Contra Costa County

HEALTH OFFICER REGULATIONS

FOR SEWAGE COLLECTION AND DISPOSAL

(Contra Costa County Ord. Code § 420-6.606)

Proposed by the Contra Costa County Health Officer

Chris Farnitano, M.D.

8/23/18
Date

Adopted by the Contra Costa County Board of Supervisors
on September 11, 2018

Effective Date: October 11, 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

SECTION 100: GENERAL

101. Purpose. The purpose of these Health Officer Regulations for Sewage Collection and Disposal ("Regulations") is to set forth standards and specifications for the siting, design and construction of onsite wastewater treatment systems, the monitoring of alternative onsite wastewater treatment systems, the review of building permit applications and subdivision maps, the design, installation and use of sewage collection systems, the abandonment of sewage disposal systems and sewage collection systems, and septic tank-chemical toilet cleaners. These Regulations are intended to protect public health and safety and the environment by preventing the creation of health hazards, nuisance conditions and degradation of surface and groundwater quality.

102. Prior Regulations and Policies. As of the effective date, these Regulations supersede the Contra Costa County Individual System Regulations adopted by the health officer and filed with the Clerk of the Board of Supervisors on October 3, 2000. Any and all health officer regulations, policies, moratoriums, guidelines or other authorities that pertain to the subject matter of these Regulations, and were issued by or on behalf of the health officer prior to the effective date of these Regulations, are repealed and of no further force or effect.

103. Effective Date. These Regulations are effective as of the effective date of Contra Costa County Ordinance No. 2018-25.

104. Definitions. The definitions below and in Chapter 420-6 of the Contra Costa County Ordinance Code will be used to interpret these Regulations:

Anticipated highest seasonal level of groundwater: The highest elevation to which the groundwater may be expected to rise, as determined by soil mottling or other soil conditions or in accordance with Subsection 306.A. of these Regulations.

Authorized supplemental treatment unit: A supplemental treatment unit identified in Subsection 501.A. of these Regulations.

Bedroom: Any room in a dwelling that is at least 70 square feet in area, has an exterior window, is designed to furnish the minimum isolation necessary for use as a sleeping area, and is not a kitchen, living room, bathroom, hallway or closet.

Design daily sewage flow: The maximum volume of sewage that a sewage disposal system is designed to receive in a 24-hour period.

Effective depth: The depth below the invert of a distribution pipe or the height of the louvered sidewalls of chambers in a trench.

Expansive soil: Soil that has a clay content by weight of 15 percent or more that causes the soil to shrink or swell with changes in moisture content, and exhibits cracks when dry.

High-strength wastewater: Wastewater having a 30-day average concentration of biochemical oxygen demand greater than 300 milligrams per liter (mg/L) or of total suspended solids greater than 330 mg/L or a fat, oil and grease concentration greater than 100 mg/L prior to the septic tank or other onsite wastewater treatment system component.

Impermeable soil: Soil that is not permeable soil.

Imported fill: Non-native soil that is placed on top of the site of a disposal field for the purpose of raising the level of the ground.

Inspection well: A well installed in a disposal field that collects effluent for the purpose of observation and sampling.

Linear loading rate: The loading rate per linear foot of a distribution pipe or line, expressed as gallons per day per linear foot.

Loamy soil: Soil that has a clay content of more than 15 percent and less than or equal to 30 percent by weight and is not expansive soil.

Low shrink/swell soil: Soil that has a clay content of 15 percent or less by weight.

Monitoring well: An inspection well or performance well.

Native soil: Soil that is naturally occurring in an area.

Natural grade: The naturally occurring surface of the ground.

Ordinance: Chapter 420-6 of the Contra Costa County Ordinance Code, as amended by County Ordinance No. 2018-25, and as may be further amended from time to time.

Peak daily sewage flow: The maximum volume of sewage that a sewage disposal system is projected to receive in a 24-hour period.

Performance well: A well installed outside the perimeter of a disposal field that collects water or effluent for the purpose of observation and sampling.

Permeable soil: Soil with a percolation rate within the specified percolation rate range for the proposed disposal field.

Properly functioning: As applied to a sewage collection or disposal system, “properly functioning” means functioning as designed and not allowing sewage to escape to the surface of the ground.

Public water well: A groundwater well serving a public water system.

Public water system: A water system regulated by the California Department of Public Health or a local primacy agency pursuant to Section 116275, subdivision (h), of the California Health and Safety Code, as may be amended from time to time.

Qualified inspector: A California-licensed civil engineer, California-registered environmental health specialist, California-licensed plumbing contractor, or person who has been issued a certificate by the National Association of Wastewater Technicians upon completion of an onsite wastewater treatment system inspector course or an onsite wastewater treatment systems operations and maintenance course.

Qualified professional: A civil engineer, environmental health specialist, geologist, professional soil scientist, or engineering geologist, who is licensed, registered or certified by the State of California.

Replacement onsite wastewater treatment system: An onsite wastewater treatment system that has its treatment capacity expanded, or its disposal field replaced or added onto, after the effective date of these Regulations.

Soil: A natural material resulting from the weathering of rock that is one of the classes of soil identified in the U.S. Department of Agriculture soil texture classification triangle.

Seasonal normal precipitation: The average precipitation over a 30-year period for a geographic area as determined by available historical data.

Wastewater loading rate: A volume of wastewater per unit of area per unit of time, expressed as gallons per day per square foot; also known as the hydraulic loading rate.

Wet weather period: A period of time between January 1 and April 30 that follows either (1) 10 inches of rain in a 30-day period or (2) at least half of the area's seasonal normal precipitation.

SECTION 200: SITE CRITERIA

201. General. The disposal field of an onsite wastewater treatment system may be constructed only in native soil naturally deposited at the site where the disposal field will be constructed. Modifying, cutting, benching or altering a site in a manner that would change the slope of the site will render it unsuitable for construction of a disposal field.

202. Setbacks. Tanks, disposal fields and transport lines proposed for use in an onsite wastewater treatment system must be located no closer to specified features than the horizontal setback distances set forth in **Appendix 1**, attached hereto and incorporated herein, unless an applicable exception applies.

203. Depth to Groundwater. Except as otherwise provided in Subsection 405.B. of these Regulations, the minimum depth to the anticipated highest seasonal level of groundwater below the bottom of a disposal field trench is based on the percolation rate of the soil in which the trench is located, in accordance with Table 1 below.

Table 1

Depth to Groundwater

Percolation Rate (MPI)	Minimum Depth High Groundwater (Feet)
$1<x\leq5$	20
$5<x\leq30$	8
$30<x\leq120$	5

MPI = minutes per inch
x = percolation rate of the site of the proposed disposal field

204. Natural Ground Slope. The maximum natural slope of the site of a disposal field is 30 percent.

205. Soil Depth.

A. Except as otherwise provided in Subsection 405.B. of these Regulations, the minimum depth of permeable soil below the bottom of a disposal field trench is 3 feet.

B. Soil depth is measured vertically to the point where bedrock (fractured or solid), impermeable soil, saturated soil, excessive rock content (more than 50 percent) or other limiting condition is encountered.

206. Percolation Rate.

A. The percolation rate of soil in a disposal field or reserve area is no faster than 1 minute per inch ("MPI") and no slower than 120 MPI.

B. Percolation rates are determined in accordance with testing procedures outlined in Section 305 of these Regulations.

SECTION 300: SITE EVALUATIONS

301. General. A site upon which construction of onsite wastewater treatment system is proposed must first be evaluated in accordance with this Section 300. Except as provided in Section 302 of these Regulations, site evaluations must be performed by or under the supervision of a qualified professional.

302. Soil Stability Evaluation. If the slope of a proposed disposal field site exceeds 20 percent, a registered civil engineer or certified engineering geologist must evaluate the soil stability at the site and prepare and submit a written geological report to the health officer prior to the commencement of any percolation testing to be observed by the health officer. The report must demonstrate that the discharge of effluent into the proposed disposal field will not, or is not likely to, affect soil stability or create a public nuisance.

303. Soil Profile Evaluation.

A. Soil Profile Hole Standards.

1. Number/location. At least one soil profile hole must be excavated in each proposed disposal field and reserve area.

2. Dimensions.

a. Depth. A soil profile hole must be excavated to a depth that is sufficient to demonstrate the presence of the minimum groundwater and soil depths required for the proposed disposal field, as set forth in Sections 203, 205 and Subsection 405.B. of these Regulations.

b. Width. A soil profile hole must be sufficiently wide to allow direct inspection of the entire soil profile.

B. Procedures.

1. Request for inspection. All soil profile holes must be inspected in the presence of the health officer. A written request for inspection of the soil profile must be submitted to the health officer at least 48 hours before the inspection.

2. Evaluation by qualified professional. The qualified professional must evaluate the soil by direct inspection of the soil in the soil profile hole and look for all of the following, or evidence thereof:

a. The thickness, depth and texture of soil layers encountered, and the classification of the soil under the U.S. Department of Agriculture soil texture classification system;

b. The depth to bedrock, impermeable soil layer, excessive rock content or other limiting layer;

c. The depths to soil mottling and gleying;

d. The anticipated highest seasonal level of groundwater; and

e. Other conditions affecting the potential use of the soil on the site for sewage disposal, including, but not limited to, roots, fissures, dampness, consistence, texture, structure, pores and rock content.

C. Reports. A written report that sets forth the findings of the qualified professional regarding the conditions described in Subsection 303.B.2. of these Regulations must be submitted to the health officer prior to the commencement of any percolation testing to be observed by the health officer.

D. Disputes. If the health officer disputes a determination by a qualified professional as to the anticipated highest seasonal level of groundwater based on soil mottling or other soil conditions, the qualified professional must evaluate the groundwater level at a site in accordance with Subsection 306.A. of these Regulations.

304. Soil Morphology Testing.

A. Requirements. In the event that the health officer disputes the conclusion of a qualified professional as to the classification of soil evaluated, the soil must be evaluated based on all of the following: (1) Hydrometer analysis of soil texture; (2) plasticity index; and (3) bulk density.

B. Reports. Laboratory reports of soil morphology tests must be submitted to the health officer prior to the commencement of any percolation testing to be observed by the health officer.

305. Soil Percolation Testing.

A. Test Hole Standards.

1. Number. Three test holes are required around each soil profile hole.

2. Location. A test hole must be located in the area of the proposed disposal field or reserve area, within 25 feet of a soil profile hole and no more than 25 feet from each other test hole.

3. Dimensions.

a. General. A test hole must be 6 inches to 12 inches in diameter and, except as provided below in Subsections 305.3.b.-e. of these Regulations, have a depth equal to the depth of the proposed disposal field trench(es).

b. Mounds. If a mound is proposed, test holes must have a depth of 12 inches to 24 inches.

c. At-grade beds. If an at-grade bed is proposed, test holes must be at least 12 inches in depth, and the deepest hole must have a minimum 6-inch vertical separation from a limiting layer.

d. Dripfields. If a dripfield is proposed, test holes must have a depth of 12 inches to 24 inches.

e. Pressure-dosed shallow trenches. If a pressure-dosed shallow trench is proposed, test holes must be a minimum of:

(1) 24 inches deep on slopes less than 20 percent;

(2) 30 inches deep on slopes of 20 percent to 25 percent; and

(3) 36 inches deep on slopes greater than 25 percent.

B. Construction of Test Holes. Test holes must be constructed as follows:

1. Dig the test holes and scarify the bottoms and sidewalls of the test holes with a sharp pointed instrument to remove any smeared soil surfaces.

2. Remove loose material from the bottom of the hole and add two inches of clean pea gravel to protect the bottom infiltrative surface from scouring and sedimentation.

3. Place a perforated pipe in the center of the hole and pack gravel in the annular space located between the pipe and the test hole sidewalls from the bottom of the pipe to the natural grade.

4. Mound a portion of the soil excavated from the test hole around the test hole on the ground surface to prevent surface water runoff from entering the hole.

C. Presoaking. Presoaking is required before all percolation tests. Each hole must be filled with water to a point that is at least 12 inches over the top of the gravel at the bottom of the hole, below the perforated pipe. Except as otherwise provided in Subsection 306.B. of these Regulations, the water must be maintained at this level for at least four hours.

D. Testing Procedures.

1. Request for inspection. Percolation testing must be performed in the presence of the health officer. A written request for inspection of the testing must be submitted to the health officer at least 48 hours before commencement of presoaking activities.

2. Commencement of testing.

a. If the soil profile evaluation conducted under Section 303 of these Regulations or a soil morphology test conducted under Section 304 of these Regulations demonstrates the presence of low shrink/swell soil in the area of the proposed disposal field or reserve area, testing may commence immediately after the presoaking.

b. If the soil profile evaluation conducted under Section 303 of these Regulations or a soil morphology test conducted under Section 304 of these Regulations demonstrates the presence of loamy soil in the area of the proposed disposal field or reserve area, testing must commence the day after and within 24 hours of the presoaking.

c. All other testing must commence in accordance with Section 306.B. of these Regulations.

3. Protocol. Testing must be conducted in all test holes in accordance with the following protocol:

a. Determine a time interval and testing period. A time interval of 5 to 10 minutes for a minimum of two hours is acceptable for sandy soils. A time interval of 30 minutes for a minimum of four hours is required for other soils. The time interval for the test must remain constant throughout the test so that it can be determined when the water level drop rate has stabilized.

b. Fill each hole with clean water to a point that is 6 to 12 inches above the gravel below the bottom of the pipe.

c. With a float gauge or secure fixed reference, measure the initial water level in each hole and record the level on the start line for that hole on the test data sheet. Use a timepiece to determine when the designated time interval has elapsed and then measure the water level. Record the level and number of minutes that have elapsed since the last measurement on the test data sheet.

d. Immediately refill the hole and repeat the process described in Subsection 305.D.3.c. of these Regulations until the end of the testing period or until subsequent measurements indicate a stabilized rate has been obtained (i.e., two consecutive rates are within 10 percent of each other).

e. If the percolation rate for a test hole is different by more than 20 MPI from the percolation rate for any other test hole in the area being tested, the health officer may require an additional test hole to be dug and percolation testing to be conducted in that hole.

E. Calculations.

1. Test hole rate. A percolation rate must be calculated for each test hole. The percolation rate for each hole must be calculated by dividing the last time interval measurement

by the last water drop measurement. If the percolation rate for a hole is in the range of 1 MPI to 120 MPI, the percolation test in that hole is considered a passing test.

2. Disposal field percolation rate. A percolation rate must be calculated for the area of a proposed disposal field or reserve area as follows:

a. If the percolation rates resulting from each passing test in at least three holes of the same depth in the area are within 20 MPI of each other, the sum of those rates is divided by the number of passing tests in those holes. The resulting average percolation rate is the percolation rate of soil in the area tested.

b. If the percolation rate resulting from one of the passing tests is different by more than 20 MPI from any of the percolation rates resulting from the other passing tests, and an average percolation rate cannot be calculated in accordance with Subsection 305.E.2.a. of these Regulations, the slowest percolation rate resulting from the passing tests in the area is considered the percolation rate of soil in the area tested.

c. Except for percolation rates less than 1 MPI or greater than 120 MPI, percolation rates calculated under Subsection 305.E.2. of these Regulations must be rounded to the nearest whole number for the purpose of calculating wastewater loading rates.

F. Reports.

1. Format. Percolation test results must be reported on percolation test data sheets. Percolation rates are expressed in minutes per inch. Percolation test data sheets must be signed by the individual who conducted the test.

2. Submission. Reports of percolation test results must be submitted to the health officer in accordance with applicable requirements in Section 600 and Section 700 of these Regulations.

3. Expiration. Provided that the soil in the location of the percolation tests is not disturbed after the testing, percolation test results are valid for five years.

306. Wet Weather Period Evaluations.

A. Groundwater Level Evaluation.

1. Direct observation procedures.

a. Inspection by health officer; request for inspection. Except as provided in Subsection 306.A.2. of these Regulations, the anticipated highest seasonal level of groundwater at the site of a proposed disposal field must be evaluated by direct observation in a wet weather period in the presence of the health officer. A written request for inspection of groundwater level observations must be submitted to the health officer at least 48 hours before commencement of the testing.

b. Protocol. The groundwater level must be observed on three separate days. There must be an interval of at least seven days between observations. The highest of the three levels is considered the anticipated highest seasonal level of groundwater in the area.

2. Historical data. During the period commencing May 1 and ending December 31, the anticipated highest seasonal level of groundwater at the site of a proposed disposal field may be determined based on direct observations of groundwater levels by qualified professionals at other sites in the presence of the health officer in a wet weather period within the previous three calendar years. The highest of at least three groundwater level observations at other sites is deemed to be the anticipated highest seasonal level of groundwater at the site of the proposed disposal field if:

a. There has been no wet weather period during the calendar year;

b. The groundwater level direct observation locations on the other sites are within 1,000 feet of the site of the proposed disposal field;

c. The applicant submits written documentation of the groundwater level direct observations at the other sites; and

d. The health officer determines the written documentation to be reliable.

