CHAPTER 73. STANDARDS FOR ONLOT SEWAGE TREATMENT FACILITIES

Commented [A1]: Key to changes:
Green: moved language
[Red]: reserved/deleted
Black: new language

Subchapter A. GENERAL

§ 73.1. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

***AASHTO*—The American Association of State Highway and Transportation Officials.**

***ANSI*—American National Standards Institute of New York, New York.**

***ASTM*—American Society for Testing and Materials.**

Absorption area—A component of an individual or community **onlot** sewage system where **[liquid]effluent** from a treatment tank seeps into the soil; it consists of **soil or** an aggregate-filled area containing **subsurface** piping **or tubing** for the distribution of **[liquid and the soil or sand/soil combination located beneath the aggregate] effluent**.

Act—The Pennsylvania Sewage Facilities Act (35 P. S. §§ 750.1—750.20).

[*Aggregate* - Coarse material manufactured from stone, gravel or slag having Type B characteristics as described in Department of Transportation specifications, Form 408, section 703.3,Table B and uniform size and grading equivalent to American Association of State Highway and Transportation Officials No. 57, as described in Form 408, section 703.3, 2 Table C.]

Commented [A2]: New proposed definition for "coarse aggregate" below

[*Agricultural areas*—Areas used primarily for the production of crops and where the soil is without vegetative cover during certain periods of the year.]

***Advanced secondary treatment*—The use of physical, biological and chemical operations and processes designed to achieve a $CBOD_5$ and total suspended solids of 10 milligrams per liter or less.**

***Aggregate area*—The square footage of the coarse aggregate in an absorption area.**

Alternate sewage system—A method of demonstrated onlot sewage treatment and disposal not described in this part.

***BNQ*—Bureau de normalization du Quebec.**

***BOD—Biochemical oxygen demand*—The amount of oxygen taken up by microorganisms that decompose organic waste matter in water. It is used as a measure of the amount of certain types of organic pollutant in water.**

***BOD_5—Five-day biochemical oxygen demand*—The 5-day measure of the pollutant parameter BOD.**

Bonded disposal system—An individual **onlot** sewage system located on a single lot serving a **[single family]single-family** residence, where soil mottling **[is within 20 inches of the mineral soil surface, the] has been determined by a qualified soil scientist, qualified registered professional geologist or a qualified registered professional engineer to not signify a SHWT. The** installation, operation, and replacement **[which] of the bonded system** is guaranteed by the property owner.

***Borehole*—A narrow shaft bored in the ground, either vertical or horizontal.**

Building sewer—Piping carrying liquid wastes from a building to the treatment tank or holding tank.

[*Buried sand filter*—A system of piping, sand media, aggregate and collection piping in a buried liner used for the intermittent filtration and biochemical treatment of sewage.]

***CBOD — Carbonaceous biochemical oxygen demand*—A measure of the total amount of oxygen consumed as a result of biological respiration of carbonaceous materials over an extended incubation period, typically with the use of a nitrification inhibitor to exclude the oxygen demand resulting from the oxidation of nitrogenous materials.**

***$CBOD_5$—Five-day carbonaceous biochemical oxygen demand*— The 5-day measure of the pollutant parameter CBOD.**

***Certification organization*—An organization that oversees the development of voluntary consensus standards and conformity assessment procedures for products and systems. The certification organization should be accredited by ANSI, the Standards Council of Canada or other international organization approved by the Department as an independent third-party organization.**

Clean Streams Law—The Clean Streams Law (35 P. S. §§ 691.1— 691.1001).

***Coarse aggregate*—Coarse material consisting of hard, tough, durable and uncoated inert particles reasonably free from clay, silt, vegetation and other deleterious substances such as reactive chert, gypsum, iron sulfide, amorphous silica and hydrated iron oxide.**

Conventional sewage system—A system employing the use of demonstrated onlot sewage treatment and disposal technology in a manner specifically recognized by this chapter. The term does not include alternate or experimental sewage systems.

Dosing pump—The pump housed in a dosing tank which provides a measured volume of sewage effluent to the pressurized distribution system in an absorption area.

***Embankment cut-face*—A steeply sloping excavation that truncates a slope or hillside.**

Experimental sewage system—A method of onlot sewage treatment and disposal not described in this title which is proposed for the purpose of testing and observation.

Filter tank—**[The] A** tank housing **[the]** piping**, [and sand of the free access sand filter]**

sand or filter media, and aggregate used in the treatment of sewage.

Forested areas—Areas where the predominant vegetative cover is comprised of trees with a closed canopy.

[*Free access sand filter*—An accessible system of tanks, dose piping, sand media, aggregate and collection piping used for the intermittent filtration and biochemical treatment of sewage.]

***gpd*—Gallons per day.**

***gpm*—Gallons per minute.**

Geotextile—**[Material consisting of mesh polypropylene, polyester, nylon, or similar material,]Permeable synthetic fabric** used to prevent **the** migration of fine **[aggregate] materials** into coarser aggregate.

Grassed area—An area where the predominant vegetative cover is comprised of grasses, bushes or trees not forming a closed canopy.

***Graywater*—Sewage drained from sinks, tubs, showers, dishwashers, clothes washers and other nontoilet sources.**

***HLLR—Hydraulic linear loading rate*—The volume of effluent applied to the soil, per linear foot of infiltration component of an onlot sewage system, that can be transmitted far enough away from the infiltrative surface so that it does not impede infiltration of additional effluent. It is expressed in gallons per linear foot per day and determined using soil morphology, depth to a limiting zone and slope.**

Individual residential spray irrigation system—An individual sewage system which serves a single dwelling, and which treats and disposes of sewage using a system of piping, treatment tanks and soil renovation through spray irrigation.

Individual sewage system—A system of piping, tanks or other facilities serving a single lot and collecting and disposing of sewage in whole or in part into the soil or into waters of this Commonwealth or by means of conveyance to another site for final disposal.

Industrial waste—**[A] Shall be construed to mean any** liquid, gaseous, radioactive, solid or other substance, **[which is]** not sewage, resulting from **any** manufacturing or industry, **[or other plant or works] or from any establishment, as defined in the Clean Streams Law,** and mine drainage, **refuse,** silt, coal mine solids, rock, debris, dirt and clay from coal mines, coal collieries, breakers or other coal processing operations. **[The term includes]"Industrial waste" shall include all such** substances whether or not generally characterized as waste.

Lift pump—**[A submersible pump used to convey effluent to the sand filter and from the sand filter to the chlorine/retention tank.] A submersible pump used to transfer effluent from one component of the sewage system to another component at a higher elevation.**

***Limiting zone*—A soil horizon or condition in the soil profile or underlying strata which includes one of the following:**

(i) **A SHWT, whether perched or regional, determined by direct observation of the water table or indicated by soil mottling.**

(ii) **A rock with open joints, fracture or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.**

(iii) **A rock formation, other stratum or soil condition which is so slowly permeable that it effectively limits downward passage of effluent.**

***Local agency*—A municipality, or any combination of municipalities acting cooperatively or jointly under the laws of this Commonwealth, county or health department (county or joint county).**

Commented [A3]: Matches definition in Chapter 71.

***Lot*—A part of a subdivision or a parcel of land used as a building site or intended to be used for building purposes, whether immediate or future, which would not be further subdivided. Whenever a lot is used for a multiple family dwelling or for commercial, institutional or industrial purposes, the lot must be deemed to have been subdivided into an equivalent number of single-family dwelling units (EDUs) as determined by estimated sewage flows.**

***mg/L*—Milligrams per liter.**

***MPN*—Most probable number.**

***Malfunctioning onlot sewage system*—An onlot sewage system that is failing as determined by the sewage enforcement officer or the Department.**

Commented [A4]: Added from TDM.

***Mineral soil*—Soil material with properties that are dominated by the mineral component of the soil rather than the organic part. Mineral soil material contains roughly less than about 35 percent organic matter (or less than about 20 percent organic carbon).**

Commented [A5]: Definition is from the NRCS Glossary of soil terms.

Municipality—A city, incorporated town, township, borough, or home rule municipality other than a county.

Official plan—A comprehensive plan for the provision of adequate sewage systems adopted by a municipality possessing authority over the provision of the systems and submitted to and approved by the Department as provided by the act and Chapter 71 (relating to administration of sewage facilities program).

Person—The term includes an individual; association; public or private corporation for-profit or not-for-profit; partnership; firm; trust; estate; department; board; bureau or agency of the United States or the Commonwealth; political subdivision; municipality; district; authority; or other legal entity which is recognized by law as the subject of rights and duties. The term includes the members of an association, partnership or firm and the officers of a local agency

or municipal, public or private corporation for-profit or not-for-profit.

***Primary treatment*—The use of physical operations to remove floating solids and a portion of settleable solids found in wastewater.**

***Proprietary alternate sewage systems and components*—An onlot sewage system or component manufactured or marketed by a company or individual having the exclusive right to manufacture or sell it.**

Qualified registered professional engineer—A person registered to practice engineering in this Commonwealth who has experience in the characterization, classification, mapping, and interpretation of soils as they relate to the function of onlot sewage disposal systems.

Qualified registered professional geologist—A person registered to practice geology in this Commonwealth who has experience in the characterization, classification, mapping, and interpretation of soils as they relate to the function of onlot sewage disposal systems.

Qualified soil scientist—A person certified as a sewage enforcement officer and who has documented 2-years' experience in the characterization, classification, mapping and interpretation of soils as they relate to the function of onlot sewage disposal systems and **has** either a Bachelor of Science Degree in **[soils] soil** science from an accredited college or university or **[certification by the American Registry of Certified Professionals in Agronomy, Crops and Soils] is an active Certified Professional Soil Scientist or Certified Professional Soil Classifier registered by the Soil Science Society of America**.

***Redoximorphic features*—Concentrations and depletions of iron (Fe) and manganese (Mn) compounds in the soil resulting from periods of prolonged soil saturation. The presence of redoximorphic depletions in a soil horizon is indicative of a SHWT limiting zone. Redoximorphic features are a form of soil mottling.**

Retaining tank—A watertight receptacle which receives and retains sewage and is designed and constructed to facilitate ultimate disposal of the sewage at another site. The term includes**[the following]**:

(i) *Chemical toilet.* **[A permanent or portable nonflushing toilet using chemical treatment in the retaining tank for odor control.] A waterless toilet with a tank that contains a chemical to limit decomposition of non-water-carried human waste during storage prior to offsite treatment.**

(ii) ***Composting toilet.* A device for holding and processing human and organic kitchen waste employing the process of biological degradation through the action of microorganisms to produce a stable, humus-like material.**

(iii) ***Holding tank*—A tank, whether permanent or temporary, to which sewage is conveyed by a water-carrying system.**

(iv) *Incinerating toilet.* A device capable of reducing waste materials to ashes.

Commented [A6]: Order of (i)-(vii) changed to be alphabetical and unchanged with the exception of "chemical toilet."

Commented [A7]: Updated to be consistent with the CIDWT Glossary 2007.

(v) ***Portable restroom trailer*—A mobile unit with self-contained water and sewage storage used on a temporary basis for an event. They may be outfitted with complete facilities including running water, flushable toilets, showers, and sinks.**

(vi) ***Privy*—A tank designed to receive sewage where water under pressure is not available.**

(vii) ***Recycling toilet*—A device in which the flushing medium is restored to a condition suitable for reuse in flushing.**

***Rock outcrop*—The part of a rock formation that appears at the surface of the ground.**

***Sand*—Natural silica or manufactured silica-based material consisting of hard, durable, and uncoated inert particles reasonably free from clay, silt, vegetation and other deleterious substances such as reactive chert, gypsum, iron sulfide, amorphous silica and hydrated iron oxide. Substances present in amount large enough to cause inconsistent performance for use as media in absorption areas and filters are considered deleterious.**

***Secondary treatment*—The use of physical, biological, and chemical operations and processes designed to achieve a BOD_5 and total suspended solids of 30 milligrams per liter or less.**

***Service provider*—An individual, company, or other entity who is trained to provide prescribed operation of, and maintenance to a sewage facility or individual components of the sewage facility.**

Sewage—**[A] Means any** substance that contains **[the]any of the** waste products or excrement or other discharge from the bodies of human beings or animals**[; a substance harmful] and any noxious or deleterious substances being harmful or inimical** to the public health, **or** to animal or aquatic life**,** or to the use of water for domestic water supply or for recreation**[; a substance], or** which constitutes pollution under **[The] the** Clean Streams Law.

Commented [A8]: Made consistent with the SFA

Sewage enforcement officer—An official of the local agency who reviews permit applications and sewage facilities planning module and issues permits as authorized by the act and conducts the investigations and inspections that are necessary to implement the act and regulations thereunder.

Sewage facilities—A system of sewage collection, conveyance, treatment and disposal which will prevent the discharge of untreated or inadequately treated sewage or other waste into waters of this Commonwealth or otherwise provide for the safe and sanitary treatment and disposal of sewage or other waste. The term includes:

(i) *Individual sewage system*—A system of piping, tanks or other facilities serving a single lot and collecting and disposing of sewage in whole or in part into the soil or into waters of this Commonwealth or by means of conveyance to another site for final disposal.

(A) *Individual onlot sewage system*—An individual sewage system which uses a system

of piping, tanks or other facilities for collecting, treating or disposing of sewage into a soil absorption area or spray field or by retention in a retaining tank.

(B) *Individual sewerage system*—An individual sewage system which uses a method of sewage collection, conveyance, treatment, and disposal other than renovation in a soil absorption area, or retention in a retaining tank.

