoon and bedrock and rock formations, or more permeable material, are a minimum of one (1) foot.

6. Predominant redoximorphic features shall not be located within six (6) inches of the ground surface. The lagoon shall not be located in areas subject to flooding as determined by the department. The soil profile shall not be hydric in classification.

7. Slopes greater than eight (8) percent shall be considered unsuitable.

8. Selection of the site shall include a clear sweep of the surrounding area by prevailing winds. Heavy timber must be removed for a distance of one hundred (100) feet from the water's edge to enhance wind action and prevent shading.

9. Areas consisting of fill shall be excluded from the area considered for installation of the waste stabilization lagoon and disposal field.

10. Lot Grading - The area to be used for the waste stabilization lagoon and disposal field shall not be disturbed when grading the lot. However, where this is unavoidable, a re-evaluation shall be made by an approved soil consultant after grading has been completed. After the suitability of any area to be used for a waste stabilization lagoon has been evaluated and approved for construction, no change shall be made to this area unless the Commissioner is notified and a re-evaluation of the area's suitability is made prior to the initiation of construction.

(b) Location - A minimum acreage tract of five (5) acres is required and larger areas may be necessary.

1. Minimum Separation Distances

(i) The lagoon shall be located a minimum of two hundred (200) feet from property lines, as measured from the water's edge.

(ii) The lagoon shall be located a minimum of two hundred (200) feet from the nearest residence, commercial or industrial establishments, any habitable building or public use area. With the owner's permission the lagoon may be within a lesser distance of his home.

(iii) The lagoon shall not be located closer than fifty (50) feet away from any spring or well. Greater horizontal separation distances may be required depending on engineering and hydrogeological data and type of water supply.

(iv) The lagoon shall not be closer than fifty (50) feet away from a stream, lake or impoundment.

(v) The lagoon shall not be located closer than fifty (50) feet from gullies, ravines, dry stream beds, natural drainage ways, sinks, caves and cut banks.

(c) Design of the Waste Stabilization Lagoon

1. The capacity of a two (2) cell lagoon shall be equivalent to a sixty (60) day minimum retention time based upon an average daily sewage flow of one hundred fifty (150) gallons per bedroom for residences. The minimum water surface area of both cells shall be one thousand two hundred fifty (1,250) square feet.

2. A properly sized and constructed two (2) compartment septic tank shall precede the lagoon.

3. The shape of the lagoon shall be such that there are no narrow or elongated portions. Round, square or rectangular cells are considered most desirable. Rectangular cells shall have a length not exceeding three (3) times the width. No islands, peninsulas or coves shall be permitted. Embankments must be rounded at corners to minimize accumulations of floating materials.

4. The embankment top width shall be a minimum of two (2) feet.

5. The embankment slopes shall not be steeper than two (2) horizontal to one (1) vertical on the inner and outer sides.

6. Inner embankment slopes shall not be flatter than three (3) horizontal to one (1) vertical. Outer embankment slopes shall be sufficient to prevent the entrance of surface water into the lagoon.

7. Freeboard (the distance from the top of the water to the top of the embankment) shall be at least two (2) feet after settling. Additional freeboard may be provided.

8. Embankments shall be seeded with a locally hardy grass from the outside toe to the water line, to minimize erosion and facilitate weed control. Alfalfa or similar long-rooted crops that may interfere with the water holding capacity of the embankment shall not be used. Riprap may be necessary under unusual conditions to provide protection of embankments from erosion.

9. On sloping areas, a diversion ditch or soil improvement practices shall be located immediately upslope from the embankment. The ditch or soil improvement practice shall be installed to intercept and remove all surface and subsurface water and shall be protected from erosion.

10. The gravity flow lagoon influent line shall be Schedule 40 PVC or equivalent and have a minimum diameter of three (3) inches with a minimum grade of one-fourth (1/4) inch per foot. When gravity flow is utilized, the outlet invert of the septic tank shall be a minimum of one (1) foot above the high water level in the lagoon. The water level of each cell shall be at an elevation lower than the original ground surface.

11. The influent line shall be center discharging at a point two (2) feet beneath the water level. A watertight cleanout shall be provided in the influent line near the lagoon embankment and shall extend upwards to finished grade.

12. The effluent line from each cell shall be designed to maintain the water level of that cell at a depth of four (4) feet and be located so as to minimize short-circuiting from the influent line.

13. The effluent from the second cell shall be disposed of by a subsurface sewage disposal system.

14. The subsurface sewage disposal system shall be constructed according to paragraph (4) of Rule 0400-48-01-.07 and shall require a minimum of one hundred fifty (150) square feet of soil absorption trench bottom area.

15. The finished grade above the subsurface sewage disposal system shall be lower in elevation than the invert of the effluent discharge line from the last cell.

(d) Dosing of the System (applicable only when pumping is necessary)

1. If pumping to the lagoon is necessary, the total dynamic head (TDH) shall be determined by the summation of the elevation head, friction head and three (3) feet of pressure head.

2. The gallons per minute (gpm) flow amount, which the pump must provide shall be a minimum of ten (10) gpm.

3. The dosing volume shall be less than one-half (1/2) daily flow.

4. A check valve must be utilized when pumping uphill.

(e) Equipment and Material Specifications

1. Septic tank and dosing tank.

(i) The septic tank shall conform to all design, construction and installation criteria set forth in Rules 0400-48-01-.08 and 0400-48-01-.09.

(ii) The dosing chamber shall conform to all design, construction and installation criteria set forth in Rule 0400-48-01-.12.

2. Pipe Materials

(i) All pipe materials shall be PVC and have a minimum equivalent strength of Schedule 40 PVC.

(ii) If pumping is necessary, all fittings shall be pressure fittings.

(iii) All connections shall be adequately cleaned with cleaning solvent and glued with PVC solvent cement.

(f) Construction

1. The area designated for the lagoon liquid storage area and embankments shall be stripped of vegetation. The organic material removed during excavation of the lagoon shall not be used in embankment construction.

2. The area designated for the lagoon liquid storage area and embankments shall be stripped of soils that will not form an effective seal.

3. The liquid storage area of the lagoon must be sealed to prevent excessive exfiltration.

4. Embankments shall be constructed of impervious materials and compacted sufficiently to form a stable structure.

5. The influent line shall be installed at sufficient depth to protect the line from freezing and be properly bedded to prevent structural damage to the pipe from wheeled vehicles that cross the area. Slope of the line shall be such that excessive flow velocities do not cause scouring at the discharge point, but shall be adequate to prevent deposition within the line.

6. Effluent from the last cell shall be withdrawn from six (6) inches below the water surface. This shall be accomplished by placing a tee, with the run in a vertical position, on the inlet end of the effluent pipe.

7. The lagoon area shall be enclosed with a minimum four (4) feet high woven or chain-link or other restricting fence to preclude livestock and discourage trespassing. The fence shall be so located to permit mowing of the embankment top and slopes. A gate of sufficient width to accommodate mowing equipment shall be provided.

8. Appropriate warning signs shall be provided to designate the nature of the facility and discourage trespassing.

(g) Operation and Maintenance

1. It shall be necessary to fill the lagoon with water prior to using it for waste disposal.

2. Vegetation growing along the water's edge and in the water shall be mowed or otherwise removed at least annually.

3. It shall be necessary to maintain a consistent water depth of four (4) feet at all times of the year.

(6) A Subsurface Drip Disposal (SDD) System is a subsurface sewage disposal system, which utilizes pressurized drip irrigation line for the uniform application of treated wastewater throughout the disposal field. SDD systems shall be designed and installed to utilize the upper profiles of a suitable soils area through the uniform distribution of effluent, dosing and resting cycles, and shallow installation of the disposal line. SDD systems are to be proceeded by a treatment device capable of achieving secondary effluent treatment standards unless otherwise determined by this department.