B. Percolation Testing.

1. General. Except as provided in Subsection 306.B.2. of these Regulations, if the soil profile evaluation conducted under Section 303 of these Regulations or a soil morphology test conducted under Section 304 of these Regulations demonstrates the presence of expansive soil, percolation testing must be conducted in a wet weather period.

2. Exception. If percolation testing cannot be conducted in a wet weather period due to weather conditions, percolation testing may be conducted on any date if the test holes have been presoaked for at least 24 hours, and the testing takes place between 24 hours and 48 hours after the presoaking.

SECTION 400: DESIGN OF ONSITE WASTEWATER TREATMENT SYSTEMS

401. Design Daily Sewage Flows.

A. **Residential Dwellings.** The design daily sewage flow of an onsite wastewater treatment system that will serve a residential dwelling is calculated by multiplying 150 gallons by the number of bedrooms in the dwelling.

B. Non-Residential Structures. The design daily sewage flow of an onsite wastewater treatment system that will serve a non-residential structure must be determined in accordance with **Appendix 2**, attached hereto and incorporated herein.

402. Septic Tanks.

A. Size. The minimum septic tank capacity below the invert of the outlet pipe is as follows:

1. Single family residential dwellings. If a single family residential dwelling has one or two bedrooms, the minimum capacity of a septic tank in an onsite wastewater treatment system that will serve the dwelling is 1,000 gallons. For single family residential dwellings with three or more bedrooms, the minimum septic tank capacity is 1,000 gallons for the first two bedrooms and 250 gallons for each additional bedroom.

2. Other structures. In an onsite wastewater treatment system that will serve a structure other than a single-family residential dwelling, the minimum septic tank capacity is calculated by multiplying the peak daily sewage flow of the structure by .75 and adding 1,125 gallons.

B. Compartments. Except as set forth below, the septic tank must have two compartments. The first compartment must have twice the capacity of the second compartment. The compartments must be separated from each other by a baffle.

C. Effluent Filter. The septic tank's outlet pipe must be fitted with a corrosion-resistant effluent filter. The filter must be removable for cleaning and be designed to remove solids greater than 3/16ths of an inch in diameter and conform to NSF International/American National Standards Institute (NSF/ANSI) Standard 46 to the extent applicable to effluent filters.

D. Material. The septic tank must be watertight and IAPMO (International Association of Plumbing and Mechanical Officials) certified. In areas to be surfaced by concrete, asphalt or similar paving, or subject to vehicular traffic, the tank must be traffic-rated.

E. Access Risers. A waterproof access riser with a gastight lid and seal must extend from the manhole of each tank compartment to the finished grade. Except as follows, the riser must be constructed of polyethylene, have a minimum diameter of 24 inches and be of a size sufficient for the tank manhole. In areas to be surfaced by concrete, asphalt or similar paving, or subject to vehicular traffic, access risers must be traffic rated.

F. Soil Cover. A minimum of 12 inches of soil cover must be placed on top of a septic tank. The top layer of the soil cover must be level with the natural grade.

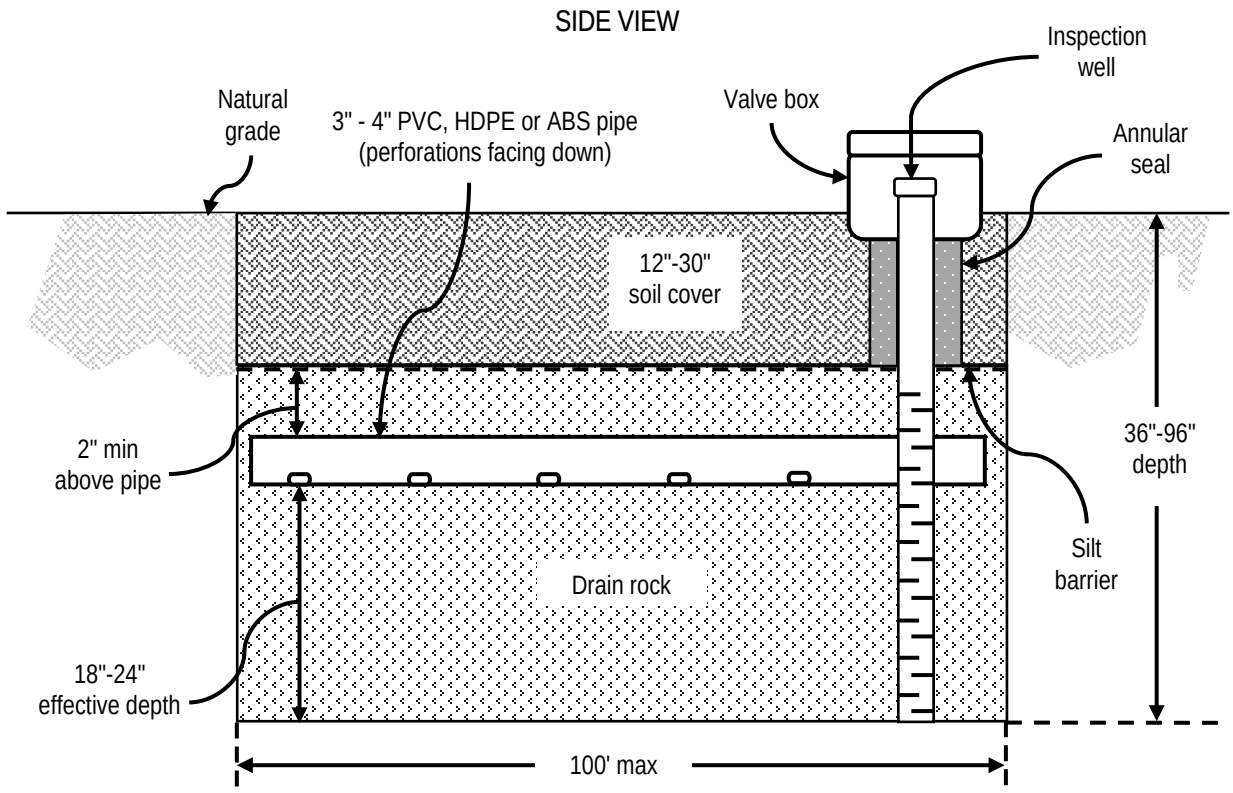
403. Transport Lines. Transport lines utilized in an onsite wastewater treatment system, and the fittings connected thereto, must be Schedule 40 polyvinyl chloride (PVC) pipe and Schedule 40 PVC connection fittings, respectively. Transport lines must be sized to meet pumping and effluent flow requirements while minimizing friction losses. Friction loss is determined in accordance with the October 1980 U.S. Environmental Protection Agency Onsite Wastewater Treatment and Disposal Systems Design Manual, Table 7-14.

404. Standard Disposal Fields.

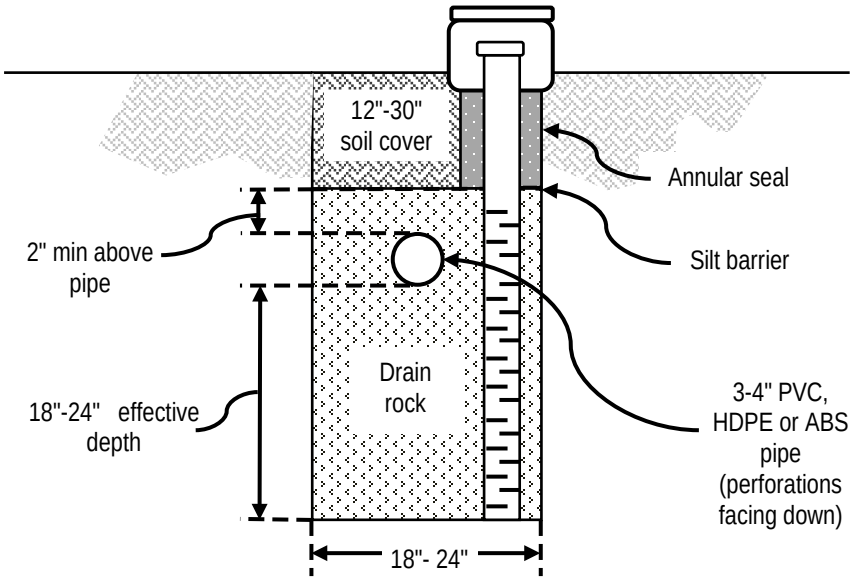
A. General. A standard disposal field is a disposal field with one or more standard trenches and a gravity distribution system. The design of a standard disposal field must conform to all applicable specifications in this Subsection 404. Design features of a standard trench are shown in Figure 1 below.

B. Wastewater Loading Rate. Disposal fields and reserve areas must be sized based on the applicable wastewater loading rate. Except as otherwise provided in these Regulations, the wastewater loading rate is determined based on the percolation rate calculated for the area of the disposal field or reserve area, in accordance with **Appendix 3**, attached hereto and incorporated herein.

C. Area. The minimum absorption area of a standard disposal field is determined by dividing the design daily sewage flow rate by the applicable wastewater loading rate set forth in Appendix 3.



The bottom of the trench will be level to within a tolerance of 3 inches in 100 feet



STANDARD TRENCH CROSS-SECTION DETAILS
(Not to Scale)

Figure 1

D. Standard Trench Dimensions.

1. Depth. The minimum and maximum depths of a standard trench are 36 inches and 96 inches, respectively. The minimum effective depth of a standard trench is 18 inches or, if chambers are used, the height of the louvered sidewalls of the chambers.

2. Width. The minimum and maximum widths of a standard trench are 18 inches and 24 inches, respectively. If chambers are used, the maximum width is 36 inches.

3. Length. The maximum length of a single standard trench is 100 feet. The required length of trench is determined by dividing the minimum absorption area of the disposal field by twice the effective depth of the trench.

4. Spacing. In standard disposal fields that have more than one trench, the minimum spacing between the centers of two trenches is twice the effective trench depth plus an additional 12 inches for each 5 percent of disposal field area slope that exceeds 20 percent. The minimum space between the centers of two trenches is 72 inches measured center to center or, if the trenches are wider than 24 inches, measured edge to edge.

5. Bottom. The trench bottom must be level to within a tolerance of 3 inches in 100 feet and installed on contour.

E. Drain Media.

1. General. Drain media must be installed in a standard trench in accordance with the following requirements. Drain media must be drain rock, bundled expanded polystyrene ("EPS") or chambers. Drain rock may be installed in any standard trench. Bundled EPS and chambers may be installed only on sites that are level or have slopes of 20 percent or less.

2. Materials.

a. Drain rock. Drain rock must be 3/4-inch to 2-inch diameter stone aggregate, double-washed with less than one percent by volume of fines (materials passing through the number 100 mesh).

b. Bundled EPS. Bundled EPS must be IAPMO-certified.

c. Chambers. Chambers must be IAPMO-certified.

3. Depth.

a. Drain rock. Drain rock must extend from the bottom of a trench to at least 2 inches above the top of the distribution pipe. There must be a minimum of 18 inches and a maximum of 24 inches of drain rock below the invert of the distribution pipe.

b. Bundled EPS. The EPS must extend from the bottom of a trench to at least 2 inches above the top of the distribution pipe. There must be a minimum of 18 inches and a maximum of 24 inches of EPS below the invert of the distribution pipe.

c. Chambers. A single layer of chambers must be placed on the bottom of the trench.

F. Gravity Distribution System.

1. Distribution box. Except as otherwise provided in Section 502 if applicable, in standard disposal fields that have more than one trench, a concrete or high-density polyethylene (HDPE) distribution box must be installed between the septic tank and the disposal trenches for the receipt of effluent from the septic tank and discharge to the trenches. Distribution boxes must be separated from each disposal trench by a minimum of 5 feet.

2. Distribution pipe.

a. Material. Distribution pipe for drain rock and chambers must be 3-inch or 4-inch (inside diameter) rigid PVC, HDPE or acrylonitrile butadiene styrene (ABS) perforated pipe with a minimum crushing strength of 1,500 pounds per square inch. Corrugated pipe is not permitted except as installed by the manufacturer in bundled EPS.

b. Length. The maximum length of a single distribution pipe is 100 feet. A single distribution pipe must extend the full length of a trench.

c. Placement. Distribution pipe must be on contour and level to within a tolerance of 3 inches in 100 feet. Orifices must face the bottom of the trench. If chambers are used, distribution pipe must be suspended inside the top of the chambers.

G. Silt Barrier.

1. General. A silt barrier must be placed on top of drain rock and bundled EPS. A silt barrier must be placed on top of chambers if the health officer determines that soil would otherwise infiltrate into the chambers.

2. Material. The silt barrier must be filter fabric, made of polyester, nylon or polypropylene, or any combination thereof, suitable for underdrain applications. Filter fabric must be permeable and non-woven and not act as a wicking agent.

H. Soil Cover.

1. General. Cover material must be placed on top of the silt barrier or, if chambers are used, on top of the chambers. The top of the cover material must be level with the natural grade.

2. Material. Cover material must be native soil or any medium, loamy-textured soil.

3. Depth. Minimum cover depths are determined based on the slope of the disposal field, in accordance with Table 2 below.

Table 2 Standard Disposal Field Cover Requirements	
Disposal Field Slope %	Minimum Cover Depth (Inches)
0≤x≤10	12
10<x≤15	18
15<x≤20	24
20<x≤30	30

x=slope of disposal field

I. Monitoring Wells.

1. General. An inspection well must be installed inside each trench, at the end farthest from the distribution box that serves the trench, for the purpose of monitoring groundwater levels and water quality sampling within the disposal field.

2. Materials. Inspection wells must be constructed of 2-inch to 4-inch diameter perforated pipe, equipped with a top cap or pipe plug. Perforations consisting of hacksaw slots at nominal 1-inch spacing must begin at the top of the drain media and extend to the bottom of the pipe. The top of an inspection well must be covered with a minimum 8-inch valve box. An inspection well must be sealed where it contacts the soil cover material with a bentonite or concrete annular seal to prevent surface infiltration.

3. Depth. An inspection well must extend from the bottom of a trench up to or above the surface of the natural grade.

405. Non-Standard Disposal Fields.

A. General. An onsite wastewater treatment system may utilize an authorized non-standard disposal field. Non-standard disposal fields utilize imported fill or contain dispersal systems other than standard trenches. Authorized non-standard disposal fields include all of the following:

1. Disposal field with mound. A mound contains a body of sand, gravel distribution bed, distribution pipes, a silt barrier and cover and is constructed on top of the natural grade. A mound is typically used on sites characterized by limited site and soil conditions, such as high groundwater, slow percolation at standard disposal field depths, and shallow soil over fractured rock, coarse alluvium, impermeable soil or bedrock. See Figure 2 below for design features of a typical mound.

2. Disposal field with at-grade bed. An at-grade bed contains a gravel distribution bed, distribution pipes, a silt barrier and cover and is constructed on top of the natural grade. An at-grade system is typically used on sites characterized by limited site and soil conditions, such as high groundwater, slow percolation at standard disposal field depths, and shallow soil over fractured rock, coarse alluvium, impermeable soil or bedrock. See Figure 3 below for design features of a typical at-grade bed.

3. Dripfield. A dripfield contains a subsurface drip dispersal system, which includes flexible distribution tubing with emitters in shallow disposal trenches. A dripfield is typically used on sites with high groundwater, steep slopes, or shallow soil over fractured rock, coarse alluvium, impermeable soil or bedrock. A dripfield must be preceded by an authorized supplemental treatment unit.

4. Disposal field with pressure-dosed trench. A pressure-dosed trench is similar to a standard trench except that it is configured for pressure distribution, and has different cover requirements. Pressure-dosed disposal trenches are typically used on sloped areas. See Figure 4 below for design features of a typical pressure-dosed trench.

5. Disposal field with pressure-dosed sand trench. A pressure-dosed sand trench is configured for pressure-distribution, but unlike a pressure-dosed disposal trench, has a layer of sand at the base of the trench and other distinguishing design criteria. Pressure-dosed sand trenches are typically used in areas of rapid soil percolation, such as sandy or rocky soils. See Figure 5 below for design features of a typical pressure-dosed sand trench.

6. Disposal field with pressure-dosed shallow trench. A pressure-dosed shallow trench is similar to a standard trench except that the trench is shallower and configured for pressure distribution. Pressure-dosed shallow trenches are typically used in areas that have shallow topsoil over slowly permeable or fractured subsurface soils.