(ii) *Community sewage system*—A sewage facility, whether publicly or privately owned, for the collection of sewage from two or more lots, or two or more equivalent dwelling units and the treatment or disposal, or both, of the sewage on one or more of the lots or at another site.

(A) *Community onlot sewage system*—A community sewage system which uses a system of piping, tanks**[,]** or other facilities for collecting, treating and disposing of sewage into a soil absorption area or retaining tank **located on one or more of the lots or at another site**.

(B) *Community sewerage system*—A publicly or privately owned com munity sewage system which uses a method of sewage collection, conveyance, treatment and disposal other than renovation in a soil absorption area, or retention in a retaining tank.

***SHWT—Seasonal high water table*—The shallowest depth to free water that stands in an unlined borehole or where the soil moisture tension is zero for a significant period (more than a few weeks).**

***Sinkhole*—A depression formed by the undermining or sudden collapse of the land surface, often as a result of groundwater enlarging cavities in underlying limestone or other easily soluble bedrock.**

Small flow treatment facility—An individual or community sewerage system designed to adequately treat sewage flows not greater than 2,000 gpd for final disposal using a stream discharge or other methods approved by the Department.

Soil horizon—A layer of soil**,** approximately parallel to the soil surface**,** with **chemical and physical** characteristics produced by soil-forming processes **which are distinguishable by observation or other method of analysis from the chemical and physical characteristics in adjacent layers of soil**.

***Soil morphological evaluation*—A soil probe and site investigation performed by a qualified soil scientist that interprets soil profile characteristics and the land surface features to determine site suitability for certain onlot sewage systems and is used to define appropriate infiltration and horizontal linear loading rates used for disposal system design.**

Soil mottling—A soil color pattern consisting of patches of different colors or shades of color interspersed with the dominant soil color which results from prolonged saturation of the soil.

***Soil probe (test pit)*—A soil excavation, dug by mechanical means and large enough for safe personal entry, used to describe and record the soil profile, including identifying the depth and type of limiting zone if one exists, as part of the site evaluation.**

Soil profile—**[The collection of soil horizons, including the natural organic layers on the surface.] A vertical cross section of soil horizons at a given location.**

Solids retainer—A deflection device at the outlet tee or baffle of a septic tank designed to deflect buoyed solids from escaping the tank.

Spray field—Piping, spray heads and ground surface to the outside edges of the wetted perimeter, used for the application and treatment of the sewage effluent in an individual residential spray irrigation system.

***TSS—Total suspended solids*—The weight of solids remaining after a well-mixed sample is filtered through a standard glass filter and the suspended portion is dried to a constant weight at 103-105ºC.**

***Testing organization*—A third-party entity that implements the technology-specific field test plan and/or performance audit, including documentation of testing conditions and procedures, sample collection and data reporting to the Department. A qualifying third-party entity is a person or body that is recognized as being independent of the person or organization that sells the onlot sewage pretreatment component or system, independent from the technology manufacturer, and independent from the property owner of the pretreatment component or system.**

***Total Nitrogen*—The sum of nitrate (NO_3-N), nitrite (NO_2-N), organic nitrogen and ammonia (all expressed as N). For laboratory analysis purposes, Total Kjeldahl Nitrogen is a test performed that is made up of both organic nitrogen and ammonia.**

Treatment tank—A water-tight tank designed to retain sewage long enough for satisfactory bacterial decomposition of the solids to take place. The term includes the following:

(i) *Septic tank*—A treatment tank that provides for **primary treatment and** anaerobic decomposition of sewage**[prior to its discharge to an absorption area]**.

(ii) *Aerobic sewage treatment tank*—A mechanically aerated treatment tank that provides aerobic biochemical stabilization of sewage**[prior to its discharge to an absorption area**].

***UV—Ultraviolet*—A wavelength of light or electromagnetic radiation ranging from 10 nanometers to 400 nanometers, shorter than that of visible light but longer than X-rays.**

Undisturbed soil—Soil or soil profile, unaltered by removal or other man-induced changes, except for agricultural activities**,** that would adversely affect the siting or operation of onlot systems**.**

Water of this Commonwealth—Rivers, streams, creeks, rivulets, impoundments, ditches, water

courses, storm sewers, lakes, dammed water, ponds, springs and other bodies or channels of conveyance of surface and underground water, or any of their parts, whether natural or artificial within or on the boundaries of this Commonwealth.

§ 73.2. Scope.

This chapter **is promulgated in accordance with the duties imposed upon the Department under the Act and the Clean Streams Law. This chapter** applies to **local agencies and** sewage enforcement officers administering the act, **[as well as to] and** persons **designing and** installing individual **and community** onlot sewage systems**[or community onlot sewage systems as defined in this chapter]**. **This chapter establishes the standards for construction, installation, alteration and maintenance and operation of individual and community onlot sewage systems. This chapter establishes the standards for approving experimental and alternate sewage systems and components.**

§ 73.3. [Policy.] {Reserved}.

(a) **[A person planning or designing a facility or intending to utilize individual or community sewage systems is advised of the importance of good water conservation practices and the potential value of water conservation, recycle or reuse systems as a means of prolonging the life of the sewage system, as well as ensuring the availability of adequate water supplies in the future.**

(b) **When considering corrective measures for malfunctioning sewage disposal systems which have been constructed in accordance with this chapter or applicable regulations at the time of construction, the efforts of the local agency or the Department will not be restricted by this chapter. It will be the policy of the Department and local agencies administering this chapter to first consider all individual onlot and community onlot sewage systems described in this chapter, excluding holding tanks, in the correction of existing malfunctions and, when the systems cannot be constructed in accordance with this chapter, to provide the best technical guidance possible in attempting to resolve existing pollution or environ- mental health problems. When application of best technical guidance results in the absorption area or spray field encroaching on the regulated isolation distance to a well, the proper well abandonment procedure or the relocation of the well should be considered. The requirements of § 72.33 (relating to well distance exemption) may be waived at the discretion of the local agency. This policy will not limit or preclude the use of experimental systems as provided in §§ 73.71 and 73.72 (relating to experimental sewage systems; and alternate sewage systems), small flow treatment systems permitted under the Clean Streams Law or, when no other alternatives are available, holding tanks.**

(c) **The Department recognizes the existence of technologies related to onlot sewage disposal which are not specifically addressed in this chapter as well as technologies from other disciplines which may be applied to the design or construction of an onlot sewage disposal system. Experimental sewage system permits provide a method for the testing and evaluation of new concepts and technologies applicable to onlot disposal in this Commonwealth. Experimental permits may be limited in number on a Statewide**

basis. The Department will determine the number of experimental permits that may be issued for a specific experimental technology or design. An experimental onlot sewage disposal system permit shall be required for all technologies, methods, system components, systems and designs the Department deems experimental. Alternate sewage systems provide a classification for innovative and alternative technology which has been developed through the experimental program, by application of existing technologies from other disciplines or through technological advances from other areas of the United States. The alternate sewage system permit will provide a method for utilizing proven technologies within this Commonwealth without constant changes to this chapter. Systems shall be permitted only where it is demonstrated that the proposed system will protect the public health and prevent pollution of the waters of this Commonwealth.]

Subchapter B. GENERAL SITE **[LOCATION AND ABSORPTION AREA REQUIREMENTS], SOIL AND TREATMENT REQUIREMENTS FOR ONLOT SEWAGE SYSTEMS**

§ 73.11. General.

(a) No person may install, and no sewage enforcement officer may issue a permit for or approve, a sewage system which violates this chapter.

(b) A structure may not be occupied before the **onlot** sewage system is finally inspected, approved and covered. Except when the sewage enforcement officer requires a change to the installation schedule because of weather and soil conditions the permit may be modified with conditions to be established by the local agency to allow use of a septic tank as a temporary holding tank. **The temporary use of the septic tank as a holding tank may not exceed 6 months without Department approval. [In these instances]When a septic tank is used as a temporary holding tank**, §§ 71.61 **[and],** 71.63(b)(1) and (2), (c)(1) and (2), 73.61 and 73.62(b) do not apply. Absorption areas shall be covered by the permittee within 5-calendar days after final inspection and approval to prevent damage.

(c) **[Liquid wastes, including kitchen and laundry wastes and water softener backwash, shall be discharged to a treatment tank.] Sewage, including graywater and drinking water treatment wastewater, shall be discharged to an onlot sewage system.** A sewage system may not discharge untreated or partially treated sewage to the surface of the ground or into the waters of this Commonwealth except as specifically permitted under sections 202 and 207 of the Clean Streams Law (35 P. S. §§ 691.202 and 691.207) and individual residential spray irrigation systems permitted by local agencies under section 7.3 of the act (35 P. S. § 750.7c). **Industrial waste or any wastewater with characteristics that are detrimental to an onlot sewage system may not be discharged to an onlot sewage system describe in this chapter.**

(d) Where additional absorption area is installed to increase the total area of an existing system and flows are generated from a common treatment tank, loading per square foot of the new area and the existing area shall be equal.

(d.1) When an existing onlot sewage system is expanded due to additional flows, the current onlot sewage system must be inspected in accordance with § 71.73(b)(2)(viii) to assure compliance with the standards in this chapter. Alterations or replacement of the system or components may be required to bring the system into compliance with this chapter.

(e) Discharge from roof gutters, foundation drainage, **garage drains or other** floor drains not from **a** sewage-generating **[connections]source,** and surface runoff may not be discharged to **[a treatment tank;]** **an onlot sewage system**; nor may the discharges be permitted to flow over an absorption area or spray **[fields] field**.

(e.1) After the onlot sewage system has been installed the site must be graded to assure that surface water is diverted away from treatment tanks and absorption areas.

(e.2) When the use of subsurface drains are proposed to divert water from an absorption area, the subsurface drains must not hydraulically capture any part of the effluent plume.

(f) The discharge of inadequately disinfected effluent or the discharge of effluent in a manner inconsistent with the system design specifications from an individual residential spray irrigation system shall constitute a nuisance.

§ 73.12. Site location.

(a) A proposed absorption area or spray field having the following characteristics shall be considered unsuitable for the installation of an onlot system or an individual residential spray irrigation system and a permit shall be denied where:

(1) The slope of the proposed absorption area or spray field is greater than 25%.

(2) The area is identified by completed Federal Flood Insurance mapping as a floodway. Where there is no flood mapping, a flood way extends 50 feet from the top of the stream bank as determined by the local agency. This paragraph is not applicable to spray fields.

(3) One or more rock outcrops exist within the proposed absorption area.

(4) In areas underlain by limestone, depressions left by earlier sinkholes exist either in whole or in part within the proposed absorption area or spray field.

(5) **Examination of the soil profile reveals any of the following conditions:**

(i) **A SHWT, whether perched or regional, determined by direct observation of the water table or as indicated by soil mottling, at less than 10 inches from the mineral soil surface.**

(ii) **A rock with open joints, fractures or solution channels, or masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids**

between the fragments at less than 16 inches from the mineral soil surface.

(iii) **A rock formation, other stratum or soil condition which is so slowly permeable that it effectively limits the downward passage of effluent located at less than 16 inches from the mineral soil surface.**

(b) Absorption areas or spray fields may not be placed in or on fill unless the fill has remained in place for a minimum of 4 years to allow **[restoration of natural permeability]natural soil forming processes to develop soil structure as determined by a qualified soil scientist**. The fill shall be composed of clean mineral soil and meet the provisions of § 73.14 (relating to site investigation).

(c) Absorption areas or spray fields shall be sited only in or on undisturbed soils.

§ 73.13. Minimum horizontal isolation distances.

(a) Minimum horizontal isolation distances shown in subsections (b)—**[(e) shall] (f) must** be maintained between the **onlot** sewage **[disposal] system** and the features **[itemized] named** except as provided by **[§ 72.33 (relating to well isolation distance exemption)] § 72.36 (relating to permit variance from standards for onlot sewage systems)**. If conditions warrant, greater isolation distances may be required. **All distances from permanent stormwater control measures must be measured from the outer perimeter of the stormwater control measures.**

(b) The minimum horizontal isolation distances **listed in Table 73-A must be maintained** between the features named **in Table 73-A** and **the** treatment tanks, dosing tanks, **distribution boxes, holding tanks,** lift pump tanks, filter tanks, **[and chlorine contact/storage tanks shall comply with the following] chlorine contact tanks and disinfection unit tanks**:

(1) **[Property line, easement or right-of-way—10 feet.**

(2) **Occupied buildings, swimming pools and driveways—10 feet.**

(3) **An individual water supply or water supply system suction line—50 feet.**

(4) **Water supply line under pressure—10 feet.**

(5) **Streams, lakes or other surface waters—25 feet.**

(6) **A cistern used as a water supply—25 feet.]**

TABLE 73-A

Horizontal Isolation Distances from Tanks.

50 feet	**Wells for water supply (potable and non-potable) and for geothermal heating systems, except wells sealed in accordance with the Water Well Drillers License Act (32 P.S. §§ 645.1—645.13)**
	Springs used for domestic water supply
	Mine subsidence areas, open boreholes and sinkholes
	Oil and gas wells, except wells plugged in accordance with Chapters 78 and 78a (relating to oil and gas wells; and unconventional wells)
	An individual water supply or water supply system suction line
25 feet	Streams, **water courses,** lakes, **ponds** and other surface waters
	A cistern used as a water supply
10 feet	Property lines, easements and rights-of-way
	Buildings **and** swimming pools
	Decks and patios
	Roads and driveways
	Water supply lines under pressure

Commented [A9]: Moved from b(3) no changes

Commented [A10]: Moved from (b)(5) and revised

Commented [A11]: Moved from (b)(6) No changes.