SDD systems designed to accommodate wastewater flows in excess of seven hundred fifty (750) gallons per day must be designed by a licensed engineer. The design shall be reviewed by the department applying the requirements of paragraph (6) of this rule.

(a) Site and Soil Requirements

1. Prior to the design of the SDD system, the suitability of the site must be demonstrated through acceptable soil properties, soil conditions and topographical characteristics. Acceptable soil textural and structural properties are shown in Table VII.

2. The design and installation of the SDD system shall be based on the most restrictive naturally occurring soil horizon or layer to a depth of twenty (20) inches or twelve (12) inches below the installation depth of the drip line, whichever is greater.

3. An area of suitable soil must be available to install the primary system and maintain a suitable area of adequate size for a one hundred (100) percent duplicate area.

4. An extra-high intensity soil map, provided by a soil consultant listed by the department, shall establish the soil properties.

   (i) An extra-high intensity soil map for use to design a SDD system shall provide site-specific profile descriptions establishing the texture and structure (shape and grade) for each suitable soil unit mapped.

   (ii) Profile descriptions require the excavation of soil pits in order to allow for site-specific pedon descriptions. The soil column shall be described to a depth of thirty-six (36) inches or to rock or fragipan whichever is shallower. There shall be a minimum of two (2) pits per acre with at least one pit in any suitable soil unit intended for use, unless a different frequency is specified by the Commissioner.

   (iii) Slope classes (Table VI) for extra-high intensity soil maps used for SDD systems shall be delineated as follows:

Table VI.
Slope Classes

Slope Classes
0 - 9 %
10 - 20 %
20 - 30 %
30 - 40 %
40 - 50 %
> 50 %

   (iv) Percolation tests shall not be allowed to establish soil properties for the design of SDD systems.

5. The size of the SDD system shall be determined by the following:

   (i) The daily wastewater flow divided by the loading rate (Table VII) shall determine the area (ft^2) required for the initial system.

Table VII.
Hydraulic Loading Rates (gpd/ft^2) - For Subsurface Drip Disposal (SDD) Systems

TEXTURE	STRUCTURE		HYDRAULIC LOADING RATE (gpd / ft^2) BOD ≤ 30 mg/L
	SHAPE	GRADE	

Coarse Sand, Loamy Coarse Sand	NA	NA	NA*
Sand	NA	NA	NA*
Loamy Sand, Fine Sand, Loamy Fine Sand, Very Fine Sand, Loamy Very Fine Sand	Single Grain	Moderate, Strong	0.50
		Massive, Weak	0.40
Coarse Sandy Loam, Sandy Loam	Massive	Structureless	0.30
	Platy	Weak	0.20
		Moderate, Strong	Not Used
	Blocky, Granular	Weak	0.40
		Moderate, Strong	0.50
Loam	Massive	Structureless	0.20
	Platy	Weak, Moderate, Strong	Not Used
	Blocky, Granular	Weak	0.30
		Moderate, Strong	0.40
Silt Loam	Massive	Structureless	0.20
	Platy	Weak, Moderate, Strong	Not Used
	Blocky, Granular	Weak	0.20
		Moderate, Strong	0.30
Sandy Clay Loam, Clay Loam, Silty Clay Loam	Massive	Structureless	NA*
	Platy	Weak, Moderate, Strong	Not Used
	Blocky, Granular	Weak	0.20
		Moderate, Strong	0.20
Sandy Clay, Clay, Silty Clay	Massive	Structureless	Not Used
	Platy	Weak, Moderate, Strong	Not Used
	Blocky, Granular	Weak	0.075
		Moderate, Strong	0.10

* Requires a special site investigation

Table VII compiled from: EPA, Netafilm, GeoFlow, AL, NC, MS, GA, TX, AR and TN

(ii) When slopes exceed nine (9) percent, slope correction factors (Table VIII) shall be used to adjust area requirements.

Table VIII.
Slope Correction Factors

Slope Class	Depth to Restrictive Layer	
	≤ 23 in	≥ 24 in
10% - 20%	15%	0%
20% - 30%	35%	15%

(iii) Slopes of more than fifty (50) percent shall be considered unsuitable.

(iv) For sites with slopes between thirty (30) to fifty (50) percent a special investigation shall be conducted to evaluate those soils to determine: depth to rock, kind of rock and particle size class designation to a depth of six (6) feet or to hard rock, whichever is shallower.

(v) SDD systems designed for sites with slopes greater than thirty (30) percent must be designed by a licensed engineer. The department shall review the design.

(b) Design and Layout of the SDD System

1. The required minimum linear tubing footage is determined by dividing the amount of required square footage of suitable soil area by two (2). However when slope correction factors are required, the minimum linear tubing footage is calculated on the required square footage (without the addition of the slope correction factors) divided by two (2). The approximate tubing spacing is then determined by dividing the required square footage (including the slope correction factor) by the minimum linear tubing footage. Complete coverage of the required square footage (including any slope correction factor) is required. Designers are permitted to specify a closer tubing spacing and additional tubing, as soil and site conditions may accommodate~~,~~ to insure complete coverage of the disposal area.

2. The location of the septic tank, effluent treatment unit, dosing chamber, and the disposal field shall be in accordance with Rule 0400-48-01-.11.

3. The drip disposal lines shall be placed on contour. The maximum length of a single line or maximum drip zone size shall be in compliance with the manufacturer's recommendations and is subject to approval by the department.

4. Drip disposal lines and drip emitters shall be spaced on twenty-four (24) inch centers unless an alternative spacing is required by the use of slope correction factors. Tubing spacing other than twenty-four (24) inch centers may be considered on a case-by-case basis through the GWP Central Office.

5. All components of an SDD system shall be designed and manufactured to resist the corrosive effects of wastewater and household chemicals, and meet applicable ASTM standards.

6. All SDD systems shall include an automatic filtration system capable of removing suspended solids to a level recommended by the drip disposal line manufacturer or to a maximum particle size of no more than 120 microns, whichever is smaller. The filtration system shall be sized to provide the specified filtration level at or above peak flow conditions.

7. All SDD systems shall be designed to automatically flush each disposal field or zone at a minimum fluid velocity of two (2) feet per second. Flushing velocity is measured at the distal end of the drip disposal line. Flushing frequency shall be at least the minimum frequency recommended by the drip disposal line manufacturer or at a minimum once every thirty (30) days.

8. The filter flush, and network forward flushing volumes are to be hydraulically acceptable to and not adversely affect the pretreatment unit design for systems that flush to the pre-treatment tank. Systems designed to continuously forward flush to the dosing tank shall incorporate a system to automatically flush the filter to the pre-treatment tank.

9. Air / vacuum release valves shall be placed at the highest point of each zone. All valves shall be installed under a protective cover allowing grade level access.

10. Non-pressure-compensating turbulent flow drip emitters shall not be used in any SDD or packaged SDD system.

11. Valves or appropriate fittings to allow for easy measurement of system pressures shall be provided on the pump output, and on each supply and return manifold of each zone.