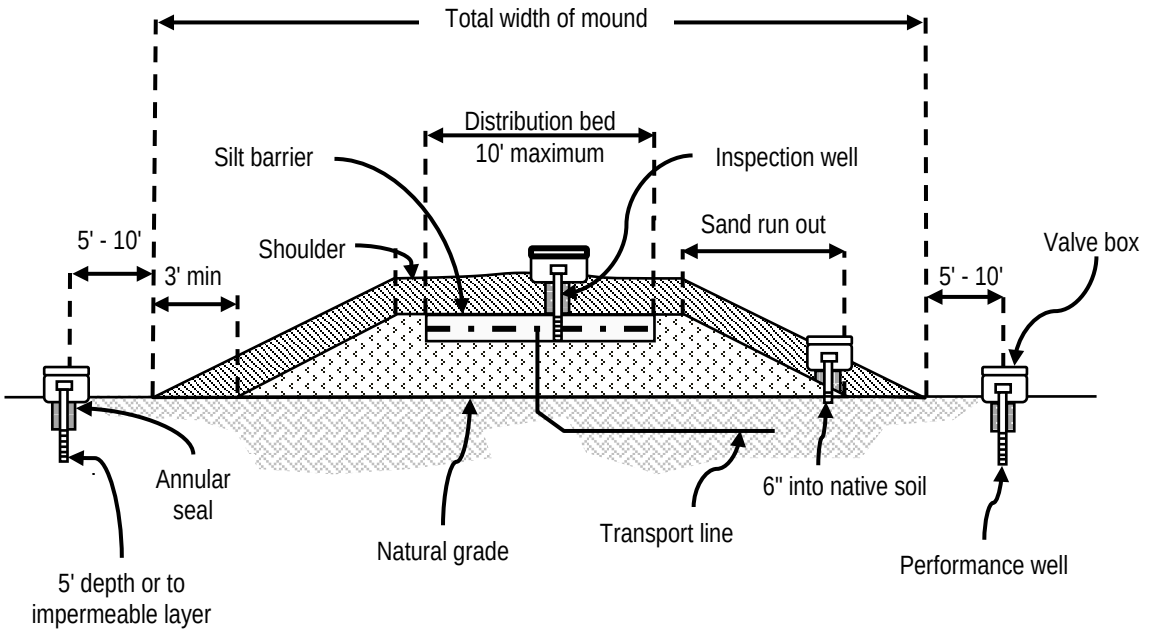
7. Disposal field with imported fill. A disposal field with imported fill is a disposal field that utilizes imported fill, which is placed on top of the natural grade prior to trench excavation in order to achieve a minimum required soil depth. Imported fill is typically used on sites with high groundwater. See Figure 6 below for design features of a standard trench constructed with imported fill.

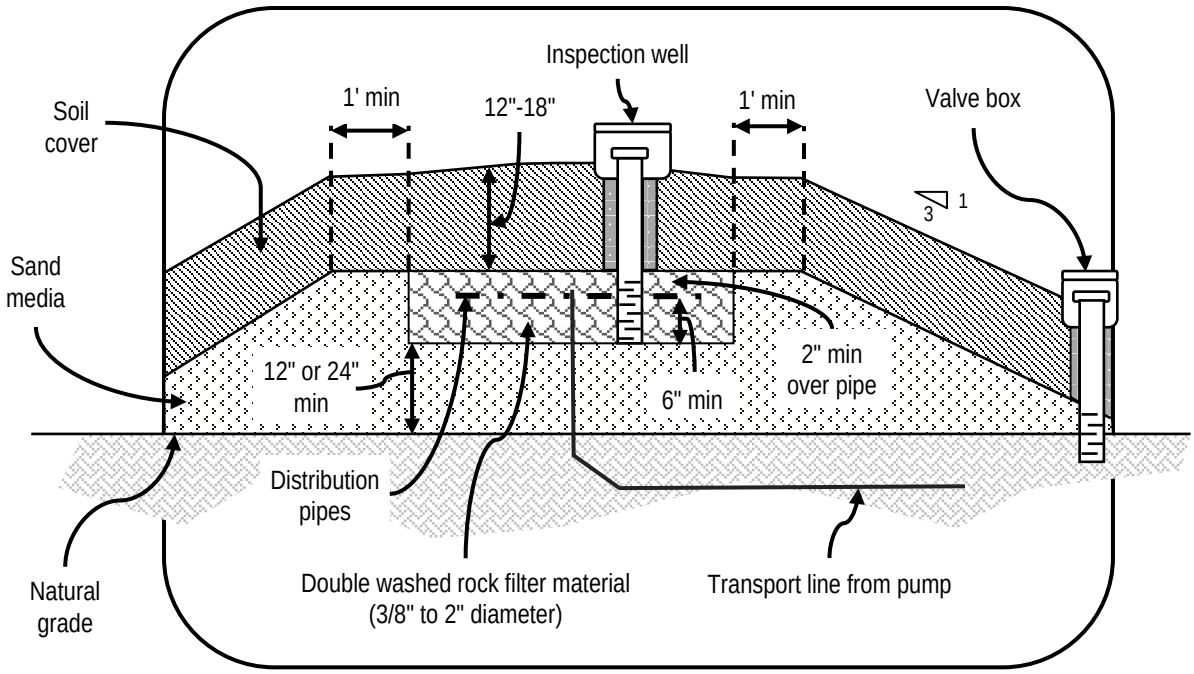
B. Site Criteria.

1. Disposal field with mound.

a. General. A disposal field containing a mound may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations and the site criteria in this Subsection 405.B.1., except that in the event specifications conflict, the specification this Subsection 405.B.1. will control.

END VIEW

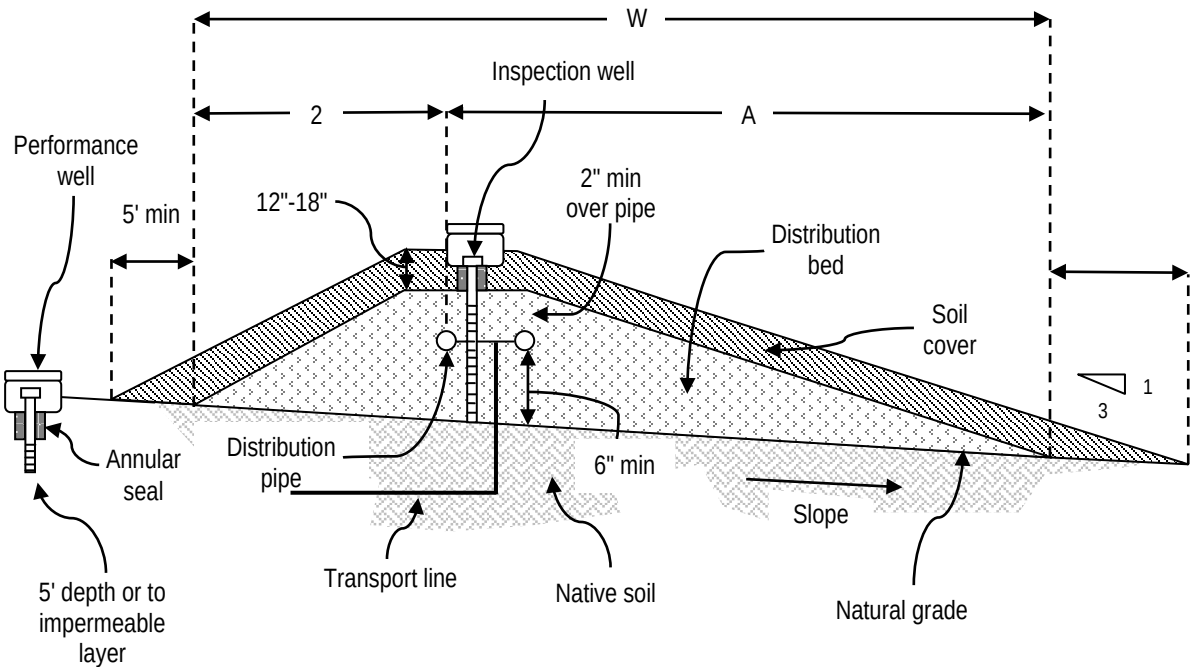




MOUND CROSS-SECTION DETAILS (Level Sites)
(Not to Scale)

Figure 2

END VIEW

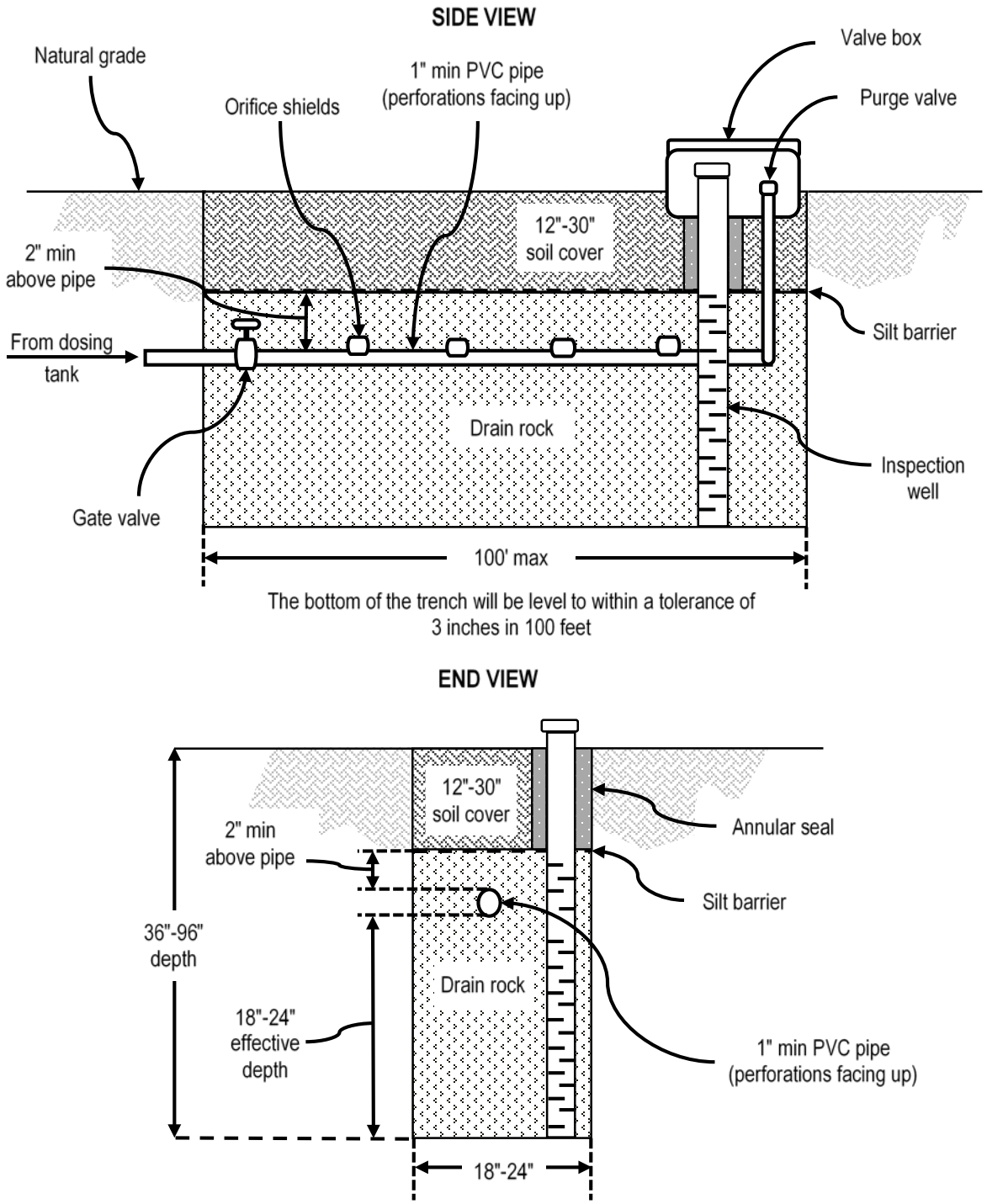


DIMENSIONS

A = Effective width of distribution bed
W = Total width of distribution bed

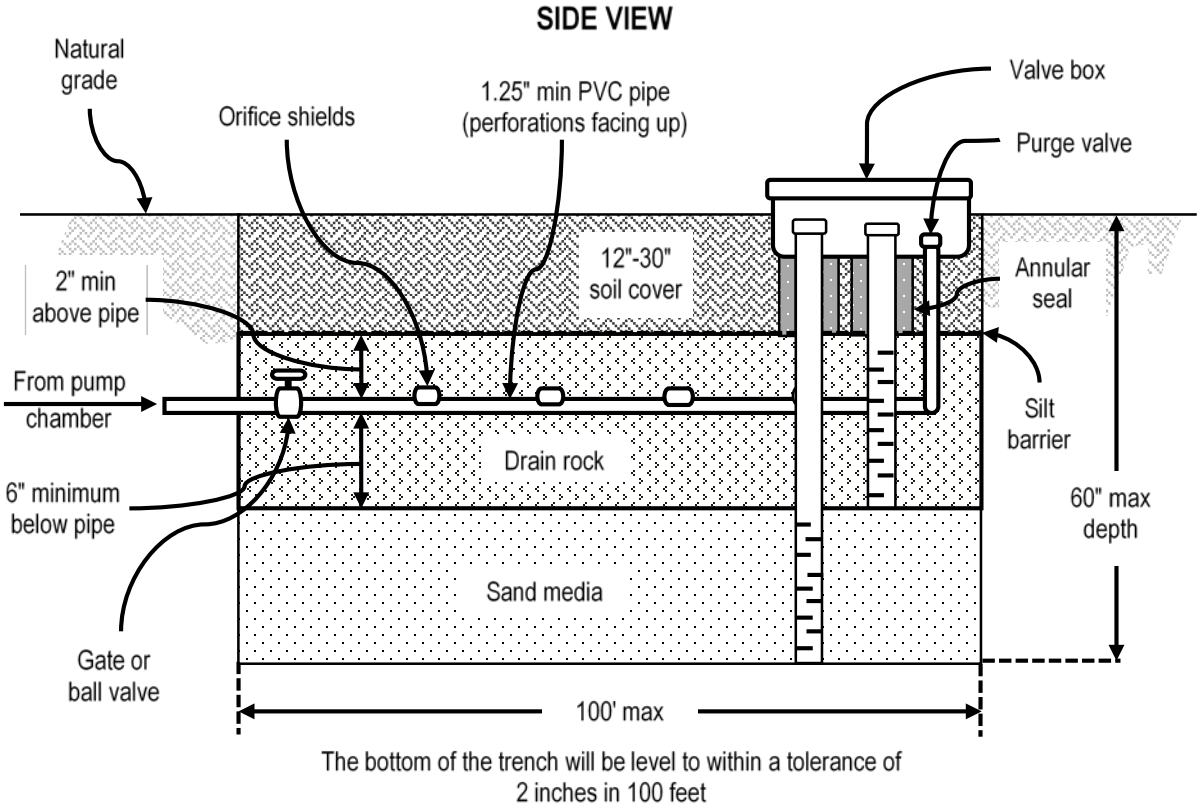
AT-GRADE BED CROSS-SECTION DETAILS
(Not to Scale)

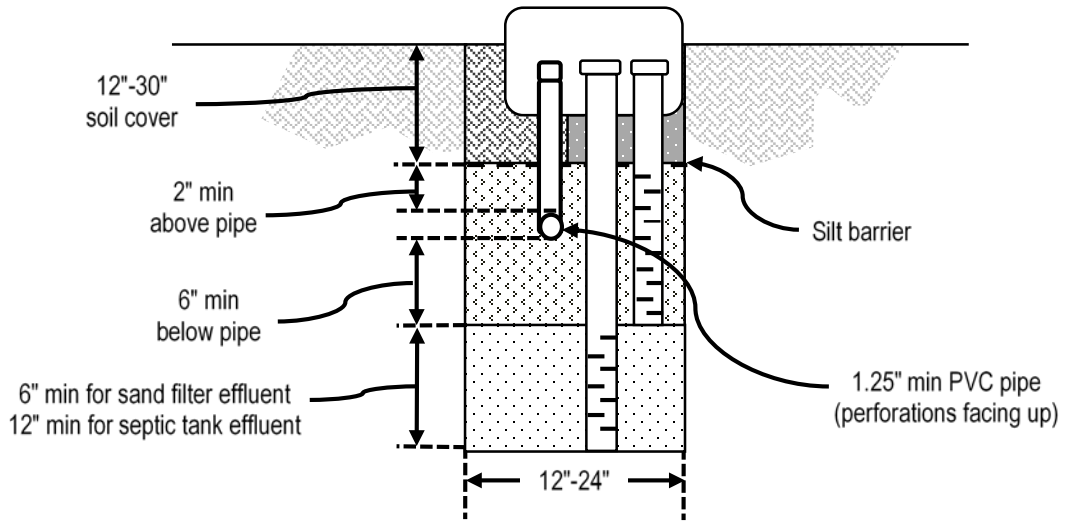
Figure 3



PRESSURE-DOSED TRENCH CROSS-SECTION DETAILS
(Not to Scale)