Commented [A12]: Moved from (b)(1) No changes.

Commented [A13]: Moved from (b)(2) and revised

Commented [A14]: Split out from (b)(2) and revised

Commented [A15]: Moved from (b)(4) with no changes.

(c) The following minimum horizontal isolation distances **listed in Table 73-B** shall be maintained between the features named **in Table 73-B** and the perimeter of the aggregate in the absorption area:

(1) **[Property line, easement or right-of-way—10 feet.**

(2) **Occupied buildings, swimming pools and driveways—10 feet.**

(3) **An individual water supply or water supply system suction line—100 feet.**

(4) **Water supply line under pressure—10 feet.**

(5) **Streams, water courses, lakes, ponds or other surface water—50 feet (for the purposes of this chapter wetlands are not surface waters).**

(6) **Other active onlot systems—5 feet.**

(7) **Surface drainageways—10 feet.**

(8) **Mine subsidence areas, mine bore holes or sink holes—100 feet.**

(9) **Rock outcrop or identified shallow pinnacle—10 feet.**

(10) **Natural or manmade slope greater than 25%—10 feet.**

(11) **A cistern used as a water supply—25 feet.**

(12) **Detention basins, retention basins and stormwater seepage beds—10 feet.]**

TABLE 73-B

Horizontal Isolation Distances from the Perimeter of the Aggregate in the Absorption Area.

100 feet	Mine subsidence areas, open bore holes and sinkholes
	Wells for water supply (potable and non-potable) and for geothermal heating system, except wells sealed in accordance with the Water Well Drillers License Act
	Springs used for domestic water supply
	Oil and gas wells, except wells plugged in accordance with Chapters 78 and 78a
	An individual water supply or water supply suction line
50 feet	Streams, water courses, lakes, ponds and other surface waters
25 feet	A cistern used as a water supply
	Swales
	A post-construction stormwater control measure
10 feet	Roads or driveways
	Natural or manmade slope greater than 25%
	Property lines, easements and rights-of-way
	Buildings and swimming pools
	Decks and patios
	Water supply lines under pressure
	Rock outcrops and identified shallow pinnacles
	Wells for water supply (potable and non-potable) and geothermal heating systems that have been properly sealed in accordance with the Water Well Drillers License Act
	Open excavations
5 feet	Other active onlot sewage systems

Commented [A16]: Moved from (c)(8) and revised

Commented [A17]: Moved from 73.13(c)(3) with no changes

Commented [A18]: Moved from (c)(5) and revised

Commented [A19]: Moved from 73.13(c) (5)

Commented [A20]: Moved from (c)(11) No changes.

Commented [A21]: Split from (c)(2) and revised

Commented [A22]: Moved from (c)(10) No changes.

Commented [A23]: Moved from (c)(1) with no changes

Commented [A24]: Moved from (c)(2) and revised

Commented [A25]: Moved from (c)(4) with no changes.

Commented [A26]: Moved from (c)(9) No changes

Commented [A27]: Moved from 73.13(c)(6) no changes

(d) The following minimum horizontal isolation distances **listed in Table 73-C** shall be maintained between the features named **in Table 73-C** and the wetted perimeter of the spray field:

(1) **[Property lines, easements or right of ways—25 feet.**

(2) **Occupied buildings and swimming pools—100 feet.**

(3) **An individual water supply or water supply suction line—100 feet.**

(4) **A cistern used as a water supply—25 feet.**

(5) **Water supply line under pressure—10 feet.**

(6) **Streams, watercourses, lakes, ponds or other surface waters—50 feet. For the purposes of this chapter wetlands are not surface waters.**

(7) **Mine subsidence, boreholes, sinkholes—100 feet.**

(8) **Roads or driveways—25 feet.**

(9) **Unoccupied buildings—25 feet.**

(10) **Rock outcrop—25 feet.]**

TABLE 73-C

Horizontal Isolation Distances from Wetted Perimeter of the Spray Field.

100 feet	**Wells for water supply (potable and non-potable) and for geothermal heating systems, except wells sealed in accordance with the Water Well Drillers License Act**
	Mine subsidence areas, open boreholes and sinkholes
	Springs used as a domestic water supply
	Oil and gas wells, except wells plugged in accordance with Chapters 78 and 78a
	An individual water supply or water supply suction line
	Occupied buildings and swimming pools
50 feet	**Property lines, easements and rights-of-way**
	A cistern used as a water supply
	Streams, watercourses, lakes, ponds and other surface waters
	Permanent stormwater control measures
25 feet	**Roads or driveways**
	Rock outcrops and identified shallow pinnacles
	Swales
	Unoccupied buildings
10 feet	**Open excavations**
	Decks and patios
	Water supply lines under pressure

Commented [A28]: Moved from (d)(7) and revised

Commented [A29]: Moved from 73.13(d)(3) with no changes.

Commented [A30]: Moved from (d)(2) and revised

Commented [A31]: Moved from (d)(1) and revised

Commented [A32]: Moved from (d)(4) and revised

Commented [A33]: Moved from (d)(6) and revised

Commented [A34]: Moved from (d)(8) No changes.

Commented [A35]: Moved to table from current layout. Some modifications and additions.

Commented [A36]: Moved from (d)(10) No changes.

Commented [A37]: Moved from (d)(9) with no changes.

Commented [A38]: Moved from (d)(5) with no changes.

(e) **[The area within the wetted perimeter of the spray field may not be sited over an unsuitable soil profile.] {Reserved}.**

(f) **In addition to the minimum horizontal isolation distances in Table 73-B, the additional minimum horizontal isolation distances listed in Table 73-D must be maintained between the features named in Table 73-D and the perimeter of the aggregate in the absorption area when the absorption area is sited on soils with a limiting zone at less than 20 inches.**

TABLE 73-D

Horizontal Isolation Distances from Aggregate Areas with Shallow Limiting Zones.

100 feet	**A cistern used as a water supply downgradient of the absorption area**
	Streams, watercourses, lakes, ponds and other surface waters downgradient of the absorption area
	Other active absorption areas or spray fields upgradient or downgradient of the absorption area
75 feet	**Permanent stormwater control measures upgradient or downgradient of the absorption area**
	Swales downgradient of the absorption area
	Embankment cut-face downgradient of the absorption area
	Natural or manmade slope greater than 25% downgradient of the absorption area
	Open excavations
50 feet	**Roads and driveways downgradient of the absorption area**
	Property lines, easements and rights-of-way downgradient of the absorption area
	Buildings and swimming pools downgradient of the absorption area
	Water supply lines downgradient of the absorption area
	Wells and boreholes for water supply (potable and non-potable) and for geothermal heating systems sealed in accordance with the Water Well Drillers License Act downgradient of the absorption area
	Rock outcrops and identified shallow pinnacles downgradient of the absorption area
25 feet	**Roads and driveways upgradient of the absorption area**

§ 73.14. Site investigation.

(a) *Absorption area.* Soil tests to determine the presence of a limiting zone and the capacity of the soil to permit the passage of water shall be conducted prior to permit issuance. **The soil profile information collected for the proposed absorption area must be considered in the design and permitting of the system. On all locations where the installation of an absorption area is proposed:**

(1) **[On all locations where the installation of an absorption area is proposed at least one excavation for examination of the soil profile shall be provided.] A minimum of two soil probes for examination of the soil profile must be evaluated. At least two soil probes must be located on opposite ends of the proposed absorption area and soil probes may not be more than 100 feet apart. When the distance between the soil probes exceeds 100 feet, additional soil probes are required to maintain a maximum distance of 100 feet between the soil probes. When variable soil conditions exist on a proposed system site, additional soil probes may be required pursuant to § 71.62(b)(2)(iii).**

(1.1) The soil probes must be a minimum of 24 inches in width and of sufficient width for safe entry into the excavation by a sewage enforcement officer, qualified soil scientist or a representative of the Department.

(2) The **[depth of the excavation shall be to the top of]** **soil probes must be of sufficient depth to identify and characterize** the limiting zone, or a maximum **depth** of 7 feet.

(3) **[All soil profile excavations shall]Soil probes must** be conducted within 10 feet of **[the]a** proposed absorption area. **[A description of the soil profile shall be recorded on the site investigation and percolation test report form for onlot disposal of sewage issued by the Department.] A description of each soil profile, including unsuitable probes and probes not used in siting the absorption areas, must be recorded on a form provided by the Department.**

(4) Where soil **[has been removed by grading or excavation]will be removed by excavation for the purpose of installing an absorption area on a sloped site**, the surface of the undisturbed soil shall be considered to be the point from which the depth to limiting zone is measured. **The depth of the upslope cut must be added to the required depth to the limiting zone when siting the system to maintain the required depth to limiting zone.** Excavating soil to system installation depth for the purpose of installing the system may not be considered disturbing the soil.

(4.1) A slope measurement must be made, perpendicular to the contour of the landscape, at each soil probe location and recorded on a form provided by the Department. All proposed absorption areas also require a slope measurement across the steepest portion of the absorption area to evaluate the suitability of the site for relying on an onlot sewage system as a viable, long-term sewage treatment and disposal option. When absorption areas are proposed for sites with a limiting zone within 20 inches of the mineral soil surface, the slope must also be measured at the least steep portion of the proposed absorption area.

(5) When the examination of the soil profile reveals a limiting zone within 20 inches of the mineral soil surface, percolation tests may not be conducted **[and a permit will be denied]** except as provided in § 73.77 (relating to general requirements for bonded disposal systems).

(6) Where the examination of the soil profile reveals the absence of a limiting zone within 20 inches **[of]from** the mineral soil surface, percolation tests **[shall]must** be performed **in accordance with § 73.15 (relating to percolation tests)** within the proposed absorption area **unless the design of the absorption area relies on a soil morphological evaluation as described in §73.15a (relating to soil morphological evaluation)**. The average percolation rate **[shall]must** be within the range indicated in [**§ 73.16 (relating to absorption area requirements)] § 73.51 (relating to general)**.

(7) The **surveyed** location **[and depth to the limiting zone of all soil profile] of all soil**

probe excavations and **[the location of]**all percolation test **holes** conducted on a lot **[shall]must** be indicated on the plot plan**[of the Application for Sewage Disposal System issued by the Department or attached diagram. The location and depth to the limiting zone of all soil profile excavations and the location of all percolation tests conducted on a lot shall be indicated on the plot plan of the Application for An Onlot Sewage System Permit issued by the Department or attached diagram.]** **Each soil probe excavation must be uniquely identified, and the limiting zone included on the plot plan. The plot plan must be attached to a form provided by the Department.**

(8) **The soil must be described using the terms and methods presented in the United States Department of Agriculture, Natural Resources Conservation Service's *Field Book for Describing and Sampling Soils (Version 3.0* or a later version).**

(b) *Spray field.*

(1) Soil tests to determine the presence of a limiting zone and the capacity of the soil to permit passage of water shall be conducted prior to permit issuance.

(2) A minimum of 4 soil profile evaluations shall be evenly spaced within 10 feet of the perimeter of the proposed spray field when the spray field is less than or equal to 20,000 square feet.

(3) Spray fields in excess of 20,000 square feet shall be evaluated by evenly spacing the soil profiles within 10 feet of the perimeter of the proposed spray field at intervals of 100 feet or less.

(4) The soil profile information collected within the proposed spray field area shall be considered in the design and permitting of the system. Additional soils profiles, both on the perimeter or within the proposed spray field, may be required when the sewage enforcement officer identifies trends in the soils profiles or surface features which document variable soils conditions in the area of the proposed spray field. These trends include, but are not limited to, unsuitable soil areas mixed with suitable soils within the proposed site and surface features such as rock outcrops, mine subsidence, boreholes**[,]** and sinkholes.

(5) Soil profiles shall be evaluated to the depth of bedrock, or rock formation or 40 inches whichever is shallower.

(6) When the examination of the soil profile reveals a limiting zone of a **[seasonal high water table]** **SHWT** within 10 inches of the mineral soil surface or a limiting zone as indicated by bedrock or coarse fragments with insufficient fine soil to fill voids that are located within 16 inches of the mineral soil surface, a permit for an individual residential spray irrigation system will be denied.

(7) **The surveyed location of all soil probes excavated on the lot must be indicated on the plot plan. Each soil probe excavation must be uniquely identified, and the**

limiting zone included on the plot plan. The plot plan must be attached to a form provided by the Department.

(c) **When an absorption area or spray field is proposed on a fill site or reclaimed mine land, a qualified soil scientist shall conduct an evaluation of the fill to determine if it can provide renovation and infiltration of the effluent. The qualified soil scientist shall submit a report to the Department and the local agency that states that the fill site meets all the requirements in this section. Soil testing for siting an onlot sewage system on a fill site must be observed by the Department in addition to the sewage enforcement officer. The Department will determine if the site is suitable for an onlot sewage system.**

§ 73.15. Percolation tests.