12. SDD systems shall be timed dosed at regular intervals. Demand dosing shall not be used. Minimum dose calculations shall include at least three (3) times the volume of the tubing plus the volume of the supply and return manifolds. All SDD systems shall incorporate a flow meter to accurately determine the volume of flow to the disposal field. The approved system shall also provide the means to calculate pump cycles, alarm events, pump run time, and automated flushing events.

13. Systems designed to continuously forward flush shall incorporate a flow meter on the supply and return in order to accurately determine the volume of flow dosed in the disposal field.

14. SDD systems shall have a dosing tank capacity that will allow float placement to provide for a minimum working volume of fifty (50) percent of the peak design flow. This volume should be calculated from the timer enable to the high water alarm floats. The dosing chamber shall also provide a reserve capacity of at least fifty (50) percent of the peak daily flow above the high water alarm. The alarm and alarm switches shall be placed on a separate electrical circuit from the pump power line.

15. SDD systems shall be designed to prevent the redistribution of effluent by gravity in the disposal area.

(c) Construction Specifications

1. All supply and return manifolds, lines and pressure pipe network elements shall be constructed using Schedule 40 PVC or equivalent.

2. Any turn in the drip disposal line greater than ninety (90) degrees shall be made using flexible sections of PVC or functional equivalent. The drip line shall be secured to the flexible PVC using fittings manufactured for that purpose.

3. All electrical installations shall be installed to meet the current wiring methods of the current edition of the "National Electric Code" (NEC) adopted by the Department of Commerce and Insurance.

4. Drip disposal line shall be installed at a depth of eight (8) to twelve (12) inches below the natural soil surface. A buffer of twelve (12) inches of undisturbed soil below the drip disposal line to rock or restrictive horizon shall be maintained throughout the disposal field.

5. Drip disposal line shall be installed with the contour of the ground and in such a manner to prevent damage to the tubing and comply with the manufacturer's recommendations.

(d) General Requirements

1. SDD systems may only be used if the effluent introduced to the SDD system has been treated to secondary effluent treatment standards.

2. Permits for SDD systems will only be considered for systems that are designed by a licensed engineer or have been previously approved as a packaged SDD system by this department.

3. This Department will maintain a list of approved SDD systems either packaged with an ATS or independently.

4. No manufacturer marketing an SDD system independently or packaged with an ATS in Tennessee shall deny the sale of replacement parts or deny technical guidance to any maintenance provider listed in accordance with Rule 0400-48-01-.23.

5. The property owner at the time of initial installation of a SDD system and any subsequent owner, for the life of the system, shall have in effect a contract for operation and maintenance of the SDD with an approved maintenance provider under Rule 0400-48-01-.23. These contracts will be reviewed by this department on an annual basis. This requirement can be included with the ATS contract specified in Rule 0400-48-01-.10.

6. SDD systems will not be considered for the purposes of subdivision plat approval or permit issuance unless the SDD system is to be utilized as the primary system.

7. SDD systems will be considered for residential applications up to and including fifteen hundred (1500) gallons per day. However, commercial applications may be considered by the department on an individual basis.

8. Upon installation of a packaged SDD system, a representative of the company holding the packaged approval shall inspect the system to certify that the system was installed to the approved specifications and provide GWP with a detailed layout of the system components. For systems designed by a licensed engineer, the engineer must submit construction as-built drawings showing the location of all components of the system.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.16 Experimental Methods of Treatment and Disposal Other Than Those Provided in These Regulations.

(1) Experimental methods of treatment and disposal of sewage in lieu of those provided herein shall not be utilized unless approval has been granted by the department.

(2) Prior to issuance of an experimental sewage system permit, an amendment to the deed (reflecting the presence of such system) shall be completed, notarized and recorded at the Register of Deeds Office in the county where the system will be located. A copy of such shall be submitted to the department.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.17 Privies and Composting Toilets.

(1) Pit privies shall be constructed to prevent a health hazard and prevent insect and rodent accessibility and shall not be located less than fifty (50) feet from a water supply or less than ten (10) feet from any habitable building or property line.

(2) Composting toilets must be certified by the National Sanitation Foundation (NSF) to be in compliance with NSF Standard 41, and be published in their "Listing of Certified Wastewater Recycle / Reuse and Water Conservation Devices," before they may be used for disposal of human excreta by non-water carriage methods.

(3) A pit privy or composting toilet shall not be permitted for a facility where the facility has running water available unless there is an acceptable means to dispose of wastewater.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.18 Approved Soil Consultants.

(1) An approved soil consultant shall be one who meets all of the following requirements:

(a) Graduation from an accredited college or university with a bachelor's degree in soil science, agronomy and/or agriculture with an emphasis in plant and soil science or agronomy, or graduation from an accredited college or university with a minimum of thirty (30) quarter hours biological, physical and earth sciences and an additional twenty-two and one-half (22 1/2) quarter hours in soil science.

(b) A minimum of two (2) years full time or equivalent of soil evaluation experience in accordance with the United States Department of Agriculture system. Experience must include studies of soil

physical characteristics, geology, and soil relationships, soil-landscape relationships, soils identification, landscape features, mapping techniques, interpretive ranges, sewage systems and soil improvement design variations.

(c) Candidates must pass a written examination to demonstrate mastery in soil science. A test result of eighty (80) percent correct shall constitute a passing score.

(d) Candidate must pass a field soil mapping test to demonstrate mastery in soil classification, soil mapping, soil interpretations and cartography skills. A score of eighty (80) percent is satisfactory. Candidate then receives interim approval as a soil consultant.

(e) After completing the first five (5) soil maps, if no serious errors were made, the candidate then becomes a soil consultant approved to make general and high intensity soil maps.

(f) If the candidate fails the written examination, the field test or any of the first five (5) soil maps, the testing procedure may begin again after a six (6) month period. The second time, if the candidate fails the written test, the field mapping test or any of the first five (5) high intensity soil maps, the testing procedure may begin again after a twelve (12) month waiting period. The testing procedure may be repeated only one time.

(g) After a period of one year and the completion of a minimum of twenty-five (25) high intensity soil maps with a total of one hundred (100) acres, and approved soil consultant who has not been reprimanded or suspended may apply to become approved to make all intensity soil maps.

(h) Soil maps shall be made to comply with criteria set forth by the most current edition of the "Soils Handbook of Tennessee" prepared by the Division of Water Resources.

(2) Revocation of Approval

(a) The department may review the performance of any approved soil consultant and require the submission of any soil map or other information necessary for performance review.

(b) The department may revoke or suspend the approval of any soil consultant for the practice of any fraud or deceit in obtaining the approval or any gross negligence, incompetence or misconduct in the practice of soil evaluation or any continued disregard of evaluation criteria as required by the "Soils Handbook of Tennessee" prepared by the Division of Water Resources. Any person whose approval as a soil consultant has been denied, suspended or revoked, may request a hearing before the Commissioner by making such request in writing within thirty (30) days of the date of his denial, suspension or revocation. Any hearing granted under this rule shall be conducted in accordance with T.C.A. §§ 4-5-301 et seq.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.19 Installer of Subsurface Sewage Disposal Systems.

(1) (a) No person shall engage in the business of constructing, installing, altering or extending or repairing a subsurface sewage disposal system unless he has a valid annual permit issued by the Commissioner. This rule does not apply to the property owner or the property owner's tenant doing his own work on his own property where such property is the residence of the owner or tenant, provided that nothing in this rule shall act to remove the requirement that any person must secure a construction permit as provided by law and duly promulgated regulations.