Figure 4



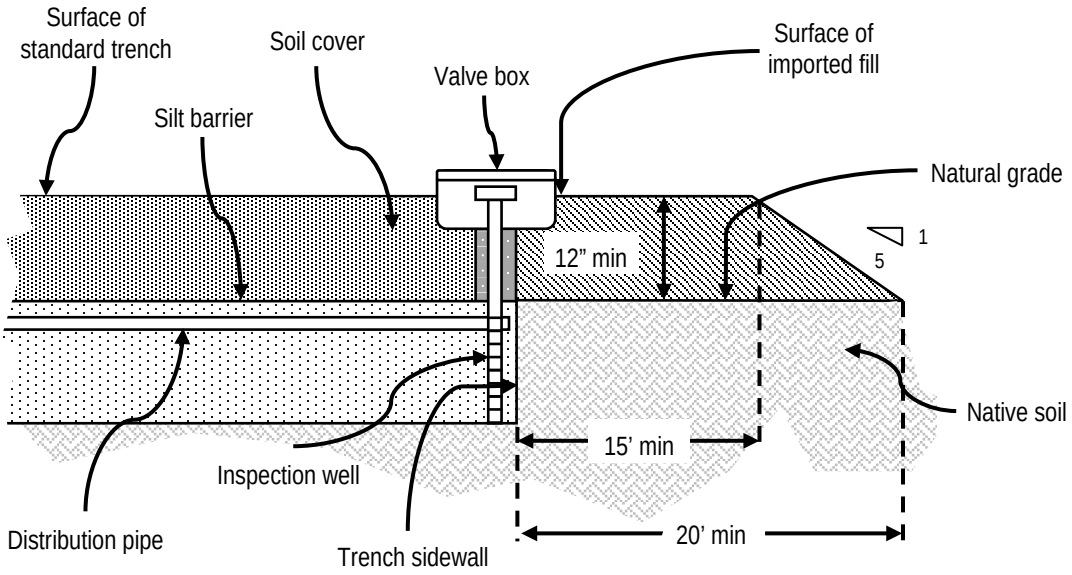


PRESSURE-DOSED SAND TRENCH CROSS-SECTION DETAILS

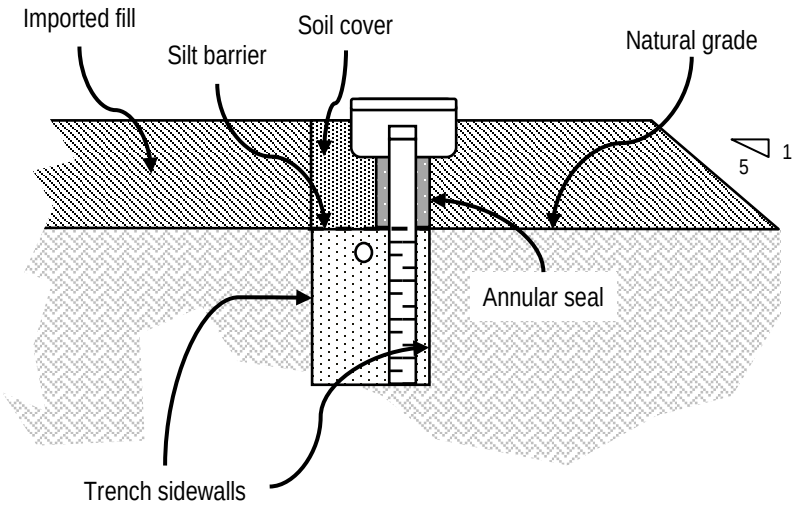
(Not to Scale)

Figure 5

SIDE VIEW



END VIEW



STANDARD TRENCH WITH IMPORTED FILL CROSS-SECTION DETAILS
(Not to Scale)

Figure 6

b. Depth to groundwater. The minimum depth from the natural grade to the anticipated highest seasonal level of groundwater is 3 feet unless the mound will be used in an alternative onsite wastewater treatment system, in which case the minimum depth to the anticipated highest seasonal level of groundwater is 2 feet.

c. Soil depth. The minimum depth of permeable soil over bedrock or an impermeable soil layer is 3 feet unless the mound will be used in an alternative onsite wastewater treatment system, in which case the minimum depth of permeable soil over bedrock or an impermeable soil layer is 2 feet. On sloping sites, permeable soil that is at least 2 feet in depth will extend a horizontal distance of no less than 25 feet down gradient from the edge of the perimeter of the distribution bed.

d. Natural ground slope. The maximum natural ground slope of the site of a disposal field containing a mound is 20 percent if the soil has a percolation rate of 1 to 60 MPI and 6 percent if the soil has a percolation rate slower than 60 MPI.

2. Disposal field with at-grade bed.

a. General. A disposal field containing an at-grade bed may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations and the site criteria in this Subsection 405.B.2., except that in the event specifications conflict, the specification in this Subsection 405.B.2. will control.

b. Depth to groundwater. The minimum depth from the natural grade to the anticipated highest seasonal level of groundwater is 3 feet unless the at-grade bed will be used in an alternative onsite wastewater treatment system, in which case the minimum depth to the anticipated highest seasonal level of groundwater is 2 feet.

c. Soil depth. The minimum depth of permeable soil over bedrock or an impermeable soil layer is 3 feet unless the at-grade bed will be used in an alternative onsite wastewater treatment system, in which case the minimum depth of permeable soil over bedrock or an impermeable soil layer is 2 feet. On sloping sites, permeable soil that is at least 2 feet in depth must extend a horizontal distance of no less than 25 feet down gradient from the edge of the perimeter of the distribution bed.

d. Natural ground slope. The maximum natural ground slope of the site of a disposal field containing an at-grade bed is 20 percent.

3. Dripfield.

a. General. A dripfield may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations and the site criteria in this Subsection 405.B.3., except that in the event specifications conflict, the specification in this Subsection 405.B.3. will control.

b. Depth to groundwater. The minimum depth from the natural grade to the anticipated highest seasonal level of groundwater is 2 feet.

c. Soil depth. The minimum depth of permeable soil over bedrock, an impermeable soil layer, or fractured, permeable bedrock is 2 feet.

4. Disposal field with pressure-dosed trench. A disposal field containing a pressure-dosed trench may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations.

5. Disposal field with pressure-dosed sand trench.

a. General. A disposal field containing a pressure-dosed sand trench may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations and the site criteria in this Subsection 405.B.5., except that in the event specifications conflict, the specification in this Subsection 405.B.5. will control.

b. Depth to groundwater. The minimum depth to the anticipated highest seasonal groundwater level below the bottom of a pressure-dosed sand trench used in an alternative onsite wastewater treatment system is 2 feet.

c. Soil depth. The minimum depth of permeable soil below the bottom of a pressure-dosed sand trench is 2 feet.

6. Disposal field with pressure-dosed shallow trench.

a. General. A disposal field containing a pressure-dosed shallow trench may be constructed only in an area that conforms to the applicable site criteria in Section 200 of these Regulations and the site criteria in this Subsection 405.B.6., except that in the event specifications conflict, the specification in this Subsection 405.B.6. will control.

b. Soil depth. The minimum depth of permeable soil under the bottom of a pressure-dosed shallow trench used in an alternative wastewater treatment system is 2 feet.

c. Percolation rate. The percolation rate of the soil below a pressure-dosed shallow trench, and of the soil within 25 feet down gradient from the edge of the last proposed trench in the disposal field, must be no slower than 120 MPI.

7. Disposal field with imported fill.

a. General. A disposal field containing imported fill may be constructed only in an area that is described in Subsections 405.A.3., 405.B.4, 405.B.5 or 405.B.6., whichever is applicable, and that conforms to the site criteria in this Subsection 405.B.7., except that in the event specifications conflict, the specification in this Subsection 405.B.7. will control.

b. Natural ground slope. In a disposal field containing a standard trench and imported fill, the maximum natural ground slope is 12.5 percent. In all other disposal fields containing imported fill, the maximum natural ground slope is 20 percent.

c. Percolation rate. In a disposal field with a standard trench and imported fill, the percolation rate must be no slower than 60 MPI. In all other disposal field containing imported fill, the percolation rate must be no slower than 120 MPI.

C. Design criteria.

1. Distribution system.

a. General. Except for a disposal field that contains a standard trench and imported fill, all non-standard disposal fields must have pressure distribution.

b. Operational standards. A pressure distribution system that serves a disposal field must be designed to achieve all of the following minimum operational standards:

(1) Uniform dosing of effluent per lineal foot of trench or, in a mound or at-grade bed, over the surface application area of the distribution bed;

(2) A flow rate that is adequate to maintain a 3-foot squirt height;

(3) Screening of effluent to preclude accumulation of solids in distribution pipes or tubing and clogging of discharge orifices;

(4) Dosing volume of a minimum of three doses per day at design flow conditions or, in drip dispersal systems, a volume that is adequate to fully pressurize the dripline or each zone thereof; and

(5) In drip dispersal systems, the automatic flushing of the pump tank filter and driplines at regular intervals. The pump tank filter must be flushed for at least 15 seconds at the end of every 10th pump cycle. Driplines must be flushed at least every 200th pump cycle.

c. Materials/components. A pressure distribution system must include the following components to create and utilize pressure to distribute effluent to the disposal field:

(1) Dosing device. Either a pump or dosing siphon that meets the following specifications may be used:

(a) Pump. The pump must be of the size and type to produce the required network discharge, achieve a 3-foot squirt height and achieve the minimum dose required by the network, designed to achieve the applicable total dynamic head and include all of the following:

i. A “hand-off-auto” (HOA) switch.

ii. An attached float tree and floats to control the starting and stopping of pump operations.

iii. A pump intake that is set a minimum of 4 inches above the dosing tank bottom.

(b) Dosing siphon. The dosing siphon must be of the size and type to produce the required network discharge, achieve a 3-foot squirt height and achieve the minimum dose required by the network. Battery-operated digital counters must be installed with all dosing siphons.

(2) Pump tank. Except for pump tanks contained in proprietary supplemental treatment units, a pump tank must be watertight, separate from the septic tank, and comply with the following specifications:

(a) Size. The minimum capacity of the tank must be 750 gallons and accommodate at least the design daily sewage flow.

(b) Certification. The tank must be IAPMO-certified.

(c) Access. The tank must have a minimum 24-inch diameter manhole.

(d) Sensor. The tank must be equipped with a high water sensing device.

(e) Pipes/conduits. All pipes and electrical conduits passing through the tank must be precast into the tank or sealed with gas-tight compression connectors.

(f) Filter. If the pressure distribution system serves a dripfield, the tank must contain a filtering device capable of filtering particles larger than 100 microns.

(g) Other. A union, swing check valve and double wedge gate valve must be mounted in this order (away from the pump) either inside the tank or adjacent to the tank in an access box.

(3) Pressure piping. Piping used in pressure distribution systems must be Schedule 40 PVC pipe with a minimum inside diameter of 1 inch.

(a) Force main. The force main from a pump tank must be equipped with an inspection port.

(b) Perforated pipe. A perforated pipe orifice must have a minimum diameter of 1/8th of an inch. Orifices must be clear of any burrs, drilling fines or other obstructions. In trenches utilizing drain rock, orifices may be placed pointing up or down, and individual orifice shields must be used if orifices point up. If bundled EPS or chambers are used, orifices must be placed pointing up, and no orifice shields are required.

(4) Electrical features. The following electrical features must be included in the design of a pressure distribution system that will serve a disposal field:

(a) An outdoor rated control box containing fused disconnect and motor protection switches, mounted on the structure served or mounted on a pipe stand or wooden post.

(b) PVC electrical conduit. Separate conduits must be provided for control wire and power supply. All conduits passing through a riser must be sealed with gas-tight compression connectors.

(c) Separate circuits with individual breakers at the main panel to serve the control panel alarm and pump.

(d) High water audible and visual alarms, mounted on the structure served or on a pipe stand or wooden post within five feet of the structure served.

(5) Other.

(a) A minimum 8-inch valve box, made of plastic or other durable material, must be installed to allow access for inspection, testing and adjustment of devices installed in the box.

(b) Gate valves must be installed within the access valve box to allow setting of orifice squirt heights.

(c) Purge valve assemblies must be installed at the end of each distribution pipe and placed within the access valve box.

2. Disposal field with mound.

a. General. The design of a disposal field containing a mound must conform to all applicable specifications set forth in this Subsection 405.C.2.

b. Distribution bed.

(1) Minimum area. The minimum distribution bed area is determined by dividing the design daily sewage flow rate of the structure(s) to be served by the onsite wastewater treatment system by 1.2 gallons per day per square foot (gpd/ft^2) in a mound that will serve a residential dwelling and 1.0 gpd/ft^2 in a mound that will serve a non-residential structure.

(2) Dimensions.

(a) Length. The distribution bed must be designed to be long and narrow. The length of a distribution bed is determined based on the required distribution bed area, site conditions and width restrictions set forth in these Regulations.

(b) Width.

i. Minimum. There must be a minimum of 36 inches of distribution bed width for every distribution pipe.

ii. Maximum. The maximum width of the distribution bed is based on the slope of the site of the proposed disposal field and must conform to Table 3 below.

Table 3	
Maximum Width of Mound Distribution Bed	
Slope %	Bed Width (Feet)
0≤x≤12	10
12<x≤13	9
13<x≤14	8
14<x≤16	7
16<x≤18	6
18<x≤20	5

x=slope of the site of the proposed disposal field

(c) Depth. The distribution bed material must extend from a minimum of 6 inches below the invert of the distribution pipe to a minimum of 2 inches above the top of the distribution pipe.

(3) Linear loading rate. The linear loading rate of the distribution bed is determined by dividing the design daily sewage flow by the length of the distribution bed. The linear loading rate of the distribution bed must not exceed the applicable maximum linear loading rate set forth in Table 4 below.

(4) Level. The bottom and toe of the distribution bed must be level (not drop below more than 0.25 feet per 100 feet). The downslope side of the distribution bed must be parallel to the slope contour.

(5) Material. Distribution bed material must be double-washed rock, 3/8-inch to 2 inches in diameter, with less than one percent by volume of fines (materials passing though the number 100 mesh).

(6) Number. A mound may contain more than one distribution bed under the following conditions:

(a) The beds are separated by a minimum of 6 feet;

(b) The beds are installed on a contour;

(c) The space between the distribution beds is filled with sand;

(d) The beds are designed to provide for automatic alternate dosing and resting of the beds.

c. Sand bed.

(1) General. A sand bed forms the base of a mound, and extends from the natural grade vertically to the bottom of the distribution bed(s) and laterally from the sides of the distribution bed(s).

(2) Effective application area.

(a) Defined. The effective application area of a mound is that portion of and sand-native soil interface at the base of the mound that can accept and absorb effluent. In a disposal field located on a site that is level or has a slope equal to or less than 2 percent, the entire sand-native soil interface is the effective application area of a mound. On all other sites, the effective application area includes the portions of the sand-native soil interface that are immediately below and downslope of the distribution bed.

(b) Minimum effective application area. The effective application area of a mound is equal to or greater than the area determined by dividing the design daily sewage flow rate of the structure(s) to be served by the onsite wastewater treatment system by the applicable wastewater loading rate set forth in Table 5 below.

Table 4

Maximum Mound Linear Loading Rates (GPD/LF)

Soil Depth = < 2.5 ft

Percolation Rate (MPI)	Ground Slope %								
	2<y≤5	5<y≤6	6<y≤8	8<y≤10	10<y≤12	12<y≤14	14<y≤16	16<y≤18	18<y≤20
1≤x≤5	9	9	11	12	12	12	12	12	12
5<x≤10	8	8	10	11	12	12	12	12	12
10<x≤20	7	7	9	10	11	12	12	12	12
20<x≤30	6	6	8	9	10	11	12	12	12
30<x≤40	5	5	7	8	9	10	11	12	12
40<x≤50	4	4	6	7	8	9	10	11	12
50<x≤60	3	3	5	6	7	8	9	10	11
60<x≤90	3	3	NP	NP	NP	NP	NP	NP	NP
90<x≤120	3	3	NP	NP	NP	NP	NP	NP	NP

Soil Depth = 2.5 ft to 3.0 ft

Percolation Rate (MPI)	Ground Slope %								
	2<y≤5	5<y≤6	6<y≤8	8<y≤10	10<y≤12	12<y≤14	14<y≤16	16<y≤18	18<y≤20
1≤x≤5	10	11	12	12	12	12	12	12	12
5<x≤10	9	10	11	12	12	12	12	12	12
10<x≤20	8	9	10	11	12	12	12	12	12
20<x≤30	7	8	9	10	11	12	12	12	12
30<x≤40	6	7	8	9	10	11	12	12	12
40<x≤50	5	6	7	8	9	10	11	12	12
50<x≤60	4	5	6	7	8	9	10	11	12

Soil Depth = > 3.0 ft

Percolation Rate (MPI)	Ground Slope %								
	2<y≤5	5<y≤6	6<y≤8	8<y≤10	10<y≤12	12<y≤14	14<y≤16	16<y≤18	18<y≤20
1≤x≤5	11	12	12	12	12	12	12	12	12
5<x≤10	10	11	12	12	12	12	12	12	12
10<x≤20	9	10	11	12	12	12	12	12	12
20<x≤30	8	9	10	11	12	12	12	12	12
30<x≤40	7	8	9	10	11	11	12	12	12
40<x≤50	6	7	8	9	10	10	11	12	12
50<x≤60	5	6	7	8	9	9	10	11	12

GPD/LF = gallons per day per linear foot
MPI = minutes per inch
NP = not permitted
x = percolation rate of the site of the proposed disposal field
y = slope of the site of the proposed disposal field

Table 5	
Wastewater Loading Rates for Mound Sand-Native Soil Interface	
Percolation Rate (MPI)	Wastewater Loading Rate (GPD/FT^2)
$1 \leq x \leq 30$	1.2
$30 < x \leq 90$	1.5 x Appendix 2 WLR*
$90 < x \leq 120$	0.2

MPI = minutes per inch
x = percolation rate of the site of the proposed disposal field
GPD/FT^2 = gallons per day per square foot
*Appendix 2 WLR = applicable wastewater loading rate from Appendix 2

(3) Dimensions.