[Percolation tests shall] When the examination of the soil profile reveals a limiting zone equal to or greater than 20 inches from the mineral soil surface, except for system designs requiring a soil morphological evaluation, percolation tests must be conducted in accordance with the following procedure:

(1) *Number and location.* **[Six or more tests shall] A minimum of six tests must** be made in separate test holes spaced uniformly over **[the]a** proposed absorption area site **up to 1,000 square feet**. **When estimating the size of the absorption area the person completing the test shall calculate the size of the absorption area using a minimum of 2 square feet per gallon of effluent. Two additional tests must be made in separate holes for every additional 400 square feet beyond 1,000 square feet.**

(2) *Results.* **[Percolation]All valid percolation test** holes located within the proposed absorption area **[shall]must** be used in the calculation of the arithmetic average percolation rate. **A minimum of six valid tests in separate holes must be used to calculate the average percolation rate for the absorption area.**

(3) *Type of hole.* **[Holes having] Test holes must have** a uniform diameter of 6 to 10 inches **[shall]and must** be bored or dug as follows:

(i) To the depth of the proposed absorption area, where the limiting zone is 60 inches or more from the mineral soil surface.

(ii) To a depth of 20 inches if the limiting zone is identified as **[seasonal high water table] SHWT**, whether perched or regional; rock formation; other stratum; or other soil condition which is so slowly permeable that it effectively limits downward passage of effluent, occurring at less than 60 inches from the mineral soil surface.

(iii) To a depth 8 inches above the limiting zone or 20 inches, whichever is less, if the limiting zone is identified as rock with open joints or with fractures or solution channels, or as masses of loose rock fragments including gravel with insufficient fine soil to fill the voids between the fragments, occurring at less than 60 inches from the mineral soil surface.

(4) *Preparation.* The bottom and sides of the hole shall be scarified with a knife blade or sharp-pointed instrument to completely remove any smeared soil surfaces and to provide a natural soil interface into which water may percolate. Loose material shall be removed from the hole. Two inches of coarse sand or fine gravel shall be placed in the bottom of the hole to protect the soil from scouring and clogging of the pores.

(5) *Procedure for presoaking.* Holes shall be presoaked, according to the following procedure, to approximate normal wet weather or in-use conditions in the soil:

(i) *Initial presoak.* Holes shall be filled with water to a minimum depth of 12 inches over the gravel and allowed to stand undisturbed for 8 to 24 hours prior to the percolation test.

(ii) *Final presoak.* Immediately before the percolation test, water shall be placed in the hole to a minimum depth of 6 inches over the gravel and readjusted every 30 minutes for 1 hour.

(6) *Determination of measurement interval*. The drop in the water level during the last 30 minutes of the final presoaking period shall be applied to the following standard to determine the time interval between readings for each percolation hole:

(i) If water remains in the hole, the interval for readings during the percolation test shall be 30 minutes.

(ii) If no water remains in the hole, the interval for readings during the percolation test may be reduced to 10 minutes.

(7) *Measurement.* After the final presoaking period, water in the hole shall again be adjusted to approximately 6 inches over the gravel and readjusted when necessary after each reading.

(i) Measurement to the water level in the individual percolation holes shall be made from a fixed reference point and shall continue at the interval determined from paragraph (6) for each individual percolation hole until a minimum of eight readings are completed or until a stabilized rate of drop is obtained whichever occurs first. A stabilized rate of drop means a difference of 1/4 inch or less of drop between the highest and lowest readings of four consecutive readings.

(ii) The drop that occurs in the final period in percolation test holes, expressed as minutes per inch, shall be used to calculate the arithmetic average percolation rate.

(iii) When the rate of drop in a percolation test is too slow to obtain a measurable rate, the rate of 240 minutes per inch shall be assigned to that hole for use in calculating the arithmetic average percolation rate. The absorption area may be placed over holes with no measurable rate when the average percolation rate for the proposed absorption area is within the limits established in **[§ 73.16 (relating to absorption and spray field area requirements), Table A]** **§ 73.51 (relating to general), Table 73-K**.

(iv) When a percolation test hole is dry at the end of a 10 minute testing interval, that hole may not be used in the calculation of the arithmetic average percolation rate. **[If 1/3 or more of the percolation test holes are dry at the end of a 10 minute testing interval, the proposed absorption area may not be designed or installed over these holes unless the local agency determines that an anomaly caused the fast percolation rate and a retest of the area is within the acceptable percolation rate limits. If no anomaly is discovered, the local agency may accept the percolation test results from the remaining holes if the results are supplemented with the results of additional percolation testing conducted outside of the area in which the dry percolation holes were found.]**

(v) **For every percolation test hole that is not used another test hole must be prepared and tested by the method described in this section.**

(vi) **When a percolation test hole is dry at the end of a 10-minute testing interval, another test must be performed within 5 feet of the dry hole unless the area of the dry hole will not be included in the final absorption area. If the additional percolation test hole is dry at the end of 10-minute testing interval the area of the two dry holes may not be used in the absorption area.**

§ 73.15a. Soil morphological evaluation.

(a) **Where an absorption area is proposed for installation on sites with soils having limiting zones greater than or equal to 10 inches but less than 20 inches to the mineral soil surface, or an onlot technology is proposed that requires a soil morphological evaluation, a qualified soil scientist shall conduct the soil morphological evaluation except as provided in § 73.77 (relating to general requirements for bonded disposal systems). A report, including soil profile descriptions for all soil evaluations performed on the site, the soil drainage classification determination, and confirmation that the appropriate loading rate and horizontal linear load from the HLLR table (§ 73.51, Table 73-L) or other sizing criteria are met, shall be signed by the qualified soil scientist. On all locations where the installation of an absorption area is proposed under this section the soil morphological evaluation must include a minimum four soil probes excavated for examination and documentation of the soil profile.**

Commented [A39]: Based on similar language in (b)(4)

(b) **A minimum of two soil probes must be placed on either side of the proposed absorption area on contour. Two additional soil probes should be placed perpendicular to the slope, one above and one below the proposed absorption area, approximately equidistant from the probes on contour when evaluating proposed absorption areas with changes in the slope.**

(c) **When the distance between the on-contour soil probes exceeds 100 feet, additional on-contour soil probes are required to maintain a maximum distance of 100 feet between the soil probes.**

(d) **Soil probes shall be approximately equally distributed throughout each of the various types of soil mapped in the proposed area. For the purpose of this section, each change of slope characteristic specified as part of the soil classification system of the United States Department of Agriculture, Natural Resources Conservation Service will be equivalent to a change in soil type.**

(e) **Describe the soil morphology of each horizon of the soil profile, to the depth of the probe, for all probes in the proposed absorption area, including the following:**

(1) **Matrix color.**

(2) **Abundance, contrast and type of redoximorphic features.**

(3) **Texture.**

(4) **Type and percent coarse fragments.**

(5) **Size, grade and shape of structure.**

(6) **Consistence.**

(f) **Identify the horizon most restrictive of infiltration above the limiting zone and among all the soil profiles evaluated in the proposed absorption area.**

(g) **Determine the infiltration loading rate based on the most restrictive soil horizon, as determined in subsection (c), using § 73.51, Table 73-L.**

(h) **Measure the gentlest slope over the proposed absorption area.**

(i) **Using the information obtained in subsections (a)—(e), determine the HLLR using Table 73-L in § 71.51 (relating to general).**

(j) **In addition to the soil probe requirements in subsection (a), for sites that have a limiting zone greater than or equal to 10 inches, but less than 20 inches to the mineral surface area, the probe placed down slope must be a minimum of 20 feet from the down slope edge of the absorption area, or at a distance agreed upon by the qualified soil scientist and the local agency's qualified soil scientist.**

§ 73.16. [Absorption and spray field area requirements.] {Reserved}.

(a) **[*General.* Absorption areas and spray fields for single family dwellings not served by a community sewage system shall be designed based on a minimum flow of 400 gpd for all dwellings having three bedrooms or less. The minimum flow of 400 gpd shall be increased by 100 gpd for each bedroom over three.**

(b) ***Absorption areas.***

(1) **Only the bottom of the aggregate area of the bed or trench shall be used in calculating absorption area requirements.**

(2) **Absorption area requirements for single family dwellings served by a community sewage system and for apartments or nonresidential establishments served by an individual onlot or community onlot sewage system shall be designed based on flows listed in § 73.17 (relating to sewage flows) for the type of facility to be served.**

(3) **For nonresidential establishments, a volume of 200 gpd shall be the minimum volume used in calculating the size of the absorption area.**

(c) ***Required absorption area.*** **Table A shall be used in calculating the square footage of absorption area required based on flows determined in subsections (a) and (b). Table A includes allowances for garbage grinders, automatic washing machines or dishwashers and water softeners.**

Commented [A40]: Moved to 73.51(a.1)(4) and revised

(d) ***Substitute.*** **When a substitute for aggregate, such as a leaching chamber, large diameter pipe, or other material or device, is used in the absorption area, subsection (b)(1) applies.**

Commented [A41]: Moved to 73.171(c) and revised

TABLE A

Commented [A42]: Moved to 73.51 Table A

Minimum Aggregate Absorption Area Requirements for Treatment Tank Effluent:

Average Percolation Rate Expressed as Minute Per Inch	Square Feet of Aggregate Area Per Gallon Per Day	
	All Systems Except Elevated Sand Mounds and Subsurface Sand Filters	Subsurface Sand Filters and Elevated Sand Mounds
Less than 3.0	Unsuitable	Unsuitable
3 - 5	Unsuitable	1.50[AB]
6 - 15	1.19[B]	1.50[AB]
16 - 30	(Avg. Perc Rate - 15) × (0.040) + 1.19[B]	1.50[AB]
31 - 45	(Avg. Perc Rate - 30) × (0.030) + 1.79[B]	(Avg. Perc Rate - 30) × (0.026) + 1.50[AB]
46 - 60	(Avg. Perc Rate - 45) × (0.028) + 2.24[B]	(Avg. Perc Rate - 45) × (0.022) + 1.89[A]
61 - 90	(Avg. Perc Rate - 60) × (0.023) + 2.66[A]	(Avg. Perc Rate - 60) × (0.020) + 2.22[A]
91 - 120[AC]	Unsuitable	(Avg. Perc Rate - 90) × (0.017) + 2.82[A]
121 - 150[C]	Unsuitable	((Avg. Perc Rate - 120) × (0.015) + 3.33) (1.05)[A]
151 - 180[C]	Unsuitable	((Avg. Perc Rate - 150) × (0.014) + 3.78) (1.10)[A]
Greater than 181[C]	Unsuitable	Unsuitable

A Pressure dosing required.

B One third reduction may be permitted for use of an aerobic tank.

C May be considered for experimental or alternate proposals.

D Unsuitable for subsurface sand filters.]

(e) ***Spray fields.*** **Table B shall be used in calculating the square footage of spray fields based on flows determined in Sub- section (a). Table B includes allowances for garbage grinders, automatic washing machines, dishwashers and water softeners.**

Commented [A43]: Moved to 73.163

TABLE B

Commented [A44]: Moved to 73.163 Table A

Soil Characteristics		Slope	Required Spray Field Area (ft ^{2})	
Depth To Rock	*Depth To Water Table*		*3 Bedroom Home*	*Additional Area Per Bedroom*
16 to 20 inches	10 to 40 inches	≤12%	40,000	10,000
		>12%	80,000	20,000
	>40 inches	≤12%	15,000	3,750
		>12%	30,000	7,500
>20 inches	10 to 20 inches	≤12%	20,000	5,000
		>12%	40,000	10,000
	>20 inches	≤12%	10,000	2,500
		>12%	20,000	5,000]

§ 73.17. Sewage flows.

(a) The flow figures in this subsection **[and subsection (b)]**are peak daily flows for the design of **individual and** community onlot sewage systems. These flow figures are not intended to be used for the calculation of flows for the design of community sewerage systems or for the allocation of flows related to community sewerage systems. Design and permit sewage flows for a community sewerage system **[are to]must** be calculated using the procedures established in the Department's ''Domestic Wastewater Facilities Manual,'' **as amended**. **[The sewage flow from single family dwellings served by a community onlot sewage system or from apartments, rooming houses, hotels and motels served by an individual or community sewage system shall be determined from the following table:] The sewage flow is determined from Table 73-E:**

Commented [A45]: Moved from (b) and revised

[Type of Establishment Residential	*Gallons/Unit/day Gallons/unit*	*BOD/unit*
Hotels and motels (per unit)	100	.30
Multiple family dwellings and apartments, including townhouses, duplexes and condominiums	400	1.13
Rooming houses (per unit)	200	.60
Single-family residences	400*	.90

Commented [A46]: Moved to new table

Commented [A47]: Moved to new table

Commented [A48]: Moved to new table

Commented [A49]: Moved to new table.

*For units of 3 bedrooms or less; for each bedroom over 3, add 100 gallons.

Commented [A50]: Incorporated into new table.

TABLE 73-E
Design Sewage Flows

Residential	*Gallons/day*	*BOD/unit*
Bed and breakfast (per unit)	100	0.30
Single-family residences, townhouses or duplexes of three bedrooms or less	400	0.90
Single-family residences, townhouses or duplexes for each additional bedroom over three	100	0.3
Mobile home parks, independent (per space)	400	1.00
Multiple family dwellings, apartments or condominiums of three bedrooms or less (per unit)	400	1.13
Multiple family dwellings, apartments or condominiums for each additional bedroom over three	100	—
Reverse osmosis water treatment system (whole unit/house)	A	—
Commercial	*Gallons/day*	
Airline catering (per meal served)	3	0.03
Airports (per passenger—not including food)	5	0.02
Airports (per employee)	10	0.06
Beauty shops attached to a single-family residence (one licensed operator/one chair)	200 additional	—
Group home (per person)	60	0.15
Bus service areas not including food (per patron and employee)	5	0.02
Country clubs not including food (per patron and employee)	30	0.02
Drive-in theaters (not including food—per space)	10	0.06
Event venues, for example, wedding barns (per person)	7	0.05
Factories and plants exclusive of industrial wastes (per employee)	35	0.08
Hotels and motels (per unit)	100	0.30
Movie theaters (not including food, per auditorium seat)	5	0.03
Offices (per employee)	10	0.06
Restaurants (toilet and kitchen wastes per patron)	10	0.06
Restaurants (kitchen and toilet wastes, single-service utensils/person)	8.5	0.03
Restaurants (kitchen waste only, single-service utensils/patron)	3	0.01
Potable water treatment system, not including water softener systems	B	

Commented [A51]: New, based on current policy

Commented [A52]: 0.3 was chosen based on the current entry for Hotels and motels and single-family residence assuming 2 ppl per room.