(b) Any person who is, on the effective date of these rules, or intends to become after the effective date of these rules, an installer, shall make application for the installer's permit in writing on a form furnished by the department.

(2) (a) No permit under this rule shall be granted until:

1. An application is filled out in its entirety, unless otherwise specified by the Commissioner; and

2. The installer scores a grade of seventy (70) percent or above on a written or oral test developed by the department. This test requirement does not apply, however, to an installer who was licensed the previous year and who performed satisfactory work, as determined by the Division of Water Resources, during the previous year. The test shall cover design, location and installation of conventional/alternative subsurface sewage disposal systems.

(b) A permit to install subsurface sewage disposal systems may be denied where the applicant has had a previous permit denied, suspended or revoked due to unsatisfactory work, where such unsatisfactory work is material to the subject matter of the permit.

(3) Permits shall not be transferable or assignable and shall automatically become invalid upon a change of ownership or upon suspension or revocation.

(4) When a permit has been denied, suspended or revoked, a hearing may be requested before the Commissioner by making such request in writing within thirty (30) days of the date of his denial, suspension, or revocation. Any hearing granted under this rule shall be conducted in accordance with T.C.A §§ 4-5-301 et seq.

(5) Permits shall expire on the 31st day of December following the date of issuance.

(6) An application for a permit shall contain the following:

(a) Name of business;

(b) Business address and phone number;

(c) Owner's name; and

(d) Address and phone number of owner.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.20 Septic Tank Pumping Contractor.

(1) Domestic Septage Removal Permit - Persons engaged in the business of removing and disposing of domestic septage from septic tanks, holding tanks, portable toilets or other similar sewage treatment or disposal facilities covered within the provision of these rules shall obtain an annual permit from the Commissioner.

Septic tank pumping contractors are authorized under the domestic septage removal permit to pump the contents of grease traps that are a part of subsurface sewage disposal systems. This grease trap waste must be disposed of in a manner approved by the Commissioner. Grease trap waste may not be disposed of on a domestic septage disposal site, as authorized under these rules.

(2) (a) No permit under this rule shall be granted until:

1. An application is filled out in its entirety, unless otherwise specified by the Commissioner; and

2. The contractor has demonstrated to the Commissioner that he is capable of conducting the operation in accordance with the rules as set forth herein; and

(b) A domestic septage removal permit may be denied where the applicant has had a previous permit denied, suspended or revoked due to unsatisfactory work, where such unsatisfactory work is material to the subject matter of the permit.

(3) Application for permit shall contain the following:

(a) Business name, owner's name, address and telephone number;

(b) Signature of applicant and date of application;

(c) Written permission of the proper official when contents are to be disposed of by discharging into a public or community wastewater treatment plant;

(d) Written permission of the landowner and disposal site operator, if different from the landowner, for each land application site used, including a copy of the domestic septage disposal site permit(s);

(e) Tank capacity, in gallons, license number and state of registration for each vehicle used to transport domestic septage;

(f) Counties in which the contractor intends to conduct most of his business.

(4) Monitoring Logs - A monthly log, on a form provided by the Department, of all pumpings and discharges shall be maintained. The log shall include, but not be limited to, the following:

(a) Date domestic septage is collected;

(b) Address of collection;

(c) Indicate if collection point is residential or commercial;

(d) Volume in gallons collected;

(e) Type of waste hauled;

(f) The discharge location, by treatment plant name or land disposal site permit number;

(g) The date, time and total number of gallons of domestic septage applied to the approved disposal site (if applicable);

(h) Method of pathogen reduction and vector attraction reduction for each load (if applicable);

(i) The following statement of certification:

"I certify, under penalty of law, that all domestic septage has been disposed of at an approved wastewater treatment facility, or that the site requirements of paragraph (6) of Rule 0400-48-01-.22, have been met."

(5) Vehicle Identification - All vehicles engaged in domestic septage removal shall carry on both sides of the vehicle the name and address of the firm or operator conducting the business and the domestic septage removal permit number under which the business is being conducted. All lettering shall be at least two (2) inches high in bold print on a background of contrasting colors. All vehicles used for transporting domestic septage shall have an identifying sticker, provided by the department, attached to the vehicle in a location determined by the department.

(6) Vehicle Maintenance - Every vehicle used for domestic septage removal purposes shall be equipped with a watertight tank and shall be maintained in a clean and sanitary condition. Liquid wastes shall not be transported in an open body vehicle unless contained within suitable portable receptacles. All pumps, valves and hose lines shall be maintained so as to prevent leakage. A splash plate or other approved method of dispersal shall be used for land application.

(7) Portable Receptacles - All portable receptacles used for transporting liquid or solid wastes shall be watertight, equipped with tight-fitting lids and cleaned daily.

(8) Domestic Septage Removal Permit

(a) Permits shall not be transferable or assignable and shall automatically become invalid upon a change of ownership or upon suspension or revocation.

(b) Permits shall expire on the 31st day of December, following the date of issuance.

(c) When a permit has been denied, suspended or revoked, a hearing may be requested before the Commissioner by making such request in writing within thirty (30) days of the date of the denial, suspension or revocation. Any hearing granted under this section shall be conducted in accordance with T.C.A. §§ 4-5-301 et seq.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.21 Fees for Services.

(1) Fees for services are assessed pursuant to the following:

	Specific Procedure Covered by Fee	Fee
(a)	General intensity soil mapping to determine eligibility for percolation tests.	Eighty dollars ($80) per acre, with eighty dollars ($80) being the minimum for each separate acre or part of acre to be mapped.
(b)	High intensity soil mapping (sufficient for final approval, 1″ = 100′ scale) of single lots, or tracts where lots have been staked, or where tracks are gridded (100′ grid staking) for residential, commercial, industrial, institutional or recreational users.	Two hundred dollars ($200) per acre, with two hundred dollars ($200) being the minimum for each separate acre or part of acre to be mapped.
(c)	Extra-high intensity soil mapping for alternative disposal system.	Two hundred fifty ($250) dollars per acre, with two hundred fifty ($250) dollars being the minimum for each separate acre or part of acre to be mapped.
(d)	Conventional, chamber, EPS and large diameter gravelless pipe subsurface sewage disposal systems permit application processing, making inspections and other regulatory activities relative to the construction of new conventional, chamber and large diameter gravelless pipe subsurface sewage disposal systems and modification or expansion of existing systems because of additions resulting in added wastewater flow, but not for repair of malfunctioning systems. Permits shall be granted or denied within forty-five (45) days of receipt of all necessary information.	Four hundred dollars ($400) up to one thousand (1,000) gpd design flow plus one hundred dollars ($100) for each additional one thousand (1,000) gpd flow, or portion thereof.
(e)	Alternative subsurface sewage disposal systems permit application up to one thousand (1,000) gpd. design flow processing (excluding chamber, EPS and large diameter gravelless pipe systems), making inspections and other enforcement activities relative to the construction of alternative subsurface sewage disposal systems and modification or expansion of existing systems because of additions resulting in added wastewater flow, but not for repair of malfunctioning systems. Permits shall be granted or denied within forty-five (45) days of receipt of all necessary information.	Five hundred dollars ($500) plus one hundred fifty dollars ($150) for each additional one thousand (1,000) gpd flow, or portion thereof.
(f)	Experimental subsurface sewage disposal	Five hundred dollars ($500).