(a) Depth. There must be a minimum of 12 inches of sand below the distribution bed unless the percolation rate of the site of the proposed disposal field is faster than 10 MPI, in which case the minimum depth of sand below the distribution bed must be 24 inches.

(b) Lateral dimensions.

i. Level sites. On sites that are level or have slopes equal to or less than 2 percent, the sand bed must extend laterally as follows:

(i) Sand shoulder. The sand must extend horizontally from all sides of the distribution bed, level with the top of the distribution bed, by a minimum of 1 foot.

(ii) Sand run out. The sand must extend laterally from the sand shoulder at a maximum slope of 3 horizontal to 1 vertical in all directions.

ii. Sloping sites. On sites with slopes greater than 2 percent, the sand bed must extend laterally as follows:

(i) Sand shoulder. The sand must extend horizontally from all sides of the distribution bed, level with the top of the distribution bed, by a minimum of 1 foot in the upslope direction, 2 feet in the downslope direction, and 2 feet in each longitudinal (side) direction.

(ii) Sand run out. The sand must extend laterally from the sand shoulder at a maximum slope of 3 horizontal to 1 vertical in all directions.

(4) Material. The sand used to construct the sand bed must meet all applicable sand specifications set forth in **Appendix 4,** attached hereto and incorporated herein.

(5) Separation. The effective application area of a mound may not overlap the effective application area of another mound.

d. Distribution system.

(1) Length. The length of distribution pipe to be installed in a distribution bed in a mound is determined in accordance with industry standards based on the design daily sewage flow of the structure(s) to be served and linear loading rate of the distribution bed.

(2) Separation. Distribution pipes must be equidistant from each other. There must be a minimum separation between an end of a distribution pipe and an end of the distribution bed of 1 foot or one-half the distance between two perforations in the distribution pipe, whichever is greater. On sites that are level or have slopes equal to or less than 2 percent, there must be a minimum 24-inch separation between a distribution pipe and the long sides of the distribution bed. On sites with slopes greater than 2 percent, there must be a minimum 12-inch separation between a distribution pipe and the upslope side of the distribution bed, and a minimum 24-inch separation between a distribution pipe and the downslope side of the distribution bed.

(3) Distribution pipe must be on contour and level to within a tolerance of 3 inches in 100 feet.

e. Silt barrier. The distribution bed must be covered in its entirety with a silt barrier that conforms to the specifications in Subsection 404.G.2. of these Regulations.

f. Soil cover.

(1) General. A continuous cover material must be placed over the entire distribution bed, sand shoulder and sand run out.

(2) Material. Cover material must conform to the specifications in Subsection 404.H.2. of these Regulations.

(3) Dimensions.

(a) Depth. A minimum of 12 inches and a maximum of 18 inches of cover material must be placed over the silt barrier and crowned to promote rainfall runoff. A minimum of 12 inches of cover material must be placed over the sand shoulder and sand run out.

The cover material must have a consistent depth over the sand shoulder and sand run out and the surface must be smooth with no depressions.

(b) Lateral extension. The cover material must extend a minimum of 3 feet beyond the perimeter edge of the sand fill in all directions.

g. Monitoring wells.

(1) Inspection wells. Two inspection wells must be installed within a mound, as follows:

(a) One well must be located near the center of the mound, extending from the mound surface to the bottom of the distribution bed. Perforations must begin at the top of the distribution bed and extend to the bottom of the well.

(b) One well must be located within the sand bed, extending from the mound surface to 6 inches into the native soil. Perforations must begin at the top of the sand bed and extend to the bottom of the well.

(2) Performance wells. Four performance wells must be installed outside the perimeter of the mound. One well must be located at the midpoint of each side of the mound, 5 to 10 feet from the toe, and extending from the natural grade to a depth of 5 feet or to an impermeable layer, whichever is less. Perforations must begin at a depth of 12 inches below the natural grade and extend to the bottom of the well.

(3) Materials. Monitoring wells must conform to the specifications in Subsection 404.I.2. of these Regulations, except that perforations must begin and end as specified above in Subsections 405.C.2.g.(1) and (2) of these Regulations.

3. Disposal field with at-grade bed.

a. General. The design of an at-grade bed must conform to all applicable specifications in this Subsection 405.C.3.

b. Distribution bed.

(1) Effective application area.

(a) Defined. The effective application area of an at-grade bed is that portion of the distribution bed-native soil interface at the base of the at-grade bed that can accept and absorb effluent. In a disposal field located on a site that is level, the effective application area is the entire distribution bed-native soil interface. On all other sites, the effective application area of an at-grade bed is that portion of the base of the distribution bed that interfaces with the native soil below and down-slope of the distribution pipe adjacent to the upslope edge of the bed.

(b) Minimum effective application area. The effective application area of an at-grade bed is equal to or greater than the area determined by dividing the design daily sewage flow rate of the structure(s) to be served by the onsite wastewater treatment system by the wastewater loading rate of the distribution bed.

(2) Wastewater loading rate. The wastewater loading rate of the distribution bed in an at-grade bed is determined in accordance with Appendix 3. The maximum wastewater loading rate of a distribution bed in an at-grade bed that will serve a residential dwelling will be 1.2 gpd/ft^2. In an onsite wastewater treatment system that will serve a non-residential structure, the maximum wastewater loading rate is 1.0 gpd/ft^2.

(3) Dimensions.

(a) Length. A distribution bed must be long and narrow. The length of the basal area of a distribution bed is determined based on the required distribution bed area, site conditions and width restrictions set forth in these Regulations.

(b) Width. Maximum. The maximum width of the distribution bed basal area is 10 feet.

(c) Depth. The distribution bed material must extend from a minimum of 6 inches below the invert of the distribution pipe to a minimum of 2 inches above the top of the distribution pipe.

(4) Linear loading rate. The linear loading rate of a distribution bed is determined by dividing the design daily sewage flow by the length of the distribution bed. The linear loading rate of the distribution bed in an at-grade bed on any site must not exceed 10 gpd/lf. The linear loading rate of the distribution bed in at-grade beds on sloping sites must not exceed the applicable linear loading rates in Table 6 below.

(5) Level. The distribution bed must follow the natural contour of the ground and must be level (not drop more than 0.25 feet per 100 feet).

(6) Material. Distribution bed material must be double-washed rock, 3/8-inch to 2 inches in diameter, with less than one percent by volume of fines (materials passing though the number 100 mesh).

(7) Number. An at-grade bed may contain multiple distribution beds if the basal areas of the beds are separated by a minimum of 5 feet.

Table 6		
Maximum At-Grade Bed Linear Loading Rates (GPD/LF)		
Soil Depth = < 3 ft		
Percolation Rate (MPI)	Ground Slope %	
	0<y≤10	10<y≤20
1≤x≤30	5	6
30<x≤60	4	5
60<x≤120	3	4
Soil Depth = 3.0 ft to 4.0 ft		
Percolation Rate (MPI)	Ground Slope %	
	0<y≤10	10<y≤20
1≤x≤30	7	8
30<x≤60	6	7
60<x≤120	5	9
Soil Depth = > 4.0 ft to 5.0 ft		
Percolation Rate (MPI)	Ground Slope %	
	0<y≤10	10<y≤20
1≤x≤30	9	10
30<x≤60	8	9
60<x≤120	7	8
Soil Depth = > 5.0 ft		
Percolation Rate (MPI)	Ground Slope %	
	0<y≤10	10<y≤20
1≤x≤30	10	10
30<x≤60	10	10
60<x≤120	9	10

GPD/LF = gallons per day per linear foot
MPI = minutes per inch
x = percolation rate of the site of the proposed disposal field
y = slope of the site of the proposed disposal field

c. Distribution system.

(1) Length. The length of distribution pipe to be installed in a distribution bed in an at-grade bed is determined in accordance with industry standards based on the design daily sewage flow of the structure(s) to be served and linear loading rate of the distribution bed.

(2) Separation. Distribution pipes must be equidistant from each other. There must be a minimum 24-inch separation between distribution pipes and all sides of the distribution bed.

(3) Distribution pipe must be on contour and level to within a tolerance of 3 inches in 100 feet.

d. Silt barrier. The distribution bed must be covered in its entirety with a silt barrier that conforms to the specifications in Subsection 404.G.2. of these Regulations.

e. Soil cover.

(1) Material. The cover material must conform to the specifications in Subsection 404.H.2. of these Regulations.

(2) Depth. A minimum of 12 inches and maximum of 18 inches of cover material must be placed on the top of the distribution bed. The soil cover over the distribution bed must be crowned to promote rainfall runoff.

(3) Lateral Extension. The cover material must extend a minimum of 5 feet beyond all perimeter edges of the distribution bed at a maximum slope of 3 horizontal to 1 vertical in all directions. On sites with slopes greater than 2 percent, the cover material must extend beyond the downslope edge of the distribution bed in accordance with Table 7 below.

Table 7

At-Grade Bed
Lateral Extension of Cover Material

Disposal Field Slope %	Minimum Extension of Cover Material (Feet)
$2<x\leq4$	6
$4<x\leq6$	8
$6<x\leq8$	10
$8<x\leq10$	12
$10<x\leq12$	14
$12<x\leq16$	16
$16<x\leq20$	20

x = slope of the site of the proposed disposal field

f. Monitoring wells.

(1) Inspection wells. One inspection well must be installed within an at-grade bed near the center of the distribution bed, extending from the surface of the at-grade bed to the bottom of the distribution bed.

(2) Performance wells. Four performance wells must be installed outside the perimeter of the at-grade bed. One well must be located at the midpoint of each side of the at-grade bed, 5 to 10 feet from the toe, and extending from the natural grade to a depth of 5 feet or to an impermeable layer, whichever is less.

(3) Materials. Monitoring wells must conform to the specifications in Subsection 404.I.2. of these Regulations, except that perforations must begin at the top of the distribution bed and extend to the bottom of the pipe.

4. Dripfield.

a. General. The design of a dripfield must conform to all applicable specifications in this Subsection 405.C.4.

b. Area. The minimum absorption area of a dripfield is determined by dividing the design daily sewage flow rate of the structure(s) to be served by the onsite wastewater treatment system by the applicable wastewater loading rate set forth in Appendix 3.

c. Trench dimensions.

(1) Depth. A dripfield trench must be a minimum of 6 inches and a maximum of 12 inches in depth.

(2) Bottom. The bottom of a dripfield trench must be level to within a tolerance of 3 inches in 100 feet and installed on contour."

d. Dripline.

(1) Material. Wastewater quality dripline must have a minimum 45 mil tubing wall thickness and bacterial growth inhibitors.

(2) Location. Dripline must be installed at the bottom of the dripfield trench and extend the entire length of the trench, from the supply manifold to the return manifold.

(3) Length. Dripline length is measured from the supply to return manifolds. The length of dripline to be installed must conform to specifications by the dripline manufacturer and be based on design daily sewage flow, design pressure, the number of emitters and emitter flow.

(4) Emitters. Emitters must be separated by a minimum of 12 inches and maximum of 24 inches. The application area per emitter, in square feet, is calculated by multiplying the number of feet between emitters by two. Example: If there are 2 feet between emitters, the application area is 2 x 2 = 4 square feet.

(5) Spacing. Dripline separation must be no less than the separation between emitters. The first and last emitters must be no closer than 12 inches from a manifold.

(6) Zones. Two or more dripline zones may be created by installing lengths of dripline separated by valves in lieu of one continuous dripline.

e. Soil cover.

(1) General. Cover material must be placed on top of the dripline. The top layer of the cover material must be level with the natural grade.

(2) Material. Cover material must conform to the specifications in Subsection 404.H.2. of these Regulations.

f. Monitoring wells.

(1) Inspection well. One inspection well must be installed near the middle of the dripfield, equidistant between two driplines. The well must extend from the natural grade to a minimum depth of 24 inches and maximum depth of 36 inches.

(2) Performance wells. Four performance wells must be installed around a dripfield. The wells must extend from the natural grade to a minimum depth of 24 inches and maximum depth of 36 inches. The wells must be located 5 to 10 feet from each side of the dripfield.

(3) Materials. Monitoring wells must conform to the specifications in Subsection 404.I.2. of these Regulations, except that perforations must begin at a depth of 12 inches below grade and extend to the bottom of the pipe.

g. Dual dripfields. If primary and secondary dripfields are installed, doses must be automatically distributed to each dripline in each dripfield, or to each zone within each dripfield.

5. <u>Disposal field with pressure-dosed trench</u>.

a. General. The design of a disposal field containing a pressure-dosed trench must conform to the specifications in this Subsection 405.C.5. and the specifications required under Subsections 404.B., 404.C., 404.D., 404.E., 404.G., 404.H. and 404.I., except that in the event specifications conflict, the specification in this Subsection 405.C.5. will control.

b. Distribution system. Distribution pipe must be on contour and level to within a tolerance of 3 inches in 100 feet. If chambers are used, distribution pipe must be suspended inside the top of the chambers.

c. Soil cover. Minimum cover depths are determined based on the slope of the disposal field and percolation rate, in accordance with Table 8 below.

Table 8		
Pressure-Dosed Trench Cover Requirements (Inches)		
Ground Slope %	Percolation Rate (MPI) **1≤y≤30**	Percolation Rate (MPI) **30<y≤120**
0≤x≤10	12	12
10<x≤15	12	12
15<x≤20	12	12
20<x≤30	15	18

x= slope of the site of the proposed disposal field
y- percolation rate of the site of the proposed disposal field
MPI – minutes per inch

6. Disposal field with pressure-dosed sand trench.

a. General. The design of a disposal field containing a pressure-dosed sand trench must conform to the specifications in this Subsection 405.C.6. and the specifications applicable to disposal fields containing pressure-dosed trenches under Subsection 405.C.5. of these Regulations, except that in the event specifications conflict, the specification in this Subsection 405.C.6. will control.

b. Area. The minimum absorption area of a disposal field containing a pressure-dosed sand trench is determined by dividing the design daily sewage flow rate of the structure(s) to be served by the onsite wastewater treatment system by the wastewater loading rate at the sand-soil interface.

c. Wastewater loading rate. The wastewater loading rate at the sand-native soil interface is determined in accordance with Appendix 3. The maximum wastewater loading rate at the sand-native soil interface in a pressure-dosed sand trench that will serve a residential dwelling is 1.2 gpd/ft^2. In an onsite wastewater treatment system that will serve a non-residential structure, the maximum wastewater loading rate at the sand-soil interface is 1.0 gpd/ft^2.

d. Trench dimensions.

(1) Depth. The maximum depth of a pressure-dosed sand trench is 60 inches.

(2) Width. The minimum width of a pressure-dosed sand trench is 12 inches.

(3) Bottom. The bottom of the trench must be level to within a tolerance of 2 inches in 100 feet.

e. Sand fill.

(1) Material. The sand media must have a medium to coarse texture and meet the gradation specifications set forth in Appendix 4.

(2) Depth. The minimum depth of sand below the drain media is12 inches unless the pressure-dosed sand trench is used in an alternative onsite wastewater treatment system, in which case the minimum sand depth is 6 inches.

f. Drain media. In pressure-dosed sand trenches that utilize drain rock, the drain rock must extend from at least 6 inches below the invert of the distribution pipe to at least 2 inches above the top of the distribution pipe. If chambers are used, a single layer of chambers must be placed on top of the sand fill.

g. Silt barrier. Drain rock must be covered in its entirety with a silt barrier conforming to the specifications in Section 404.G.2. of these Regulations.

h. Soil cover. Minimum cover depths are determined based on the slope and percolation rate of the disposal field, in accordance with Table 9 below.

Table 9		
Pressure-Dosed Sand Trench Cover Requirements (Inches)		
Ground Slope %	Percolation Rate (MPI) $1 \leq y \leq 30$	Percolation Rate (MPI) $30 < y \leq 120$
$0 \leq x \leq 20$	12	12
$20 < x \leq 30$	15	18

x = slope of the site of the proposed disposal field
y = percolation rate of the site of the proposed disposal field
MPI = minutes per inch

i. Monitoring wells.