Commented [A53]: Incorporated the * from previous table into the table. Reworded to make consistent.

Stores (per public toilet)	400	2.00
Vehicle repair shop (per vehicle served and per employee)	15	—
Warehouses (per employee)	35	—
Work or construction camps (semipermanent) with flush toilets (per employee)	50	0.17
Work or construction camps (semipermanent) without flush toilets (per employee)	35	0.02
Institutional	*Gallons/day*	
Churches (per seat)	3	—
Churches (additional kitchen waste per meal served)	3	—
Churches (additional with paper service per meal served)	1.5	—
Hospitals (per bed space, with laundry)	300	0.20
Hospitals (per bed space, without laundry)	220	—
Institutional food service (per meal)	20	—
Institutions other than hospitals (per bed space)	125	0.17
Potable water treatment system, not including water softener systems	[B]	
Schools, boarding (per resident)	100	0.17
Schools, day (without cafeterias, gyms or showers per student and employee)	15	0.04
Schools, day (with cafeterias, but no gym or showers per student and employee)	20	0.08
Schools, day (with cafeterias, gym and showers per student and employee)	25	0.10
Recreational and Seasonal	*Gallons/day*	
Camps, day (no meals served)	10	0.12
Camps, day (with meal)	20	
Camp, children's with central toilet/bath	50	0.50
Campgrounds, with individual sewer and water hookup (per space)	100	0.50
Campgrounds with water hookup only or central comfort station, or both, which includes water-carried toilet wastes (per space)	50	0.50
Fairgrounds and parks, picnic—with bathhouses, showers and flush toilets (per person)	15	0.06
Fairgrounds and parks, picnic (toilet wastes only, per person)	5	0.06
Swimming pools and bathhouses (per person)	10	0.06

[A] The additional wastewater flow generated must be based on the ratio of reject water to peak treated water assuming peak treated water use of 100 gpd per bedroom. The ratio of reject water to treated water is provided by the manufacturer of the reverse osmosis system.

[B] The additional wastewater flow generated must be based on the ratio of reject water to peak treated water, provided by the manufacturer of the treatment system, based on the peak water usage. For existing facilities, the peak water usage will be calculated using either the peak daily flow of actual water meter flow data, collected during a minimum of 12 consecutive months, or two times the average daily flow of the actual water meter flow data over 12 consecutive months, whichever is greater. For new facilities the peak water usage will be obtained, as described for existing facility, but from actual data of a similar type of establishment.

(b) **[The sewage flow, which shall exclude any industrial waste, for nonresidential establishments served by an individual or community sewage system shall be determined from the following table:] {Reserved}.**

[Type of Establishment Commercial	*Gallons/day*	*BOD/day*
Airline catering (per meal served)	3	.03
Airports (per passenger—not including food)	5	.02
Airports (per employe)	10	.06
One licensed operator Beauty shops	200	—
Bus service areas not including food (per patron and employe)	5	.02
Country clubs not including food (per patron and employe)	30	.02
Drive-in theaters (not including food — per space)	10	.06
Factories and plants exclusive of industrial wastes (per employe)	35	.08
Laundries, self-service (gallons/washer)	400	2.00
Mobile home parks, independent (per space)	400	1.00
Movie theaters (not including food, per auditorium seat)	5	.03
Offices (per employee)	10	.06
Restaurants (toilet and kitchen wastes per patron)	10	.06
(Additional for bars and cocktail lounges)	2	.02
Restaurants (kitchen and toilet wastes, single-service utensils/person)	8.5	.03
Restaurants (kitchen waste only, single service utensils/patron)	3	.01
Stores (per public toilet)	400	2.00
Warehouses (per employe)	35	—
Work or construction camps (semipermanent) with flush toilets (per employe)	50	.17

Work or construction camps (semipermanent) without flush toilets (per employe)	35	.02
Institutional		
Churches (per seat)	3	—
Churches (additional kitchen waste per meal served)	3	—
Type of Establishment		
Institutional	*Gallons/day*	*BOD/day*
Churches (additional with paper service per meal served)	1.5	—
Hospitals (per bed space, with laundry)	300	.20
Hospitals (per bed space, without laundry)	220	—
Institutional food service (per meal)	20	—
Institutions other than hospitals (per bed space)	125	.17
Schools, boarding (per resident)	100	.17
Schools, day (without cafeterias, gyms or showers per student and employee)	15	.04
Schools, day (with cafeterias, but no gym or showers per student and employee)	20	.08
Schools, day (with cafeterias, gym and showers per student and employe)	25	.10
Recreational and Seasonal		
Camps, day (no meals served)	10	.12
Camps, hunting and summer residential (night and day) with limited plumbing including water-carried toilet wastes (per person)	50	.12
Campgrounds, with individual sewer and water hookup (per space)	100	.50
Campgrounds with water hookup only and/or central comfort station which includes water-carried toilet wastes (per space)	50	.50
Fairgrounds and parks, picnic—with bathhouses, showers, and flush toilets (per person)	15	.06
Fairgrounds and parks, picnic (toilet wastes only, per person)	5	.06
Swimming pools and bathhouses (per person]	10	.06

(b.1) A commercial facility must include an additional 2 gpd per person if alcohol is served as part of the facility's routine business.

(c) Actual water meter or sewer meter flow data indicating peak daily flows different than those shown in this section **collected** over a 1-year period for a similar nonresidential establishment may be accepted **at the discretion of the Department,** for use in sizing the onlot disposal system. If average daily flows are used, the peak daily flow **[shall]must** be calculated by multiplying the average daily flow **of the maximum month** by two.

(d) Establishments with food preparation facilities**, including restaurants, caterers and bakeries,** are required to install pretreatment units and traps to reduce **oil and** greases and **[biological oxygen demand (BOD_5)] BOD_5** prior to discharge to an individual or community **onlot** sewage system.

(e) **Onlot sewage systems receiving high-strength wastewater, as defined in Table 73-F, must be designed by a professional engineer and account for the anticipated high-strength concentration of the influent wastewater.**

TABLE 73-F
High-Strength Wastewater

Constituent	*Unit*	*High-Strength*
Total Suspended Solids	mg/L	400
BOD_5 (20ºC)	mg/L	350
Total Nitrogen	mg/L	70
Oil and Grease	mg/L	100

§ 73.18. Onlot sewage system treatment performance standards.

(a) **Onlot sewage treatment performance standards establish minimum performance requirements for onlot sewage systems and components. These treatment standards establish the standards to be applied when designing and permitting onlot sewage systems.**

(b) **The sewage treatment standards are as follows:**

TABLE 73-G
Sewage Treatment Standards

Treatment Standard	*Name*	*$CBOD_5$ mg/L[A]*	*TSS mg/L[B]*	*Total Nitrogen (mg/L or % Reduction)*
Primary	TS-1	≤ 125 mg/L	≤ 80 mg/L	NA
Secondary	TS-2	≤ 25 mg/L	≤ 30 mg/L	NA
Advanced	TS-3	≤ 10 mg/L	≤ 10 mg/L	NA
Total Nitrogen 1	TN-1	≤ 25 mg/L	≤ 30 mg/L	≥ 50% [C]
Total Nitrogen 2	TN-2	≤ 25 mg/L	≤ 30 mg/L	≤ 20 mg/L [D]
Total Nitrogen 3	TN-3	≤ 25 mg/L	≤ 30 mg/L	≤ 10 mg/L [D]

[A] $CBOD_5$ mean effluent concentration as determined by statistical analysis of effluent $CBOD_5$ data provided in § 73.72a(f) (relating to performance verification of proprietary alternate sewage systems and components).

[B] TSS mean effluent concentration as determined by statistical analysis of effluent TSS data provided in § 73.72a(f).

[C] Total Nitrogen mean reduction of total nitrogen based on statistical analysis of influent and effluent total nitrogen data provided in § 73.72a(f).

[D] Total Nitrogen mean effluent concentration as determined by statistical analysis of effluent total nitrogen data provided in § 73.72a(f).

(c) **The disinfection treatment standards are as follows:**

TABLE 73-H
Disinfection Treatment Standards

Treatment Standard	*Fecal Coliform*	*MPN/100ml [A]*
Fecal Coliform 1	FC-1	≤ 50,000
Fecal Coliform 2	FC-2	≤ 1,000
Fecal Coliform 3	FC-3	≤ 200
Fecal Coliform 4	FC-4	≤ 1

[A] The geometric mean of the fecal coliform data expressed as the MPN of fecal coliforms per 100 milliliters of effluent.

(d) **The required treatment performance standards based on the depth and type of the limiting zone are as follows:**

TABLE 73-I
Treatment Performance Standard Requirements

Type and depth to limiting zone below the mineral soil surface (in.)	*Sewage Treatment Standard*	*Disinfection Treatment Standard*
SHWT[A] ≥ 10 and < 12	TS-3	FC-3
SHWT[A] ≥ 12 and < 20	TS-3	FC-2
Rock[B] ≥ 16 and < 20	TS-3	FC-2
Limiting Zone[C] ≥ 20 and < 48	TS-2	FC-1
Limiting Zone[C] ≥ 48 and < 60	TS-1	N/A
Limiting Zone[C] ≥ 60	TS-1	N/A

[A] SHWT limiting zone as defined in § 73.1 (relating to definitions).

[B] The two types of rock limiting zones, under subparagraphs (ii) and (iii) of the definition of "limiting zone" in § 73.1.

[C] All limiting zones defined in § 73.1

Subchapter C. BUILDING SEWERS

§ 73.21. Specifications.

(a) Building sewers **[shall]must** be constructed of **[a durable material acceptable to the Department or the local agency]pipe meeting the requirements of ASTM D 2665 for polyvinyl chlorideSchedule 40 drain, waste and vent pipe**.

(b) **[The local agency may restrict the type of materials used by code, ordinance or resolution and shall notify the applicant when restrictions are imposed.] {Reserved}.**

(c) When the **[average]peak** daily flow of sewage from an establishment is 1,000 gallons or less, building sewers **[shall]must** be at least 3 inches in diameter unless otherwise specified by local plumbing or building codes. When the **[average]peak** daily flow exceeds 1,000 gpd, all building sewers **[shall]must** be at least 6 inches in diameter unless otherwise specified by local plumbing or building codes.

(d) Cleanouts shall be provided at the junction of the building drain and building sewer.

(e) Cleanouts shall be provided at intervals of not more than 100 feet.

(f) Bends ahead of the treatment tank **[shall]must** be limited to 45° or less where possible. If 90° bends cannot be avoided, they **[shall]must** be made with two 45° bends. **A cleanout must be provided at the bend.**

(g) The grade of the building sewer shall be at least 1/8 inch per foot; however, the grade of the 10 feet of building sewer immediately preceding the treatment tank may not exceed 1/4 inch per foot.

(h) Building sewers **[shall]must** be constructed with watertight joints, **[shall]must** be of sufficient strength to withstand imposed loads and installed on **[material suitable]aggregate as detailed in § 73.171(c) (relating to general)** for preventing damage from settling.

(i) The building sewer shall be installed to allow continuous venting of the treatment tank through the main building stack unless otherwise specified by local plumbing or building codes.

(j) Building sewers **[shall]must** be connected to treatment tanks by means of water-tight mechanical seals**[or hydraulic grouting]**. Use of **[Portland cement]**grouting is not permitted.

(k) **Operations and maintenance must follow the requirements in § 71.73 (relating to sewage management programs for sewage facilities permitted by local agencies).**

Subchapter D. TREATMENT TANKS AND UNITS

§ 73.31. Standards for septic tanks.

(a) **[*Capacity.***

(1) **The minimum liquid septic tank capacity for any installation is 900.**

(2) **For single-family dwelling units, not served by a community onlot system, a minimum daily flow of 400 gpd shall be used to determine required septic tank capacity. This figure shall be increased by 100 gallons for each additional bedroom over three. The daily flow indicated provides for use of garbage grinders, automatic washing machines, dishwashers and water softeners.**

(3) **The minimum septic tank capacity shall be calculated from the following table using estimated sewage flows from paragraph (2), or § 73.17(a)—(c) (relating to sewage flows):**

Design flow (gallons per day)	*Tank capacity (gallons)*
0—500	**(3.5 x flow exceeding 400 gpd) + (900)**
500—5,000	**(1.50 x flow exceeding 500 gpd) + (1,250)**
5,000—7,500	**(1.45 x flow exceeding 5,000 gpd) + (8,000)**
7,500—10,000	**(1.35 x flow exceeding 7,500 gpd) + (11,625)**
over 10,000	**(1.50 x the daily flow)**

Note: Septic tanks may be connected in series to attain required capacity.]
{Reserved}.