	systems permit application processing, making inspections and other enforcement activities relative to the construction of experimental subsurface sewage disposal systems and expansion of systems because of additions resulting in added wastewater flow, but not for repair of malfunctioning systems. Permits shall be granted or denied within forty-five (45) days of receipt of all necessary information.	
(g)	Subdivision Evaluation - Evaluations of lots within proposed subdivisions to determine and to specify limitations on their usability for subsurface sewage disposal systems.	Sixty five dollars ($65) per evaluated lot.
(h)	Inspections of existing subsurface sewage disposal systems.	Two hundred dollars ($200) per inspection.
(i)	Installer and Pumper Permits - Enforcement activities relative to sewage system installers and septic tank pumpers. Permits shall be granted or denied within forty-five (45) days of the date of application.	Two hundred dollars ($200) per annual permit for pumpers and installers. The $200 annual installer permit applies to installation of conventional, chamber, EPS and large diameter gravelless pipe systems. If an installer wishes to be permitted for installation of alternative systems, an additional one hundred dollars ($100) applies for each type of alternative system.
(j)	Sewage Surveys - Activities involved in the inspections and surveying of subsurface sewage disposal systems.	Actual costs.
(k)	Water Samples - Collection of water samples for bacteriological laboratory analysis, but does not include samples collected in enforcement activities.	
	1. Mail Deliver	One hundred fifteen dollars ($115) per sample.
	2. Direct Deliver	Two hundred fifteen dollars ($215) per sample.
(l)	Plans Review - Review of designs for large conventional or large alternative subsurface sewage disposal systems to the point of permit issuance.	Seven hundred fifty dollars ($750) per proposed system.
(m)	Plat approval for individual lots.	Sixty five dollars ($65) per evaluated lot.
(n)	Domestic Septage Disposal Site Permit - Permit application processing, making inspections and other regulatory activity relative to domestic septage disposal sites Permits shall be granted or denied within forty-five (45) days of receipt of all necessary information.	Four hundred dollars ($400).
(o)	Training - Non-state agencies and individuals.	Calculated costs.
(p)	Certificate of Verification by homeowners of existing system.	One hundred dollars ($100).

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.22 Domestic Septage Disposal.

(1) When permission for use is obtainable, a public, community or private wastewater treatment facility shall be used to dispose of domestic septage. When permission to use wastewater treatment facilities cannot be obtained, then a permitted domestic septage disposal site may be used in accordance with this rule. A domestic septage disposal site permit shall be obtained from the Commissioner.

(2) Domestic Septage Disposal Site Permit - Any site used for the disposal of the domestic septage from septic tanks or other sewage treatment or disposal facilities covered within the provisions of these regulations shall require an annual permit from the Commissioner. The operator of the site shall obtain this permit prior to any use of the site and shall be responsible for the proper use and maintenance of the site.

(3) (a) No permit under this rule shall be granted until:

1. An application is filled out in its entirety, unless otherwise specified by the Commissioner;

2. The operator has demonstrated to the Commissioner that he is capable of operating the site in accordance with the regulations as set forth herein; and

3. The department has determined that the site meets the minimum requirements as set forth herein.

(b) A domestic septage disposal site permit may be denied, suspended or revoked when the disposal site does not meet the minimum requirements as set forth herein or where it is determined that the operator is not operating the site in accordance with the regulations as set forth herein.

(4) Application for permit shall contain the following:

(a) Business name, address and telephone number of operator;

(b) Name, address and telephone number of applicant;

(c) Written permission of the landowner. The landowner must agree, in writing, to abide by the land use restrictions as provided in these rules;

(d) A high intensity soil map of the proposed disposal area prepared in accordance with Rules subparts (3)(a)1(i) and (3)(a)(2)(i) of Rule 0400-48-01-.03. This map must note any areas where slope exceeds twelve (12) percent or where there is less than twenty-four (24) inches of soil material before subsurface bedrock formations, fragipans, seasonal high water table or water are encountered;

(e) A plat, with seal and signature of a registered surveyor, of sufficient scale and accuracy to locate pertinent features. This plat shall include, but not be limited to, the property boundaries, disposal boundaries, buildings, underground utilities, roads, surface waters, water supplies, water courses, sinks, sinkholes, caves, etc.;

(f) The crop to be grown on the disposal site for the coming year; and

(g) Any additional information that the Commissioner determines is necessary to properly evaluate the site.

(5) Permits for Domestic Septage Disposal Site

(a) Permits shall not be transferable or assignable and shall automatically become invalid upon a change of land or business ownership or upon suspension or revocation.

(b) Permits shall expire on the 31st day of December, following the date of issuance.

(c) When a permit has been denied, suspended or revoked, a hearing may be requested before the Commissioner by making such request in writing within thirty (30) days of the date of the denial, suspension or revocation. Any hearing granted under this section shall be conducted in accordance with T.C.A. §§ 4-5-301 et seq.

(6) (a) Land application of domestic septage shall be approved as follows:

1. (i) The pH of the domestic septage shall be raised to a minimum of twelve (12) or higher by the addition of an alkali such as hydrated lime or quicklime, and without adding more alkali, the domestic septage shall remain at a pH of twelve (12) or higher for at least thirty (30) minutes prior to being land applied;

(ii) Domestic septage shall be injected below the surface of the soil. When domestic septage is injected below the surface of the soil, no significant amount of domestic septage shall be present on the surface of the soil within one (1) hour after the domestic septage is injected; or

(iii) Domestic septage shall be incorporated into the surface of the soil within six (6) hours of land application; and

2. The vehicle must be in motion during land application to evenly distribute the domestic septage over the site. A splash plate or other effective method of dispersal shall be used for land application.

(b) Grease and/or the contents of grease traps shall not be disposed of at any domestic septage disposal site approved under these rules.

(c) Commercial or industrial wastewater shall not be disposed of at any domestic septage disposal site approved under these rules.

(d) The contents of portable toilets, Type III marine sanitation devices, or similar materials shall not be applied to domestic septage disposal sites unless the site is approved in conjunction with the Director of the Division of Water Resources.

(7) Site Restrictions

(a) Soil requirements

1. Domestic septage disposal sites shall have a slope of twelve (12) percent or less.

2. The soil material in the domestic septage disposal site shall be at least twenty-four (24) inches deep before subsurface rock formations or seasonal ground water is encountered.

3. Domestic septage disposal sites shall have a well-established sod cover unless domestic septage is injected below the soil surface or incorporated into the soil surface within six (6) hours of land application.

4. The minimum soil absorption rate shall be thirty (30) minutes per inch. There are no upper limits on soil absorption rates.

(b) The annual application rate (AAR) for domestic septage shall not exceed the annual application rate calculated using the equation:

$$\mathrm{AAR} = \frac{N}{0.0026}$$

Where:

AAR = Annual application rate in gallons per acre per 365 day period.

N = Amount of nitrogen in pounds per acre per 365 day period needed by the crop or vegetation grown on the land.

Once the annual application rate has been reached for an approved domestic septage disposal site, no additional domestic septage disposal will be allowed on that site during that calendar year.

(c) The location of the disposal site shall be selected in accordance with the following minimum distances:

1. Five hundred (500) feet from any habitable building or public use area. With the owner's permission, the site may be within a lesser distance of his residence.

2. One hundred (100) feet from adjoining property, any highway or public road, sink, cave or bedrock outcrop.

3. Three hundred (300) feet from surface waters or any point where it can pollute any water course or groundwater.

4. Five hundred (500) feet from water supplies or bathing areas.

5. No disposal in areas subject to flooding, as determined by the department.

(d) Grazing restrictions - Animals shall not be allowed to graze on the land for thirty (30) days after application of domestic septage.