(1) Inspection wells. Two inspection wells must be installed in each trench, as follows:

(a) One well must extend from the natural grade to the drain media-sand interface. This well must be perforated only where it contacts drain media.

(b) One well must extend from the natural grade to the sand-native soil interface. This well must be perforated only where it contacts sand.

(2) Performance wells. A minimum of two performance wells must be installed, as follows:

(a) One well must be installed 5 feet upgradient of the edge of a disposal trench, 5 to 10 feet from the trench and extending to the depth of the trench. Perforations must begin at the top of the soil cover and end at the bottom of the well.

(b) One well must be installed 10 feet downgradient of the edge of a disposal trench, 5 to 10 feet from the trench and extending to the depth of the trench. Perforations must begin at the top of the soil cover and end at the bottom of the well.

7. Disposal fields with pressure-dosed shallow trenches.

a. General. The design of a disposal field containing a pressure-dosed shallow trench must conform to the specifications in this Subsection 405.C.7. and the specifications applicable to disposal fields containing pressure-dosed trenches under Subsection 405.C.5. of these Regulations, except that in the event specifications conflict, the specifications in this Subsection 405.C.7. will control.

b. Area. The minimum absorption area of a disposal field containing a pressure-dosed shallow trench is calculated by dividing the design daily sewage flow of the structure(s) to be served by the onsite wastewater treatment system by the applicable wastewater loading rate set forth in Appendix 3.

c. Trench dimensions.

(1) Depth. The maximum depth of a pressure-dosed shallow trench is 60 inches.

(2) Spacing. The minimum space between the centers of two pressure-dosed shallow trenches is as follows:

(a) 6 feet on slopes $\leq$ 12.5 percent.

(b) 7 feet on slopes > 12.5 percent and $\leq$ 16 percent.

(c) 8 feet on slopes > 16 percent and $\leq$ 20 percent.

(d) 9 feet on slopes > 20 percent and $\leq$ 25 percent.

(e) 10 feet on slopes > 25 percent.

d. Distribution system. The maximum dose to a pressure-dosed shallow trench is 125 gallons for onsite wastewater treatment systems that will serve a residential dwelling and 150 gallons for all other systems.

8. Disposal field with imported fill.

a. General.

(1) Imported fill may be used to raise the level of the surface of a proposed disposal field that will utilize one of the following types of disposal trenches and no other means of final distribution:

(a) Standard trench.

(b) Pressure-dosed trench.

(c) Pressure-dosed sand trench.

(d) Pressure-dosed shallow trench.

(2) The design of a disposal field that utilizes imported fill must conform to the design specifications in this Subsection 405.C.8. and the design specifications in either Subsection 404 of these Regulations (standard disposal fields), Subsection 405.C.5. of these Regulations (disposal fields with pressure-dosed trenches), Subsection 405.C.6. of these Regulations (disposal fields with pressure-dosed sand trenches), or Subsection 405.C.7. of these Regulations (disposal fields with pressure-dosed shallow trenches), whichever are applicable. In the event specifications conflict, the specifications in this Subsection 405.C.8. will control.

b. Material. Imported fill must be soil that is similar in texture to the native soil or any medium loamy textured soil.

c. Dimensions.

(1) Depth. A minimum of 12 inches of imported fill must be placed over the entire disposal field prior to trench excavation.

(2) Lateral extension. In disposal fields with pressurized trenches and imported fill, the fill must extend a minimum of 10 feet from each trench edge, and then taper to the natural grade at not less than a 5:1 ratio. In disposal fields with standard trenches and imported fill, the fill must extend a minimum of 15 feet from each trench edge and then taper to the natural grade at not less than a 5:1 ratio. In all disposal fields with imported fill on sites with slopes greater than 2 percent, the fill must extend an additional 5 feet downslope from the downslope edge of each trench.

d. Trenches. The section of trench extending from the top of the drain media to the bottom of the trench must be constructed entirely in native soil.

e. Soil cover. The top layer of the cover material must be level with the top of the imported fill.

406. Reserve Areas; Secondary Disposal Fields.

A. General.

1. Residential systems. A reserve area must be designated for future replacement of a disposal field in an onsite wastewater treatment system that will serve a residential dwelling if the system does not have dual disposal fields.

2. Non-residential systems. An onsite wastewater treatment system that will serve a non-residential structure must have dual disposal fields. A reserve area must be designated for future replacement of both disposal fields.

B. Reserve Area. A reserve area may be designated on a site if it conforms to the site criteria in Section 200 and Subsection 405.B. of these Regulations that are applicable to the proposed disposal field. A reserve area must be equivalent in size to that of the proposed disposal field in a residential system and large enough to allow construction of replacement dual disposal fields in a non-residential system.

C. Dual Disposal Fields. If a system has dual disposal fields, one disposal field must be the primary disposal field and the second must be the secondary disposal field. Primary and secondary disposal fields must each conform to all of the design requirements applicable to a single disposal field. Except for dual dripfields, dual disposal fields must have a ball-type Schedule 80 diversion valve to alternate use of the primary and secondary disposal fields on a rotational basis, and each of the disposal fields may be operated continuously for a period not less than six months and no more than one year.

D. Separation. A reserve area and a disposal field may not overlap. A primary disposal field and a secondary disposal field may not overlap.

SECTION 500. ALTERNATIVE ONSITE WASTEWATER TREATMENT SYSTEMS

501. General.

A. Authorized Supplemental Treatment Units. An alternative onsite wastewater treatment system may include any authorized supplemental treatment unit. Authorized supplemental treatment units are intermittent sand filters, recirculating sand filters and proprietary units.

B. Site Criteria. An alternative onsite wastewater treatment system must conform to all applicable site criteria set forth in Section 200 or Subsection 405.B. of these Regulations.

C. Findings.

1. The health officer may make the finding set forth in Section 420-6.810, subsection (a)(4)(A), of the Ordinance based on a report from the owner of the water source that a sample taken from the public water source has:

a. An absence of fecal coliform and Escherichia coli; and

b. A nitrate concentration that does not exceed 10 milligrams per liter measured as nitrogen (mg/L).

2. The health officer may make the finding set forth in Section 420-6.810, subsection (a)(4)(B), of the Ordinance based on any of the following:

a. Topographical features exist that would minimize migration of effluent to the public water source;

b. The soil in the area of the proposed disposal field is deeper than the required minimum depth of soil;

c. The percolation rate of the soil in the area of the proposed disposal field is greater than 5 MPI; or

d. The depth to groundwater conforms to the requirements in Table 1.

502. Design Specifications.

A. Intermittent Sand Filters.

1. General.

a. An intermittent sand filter provides supplemental treatment of septic tank effluent by directing it through the sand filter once before delivery to a disposal field.

b. The design of an intermittent sand filter must conform to all applicable specifications in this Section 502.

2. Maximum wastewater strength. Wastewater applied to an intermittent sand filter must not exceed any of the following:

a. Five-day biochemical oxygen demand of 300 parts per million (ppm).

b. Total suspended solids of 150 ppm.

c. Grease/oil level of 25 ppm.

3. Area. The minimum distribution area of an intermittent sand filter is calculated by dividing the design daily sewage flow of the structure(s) to be served by the onsite wastewater treatment system by a wastewater loading rate that does not exceed 1.2 gpd/ft^2 in a system that will serve a residential dwelling and 1.0 gpd/ft^2 in a system that will serve a non-residential structure.

4. Components and materials. An intermittent sand filter must include all of the following components and materials:

a. Sand fill. Two inches of sand fill must be installed at the bottom of the intermittent sand filter. The sand fill must conform to the applicable specifications in Appendix 4.

b. Filter bottom. In an intermittent sand filter without an internal pump, the slope of the bottom of the filter must be no greater than 1 percent. In an intermittent sand filter with an internal pump, there must be a minimum 8-inch deep depression in the middle of the bottom of the filter to accommodate a pump basin. The bottom of the intermittent sand filter must slope toward this depression at a minimum grade of 1 percent.

c. Containment liner. A containment liner must be installed adjacent to the interior of all sides of the intermittent sand filter and on top of the sand fill. The liner must be 30 mil PVC or reinforced, poured-in place concrete. Concrete liners must have a thickness of a minimum of 6 inches adjacent to the walls and a minimum of 3½ inches on the bottom.

d. Underdrain. An underdrain must be installed at the bottom of the intermittent sand filter to convey treated wastewater to an internal pump system, external dosing tank or disposal field. The underdrain must consist of the following components:

(1) Gravel bed. A minimum of 9 inches of double-washed pea gravel must be installed at the bottom of the intermittent sand filter, on top of the containment liner.

(2) Pipe. Perforated PVC pipe that is at least 4-inches in diameter and has a PVC cap on each end must be installed within the gravel bed at a minimum grade of 1 percent toward the outlet of the pipe. There must be a minimum of 2 inches of gravel below the pipe.

The pipe must have a minimum storage volume equal to 50 percent of the disposal field dose volume. Pipe perforations must be no larger than 1/8th of an inch in width or diameter.

(3) Riser. For cleanout and inspection purposes, a vertical riser constructed of non-perforated pipe of equal diameter to the underdrain pipe must extend from the upslope end of the underdrain pipe to the finished grade of the filter.

(4) Outlet boot. Except for filters with internal pump systems, a watertight outlet boot must be connected to the outlet of the underdrain.

e. Filter sand. A minimum of 24 inches of medium to coarse sand conforming to the applicable specifications in Appendix 4 must be installed on top of the underdrain.

f. Distribution bed. A distribution bed must be installed on top of the filter sand and extend to all sides of the intermittent sand filter. The distribution bed must consist of double-washed pea gravel, free of fines. The pea gravel must extend from a minimum of 6 inches below the invert of the distribution pipe to 2 inches above the top of the distribution pipe.

g. Distribution system.

(1) To intermittent sand filter. A pressure distribution system must dose septic tank effluent to the intermittent sand filter. The pressure distribution system must meet the operation standards and include the components set forth in Subsection 405.C.1. of these Regulations, except that the system will dose effluent to the distribution area of the intermittent sand filter instead of to a disposal field. There must be a minimum of one distribution pipe for every 24 inches of intermittent sand filter width.

(2) To disposal field. If the alternative onsite wastewater treatment system includes a standard disposal field with more than one trench, a distribution box must be installed between the intermittent sand filter and the disposal trenches. If the alternative onsite wastewater treatment system includes a non-standard disposal field, the intermittent sand filter may contain an internal pump system to dose treated effluent to the disposal field. An internal pump system must conform to the applicable specifications in Subsection 405.C.1.c. of these Regulations, and this Subsection 502.A.5.g.(2). In the event of a conflict, the latter will control.

(a) An internal pump chamber must be seated at or below the level of the bottom of the underdrain pipe.

(b) The operating depth of an internal pump must be no less than the depth of the underdrain.

h. Silt barrier. A silt barrier conforming to the specifications in Subsection 404.G.2. of these Regulations must be installed over the top of the distribution bed.

i. Soil cover.

(1) General. Cover material must be placed on top of the silt barrier. The cover material must be crowned or sloped to promote rainfall runoff. The edges of the top layer of the cover material must be level with the natural grade.

(2) Material. Cover material must conform to the specifications in Subsection 404.H.2. of these Regulations.

(3) Depth. A minimum of 12 inches and maximum of 18 inches of cover material must be installed on top of the silt barrier.

j. Monitoring wells.

(1) Number; depth. Two inspection wells must be installed in an intermittent sand filter, as follows:

(a) One well must extend from the finished grade of the intermittent sand filter to the bottom of the distribution bed. This well must be perforated only within the distribution bed.

(b) One well must extend from finished grade of the intermittent sand filter through the filter sand to the top of the underdrain. This well must be perforated only within the bottom half of the filter sand.

(2) Material. Inspection wells must conform to the specifications in Subsection 404.I.2. of these Regulations, except that perforations must begin and end as set forth above.

B. Recirculating Sand Filters.

1. General.

a. A recirculating sand filter provides supplemental treatment of septic tank effluent by directing it through a sand filter and then recycling it through a recirculating tank for further processing and delivery to a disposal field.

b. The design of a recirculating sand filter must conform to all specifications applicable to intermittent sand filters set forth in Subsection 502.A. of these Regulations except for the specifications in Subsection 502.A.5.g. and the specifications in this Subsection 502.B. In the event of conflicting specifications, the specification in this Subsection 502.B. will control.

2. Area. The minimum distribution area of a recirculating sand filter is calculated by dividing the design daily sewage flow of the structure(s) to be served by the onsite wastewater treatment system by a wastewater loading rate that must not exceed 1.2 gpd/ft^2 in a system that

will serve a residential dwelling and 1.0 gpd/ft^2 in a system that will serve a non-residential structure.

3. Components and materials.

a. Distribution system. A recirculating sand filter must contain a recirculation tank that doses septic tank effluent to the recirculating sand filter, recirculates treated effluent through the tank and then directs treated effluent back to the recirculating sand filter and to the disposal field. The recirculation tank must include a tank, pump and water flow splitter that meet the following specifications, except that in the event of a conflict, the specifications in this Subsection 502.B.3 will control.

(1) The recirculating tank must conform to the pump tank specifications in Subsection 405.C.1.c.(2) of these Regulations.

(2) The pump must conform to the specifications in Subsection 405.C.1.c.(1)(a) of these Regulations. The pump must dose effluent back to the sand filter and disposal field at a ratio of approximately 5:1 at design flow conditions.

(3) The water flow splitter must be a buoyant ball valve.

b. Underdrain. The underdrain pipe must extend from the sand filter to an inlet on the recirculation tank.

c. Silt barrier. No silt barrier is required in a recirculating sand filter.

d. Cover.

(1) General. Cover material must be placed on top of the distribution bed. The top layer must be level with the natural grade.

(2) Material. Cover material must range in size from pea gravel to 2½-inch rounded rock.

C. Proprietary supplemental treatment units.

1. General. An alternative wastewater treatment system may include any of the following proprietary supplemental treatment units:

a. Aerobic treatment unit.

b. Textile recirculating filter.

2. Effluent quality parameters. A proprietary supplemental treatment unit that is utilized in an alternative onsite wastewater treatment system must be certified by NSF

International as meeting all effluent quality parameters applicable to Class 1 systems under Standard NSF 40.

3. Sizing. An alternative onsite wastewater treatment system that includes a proprietary supplemental treatment unit must be sized to accommodate the design daily sewage flow and conform to the manufacturer's specifications.

4. Emergency storage. An alternative onsite wastewater treatment system that includes a proprietary supplemental treatment unit must have emergency storage capacity that is (a) no less than the design daily sewage flow for one day and (b) located either inside the supplemental treatment unit or in a separate pump tank that conforms to the specifications in Subsection 405.C.1.c.(2) of these Regulations.

503. Monitoring. The monitoring of alternative onsite wastewater treatment systems that is required by Section 420-6.810, subsection (b), of the Ordinance must include periodic inspections and submission of reports in accordance with all of the following:

A. Inspections. A qualified inspector must periodically inspect an alternative onsite wastewater treatment system on behalf of the owner of the system. At a minimum, the qualified inspector must do all of the following: (1) Inspect the disposal field, supplemental treatment unit, pump tank, septic tank and alarms and assess whether they are functioning as designed; (2) check the supplemental treatment unit for water tightness; (3) check the disposal field for any surfacing effluent; and (4) check all performance wells for the presence of water, and if present, collect samples and field-test them for the presence of any effluent. An inspection must be conducted within 60 days prior to the deadline for submission of a report on the inspection as set forth below.

B. Reports.

1. General. A written report on an inspection conducted under Subsection 503.A. of these Regulations must be prepared by the qualified inspector who conducted the inspection and submitted to the health officer. The report must, at a minimum, identify the date of the inspection and street address of the system inspected, describe all activities conducted and observations made by the qualified inspector during the inspection, set forth the qualified inspector's determination as to whether the supplemental treatment unit, disposal field, pump tank, septic tank and alarms are functioning as designed, and provide recommendations for returning a system component that is not functioning as designed to a properly functioning condition.

2. Submission requirements.

a. Initial report. An initial monitoring report must be submitted no later than one year after (a) issuance of a certificate of occupancy of the structure served by the system, (b) the health officer's final approval of construction or alteration of the system, or (c) the effective date of these Regulations, whichever occurs later.

b. Subsequent reports.

(1) If the alternative onsite wastewater treatment system was constructed on or after the effective date of these Regulations, a second monitoring report must be submitted to the health officer within one year after the deadline for submission of the initial report.

(2) A monitoring report must be submitted to the health officer within five years after the deadline for submission of the second monitoring report or, as to alternative onsite wastewater treatment systems constructed prior to the effective date of these Regulations, within five years after the deadline for submission of the initial report. Thereafter, as to all alternative wastewater treatment systems, a monitoring report must be submitted to the health officer within five years after the deadline for submission of the immediately preceding monitoring report.