(a.1) ***Design*.**

(1) The minimum liquid septic tank capacity for any installation is 1,000 gallons or equal to three times the estimated peak daily sewage flow in gpd, whichever is greater, as established in § 73.17 (relating to sewage flows).

(2) Septic tanks must be rectangular or horizontally cylindrical in shape.

(b) *Construction.*

(1) Tanks shall be watertight and constructed of sound and durable material not subject to excessive corrosion or decay.

(i) Precast concrete tanks shall have a minimum wall thickness of 2 1/2 inches and be adequately reinforced.

(ii) Precast slabs used as covers shall have a thickness of at least 3 inches and be adequately reinforced.

(iii) Tanks having a liquid capacity of 5,000 gallons or less may not be constructed of blocks, bricks**[,]** or similar masonry construction.

(iv) Tanks having a capacity in excess of 5,000 gallons may be constructed onsite **[to meet the standards of the National Concrete Masonry Association for reinforcement and waterproofing [as listed in the most recent edition of its publication ''Concrete Masonry Foundation Walls,'' copyright 1957 NCMA]**. **Tanks shall be constructed of structurally reinforced cast-in-place concrete and be designed by a registered professional structural engineer licensed to practice in Pennsylvania.**

(v) **[Steel tanks shall meet United States Department of Commerce Standards 177-62.] {Reserved}.**

(vi) **Tanks shall be vacuum tested as follows:**

(A) **Tanks made of concrete must be vacuum tested after installation to ensure they are watertight. The vacuum test must be performed prior to backfilling around the tank. The tank must be sealed, vacuum equal to 4 inches (100 millimeters) of mercury must be applied to the tank, and the tank must hold 90% of the applied vacuum for a minimum of 5 minutes to pass a vacuum test. The test must follow the ASTM testing standards in ASTM C1719, "Standard Test Method for Installed Precast Concrete Tanks and Accessories by the Negative Air Pressure (Vacuum) Test Prior to Backfill."**

(B) **Tanks made of materials other than concrete (for example, plastic or fiberglass) must be vacuum tested after installation to ensure they are watertight. The recommended manufacturer vacuum level for a tank may not be exceeded during vacuum testing.**

(vii) **Tanks made of plastic or fiberglass must have a mark permanently embossed on the tank showing compliance with one of the following applicable standards:**

(A) **"Design, Material, and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks" by the Canadian Standards Association in CSA B66:21.**

(B) **"Prefabricated Septic Tanks" by the International Association of Plumbing and Mechanical Officials in IAPMO Z1000-2019.**

(C) **"Fibre Reinforced Underground Tanks for Flammable and Combustible Liquid" by Underwriters Laboratories in UL Standard 1316.**

(2) The depth of liquid in any tank or its compartments shall be:

(i) Not less than 2 ½ **feet,** nor more than 5 feet for tanks having a liquid capacity of 600 gallons or less.

(ii) Not less than 3 feet**,** nor more than 7 feet for tanks having a liquid capacity of more than 600 gallons.

(3) No tank or compartment may have an inside horizontal dimension less than 36 inches.

(4) Septic tank installations **[shall consist of tanks] must consist of, at a minimum, a single tank** with **[multiple] two** compartments or **[multiple tanks] two single compartment tanks connected in series**. The first **tank** compartment or tank **[shall have at least the same capacity as the second but may not exceed twice the capacity of the second] in the series must have a liquid capacity equal to 1/2 to 2/3 of the total liquid capacity of both compartments or tanks**. Tanks or compartments **[shall]must** be connected in series and may not exceed four in number in any one installation.

(5) The tanks must be designed and constructed using anti-buoyancy measures to prevent floatation when the proposed installation site is below a SHWT, actual water table or is prone to flooding.

(6) Tanks must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(d) (relating to general), to bed the tank.

(7) Inlet and outlet connections must meet the following requirements.

(i) **The bottom of the inlet must be a minimum of 3 inches above the bottom of the outlet.**

(ii) **Inlet baffles or vented tees must extend below the liquid level at least 6 inches. Penetration of the inlet device may not exceed that of the outlet device.**

(iii) **The outlet baffles or vented tees of each tank or compartment must extend below the liquid surface to a distance equal to 40% of the liquid depth. Penetration of outlet baffles or tees in horizontal cylindrical tanks must be equal to 35% of the liquid depth.**

(iv) **The inlet and outlet baffles or vented tees must extend above liquid depth to approximately 1 inch from the top of the tank. Venting must be provided between compartments and each tank.**

(v) **An ANSI-accredited effluent filter indicating testing and approval by ANSI under NSF/ANSI Standard No. 46, or as subsequently amended, must be installed on the outlet of the final tank or compartment.**

(vi) **All inlet and outlet pipes must be connected to tanks by means of a flexible watertight seal. Use of grouting is not permitted.**

Commented [A54]: Moved from (c) with no changes.

Commented [A55]: Moved from (c)(1)

Commented [A56]: Moved from (c)(2)

Commented [A57]: Moved from (c)(3)

Commented [A58]: Moved from (c)(4)

Commented [A59]: Moved from (c)(5) and revised

(8) **A maximum 4-inch diameter inspection port with sealed cover must be installed to grade level above the inlet tee. Alternatively, the treatment tank access may be used as the inspection port if the access gives a clear and unobstructed view of the baffles.**

Commented [A60]: Moved from (e) and revised

(c) **[*Inlet and outlet connections.***

(1) **The bottom of the inlet shall be a minimum of 3 inches above the bottom of the outlet.**

(2) **Inlet baffles or vented tees shall extend below the liquid level at least 6 inches. Penetration of the inlet device may not exceed that of the outlet device.**

(3) **The outlet baffles or vented tees of each tank or compartment shall extend below the liquid surface to a distance equal to 40% of the liquid depth. Penetration of outlet baffles or tees in horizontal cylindrical tanks shall be equal to 35% of the liquid depth.**

(4) **The inlet and outlet baffles or vented tees shall extend above liquid depth to approximately 1 inch from the top of the tank. Venting shall be provided between compartments and each tank.**

(5) **The outlet baffles or vented tees of the last compartment or tank shall be equipped with a solids retainer.] {Reserved}.**

(c.1) ***Maintenance.***

(1) **The depth of sludge and scum in the septic tank must be measured at least once every 3 years by a service provider. Removal of septage or other solids from a treatment tank must be done whenever an inspection reveals that the treatment tank is filled with solids in excess of 1/3 of the liquid depth of the tank or with scum in excess of 1/3 of the liquid depth of the tank. Pumping may be substituted for measurement.**

(2) **The tank and inlet and outlet baffles must be inspected every 3 years for structural integrity by a service provider.**

(3) **The effluent filter must be inspected and cleaned at least every 3 years or according to the manufacturer's recommended maintenance schedule by a service provider.**

(4) **The effluent filter must be replaced if an inspection reveals the filter is not functioning as intended.**

(5) **The area around the tank must be inspected by a service provider every 3 years for signs of a malfunction including but not limited to vigorous plant growth, spongy soil and unusual odors.**

(6) **Maintenance of surface contouring and other measures to divert stormwater away from the septic tank.**

(7) **The municipality must follow the requirements in § 71.73 (relating to sewage management programs for sewage facilities permitted by local agencies).**

(d) *Treatment tank access.*

(1) Access to each tank or compartment of the tank **[shall]must** be provided by a manhole with an inside dimension of at least **[20 inches square (20 × 20) or in]24 inches** in diameter, with a removable cover. **[The top of the tank containing the manhole or the top of a manhole extension may not be more than 12 inches below grade level. If access is extended to grade, the access cover shall be airtight.] The access to the manhole must be a minimum of 6 inches above the ground surface and be airtight. [Grade level] All** access covers **[shall be]must be kept** secured by bolts or **similar** locking mechanisms or **[have]be of** sufficient weight to prevent unauthorized access. **Mechanisms to prevent unauthorized access into the tank appropriate to the individual tank or riser, or both, must be installed and maintained in accordance with the tank manufacturer's specifications. These mechanisms may include tamper-resistant screws or an internal concrete lid with lifting handle.**

(2) The ground **[shall] surface must** slope away from **[any access extended to grade level] the access to divert surface water away from the access**.

(e) **[*Inspection port.* A maximum 4-inch diameter inspection port with sealed cover shall be installed to grade level above the inlet tee.] {Reserved}.**

§ 73.32. Standards for [aerobic treatment tank]secondary treatment units.

(a) **[Capacity shall comply with the following:]*Design*.**

(1) The rated treatment capacity of **[an aerobic treatment tank]a secondary treatment unit** shall be specified by the manufacturer **and must meet or exceed the estimated daily sewage flows as determined from § 73.17 (relating to sewage flows). [The manufacturer's data shall be in conformance with the approved test sequence and protocol in subsection (b).] Multiple aerobic treatment units may be connected for the purpose of achieving required hydraulic capacity. Multiple units must be connected in parallel and must have equal capacity and receive equal loading.**

(2) The **[minimum manufacturer's]**rated treatment capacity of **[an aerobic treatment tank approved under this section is 400 gpd] a secondary treatment unit must be between 400 gpd and 1,500 gpd.**

(3) **[For single family dwelling units not served by a community system, a minimum daily flow of 400 gpd shall be used to determine required aerobic tank capacity. This figure shall be increased by 100 gallons for each additional bedroom over**

Commented [A61]: Added from 71.73(b)(2)(ii)

Commented [A62]: Added from 71.73(b)

Commented [A63]: Moved to (b)(8)(i) and (ii)

Commented [A64]: Moved to (b)(9)

Commented [A65]: Moved from (a)(4) and revised

Commented [A66]: Moved from (d) and revised

three. The daily flow indicated provides for use of garbage grinders, automatic washing machines, dishwashers and water softeners.] {Reserved}.

(3.1) Aerobic treatment tanks may not be used with systems that are only used seasonally, or in other instances where the system remains unused for periods of time that would detrimentally affect the biological activity in the tank. Active use is required to maintain the level of aerobic biological activity needed to meet the required secondary treatment standards.

(4) [For all other installations, the rated treatment capacity shall meet or exceed the estimated daily sewage flow as determined from § 73.17(a), (b) or (c) (relating to sewage flows).] {Reserved}.

(5) Systems using secondary treatment units must bear the mark of an ANSI accredited testing organization indicating testing and approval under NSF/ANSI Standard No. 40, 245 or 350, or as subsequently amended.

(b) [Testing and approval shall comply with the following:

(1) Aerobic treatment tanks serving single family dwellings, or establishments, with flows of 1,500 gpd or less shall bear the seal of the NSF indicating testing and approval by that agency under Standard No. 40.

(2) Units tested and awarded a seal under other than the current standard shall be approved for use until expiration of the seal. Units initially submitted for testing or resubmitted for testing shall be approved under the version of Standard No. 40 in effect at that time.

(3) Aerobic treatment tanks serving establishments with flows exceeding 1,500 gpd shall either:

(i) Have NSF certification under Criteria C-9.

(ii) Have performance data certified by NSF under the provisions of that agency's Standard Performance Evaluation Method.] {Reserved}.

(b.1) *Construction*.

(1) Treatment tanks must meet the construction requirements established at § 73.31(b)(1) (relating to standards for septic tanks).

(2) Every treatment system must be equipped with a visible and audible alarm system that must be designed to respond to any electrical or mechanical failure or malfunction of the tank or any component thereof. Alarms must be located where they are readily visible and audible by the property owner. The alarm must be placed on an independent circuit breaker.

Commented [A67]: Moved from (e) and revised

(3) The tanks must be designed and constructed using anti-buoyancy measures to

prevent floatation when the proposed installation site is below a SHWT, actual water table or is prone to flooding.

(4) **All tanks in the secondary treatment unit must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(d), to bed the tank.**

(5) **Treatment unit access must meet the requirements of § 73.31(d).**

(6) **Treatment unit inspection ports must meet the requirements of § 73.31(b)(8).**

(7) **Safety features specified by the unit manufacturer must be present and utilized.**

(c) **[The Department will provide local agencies with a current list of aerobic sewage treatment tanks that have been found to be in conformance with the Department's standard.] {Reserved}.**

(c.1) ***Maintenance:***

(1) **The secondary treatment unit owner shall complete maintenance in accordance with the manufacturer's specifications.**

(2) **The secondary treatment unit must be inspected at least annually by a service provider. Any problems identified during an inspection must be corrected to ensure full functionality. At a minimum, the service provider must complete the following:**

(i) An inspection of the aeration tank for evidence of foaming and uneven air distribution.

(ii) An inspection of the aeration tank for solids accumulation in excess of manufacturer's recommended guidelines and removal of solids when they are exceeded.

(iii) An inspection of all mechanical and electrical components.

(iv) Replace or repair any damaged access covers.

(v) Clean or replace the effluent filter.

(vi) Remove any debris, rags or other foreign material from the aerator propeller and shaft and verify the aerator and its components are functioning as designed.

(vii) Check the area around the tank for signs of a malfunction including but not limited to vigorous plant growth, spongy soil and unusual odors.

(viii) Maintenance of surface contouring and other measures to divert stormwater away from the secondary treatment unit.

(ix) **The secondary treatment tank must be inspected for structural integrity by the service provider at the time of the inspection.**

(x) **Operations and maintenance must follow the requirements in 71.73 (relating to sewage management programs for sewage facilities permitted by local agencies).**

(d) **[Multiple aerobic treatment tanks connected for the purpose of achieving required hydraulic capacity shall only be permitted where the tanks are connected in parallel. All tanks shall have equal capacity and receive equal loading.] {Reserved}.**

Commented [A68]: Moved to (b.1)(2)

(e) **[Every aerobic sewage treatment tank shall be equipped with a visual and audible alarm system which shall be designed to respond to any electrical or mechanical failure or malfunction of the tank or any component thereof.] {Reserved}.**

Commented [A69]: Moved to (b.1)(5)

§ 73.32a. Standards for flow-equalization units.