(e) Public access to the domestic septage disposal site shall be restricted for one year after application of domestic septage. Examples of restricted access include remoteness, posting "no trespassing" signs and/or simple fencing.

(f) Crop restrictions

1. Food crops with harvested parts that touch the domestic septage/soil mixture and are totally above ground shall not be harvested for fourteen (14) months after application of domestic septage.

2. Food crops with harvested parts below the surface of the land shall not be harvested for thirty-eight (38) months after application of domestic septage.

3. Animal feed, fiber and those food crops that do not touch the soil surface shall not be harvested for thirty (30) days after application of domestic septage.

(8) Facility Standards

(a) Storage facilities shall be identified and approved and must be used if pumping is continued when the site is not accessible or usable.

(b) Mixing facilities for lime and domestic septage shall be identified, inspected and approved by the Commissioner.

(c) Mixing tanks must be watertight, structurally sound and not subject to excessive corrosion or decay.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.23 Maintenance Provider for Advanced Treatment Systems and Subsurface Drip Disposal Systems.

(1) An approved maintenance provider shall be one who meets all of the following requirements:

(a) Any person who, on or after, the effective date of these rules, is or intends to become after the effective date of these regulations, a maintenance provider, shall make application for approval in writing on a form furnished by the department.

(b) After December 31, 2010, persons applying for approval to become a maintenance provider must have a high school education or equivalent.

(2) No approval under this rule shall be granted until:

(a) An application is filled out in its entirety, unless otherwise specified by the Commissioner.

(b) The maintenance provider candidate attends and successfully complete a training course approved by the Division of Water Resources; and

(c) The maintenance provider candidate scores a grade of eighty (80) percent or above on a written test developed by the department. This test requirement does not apply, however, to a maintenance provider who was approved the previous year and who performed satisfactory work, as determined by the Division of Water Resources, during the previous year.

(3) Approval to maintain ATS, SDD, or packaged systems may be denied where the applicant has had a previous approval denied, suspended or revoked, or has been shown to provide unsatisfactory work, where such unsatisfactory work is material to the subject matter of the approval. Failure to timely provide maintenance tasks required by the manufacturer or this Department shall constitute unsatisfactory work.

(4) This Department will maintain a list of approved maintenance providers that have met the requirements of this rule and provided satisfactory work.

(5) Approvals shall not be transferable or assignable and shall automatically become invalid upon any suspension or revocation becoming final.

(6) When an approval has been denied, suspended or revoked, a hearing may be requested before the Commissioner by making such request in writing within thirty (30) days of the date of his denial, suspension, or revocation. Any hearing granted under this rule shall be conducted in accordance with T.C.A. §§ 4-5-301 et seq. If no such hearing is timely filed, the denial, suspension, or revocation is final.

(7) Approvals shall expire on the 31st day of December following the date of approval.

(8) An application for approval shall contain the following:

(a) Name of business;

(b) Business address and phone number;

(c) Owner's name;

(d) Address and phone number of owner; and

(e) Proof of Professional Development Hours (Renewal Only).

(9) Annual Renewal

(a) Any maintenance provider approved in accordance with this rule will be responsible for obtaining at least 6 Professional Development Hours (PDH's) annually. Courses qualifying as having PDH's will be approved by this Department.

(b) Maintenance provider approval annual renewal will be considered upon submittal of application and proof of PDH at the close of each calendar year.

(10) Maintenance Providers Responsibilities:

(a) Any maintenance provider approved in accordance with this rule shall be responsible to provide proof of the operation and maintenance agreement referenced in this rule and the deed of the property, and paying the appropriate tracking fee for each ATS, SDD, or packaged system that the provider has under an operation and maintenance contract. Proof of maintenance contract and the associated tracking fee shall be due on the anniversary of the certificate of completion of the system.

(b) Services provided by a maintenance provider shall include, but are not limited to, any operational or maintenance requirements in these rules for such systems operated and maintained.

(c) In the event that a property owner chooses not to renew or cancels an operation and maintenance contract with a maintenance provider, the maintenance provider shall notify the Department within 30 days of such action.

(d) Any maintenance provider approved in accordance with this rule will be responsible for maintaining manufacturers certification for any ATS models being maintained. Documentation of such certifications shall be provided to this department.

(e) Maintenance providers shall be responsible for notifying this Department of any condition, event, or failure of an ATS, SDD or packaged system that is outside the parameters of routine operation.

(f) Operation and maintenance visits shall be conducted by the approved maintenance provider. Any individual making such visits shall meet the requirements of this rule and be listed by this Department as an approved maintenance provider.

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

0400-48-01-.24 Severability.

(1) Severability

If any provision or application of any provision of these rules is held invalid, that invalidity shall not affect other provisions or applications of these rules.

Appendix I
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Abernathy	30	1
Adaton	> 75	2
Adler	30	1
Agee	> 75	4
Alcoa	45	
Allegheny	30	
Allen	45	
Alligator	> 75	4
Almaville	> 75	4
Almo	> 75	
Alticrest	30	5
Altavista	30	2
Alva	15	1
Amagon	75	1
Apison	45	5
Arkabutla	45	4
Armour	30	
Armuchee	> 75	5
Arrington	30	1
Ashe	15	3
Askew	45	1
Ashwood	> 75	3
Atkins	30	4
Augusta	> 75	2
Balfour	30	
Barbourville	15	1
Barfield	> 75	2
Barger		2,6
≥ 20 in to fragipan	75	
< 20 in to fragipan	> 75	
Bays	> 75	3
Baxter (Cherty)	60	
Beason	> 75	2
Bedford		
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Beechy	30	4
Bellamy		2,6
≥ 20 in to fragipan	75	
< 20 in to fragipan	> 75	
Bewleyville	45	
Bibb	15	4
Biffle	45	5
Biltmore	<10	1
Birds	30	4
Bland	> 75	3

Soil Series or Phase	Soil Absorption Rate	Note
Bloomingdale	> 75	4
Bodine (Cherty)	30	
Bolton	45	
Bonair	30	4
Bonn	> 75	2
Bosket	30	1
Boswell	> 75	
Bouldin	10	
Bowdre	30	4
Bradyville		
≥ 20 in to clay	75	
< 20 in to clay	> 75	
Brandon	30	
Brantley	> 75	
Brasstown	45	
Braxton		
≥ 24 in to clay	75	
< 24 in to clay	> 75	
Brevard	30	
Briensburg	30	1
Britton	> 75	
Brookshire	15	
Bruno	<10	1
Bryson		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Buncombe	<10	1
Burgin	> 75	2
Burton	30	3
Busseltown		
≥ 20 in to fragipan	75	6
< 20 in to fragipan	> 75	
Byler		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Calhoun	> 75	2
Calloway	> 75	2
Calvin	> 75	3
Camp	30	1
Cannon	15	1
Capshaw	> 75	2
Captina		
≥ 24 in to fragipan	75	2
< 24 in to fragipan	> 75	2
Carbo	> 75	3
Cataska	> 75	