504. Mitigation. The mitigation measures required by Section 420-6.810, subsection (c), of the Ordinance are:

A. Sampling. Except as provided below, effluent samples must be collected from the system's monitoring wells. At least one sample must be collected from an inspection well. If any performance well contains effluent, at least one effluent sample must be collected from a performance well. In the event all inspection wells are dry at the time of sampling, at least one sample must be collected from a point in the transport line that connects the supplemental treatment unit to the disposal field.

B. Laboratory Testing. Effluent samples must be submitted to a certified laboratory to evaluate conformance with all of the following parameters:

1. Biochemical oxygen demand: No greater than 30 mg/L

2. Total suspended solids: No greater than 30 mg/L

3. Fecal coliform: No greater than 200 colonies per 100 milliliters

4. Nitrate reduction: At least 50 percent

C. Reports.

1. General. A written report on the quality of the effluent discharged from the supplemental treatment unit, as determined by laboratory testing, must be prepared and submitted to the health officer no later than 60 days after collection of the most recent effluent sample(s) tested and referenced in the report, in accordance with the submission requirements below. The report must identify the date and location of collection of the sample(s) and include a copy of all laboratory test reports applicable to the sample(s).

2. Submission requirements. Reports required under this Subsection 504.C. are due and must be submitted by the applicable deadlines for reports set forth in Section 503 of these Regulations.

D. Corrective Action. If a laboratory test report submitted to the health officer under Subsection 504.C. of these Regulations shows that any effluent sample failed to meet any of the applicable effluent quality parameters set forth in Subsection 504.B. of these Regulations (a "Failing Report"), the owner of the system must take any and all corrective actions necessary to cause the effluent treated by the system to conform to those parameters. Corrective actions must be completed, and a report discussing those corrective actions and demonstrating that effluent conforms to the applicable effluent quality parameters must be submitted to the health officer, no later than 180 days after the date of the Failing Report.

SECTION 600: CONSTRUCTION PERMITS

601. General. Application for a permit to construct, alter, relocate or replace an onsite wastewater treatment system, or primary component thereof, must be made by using a form approved by the health officer.

602. Application Requirements. Applications will be accepted only if they are complete. A complete application must include an application form that has been completed in full and, except as set forth in Section 603 of these Regulations, all of the items described below:

A. Plot Plan. Four copies of a plot plan must be submitted with the application. The plot plan must be drawn to scale of not less than 1 inch equals 20 feet and be a minimum of 8½ inches x 11 inches in size. A plot plan must contain all of the following information regarding the lot where the onsite wastewater treatment system to be constructed or altered will be located:

1. A location map, indicating the location of the lot with respect to abutting lots and the nearest public road;

2. Lot boundaries and dimensions;

3. The name of the lot owner and address and Assessor's Parcel Number of the lot;

4. A north arrow and plan scale;

5. The location of all water and monitoring wells on the subject lot and all abutting lots, watercourses and water bodies (including, but not limited to, springs, marsh areas, drainage ditches, channels), cuts, embankments, natural bluffs or unstable land forms within 100 feet of any portion of the onsite wastewater treatment system to be constructed or altered, and any reserve area;

6. The location of any and all existing and proposed buildings, swimming pools, retaining walls, driveways, paved areas, water lines, underground utilities, storage tanks (underground and above ground), trees equal to or greater than 6 inches in diameter (measured at 4.5 feet from the ground surface) and easements located on the lot that are within 25 feet of the onsite wastewater treatment system to be constructed or altered;

7. Contour lines, if slopes are greater than 5 percent. If slopes are equal to or less than 5 percent, the direction and percentage of slopes must be shown;

8. The location of any existing onsite wastewater treatment systems and other sewage disposal systems on the lot;

9. The layout (including dimensions) of the onsite wastewater treatment system to be constructed or altered;

10. The location of each soil percolation test hole and soil profile hole; and

11. The name, signature, stamp or seal of the qualified professional who prepared the plan, and the date the plan was signed and stamped or sealed.

B. Floor Plan. Four copies of a floor plan of a structure to be served by the onsite wastewater treatment system to be constructed or altered must be submitted with the application. The floor plan must be drawn to scale of not less than 1 inch equals 20 feet and a minimum of 8½ inches x 11 inches in size. A floor plan must contain all of the following information:

1. The layout of all rooms on each floor of the structure;

2. The clear labeling of each room as to type; and

3. The name and signature of the person who prepared the plan.

C. Construction Plan. Four copies of a plan for construction of the onsite wastewater treatment system to be constructed or altered must be submitted with the application. The construction plan must be drawn to scale of not less than 1 inch equals 20 feet and a minimum of 8½ inches x 11 inches in size. A construction plan must be prepared by a California-licensed civil engineer or California-registered environmental health specialist, conform to all applicable design requirements set forth in these Regulations and contain all of the following information:

1. The layout of the system, including the location of all primary components;

2. The location of all transport lines;

3. Typical cross-sections of the proposed disposal field;

4. Construction details of all septic tanks, pumps, supplemental treatment units, distribution boxes, transport lines and distribution pipes; and

5. The name, signature, stamp or seal of the person responsible for the plan, and the date the plans were signed and stamped or sealed.

D. Soil Percolation Test Results. The results of soil percolation tests conducted on the lot in accordance with Section 305 of these Regulations must be submitted with the application in the form described in Subsection 305.F.1. of these Regulations.

E. Calculations; Specifications.

1. Calculations. Calculations that are used to determine the required size of the septic tank and absorption area of the disposal field and that conform to the requirements in Section 400 of these Regulations must be submitted with the application.

2. Specifications. A copy of the manufacturer's specifications of all septic tanks, pumps, supplemental treatment units, distribution boxes, transport lines and distribution pipes must be submitted with the application.

603. Permits for Tank Replacements. An application for a permit to replace a septic tank, pump tank or supplemental treatment unit must include a copy of the manufacturer's specifications for the replacement tank or supplemental treatment unit.

604. No Guarantees. Acceptance of a permit application does not guarantee that a permit will be issued. Issuance of a permit does not guarantee that a system will operate satisfactorily.

SECTION 700: BUILDING PERMITS; CERTIFICATES OF OCCUPANCY; SUBDIVISION MAPS

701. Building Permits.

A. Review of Proposed Sewage Disposal Method. An application that is submitted to the health officer for review of a proposed method of sewage disposal under Section 420-6.604, subsection (a)(1) or (a)(2), of the Ordinance must be submitted with a plot plan that shows the locations of any and all existing and proposed buildings and other structures on the lot and contains all of the information described in Subsections 602.A.1.-4. of these Regulations, floor plans, the construction plan of the sewage disposal system and, if the sewage disposal system has not yet been constructed, the soil percolation test report described in Section 305 of these Regulations.

B. Review of Proposed Structure Location.

1. Application. An application that is submitted to the health officer for review of the location of a proposed structure under Section 420-6.604, subsection (a)(3), of the Ordinance must be submitted with a plot plan that shows the locations of any and all existing and proposed buildings and other structures, sewage disposal systems and reserve areas on the lot and contains all of the information described in Subsections 602.A.1.-4. of these Regulations.

2. Findings supporting approval of location. The health officer may determine under Section 420-6.604, subsection (d)(2), of the Ordinance that construction of a structure will not interfere with the use of a necessary approved sewage disposal system, reserve area or designated disposal field area if the health officer makes one of the following three findings:

a. That no part of the structure would be located:

(1) Within the footprint of, or any applicable setback from, an approved sewage disposal system; or

(2) Within a reserve area or setback therefrom equivalent to the setback from a disposal field; or

(3) Within a designated disposal field area or setback therefrom equivalent to the setback from a disposal field.

b. That part of the structure would be located within a reserve area or setback therefrom equivalent to the setback from a disposal field, but that:

(1) No part of the structure would be located within the footprint of, or any applicable setback from, an approved sewage disposal system, and

(2) If part of the structure would also be located within a designated disposal field area, or setback therefrom equivalent to the setback from a disposal field, the health officer makes one of the findings set forth in Subsection 701.B.2.c.(3)-(4) of these Regulations; and

(3) The health officer finds:

(a) That a sanitary sewer is available for connection to a structure that is connected to the onsite wastewater treatment system for which the reserve area was approved; or

(b) That the onsite wastewater treatment system for which the reserve area was approved has been abandoned; or

(c) That the onsite wastewater treatment system for which the reserve area was approved is not connected to any structure and a sanitary sewer is available for connection to at least one structure that could be constructed on the lot; or

(d) That a replacement reserve area has been approved by the health officer.

c. That part of the structure would be located within a designated disposal field area or setback therefrom equivalent to the setback from a disposal field, and that:

(1) No part of the structure would be located within the footprint of, or any applicable setback from, an approved sewage disposal system; and

(2) If part of the structure would also be located within a reserve area or setback therefrom equivalent to the setback from a disposal field, the health officer makes at least one of the findings set forth in Subsection 701.B.2.b.(3)(a)-(d) of these Regulations; and either

(3) The lot owners have executed and submitted to the health officer a notarized document stating that the designated disposal field area is not needed and acknowledging that construction in the proposed location could inhibit future development of a structure containing plumbing fixtures on the lot if an onsite wastewater treatment system cannot be constructed to serve that structure or connection to a sanitary sewer is not available to that structure, or

(4) The health officer finds:

(a) That a sanitary sewer is available for connection to at least one structure that could be constructed on the lot; or

(b) That a replacement designated disposal area has been approved by the health officer.

3. Findings requiring disapproval of location. The health officer may determine under Section 420-6.604, subsection (d)(2), of the Ordinance that construction of a structure will interfere with the use of a necessary approved sewage disposal system, reserve area or designated disposal field area if the health officer makes one of the following three findings:

a. That part of the structure would be located within the footprint of, or any applicable setback from, an approved sewage disposal system.

b. That part of the structure would be located within a reserve area or setback therefrom applicable to the setback from a disposal area, and that:

(1) A structure is connected to the onsite wastewater treatment system for which the reserve area was approved, and a sanitary sewer is not available for connection to that structure; and

(2) A replacement reserve area has not been approved by the health officer.

c. That part of the structure would be within a designated disposal field area or setback therefrom equivalent to the setback from a disposal field, and that:

(1) A sanitary sewer is not available for connection to any structure that could be constructed on the lot; and

(2) A replacement designated disposal field area has not been approved by the health officer; and

(3) The notarized statement described in Subsection 701.B.2.c.(3) of these Regulations has not been submitted.

702. Certificates of Occupancy. An application that is submitted to the health officer for review of a proposed method of sewage disposal under Section 420-6.604, subsection (b), of the Ordinance must be submitted with a plot plan, floor plans, the construction plan of the sewage disposal system and, if the sewage disposal system has not yet been constructed, the soil percolation test report described in Section 305 of these Regulations.

703. Subdivision Maps. A proposed tentative map that is submitted to the health officer for review of a proposed method of sewage disposal must be submitted with a plot plan and the soil percolation test report described in Section 305 of these Regulations.

SECTION 800: CONSTRUCTION, INSTALLATION AND INSPECTION

801. General. An onsite wastewater treatment system must be constructed in strict accordance with the Ordinance, these Regulations and construction plans approved by the health officer. A copy of the construction plans must be available at the job site until construction of the system is completed and approved by the health officer.

802. Commencement of Work. Work may commence upon issuance of a permit to construct, alter, relocate or replace an onsite wastewater treatment system, or primary component thereof, provided that the applicant has obtained any and all other permits and authorizations that might be required by the State, County or other public agency.

803. Tanks.

A. Installation. A tank utilized in an onsite wastewater treatment system must be installed level on a firm bedding of compacted soil, sand or gravel in accordance with the manufacturer's specifications. All pipes that pass through a tank must be sealed with a watertight sealant.

B. Testing. A tank utilized in an onsite wastewater treatment system must be demonstrated to be watertight by field testing conducted in the presence of the health officer as follows during the installation of the system: Fill tanks with water two inches into riser connections at least 24 hours prior to commencement of the test and mark water level. The test consists of a one-hour observation period. The absence of any water drop during this period is considered a passing test. If the water level drops, the tank must be resealed and retested.

C. Cover. A tank utilized in an onsite wastewater treatment system may not be covered until after the health officer has conducted an inspection of the tank and its connections.

804. Transport Lines. Transport lines must be buried a minimum of 12 inches below the natural grade.

805. Disposal Fields.

A. Trenches.

1. Trenches must be constructed when the soil is dry to minimize soil compaction and smearing of trench sidewalls.

2. Smearing of the bottom and sidewalls of a trench during construction must be corrected by scarifying those surfaces after trench excavation is complete.

3. Physical barriers must be used to minimize the entry of surface runoff into open trenches during construction.

4. Cover material must be placed so as to maximize protection from surface runoff and not crush piping or drain media. Cover material must be placed as soon as possible after the final construction inspection.

B. Drain Media.

1. Drain media must be protected from contamination with soil during installation.

2. Drain media in trenches must be installed entirely within native soil and below the existing grade.

C. Imported Fill.

1. Site preparation. Prior to placement of imported fill, all vegetation must be removed from the native soil in the area of the proposed disposal field and the ground surface disced or plowed to permit good mixing of native soil and fill material.

2. Compaction. Imported fill must be placed in layers of not more than 8 inches and compacted in a manner to minimize settlement and allow transmission of air.

D. Mounds. The construction of mounds must conform to the guidelines contained in the Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual by James C. Converse et al., January 2000 and as amended, except that in the event specifications conflict, the applicable specifications in these Regulations will control.

E. At Grade Beds. The construction of at-grade beds must conform to the guidelines contained in the Wisconsin At-Grade Soil Absorption System: Siting, Design and Construction Manual by James C. Converse et al., January 1990 (part of the Small Scale Waste Management Project, University of Wisconsin-Madison) and as amended, except that in the event specifications conflict, the applicable specifications in these Regulations will control.

F. Alternative Onsite Wastewater Treatment Systems. Proprietary supplemental treatment units must be assembled and installed in strict accordance with the manufacturer's instructions.

806. Inspections. All installations must be inspected and approved by the health officer before they are considered complete and may be used. Inspection requests must be submitted to the health officer a minimum of two business days prior to an inspection.

SECTION 900: ALTERATIONS AND CHANGES OF USE OF EXISTING STRUCTURES

901. Alterations.

A. General. Sewage disposal requirements for an addition to, or remodel of, an existing structure that is served by an onsite wastewater treatment system are determined based on the existence of plumbing fixtures, the type and capacity of any existing system and sewer availability, as set forth below.

B. Type of System. An onsite wastewater treatment system that serves a structure may be used as a method of sewage disposal to serve an addition to or remodeled portion of that structure if the owner of the system proves, though the submission of written evidence, all of the following: (1) The system is an approved sewage disposal system; (2) the system is properly functioning; and (3) the design daily sewage flow of the system is sufficient to accommodate the peak daily sewage flow to be generated by the existing structure and the addition or remodel. Evidence that will be considered by the health officer includes, but is not necessarily limited to, historical permit records and a written evaluation report by a qualified professional that identifies the components of the system and addresses the system's integrity, performance, design daily sewage flow, peak daily sewage flow and, with regard to non-residential structures, wastewater strength.

C. Sewer Availability. If an addition to or remodeled portion of a structure requires a method of sewage disposal, and an existing onsite wastewater treatment system that serves the structure does not meet all of the criteria set forth in Subsection 901.B. of these Regulations, the addition to or remodeled portion of the structure must be connected to either (1) a sanitary sewer, if available or (2) if a sanitary sewer is not available, an onsite wastewater treatment system that complies with all applicable requirements in the Ordinance and these Regulations.

902. Non-Residential Changes in Use.

A. If a proposed change in use of a non-residential structure that is served by an onsite wastewater treatment system is not projected to cause any increase in sewage flow or wastewater strength, the structure may continue to be served by that system if the health officer determines that it is an approved sewage disposal system.

B. If a proposed change in use of a non-residential structure that is served by an onsite wastewater treatment system is projected to cause an increase in sewage flow or wastewater strength, the structure must be connected to either (1) a sanitary sewer, if available or (2) an onsite wastewater treatment system that complies with all applicable requirements in the Ordinance and these Regulations.

SECTION 1000: SEWAGE HOLDING TANK SYSTEMS

1001. General. A sewage holding tank system is a sewage collection system that includes a watertight tank designed to collect and temporarily store wastewater that is periodically removed by a permitted septic tank-chemical toilet cleaner.

1002. Permits. An application for a permit to install a sewage holding tank system must conform to the requirements in Sections 601 and 603 and Subsections 602.A. and 602.B. of these Regulations.

1003. Design.

A. Tanks. The design of a sewage holding tank must conform to the requirements in Subsections 402.A., 402.D., 402.E. and 402.F. of these Regulations.

B. Alarms.

1. A sewage holding tank must be equipped with a high water sensing device and high water audible and visual alarms, mounted on the structure served or on a pipe stand or wooden post within 5 feet of the structure served.

2. The high water sensing device must be designed to activate the alarms when the remaining volume available in the holding tank to store sewage is no less than the design daily sewage flow of the structure being served.