(a) ***Design.***

(1) **Flow-equalization units equalize the system's variable flow allowing for consistent dosing of the treatment components including the absorption area.**

(2) **A flow-equalization tank may not be used before a septic tank.**

(3) **The equalized flow rate shall be used when sizing system components following the equalization tank in the treatment system.**

(4) **When calculating the capacity of the flow-equalization tank, the design must consider the peak daily flow as determined in § 73.17 (relating to sewage flows) and the equalized flow rate.**

(b) ***Construction.***

(1) **Equalization tanks must meet the construction requirements in § 73.31(b)(1) (relating to standards for septic tanks).**

(2) **Equalization tank access must meet the requirements of § 73.31(b)(8).**

(3) **The equalization unit must be equipped with a visible and audible alarm system designed to respond to any electrical or mechanical failure or malfunction of the tank or any component thereof. Alarms must be located where they are readily visible and audible by the property owner. The alarm must be placed on an independent circuit breaker.**

(4) **The equalization tank must be designed and constructed using anti-buoyancy measures to prevent floatation when the proposed installation site is below a SHWT, actual water table or is prone to flooding.**

(5) **The equalization tank must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(d) (relating to general), to bed the tank.**

(6) **Inlet and outlet connections must meet the requirements in § 73.31(b)(7).**

(c) ***Maintenance.***

(1) **An inspection of the equalization tank for solids accumulation and removal of any solids.**

(2) **The pump must be inspected annually by a service provider to verify it is fully functional.**

(3) **Safety features must be checked annually by a service provider verify their full functionality.**

(4) **The area around the tank must be inspected by a service provider annually for signs of a malfunction including but not limited to vigorous plant growth, spongy soil and unusual odors.**

(5) **Maintenance of surface contouring and other measures to divert stormwater away from the flow-equalization tank.**

(6) **The flow-equalization tank must be inspected for structural integrity by the service provider at the time of the inspection.**

(7) **Operations and maintenance must fallow the requirements in § 71.73 (relating to sewage management programs for sewage facilities permitted by local agencies).**

§ 73.36. Standards for ultraviolet radiation units.

(a) **Wastewater entering the UV radiation unit must meet or exceed the secondary or advanced secondary treatment standard.**

(b) **To inactivate microorganisms in the treated wastewater effluent, the optimum wavelength of the UV light must be maintained between 250 and 270 nanometers.**

(c) **The UV unit must provide the necessary UV radiation intensity to reduce the fecal coliform concentrations to meet the selected level of treatment in the table located in § 73.18(c) (relating to onlot sewage system treatment performance standards).**

(d) **The UV tubes must be jacketed to maintain proper operating temperature. The jacket must be made of quartz or high-silica glass with similar optical characteristics.**

(e) **The contact chamber must be at least four-inch diameter. The minimum contact time with the wastewater is 30 seconds.**

(f) **The units must be designed to permit frequent mechanical cleaning of the water contact surface of the jacket without disassembly of the unit.**

(g) **An automatic flow control valve, accurate within the expected pressure range, must be installed to restrict flow to not exceed the maximum design flow of the treatment unit.**

(h) **An accurately calibrated UV intensity meter, properly filtered to restrict its sensitivity to the point of the disinfection spectrum, must be installed in the wall of the disinfection chamber at the point of greatest vertical water depth from the tube.**

(i) **A lamp life indicator must be installed on each lamp to notify the property owner when the lamp must be replaced.**

(j) **A visible and audible alarm must be installed to notify the property owner if a UV lamp fails, the UV intensity drops below 50% or the UV system is not operating. Alarms must be located where they are readily visible and audible by the property owner. The alarm must be placed on an independent circuit breaker.**

(k) **The UV radiation treatment owner shall complete maintenance using a qualified service provider in accordance with the manufacturer's specifications.**

Subchapter E. DOSING AND DISTRIBUTION REQUIREMENTS

§ 73.41. General.

(a) Effluent from the treatment tank shall be discharged to the dosing tank, to the distribution box or directly to the absorption area through a watertight line a minimum of 3 inches in diameter unless otherwise specified by local plumbing or building codes.

(b) All lines shall be placed on a minimum grade of at least 1/4 inch per foot, sloping away from the treatment tank. Where a distribution box is used, the lines from that box to the laterals shall meet the same standard.

(c) If a free access sand filter or buried sand filter is used, the lines from the treatment tank to the pump station and the filter tank to a lift station or chlorine contact tank or storage tank shall meet the standards of this section. Connections of lines to tanks and distribution boxes **[shall]must** be made using **flexible** watertight **[mechanical]**seals**[or hydraulic grouting]**. Use of **[Portland cement]**grouting material is not permitted.

(d) All lines must meet the requirements of the most recent revision of ASTM D 2665, or as subsequently amended, for polyvinyl chloride drain, waste and vent pipe.

§ 73.42. Gravity distribution.

(a) Gravity distribution may **only** be used **[in all instances, except where prohibited by]when pressurized distribution is not required under** § 73.43 (relating to pressurized distribution).

(b) The distribution system shall be arranged to provide for uniform distribution of the effluent.

(c) The flow shall be equally divided between individual laterals of a trench system or between seepage beds by use of a distribution box.

(d) The flow shall be divided between individual laterals in a seepage bed by a distribution box or by an unperforated pipe header connecting all laterals within the bed. Where distribution is via an unperforated pipe header, the terminal ends of all individual laterals shall also be connected with unperforated pipe.

(e) Distribution boxes shall comply with the following:

(1) When a distribution box is used, it shall be installed level to provide equal distribution of treatment tank effluent to each line. For testing purposes, the person responsible for the installation shall provide an adequate amount of water to check the level of the inlet and outlet lines.

(2) Construction shall comply with the following:

(i) Distribution boxes **[shall]must** have removable covers. **The top of the box or the top of the access extension must be at or above the ground surface and be airtight. Access covers must be kept secured by bolts or similar locking mechanisms or be of sufficient weight to prevent unauthorized access.**

(ii) **The ground surface must slope away from the access to divert surface water away from the access location.**

(iii) Each lateral shall be connected separately to the distribution box.

(iv) The bottom of all outlets shall be at the same elevation, and the bottom of the inlet shall be at least 1 inch above the bottom of the outlet. The bottom of the outlet shall be at least 4 inches above the bottom of the distribution box.

(v) Baffles shall comply with the following:

(A) A baffle shall be installed in the distribution box in the event that treatment tank effluent is discharged to the distribution box by a pump or siphon.

(B) The baffle shall be perpendicular to the inlet, be secured to the bottom of the box and extend vertically to a point level with the crown of the inlet pipe.

(vi) A tee or elbow directed toward the bottom of the distribution box may be substituted for the baffle required by subparagraph **[(iv)](v).**

(3) Distribution boxes **[shall]must** be installed on **[an adequate base of undisturbed or properly compacted earth or aggregate outside of the absorption area]a minimum of 6 inches of aggregate, as detailed in § 73.171(d) (relating to general), to bed the box, and must be level**. Lightweight nonconcrete distribution boxes

[shall]must be anchored or otherwise secured to prevent shifting after installation. Adjustable distribution box weirs may be used on the outlet of the box.

(f) Laterals **[shall]must** be a minimum of 3 inches in diameter unless a larger diameter is specified by local plumbing or building codes. **[Bends used in the disposal field shall be made with standard fittings.]** **Laterals must meet the minimum requirements detailed in § 73.21 (relating to specifications).**

(g) The maximum length of individual laterals employing gravity distribution is 100 feet.

(h) ***Maintenance.***

(1) **All operation level switches, and all alarms associated with the distribution system must be inspected annually.**

(2) **All pumps, siphons and electrical connections installed in the system must be inspected annually.**

(3) **The distribution box must be inspected a minimum of every 3 years, or as required by local ordinance, whichever is more frequent, and leveled as necessary to ensure equal distribution to each lateral. The distribution box must be clear of solids and if not, the solids must be removed.**

(4) **The area around the box must be inspected annually for signs of a malfunction including but not limited to vigorous plant growth, spongy soil and unusual odors.**

§ 73.43. Pressurized distribution.

Pressurized distribution is required in the following instances:

(1) All elevated mounds.

(2) When the percolation rate exceed 60 minutes/inch.

(3) All systems having a total absorption area in excess of 2,500 square feet.

(4) Individual residential spray irrigation system spray fields and buried sand filters.

(5) **At-grade absorption areas.**

(6) **Advanced secondary treatment units that utilize filtration.**

(7) **Absorption areas sited on areas with a depth to a limiting zone of less than 48 inches.**

§ 73.44. Pressurized distribution design.

(a) General requirements are as follows:

(1) The piping used in a pressurized effluent system shall have watertight joints.

(2) Systems using pressure distribution shall meet the general requirements of §§ 73.52, 73.53, 73.55, and 73.166.

(3) Delivery pipes from dosing pumps shall be installed to facilitate drainage of the distribution piping back to the dosing tank between doses.

(4) **Piping must meet the requirements of the standard ASTM D 2665, as subsequently amended, for polyvinyl chloride drain, waste and vent pipe.**

(5) **When an absorption area is placed on a site where the limiting zone is less than 20 inches to the mineral surface area, the pressurized distribution system must be time dosed.**

(a.1) Pressure distribution system designs that do not meet the requirements in this section may be permitted when the design is signed and sealed by a qualified professional engineer and the local agency qualified professional engineer concurs with the design.

(b) Seepage beds **[of 2,500 square feet or less shall]must** meet the following design standards.

(1) Conveyance of effluent from the dosing tank to the absorption area shall be through a delivery pipe sized to minimize friction loss. Check valves shall be prohibited on delivery pipes. Where the system designer determines that water hammer may be a problem, thrust blocks may be installed on delivery pipes.

(2) When equally sized absorption areas are dosed simultaneously, a header pipe shall be used to connect the delivery pipe from the tank to the manifolds. The header pipe shall be sized to minimize friction loss. Effluent application rates per square foot of absorption areas served by a common header shall have a maximum design variation of 10%. If the distance from the treatment tank to the absorption area would cause excessive backflow into the dosing tank, a transfer tank may be used between the treatment tank or storage tank and dosing tank.

(3) Distribution of effluent to the individual laterals shall be by a central manifold extending into the absorption area from the delivery pipe or header. The manifold shall have the following minimum diameters **[:] as listed in Table 73-J.**

[Sq. ft. of Absorption Area	***Minimum Manifold Diameter***
200 to 1,199	**1 1/2"**
1,200 to 2,500	**2"]**

Table 73-J
Lateral Diameters for Seepage Bed Absorption Areas.

Square Feet of Absorption Area	*Minimum Manifold Diameter*
200 to 1,199	1 1/2"
1,200 to 2,500	2"

(3.1) The seepage bed must contain a minimum of two laterals.

(3.2) Laterals within the same seepage bed area must be equally spaced with a maximum of 6 feet on center.

(3.3) Spacing of laterals and discharge holes in the laterals must provide for uniform distribution of the effluent over the seepage bed.

(4) Laterals shall be extended from both sides of the manifold by opposing tees or a double sanitary tee.

(5) Laterals **[shall consist]**must be a minimum of 1 1/2 inch diameter pipe, with holes placed along the bottom of the pipe**[; an end cap shall be cemented on the terminal end of the lateral]**. **[Minimum hole size shall]** The minimum hole size must be 1/4 inch. When siphons are used in a pressure distribution system, each discharge hole must be at least 5/16-inch in diameter. The discharge from all the holes in the distribution system may not be less than the minimum rate of the siphon and may not vary from the average discharge rate of the siphon by more than 20%.

(5.1) The arrangement of laterals and discharge holes must result in the discharge holes being spaced at the apexes of either squares or equilateral triangles.

(5.2) Laterals must be placed no further than 5 feet nor less than 2 feet from the edge of the seepage bed area except as provided for in § 73.56 (relating to at-grade absorption areas).

(5.3) Laterals must be placed in the seepage area so that the first and last discharge holes may be no more than 5 feet nor less than 2 feet from the ends of the seepage bed area.

(6) The first hole in the lateral **[shall]**must be 3 feet from the manifold. Additional holes **[shall]**must be placed 6 feet on center with the last hole placed **[directly]** in the **[end cap]** bottom of the cleanout elbow.

(7) **[The maximum length of a lateral from the manifold to the end cap shall be 51 feet and contain nine holes.]** {Reserved}.

(7.1) The maximum length of a lateral from the manifold to the cleanout may not exceed 84 feet for 1 ½-inch diameter pipe and 126 feet for 2-inch diameter pipe.

Commented [A70]: Moved from 73.53(3) and revised

Commented [A71]: Moved from 73.53(4) and revised

Commented [A72]: Moved from (c)(7)

Commented [A73]: Moved from (15) with no changes.

Commented [A74]: Moved from (c)(8)

Commented [A75]: Moved from 73.53(5) and revised

Commented [A76]: Moved from 73.53(6) and revised

(8) **[The location and spacing of the laterals shall conform to § 73.53(3)—(6) (relating to seepage beds).] {Reserved}.**

(8.1) Discharge rates from the individual holes of the lateral at the design hydraulic head pressure must be calculated using the sharp-edged discharge hole equation:

Q=discharge rate, in gpm–11.82(d)^2 (√h)

d=diameter of hole, in inches

h=head to be maintained at the terminal ends of the lateral, in feet

Commented [A77]: Moved from (c)(3) and revised

(9) Opposing laterals may not differ in length by more than 6 feet.