Appendix I (continued)
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Caylor	60	
Center	75	2
Chagrin	30	1
Chenneby	45	2
Chewacla	30	4
Chickasaw	> 75	
Christian	> 75	
Citico	45	
Claiborne	45	
Clarksville (Cherty)	30	
Clarkrange		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Clifton	45	
Cloudland		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Cobstone	15	1
Coghill	> 75	5
Coile	> 75	5
Colbert	> 75	
Collegedale	> 75	
Collins	30	1
Commerce	60	4
Conasauga	> 75	2
Conagree	15	1
Convent	45	4
Cookeville	60	
Corryton	> 75	
Cotaco	30	1
Craggey	> 75	
Craigsville	15	1
Crevassee	<10	1
Crider	30	
Crossville	30	3
Culleoka	30	5
Cumberland	45	
Curtistown	30	
Cuthbert	> 75	3
Cynthiana	> 75	3
Dandridge	> 75	3
Deanburg	30	
Decatur	45	
DeKalb	15	5
Dekoven	> 75	4

Soil Series or Phase	Soil Absorption Rate	Note
Delanco	30	2
Dellrose (Cherty)	30	
Dewey	60	
Dexter	30	
Dickson		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Dilton	75	2
Ditney	30	5
Donerail	> 75	
Dowelltown	> 75	2
Dubbs	45	1
Dulac		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Dundee	60	4
Dunmore		
≥ 24 in to clay	60	
< 24 in to clay	75	
Dunning	> 75	2
Dyer	45	4
Eagleville	> 75	3
Ealy	15	1
Egam	> 75	1
Elk	45	
Elkins	45	4
Elliber	30	
Ellisville	30	1
Emory	30	1
Enders	> 75	
Ennis	30	1
Enville	45	4
Etowah	30	
Eustis	<10	
Eupora	30	4
Evard	45	
Fairmount	> 75	3
Falaya	45	4
Falkner	> 75	
Fannin	30	5
Farragut		
≥24 in to shale material	75	
< 24 in to shale material	> 75	
Fletcher	45	
Forestdale	> 75	4

Appendix I (continued)
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Fountain	> 75	2
Frankstown (Cherty)	45	
Freeland		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Fullerton (Cherty)	45	
Fullerton	60	
Gilpin	> 75	3
Gladdice	> 75	3
Gladeville	> 75	3
Godwin	> 75	4
Greendale (Cherty)	30	1
Grenada		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Groseclose	> 75	
Guin	15	
Gumdale	> 75	2
Guthrie	> 75	4
Guyton	> 75	2
Hagerstown	60	
Hamblen	30	1
Hampshire	> 75	
Hanceville	45	
Harpeth	30	
Hartsells	30	5
Hatchie	> 75	2
Hawthorne	45	5
Hayesville	45	
Hayter	45	
Hector	> 75	3
Hendon		2,6
≥ 20 in to fragipan	75	
< 20 in to fragipan	> 75	
Henry	> 75	2
Hermitage	30	
Hicks	45	
Hillwood	45	
Hiwassee	45	
Hollywood	> 75	2
Holston	45	
Humphreys	30	
Huntington	30	1
Hymon	30	1
Iberia	> 75	4

Soil Series or Phase	Soil Absorption Rate	Note
Ina	45	4
Inman	> 75	3
Iron City	60	
Iuka	30	1
Jeffrey	30	3
Jefferson	30	
Jefferson		
Stoney	15	
Cobbly	15	
Gravelly	15	
Johnsburg	> 75	2
Junaluska	45	5
Keener	45	
Landisburg	> 75	2
Lanton	> 75	1
Lawrence	> 75	2
Lax		
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Leadvale	> 75	2
Lee	30	4
Leesburg	30	
Lehew	30	5
Lewistown	> 75	
Lexington	30	
Lickdale	60	4
Lily	30	5
Lindell	30	1
Lindside	30	1
Linker	30	5
Litz	> 75	3
Lintonia	45	
Lobdell	30	1
Lobelville	30	1
Lomond	45	
Lonewood	60	
Lonon	45	
Loring		
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Lost Cove	30	
Lucy	30	
Luverne	> 75	
Lynnville	45	4
Magnolia	> 75	

Appendix I (continued)
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Manse	30	
Mantachie	45	4
Marsh	45	3
Masada	30	
Matney	30	3
Maury	45	
Maymead	30	
McCamy	30	3
Melvin	45	4
Memphis	45	
Mercer		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Mhoon	60	4
Mimosa	> 75	
Minter	> 75	4
Minvale	45	
Minvale (Cherty)	30	
Morganfield	30	1
Monongahela		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Monteagle	60	3
Montevallo	> 75	3
Morehead	> 75	4
with drainage	75	
Mountview	45	
Muskingum	60	3
Mullins	> 75	4
Muse	> 75	
Natchez	60	
Needmore	> 75	5
Nella	15	
Nesbitt	75	
Neubert	15	1
Newark	30	4
Nixa		
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Noah	75	
Nolichucky	30	
Nolin	30	1
Norene	> 75	4
Northcove	30	
Nugent	<10	1

Soil Series or Phase	Soil Absorption Rate	Note
Oaklimeter	30	1
Ocana	15	1
Ochlochkonee	30	1
Oktibbeha	> 75	
Oliver	> 75	4
Ooltewah	30	1
Opeduon	> 75	3
Openlake	> 75	1
Orrville	30	4
Pace	75	2
Paden		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Pailo	60	
Paraloma		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Pembroke	45	
Perkinsville	45	
Petros	> 75	3
Pettyjon	45	1
Philo	30	1
Pickaway		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Pickwick	60	
Pikeville	45	
Platt	30	
Pope	30	1
Porters	30	5
Potomac	45	1
Prader	45	4
Prentiss		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Providence		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Pruitton	45	1
Pottsville	> 75	3
Purdy	> 75	4
Ramsey	> 75	3
Ranger	45	5
Red Hills	45	5
Reelfoot	60	4

Appendix I (continued)
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Renox	45	
Richland		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Riverby	15	1
Roane	> 75	4
Roanoke	> 75	2
Robertsville	> 75	4
Robinsonville	15	1
Roellen	> 75	2
Rosebloom	45	4
Routon	> 75	2
Russellville		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Ruston	30	
Saffell	30	
Safford	> 75	
Sandhill	15	3
Sango		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Savannah		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Sees	> 75	
Sensabaugh	30	1
Sengtown	60	
Sequatchie	30	1
Sequoia	> 75	
Sewanee	30	1
Shack		2,6
≥ 20 in to fragipan	75	6
< 20 in to fragipan	> 75	
Shady	45	
Shannon	30	1
Shelocta	45	
Sharkey	> 75	4
Shouns	60	
Shubuta	75	
Silerton		
≥ 24 in to clay	75	
< 24 in to clay	> 75	
Skidmore	30	1
Smithdale	30	

Soil Series or Phase	Soil Absorption Rate	Note
Soco	45	5
Solway	> 75	3
Spivey	15	
Staser	30	1
State	30	1
Statler	30	1
Steadman	> 75	4
(with drainage)	75	
Steekee	> 75	3
Steens	75	2
Stemley		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Stiversville	30	
Suches		1
(well drained)	45	
(moderately well drained with subsurface drain)	45	
Sugargrove	45	5
Sulphura	> 75	3
Sullivan	30	1
Sumter	> 75	
Sunlight	> 75	3
Susquehanna	> 75	
Swafford		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Swaim	> 75	
Sweatman	> 75	
Sykes		
Depth to clay ≥ 30 in	60	
Depth to clay 24 - 30 in	75	
Depth to clay < 24 in	> 75	
Sylco	> 75	5
Taft	> 75	2
Talbott	> 75	3
Talladega	> 75	3
Tallant	60	3
Tarklin		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Tasso		
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Tate	30	