1004. Installation; Inspections. A sewage holding tank system must be installed and inspected in accordance with the requirements in Section 803 of these Regulations.

SECTION 1100. ABANDONMENT

1101. Sewage Disposal Systems.

A. Onsite Wastewater Treatment Systems. The procedures for abandonment of an onsite wastewater treatment system are:

1. Convert the septic tank to a sewage holding tank; or

2. Complete all of the following tasks:

a. All contents must be removed from the septic tank and all other tanks utilized in the system and hauled away by a registered septic tank-chemical toilet cleaner;

b. All tank lids must be removed and either recycled or disposed of at a permitted solid waste facility;

c. All tanks must be excavated, removed and disposed of at a permitted solid waste facility or abandoned in place. If a tank will be abandoned in place, a sufficient number of holes must be made in the bottom of the tank to prevent accumulation of surface water in or above the tank; and

d. All tanks that are abandoned in place and excavations made in the course of an abandonment under this Subsection 1101.A. must be filled with pea gravel, drain rock or compacted native soil.

B. Cesspools; Pit Privies. The procedures for abandonment of a cesspool or pit privy are:

1. All contents must be removed from the cesspool or pit and hauled away by a registered septic tank-chemical toilet cleaner; and

2. The cesspool or pit must be filled with pea gravel, drain rock or compacted native soil.

1102. Sewage Collection Systems.

A. Sewage Holding Tank Systems. The procedures for abandonment of a sewage holding tank system are:

1. Convert the sewage holding tank to a septic tank; or

2. Complete all of the following tasks:

a. All contents must be removed from the holding tank and hauled away by a licensed septic tank chemical toilet cleaner;

b. The lid of the holding tank must be removed and either recycled or disposed of at a permitted solid waste facility;

c. The holding tank must be excavated, removed and disposed of at a permitted solid waste facility or abandoned in place. If the tank will be abandoned in place, a sufficient number of holes must be made in the bottom of the tank to prevent accumulation of surface water in or above the tank; and

d. A holding tank that is abandoned in place or excavation made in the course of an abandonment under this Subsection 1102.A. must be filled with pea gravel, drain rock or compacted native soil.

B. Vault Privies. The procedures for abandonment of a vault privy are:

1. All contents must be removed from the vault and hauled away by a registered septic tank chemical toilet cleaner;

2. The vault must be excavated, removed and disposed of at a permitted solid waste facility; or, if the vault will be abandoned in place, a sufficient number of holes must be made in the bottom of the vault to prevent accumulation of surface water in or above the vault; and

3. The vault or excavation must be filled with pea gravel, drain rock or compacted native soil.

SECTION 1200. SEPTIC TANK-CHEMICAL TOILET CLEANERS

1201. Registration. An applicant for septic tank-chemical toilet cleaner registration must earn a passing score of at least 70 percent on the examination administered by the health officer under Health and Safety Code section 117420 as a condition of issuance of registration.

1202. Equipment.

A. Vehicles.

1. Vehicle identification markings required under Section 420-6.1206 of the Ordinance must:

a. Be applied to both sidewalls of the vehicle;

b. Be in sharp contrast to the background;

c. Be of such size as to be readily visible during daylight hours from a distance of 50 feet; and

d. Include the following information:

(1) The name and address of the permitted septic tank-chemical toilet tank cleaner; and

(2) The capacity of the sewage collection tank, in gallons.

2. The permit decal required under Section 420-6.1206 of the Ordinance must be prominently displayed on the rear of the vehicle.

B. Tanks. Sewage collection tanks on vehicles used to collect or transport sewage must be constructed of metal, watertight, and designed to prevent spillage of the contents. A means to accurately measure the volume of the contents in the tank must be provided. A leak-proof gate valve must be provided on the tank for the collection or discharge of the tank contents. The gate valve must have a leak-proof screw plug or screw cap that must be installed when the valve is not being used.

C. Pumps. Pumps on vehicles used to collect or transport sewage must be designed to prevent leakage.

D. Pipes and hoses. Pipes and hoses on vehicles used to collect or transport sewage must be designed to prevent leakage and be of a sufficient length to extend fully into, and maximize the removal of the contents of, the septic tank, sewage holding tank, onsite wastewater treatment system, cesspool, privy pit or vault, seepage pit or chemical toilet being cleaned.

1203. Chemical Toilets.

A. Design; Construction.

1. Chemical toilets must be designed and constructed to keep out flies and vermin.

2. The interior surfaces of a chemical toilet must be durable, non-absorbent, smooth and easily cleanable.

3. A chemical toilet must be equipped with a tank upon which is mounted a toilet seat that is durable, non-absorbent, smooth and easily cleanable.

4. A chemical toilet tank must have a capacity of at least 40 gallons. The tank must be constructed of durable easily cleanable material, leak proof and designed to prevent spillage.

5. Chemical toilets must be ventilated and equipped with a self-closing door that is lockable from the inside.

B. Markings. The name of the permitted septic tank-chemical toilet cleaner and the unit number must be applied to each chemical toilet so that it is clearly visible and in lettering at least 3-inches in height.

C. Operation.

1. Chemical toilets must be kept clean and sanitary.

2. Effective odor control and solid-liquefying chemicals must be used in the chemical toilet holding tank at all times the chemical toilet is available for use.

APPENDICES

Appendix 1

Minimum Horizontal Setback Requirements

Except as otherwise provided herein, the following minimum horizontal setbacks apply to the installation of sewage holding tanks and new or replacement onsite wastewater treatment systems, or the primary components thereof. If a minimum horizontal setback requirement cannot be met on a lot upon which an approved sewage disposal system was lawfully installed prior to the effective date of the Health Officer Regulations for Sewage Collection and Disposal incorporating this Appendix 1, the setback requirements must be met to the greatest extent practicable. Notwithstanding the foregoing, a replacement system or sewage holding tank setback must not be less than the corresponding setback requirement in effect at the time of installation of the system to be replaced or, in the absence of a corresponding historical setback requirements, the corresponding setback of the system to be replaced.

Site Feature	Setback to Tanks	Setback to Edge of Disposal Field	Setback to Transport Lines
High water marks of bays, streams, rivers, canals	100 feet	100 feet[1 2]	50 feet
High water marks of ditches, culverts, ephemeral streams	50 feet	50 feet	50 feet
High water marks of lakes, reservoirs	100 feet	200 feet[1]	50 feet
Depressions and low areas	5 feet	10 feet	5 feet
Downslope or adjacent cutbanks, fill banks, escarpments, embankments, natural bluffs	10 feet	25 feet or 4x height of feature, whichever is greater, but not more than 100 feet[3]	10 feet
Fill areas, unstable soil, unstable landforms, drainage swales	10 feet	25 feet	10 feet
Trees	10 feet	10 feet	10 feet
Areas subject to vehicular traffic	N/A	5 feet	N/A
Structures, foundations	10 feet	10 feet	5 feet
Underground irrigation or drainage systems (watertight piping)	10 feet	10 feet	10 feet
Underground irrigation or drainage systems (non-watertight piping)	100 feet	100 feet	50 feet
Easements	5 feet	5 feet	5 feet

Site Feature	Setback to Tanks	Setback to Edge of Disposal Field	Setback to Transport Lines
Property lines of lots with public water supply and no on-site well	10 feet	10 feet	10 feet
Property lines of lots with on-site well or spring water supply	25 feet	50 feet	10 feet
Slopes (down gradient or level with disposal field) $0 \leq x < 25\%$ $25\% \leq x < 30\%$ $30\% \leq x < 35\%$ $x > 35\%$ x=slope	 12 feet 25 feet 37 feet 50 feet	 12 feet 25 feet 37 feet 50 feet	 N/A N/A N/A N/A
Toe or cut of up gradient slope > 20%	5 feet	5 feet	N/A
Water mains	25 feet	25 feet	10 feet
Edges of disposal field	5 feet	N/A	N/A
Underground utilities	5 feet	5 feet	5 feet
Public water lines	10 feet	10 feet	10 feet
Private water lines	5 feet	5 feet	10 feet
Public water wells	150 feet	150 feet	50 feet
Private water wells, springs	100 feet	100 feet	50 feet
Domestic water supply reservoirs or tributary streams thereof	100 feet	1,000 feet	50 feet

[1] If the disposal field is within 1,200 feet from a public water system's surface water intake point, within the catchment of the drainage, and located such that effluent from the disposal field may impact water quality at the intake point, such as upstream of the intake point for flowing water bodies, the disposal field shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

[2] If the disposal field is more than 1,200 feet but less than 2,500 feet from a public water system's surface water intake point, within the catchment of the drainage, and located such that effluent from the disposal field may impact water quality at the intake point, such as upstream of the intake point for flowing water bodies, the disposal field shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

[3] Setback will be measured from the top edge of the feature. Where an impermeable layer intersects a cut, and natural seepage is evident, the minimum setback must be 100 feet from the cut unless it is demonstrated to the satisfaction of the health officer that other site factors (e.g., soil depth) will prevent lateral seepage of effluent.

Appendix 2

Estimated Sewage Flows For Non-Residential Uses

Table 1

Type of Establishment[1]	Unit	Sewage Flow (gallons/unit/day)
Airports	Passenger	5
Assembly halls/churches without kitchens	Seat	5
Assembly halls/churches with kitchens	Seat	10
Boarding schools	Student	100
Country clubs	Resident member	100
Country clubs	Non-resident members and guests present	25
Day camps (no meals served)	Person	15
Offices	Employee	20
Drive-in theaters	Car space	5
Factories	Employee	35
Hospitals	Bed space	250
Hotels/motels/bed and breakfasts with private baths	Bed space	60
Hotels/motels/bed and breakfasts without private baths	Bed space	50
Hotels/motels with private baths and kitchens	Bed space	75
Institutions other than hospitals	Bed space	125
Movie theaters	Auditorium seat	5
Offices	Employee	20
Picnic parks with bathing facilities and flush toilets	Person	10
Picnic parks with flush toilets only	Person	5
Resort camps with plumbing fixtures	Person	50
Resort cottages/cabins	Person	50
Restaurants – Add the applicable flows per category:		
Multi-use utensils	Seat	35
Single-use utensils	Seat	25
Bar and cocktail lounge	Seat	20
Retail stores (excluding food facilities)	Employee	20

Type of Establishment[1]	Unit	Sewage Flow (gallons/unit/day)
Schools without cafeterias, gymnasiums or showers	Student	15
Schools with cafeterias, but no gymnasiums or showers	Student	20
Schools with cafeterias, gyms and showers	Student	25
Self-service laundries	Wash	50
Service stations	Vehicle served	10
Swimming pools/bathhouses	Person	10
Tourist camps/mobile home parks with individual bath units	Person	100
Tourist camps and trailer parks with central bathhouses	Person	75
Work or construction camps (temporary)	Person	50
Alcoholic beverage tasting facility (no meals served)	Person	2.5

[1] If an establishment is not listed in Table 1 above, sewage flow may be estimated based on the total fixture unit value for the establishment and Table 2 below. Fixture unit values for specified drainage fixtures are based on Table 702.1 of the 2013 California Plumbing Code, as may be amended from time to time

Table 2

Total Fixture Units	Sewage Flow (gallons/day)
1 to 15	375
16 to 20	500
21 to 25	600
26 to 35	750
36 to 45	1,000
46 to 55	1,112
56 to 60	1,250
61 to 70	1,375
71 to 80	1,500
81 to 90	1,625
91 to 100 [2]	1,750

[2] For each additional fixture unit over 100, add 12.5 gallons per fixture unit.

Appendix 3
Wastewater Loading Rates

Percolation Rates (Minutes per inch) and
Associated Wastewater Loading Rates (Gallons per square foot per day)

1-3 MPI = 1.200 gal/sq ft/day	47 MPI = 0.437 gal/sq ft/day
4 MPI = 1.143 gal/sq ft/day	48 MPI = 0.430 gal/sq ft/day
5 MPI = 1.086 gal/sq ft/day	49 MPI = 0.423 gal/sq ft/day
6 MPI = 1.029 gal/sq ft/day	50 MPI = 0.417 gal/sq ft/day
7 MPI = 0.971 gal/sq ft/day	51 MPI = 0.410 gal/sq ft/day
8 MPI = 0.914 gal/sq ft/day	52 MPI = 0.403 gal/sq ft/day
9 MPI = 0.857 gal/sq ft/day	53 MPI = 0.397 gal/sq ft/day
10 MPI = 0.800 gal/sq ft/day	54 MPI = 0.390 gal/sq ft/day
11 MPI = 0.786 gal/sq ft/day	55 MPI = 0.383 gal/sq ft/day
12 MPI = 0.771 gal/sq ft/day	56 MPI = 0.377 gal/sq ft/day
13 MPI = 0.757 gal/sq ft/day	57 MPI = 0.370 gal/sq ft/day
14 MPI = 0.743 gal/sq ft/day	58 MPI = 0.363 gal/sq ft/day
15 MPI = 0.729 gal/sq ft/day	59 MPI = 0.357 gal/sq ft/day
16 MPI = 0.714 gal/sq ft/day	60 MPI = 0.350 gal/sq ft/day
17 MPI = 0.700 gal/sq ft/day	61 MPI = 0.345 gal/sq ft/day
18 MPI = 0.686 gal/sq ft/day	62 MPI = 0.340 gal/sq ft/day
19 MPI = 0.671 gal/sq ft/day	63 MPI = 0.335 gal/sq ft/day
20 MPI = 0.657 gal/sq ft/day	64 MPI = 0.330 gal/sq ft/day
21 MPI = 0.643 gal/sq ft/day	65 MPI = 0.325 gal/sq ft/day
22 MPI = 0.629 gal/sq ft/day	66 MPI = 0.320 gal/sq ft/day
23 MPI = 0.614 gal/sq ft/day	67 MPI = 0.315 gal/sq ft/day
24 MPI = 0.600 gal/sq ft/day	68 MPI = 0.310 gal/sq ft/day
25 MPI = 0.593 gal/sq ft/day	69 MPI = 0.305 gal/sq ft/day
26 MPI = 0.587 gal/sq ft/day	70 MPI = 0.300 gal/sq ft/day
27 MPI = 0.580 gal/sq ft/day	71 MPI = 0.295 gal/sq ft/day
28 MPI = 0.573 gal/sq ft/day	72 MPI = 0.290 gal/sq ft/day
29 MPI = 0.567 gal/sq ft/day	73 MPI = 0.285 gal/sq ft/day
30 MPI = 0.560 gal/sq ft/day	74 MPI = 0.280 gal/sq ft/day
31 MPI = 0.553 gal/sq ft/day	75 MPI = 0.275 gal/sq ft/day
32 MPI = 0.545 gal/sq ft/day	76 MPI = 0.270 gal/sq ft/day
33 MPI = 0.538 gal/sq ft/day	77 MPI = 0.265 gal/sq ft/day
34 MPI = 0.531 gal/sq ft/day	78 MPI = 0.260 gal/sq ft/day
35 MPI = 0.523 gal/sq ft/day	79 MPI = 0.255 gal/sq ft/day
36 MPI = 0.516 gal/sq ft/day	80 MPI = 0.250 gal/sq ft/day
37 MPI = 0.509 gal/sq ft/day	81 MPI = 0.245 gal/sq ft/day
38 MPI = 0.501 gal/sq ft/day	82 MPI = 0.240 gal/sq ft/day
39 MPI = 0.494 gal/sq ft/day	83 MPI = 0.235 gal/sq ft/day
40 MPI = 0.487 gal/sq ft/day	84 MPI = 0.230 gal/sq ft/day
41 MPI = 0.479 gal/sq ft/day	85 MPI = 0.225 gal/sq ft/day
42 MPI = 0.472 gal/sq ft/day	86 MPI = 0.220 gal/sq ft/day
43 MPI = 0.765 gal/sq ft/day	87 MPI = 0.215 gal/sq ft/day
44 MPI = 0.457 gal/sq ft/day	88 MPI = 0.210 gal/sq ft/day
45 MPI = 0.450 gal/sq ft/day	89 MPI = 0.205 gal/sq ft/day
46 MPI = 0.443 gal/sq ft/day	90-120 MPI = 0.200 gal/sq ft/day

Appendix 4
Sand Specifications

The following specifications apply to sand fill used in an intermittent sand filter, recirculating sand filter, pressure-dosed sand trench or mound. Sand fill may be used only after a sieve analysis report documenting the sand's conformance with applicable specifications has been submitted to and approved by the health officer.

Sieve Size	Sieve Diameter (mm)	Percent Passing	
		RSF[1]	Mounds, ISF[2], PDST[3]
3/8 in	9.50	100	100
# 4	4.75	70-100	95-100
# 10	2.00	5-80	65-100
# 16	1.18	0-4	45-85
# 30	0.59	0-4	25-55
# 50	0.297	0-1	5-20
# 60	0.249	0-1	0-10
# 100	0.149	0-1	0-4
# 200	0.074	0-1	0-2

1 Recirculating sand filter
2 Intermittent sand filter
3 Pressure-dosed sand trench