Appendix I (continued)
Average Soil Absorption Rates (mpi) for Soil Series and Phases of Soil Series

Soil Series or Phase	Soil Absorption Rate	Note
Teas	> 75	3
Tellico	45	
Tichnor	> 75	4
Tickfaw	> 75	4
Tigrett	30	1
Tilsit		
≥ 24 in to clay	75	2
< 24 in to clay	> 75	2
Tioga	10	1
Tippah		
≥ 24 in to clay	75	
< 24 in to clay	> 75	
Tiptonville	45	1
Toccoa	> 75	1
(with drainage)	30	
Tooterville	> 75	4
Townley	> 75	5
Trace	45	1
Transylvania	15	1
Trappist	> 75	5
Tsali	> 75	5
Tunica	> 75	4
Tate	30	
Tupelo	> 75	2
Tuscumbia	> 75	4
Tusquitee	30	
Tyler	> 75	2
Una	> 75	4
Unaka	30	5

Soil Series or Phase	Soil Absorption Rate	Note
Unicoi	> 75	3
Upshur	> 75	
Urbo	> 75	
Vacherie	> 75	4
Vaiden	> 75	2
Vicksburg	30	1
Wakeland	45	4
Wallen	45	5
Watauga	30	5
Waverly	45	4
Waynesboro	60	
Waynesboro (gravelly)	30	
Weaver	30	1
Wehadkee	45	4
Welchland	15	1
Wellston	75	
Weon	> 75	
Whitesburg	45	1
Whitwell	45	2
Wilcox	> 75	
Wolftever	> 75	2
Woodmont	75	2
Woolper	> 75	
Worthen	30	2
Wynnville		2
≥ 24 in to fragipan	75	
< 24 in to fragipan	> 75	
Zenith	45	5

Notes

1. Flooding or standing water during brief periods of high rainfall makes many areas of these soils unsuitable even though the absorption rate is favorable. Areas protected from flooding or otherwise not subject to flooding may be suitable. These are dominantly well drained and moderately well drained soils along rivers and streams.

2. A seasonally high water table due to position in landscape and/or soil properties make most areas of these soils unsuitable.

3. Depth to bedrock is generally not sufficient to accommodate a septic tank system. There are some spots of these soils with adequate depths.

4. Flooding and / or a seasonally high water table make these soils unsuitable sites for subsurface sewage disposal systems. Areas protected from flooding and / or artificially drained may be suitable.

5. Depth to bedrock is generally sufficient to accommodate a filter field system. There are some spots of these soils with inadequate depths.

6. Depths less than twenty-four (24) inches and equal to or greater than twenty (20) inches shall be used on extra-high intensity soil maps in support of modified mound and drip dispersal consideration only.

Appendix II

SOIL ABSORPTION / PERCOLATION RATES AND CORRESPONDING ABSORPTION AREA REQUIREMENTS

Absorption / Percolation Rate (mpi)	Absorption Area (As Trench Bottom Rates Area)	
	(ft^2/gallon)	(ft^2/bedroom)
10	1.2	165
15	1.4	190
30	2.0	250
45	2.5	300
60	2.9	330
75	3.2	370
80	3.3	380
85	3.4	390
90	3.5	400
95	3.6	415
100	3.7	430
105	3.8	445

NOTE: Round percolation rates to next highest increment of five (5).

NOTE: Trenches of two (2) to three (3) feet in width are preferred. For trenches greater than three (3) feet in width, increase the absorption area by the following factors:

Trench Width	Factor
4 ft	1.33
6 ft	1.50
8 ft	1.60

EXAMPLES:

1. The soil absorption rate is 15 minutes per inch. A factory with a daily flow of 3,000 gallons is to be located on this site.

$$\frac{(3000 \text{ gpd})\left(1.4 \frac{\text{ft}^2}{\text{gallon}}\right)}{2 \text{ ft Trench}} = 2100 \text{ ft}$$

2. The soil absorption rate is 30 minutes per inch. A 4 bedroom house is to be constructed.

$$\frac{\left(250 \frac{\text{ft}^2}{\text{Bedroom}}\right)(4 \text{ Bedrooms})}{3 \text{ ft Trench}} = 333 \text{ ft}$$

NOTE: Flow rates for non-residential establishments shall be based on the memo from Kent D. Taylor to the Division of Ground Water Protection Field Office Managers dated July 8, 1993, regarding expected sewage flow from non-residential establishments.

Appendix III

Friction Loss (ft), Through 100 ft of Schedule 40 PVC Pipe

Flow (gpm)	Pipe Diameter (in) 1	1 1/4	1 1/2	2	3	4	6
1	0.09						
2	0.32	0.09					
3	0.68	0.18	0.08				
4	1.17	0.31	0.14				
5	1.76	0.46	0.22	0.06			
6	2.47	0.65	0.31	0.09			
7	3.28	0.86	0.41	0.12			
8	4.20	1.10	0.52	0.15			
9	5.22	1.37	0.65	0.19			
10	6.35	1.67	0.79	0.23			
11	7.57	1.99	0.94	0.28			
12		2.34	1.10	0.33			
13		2.71	1.28	0.38			
14		3.11	1.47	0.43	0.06		
15		3.54	1.67	0.49	0.07		
16		3.98	1.88	0.56	0.08		
17		4.46	2.10	0.62	0.09		
18		4.95	2.34	0.69	0.10		
19		5.47	2.58	0.77	0.11		
20		6.02	2.84	0.84	0.12		
25			4.29	1.27	0.19		
30			6.02	1.78	0.25	0.07	
35				2.37	0.35	0.09	
40				3.03	0.44	0.12	
45				3.77	0.55	0.15	
50				4.58	0.67	0.18	
60				6.42	0.94	0.25	
70					1.25	0.33	
80					1.60	0.43	0.06
90					1.99	0.53	0.07
100					2.41	0.64	0.09
125					3.65	0 .9 7	0.13
150					6.11	1.36	0.19
175					6.80	1.81	0.25

Flow (gpm)	Pipe Diameter (in) 4	6
200	2.32	0.32
225	2.88	0.39
250	3.50	0.48
275	4.18	0.57
300	4.91	0.67
325	5.69	0.77
350	6.53	0.89
375	7.41	1.01
400		1.14
425		1.27
450		1.41
475		1.56
500		1.72
550		2.05
600		2.40
650		2.79
700		3.20
750		3.63
800		4.09
850		4.58
900		5.09
950		5.63

NOTE: 160 psi pipe is assumed to be SDR 26.
Computed by the Hazen Williams Formula, assuming C = 140:

$$h_f = \frac{0.00113LQ^{1.85}}{D^{4.87}}$$

Where: h_f = Head Loss (ft)
L = Pipe Length
Q = Flow (gpm)
D = Pipe Inside Diameter (in)

Authority: T.C.A. §§ 68-221-401 et seq. and 4-5-201 et seq.

I certify that the information included in this filing is an accurate and complete representation of the intent and scope of rulemaking proposed by the agency.

Date: 2/12/13

Signature: Sandra K. Dudley

Name of Officer: SANDRA K. DUDLEY

Title of Officer: DIRECTOR, WATER RESOURCES

BETH B. SMITH
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY, TENN.
My Commission Expires JULY 6, 2015

Subscribed and sworn to before me on: 2-12-13

Notary Public Signature: Beth B. Smith

My commission expires on: July 6, 2015

Department of State Use Only

Filed with the Department of State on: 2/13/13

Tre Hargett
Secretary of State

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