(10) When less than the maximum length of lateral is used, as described in paragraph **[(7)] (7.1)**, the lateral shall be shortened in 6-foot sections with hole spacing maintained as required in paragraph (6).

(11) All systems shall be designed to maintain a minimum of 3 feet of head at the terminal end of each lateral.

(12) The minimum pump capacity (gpm) shall be calculated by multiplying the total number of discharge holes contained in the laterals of a proposed distribution layout by the gpm factor determined by the hole size at the design head level.

(13) Total pump head shall be calculated by the addition of all losses incurred due to elevation changes, pipe and fitting friction losses, and the head level to be maintained at the terminal end of the lateral as specified in paragraph (11).

(14) For purposes of calculating head loss due to friction, head loss in the **[standard lateral as described in paragraph (7) shall] lateral must** be assumed to be 0. Head loss due to friction in pipe and fittings used in construction of the pressure system **[shall]must** be calculated using a friction loss table for smooth-walled plastic pipe (C=150). **The head loss due to friction from the beginning of the central manifold to the terminal end of the last lateral may not exceed 15% of the head level to be maintained at the terminal end of the lateral.**

(15) **[When siphons are used in a pressure distribution system, each discharge hole must be at least 5/16 inch in diameter. The discharge from all the holes in the distribution system may not be less than the minimum rate of the siphon and may not vary from the average discharge rate of the siphon by more than 20%.] {Reserved}.**

Commented [A78]: Moved to (5) second sentence with no changes.

(16) **All piping and fittings in the system must be sized to minimize friction losses to provide as uniform distribution of effluent as possible.**

Commented [A79]: Moved from (c)(4)

(17) **The permittee shall conduct a pressurization test of the completed distribution**

system in the presence of the sewage enforcement officer prior to covering the piping system from view. During the test, the permittee shall demonstrate that all joints are watertight and that a discharge is occurring from each hole.

Commented [A80]: Moved from (c)(10) and revised

(18) **A cleanout must be provided at the terminal end of each lateral consisting of two 45°-elbows or a 90°-sweep elbow with a removable threaded end cap or plug to allow for cleaning of the lateral. The cleanouts must be accessible at the surface and be protected from damage.**

(c) **[Seepage beds of greater than 2,500 square feet shall meet the following design standards:**

(1) **The diameter of individual laterals, size and spacing of discharge holes, and minimum diameter of the distribution manifold may not be restricted by subsection (b) except that no discharge hole may be less than 1/4 inch for systems using pumps or 5/16 inch for systems using siphons.**

(2) **The maximum length of a lateral designed under this subsection or subsection (d) shall be 100 feet.**

Commented [A81]: Moved to (b)(7.1)

(3) **Discharge rates from the individual holes of the lateral at design head shall be calculated using the sharp-edged discharge hole equation:**

$gpm=11.82(d^2)(y\sqrt{h})$

gpm=gallons per minute

(d)=diameter of hole (inches)

(h)=head to be maintained at the terminal ends of the lateral (in feet).

Commented [A82]: Moved to (b)(8.1)

(4) **All piping and fittings in the system shall be sized to minimize friction losses to provide as uniform distribution of effluent as possible.**

Commented [A83]: Moved to (b)(16)

(5) **The design head at the terminal end of the last lateral shall be at least 3 feet.**

(6) **The head loss due to friction from the beginning of the distribution manifold to the terminal end of the last lateral may not exceed 15% of the head level to be maintained at the terminal end of the lateral.**

Commented [A84]: Moved to (b)(14) 2nd sentence.

(7) **Spacing of laterals and discharge holes in the laterals shall provide for uniform distribution of the effluent over the seepage bed.**

Commented [A85]: Moved to (b)(3.3)

(8) **The arrangement of laterals and discharge holes shall result in the discharge holes being spaced at the apexes of either squares or equilateral triangles.**

Commented [A86]: Moved to (b)(3.2)

(i) **The maximum spacing between discharge holes shall be 10 feet where an equilateral triangle pattern is utilized.**

(ii) **The maximum spacing between discharge holes shall be 8 feet where a square pattern it utilized.**

(9) **The minimum pump capacity shall equal the total discharge from all holes in the laterals when operating at designed head.**

(10) **The permittee shall conduct a test pressurization of the completed distribution system in the presence of the sewage enforcement officer prior to covering the piping system from view. During the test, the permittee shall confirm that all joints are watertight and that a discharge is occurring from each hole.] {Reserved}.**

(d) Design of pressure distribution in trenches shall comply with the following:

(1) Subsection **[(c)(1)—(4) and (10)] (b)(7.1), (8.1) and (16)** applies to design of trenches utilizing pressurized effluent distribution.

(1.1) **The minimum hole size of the laterals must be 1/4 inch. When siphons are used in a pressure distribution system, each discharge hole must be at least 5/16 inch in diameter. The discharge from all the holes in the distribution system may not be less than the minimum rate of the siphon and may not vary from the average discharge rate of the siphon by more than 20%.**

(2) Variation in head in the laterals caused by differences in elevation or friction losses shall be compensated for by individual design of the laterals.

(3) The effluent application rate per square foot of any two trenches served by a common dosing tank shall have a maximum design variation of 10%.

(4) Equalization of loading may be accomplished by variation of discharge hole diameter between trenches, variation of spacing of discharge holes between trenches or another method approved by the Department**[or sewage enforcement officer]**.

(5) The maximum spacing between discharge holes is 10 feet.

(6) The manifold for a trench system shall be placed on undisturbed soil a minimum of 6 inches above the trench bottom.

(7) A minimum isolation distance of 3 feet shall be maintained between the manifold and the beginning of any trench. The individual laterals in the trench shall be connected to the manifold using unperforated pipe. The area beneath the manifold and connecting pipe shall consist of undisturbed or compacted soil.

(8) The design head at the terminal end of each lateral shall be at least 3 feet.

(9) **The permittee shall conduct a pressurization test of the completed distribution system in the presence of the sewage enforcement officer prior to covering the piping system from view. During the test, the permittee shall demonstrate that**

Commented [A87]: Moved to (b)(17) and copied to (d)(9)

Commented [A88]: Moved from 73.44(b)(5) and revised

Commented [A89]: Moved from (15) and revised

Commented [A90]: Pulled the language from (b)(5) that applied to trenches and was referenced in the previous regulations in (c)(1).

all joints are watertight and that a discharge is occurring from each hole.

Commented [A91]: Was referenced in (d)(1), previously (c)(10) now copied into the trench section and revised

§ 73.45. **Dosing and effluent lift tanks.**

[Dosing tanks shall be constructed to the following specifications:]

(1) **[Dosing tanks shall be constructed of materials to the specifications outlined in § 73.31(b) (relating to standards for septic tanks).] {Reserved}.**

(2) **[For all systems other than individual residential spray irrigation systems, the dosing tank shall be designed so that the estimated daily flow shall be discharged to the absorption area in one or more doses. Minimum dose volume shall be five times the internal liquid capacity of the delivery pipe, manifold and laterals, or 100 gallons, whichever is greater. When a siphon is used in a pressure distribution system, the minimum dose volume shall be equal to the internal liquid capacity of the delivery line plus five times the internal liquid capacity of the manifold and laterals.] {Reserved}.**

(3) **[The dosing tank shall have a minimum liquid capacity equal to or greater than two times the designed dose volume.] {Reserved}.**

(4) **[Sufficient space shall be provided for electrical connections and proper pump control operation.] {Reserved}.**

(5) **[Unless otherwise regulated by local electrical codes, all electrical connections shall be moisture resistant and at a point higher than the inlet pipe, or mounted above grade outside of the dosing tank or manhole extension within a tamper resistant, lockable control box.] {Reserved}.**

(6) **[A watertight manhole, at least 20 inches square or 24 inches in diameter, extended to grade, shall be provided for access to the dosing tank. Man- hole covers shall meet the specifications of § 73.31(d).] {Reserved}.**

Commented [A92]: Moved to (b)(5)

(a) ***Design.***

(1) **For all systems other than individual residential spray irrigation systems, the dosing tank shall be designed so that the estimated daily flow shall be discharged to the absorption area in one or more doses.**

Commented [A93]: Moved from 73.45(2)

(2) **Minimum dose volume must be five times the internal liquid capacity of the delivery line, manifold and laterals. When a siphon is used in a pressure distribution system, the minimum dose volume must be designed to keep the entire distribution system full for between 3 and 5 minutes.**

Commented [A94]: Moved from 73.45(2) and revised

(3) **The dosing tank must have a minimum liquid capacity equal to or greater than two times the designed dose volume.**

Commented [A95]: Moved from (3)

(4) **The effluent lift tank must have a minimum liquid capacity of two times the**

internal liquid capacity of the pipe between the effluent lift tank and the next component in the system.

(b) ***Construction.***

(1) Tanks must be constructed of materials to the specifications established in § 73.31(b)(1) (relating to standards for septic tanks).

(2) The tanks must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(b)(4) (relating to general), to bed the tank.

(3) Sufficient space must be provided for electrical connections and proper pump control operation.

(4) Unless otherwise regulated by local electrical codes, all electrical connections must be directly wired within a moisture-proof and corrosion-resistant electrical box, meeting National Electrical Manufacturers Association 4X rating. Electrical control and other electrical components must be approved by Underwriters Laboratories or equivalent.

(5) Access to the dosing and effluent lift tank must meet the requirements in § 73.31(b)(8).

(6) All inlet and outlet pipes must be connected to tanks by means of a sealed flexible joint connector. Use of grouting is not permitted.

(c) ***Maintenance.***

(1) The dosing and effluent tanks must be inspected every 3 years for structural integrity by a service provider.

(2) All mechanical and electrical components must be inspected every 3 years for proper operation by a service provider.

(3) The dosing and effluent tanks must be pumped whenever the septic tank or other treatment tanks are pumped.

(4) The area around the tank must be inspected by the property owner annually and by a service provider every 3 years for signs of a malfunction including but not limited to vigorous plant growth, spongy soil and unusual odors.

(5) Maintenance of surface contouring and other measures to divert stormwater away from the tanks.

(6) The tank must be inspected for structural integrity by the service provider at the time of the inspection.

(7) Operations and maintenance must fallow the requirements in § 71.73 (relating to

Commented [A96]: Moved from (1)

Commented [A97]: Moved from (4)

Commented [A98]: Moved from (6) and revised

sewage management programs for sewage facilities permitted by local agencies).

§ 73.46. Dosing pumps, siphons and lift pumps.

(a) Dosing pumps**, siphons and lift pumps used** for **[all] onlot** sewage **[disposal]** systems except individual residential spray irrigation systems **[shall]must** meet the following specifications:

(1) The pump shall be sized to deliver a flow in gpm equal to or greater than the combined flows from all discharge holes in the laterals when operating at designed level of head and shall be rated by the manufacturer for handling of sewage effluent.

(2) The intake of the dosing pump shall be at least 6 inches from the bottom of the tank. The intake of any dosing pump shall be at a lower elevation than the lowest lateral.

(3) Pumps may not be suspended above the bottom of the tank by chains or similar equipment.

(4) A disconnect **[shall]must** be incorporated into the piping within the dosing tank for ease of pump removal. **The disconnect must be located within 18 inches of the top of the tank cover.**

(5) **[An effective warning device, as described in § 73.62(c) (relating to standards for holding tanks),] A visible and audible alarm must** be installed in the dosing tank to indicate failure of the pump or siphon. **The alarm must be located where it is readily visible and audible by the property owner.** Electrically operated warning systems **[shall]must** be on a circuit and breaker separate from the pump.

(6) A siphon or other discharge mechanism may be substituted for a pump where site conditions permit the use of a gravity flow device, if the average discharge rate of the device meets the requirements of paragraph (1).

(7) A copy of the performance curve of the pump or discharge specifications for the siphon to be used shall be attached to the system design. A copy of the manufacturer's specification showing that the pump is designed to handle sewage or sewage effluent shall also be attached to the system design.

(8) When **[an aeration tank] a secondary or advanced secondary treatment unit** is used which results in a periodic pump discharge from the treatment tank, the discharge mechanism may be substituted for a dosing tank and pump if the periodic discharge rate meets the criteria in subsections (a)(1) and (b)(2) and **[§ 73.45(2) (relating to dosing tanks)]** **§ 73.45(a)(1) (relating to dosing and effluent lift tanks)**.

(9) Pumps or siphons serving systems having total absorption areas greater than 2,500 square feet shall have a minimum discharge capacity at least two times the estimated peak flow for the facility served.

(10) When an establishment produces more than 50% of its total daily flow during a peak flow period, the minimum dose volume **[shall]must** equal the anticipated flow during the peak **flow** period **unless flow equalization is used in accordance with § 73.32a (relating to standards for flow-equalization units)**.

(11) Pumps employed for the purpose of lifting effluent to a higher elevation may not be deemed dosing pumps when the system does not meet the criteria of § 73.43 (relating to pressurized distribution). Pumps for this purpose shall have a discharge capacity at least two times the estimated peak flow of the facility served when operating at designed level of head, but at least 5 gpm and shall be rated by the manufacturer for handling sewage effluent.

(12) Siphon discharge lines shall be equipped with an observation port. The access to the observation port shall be extended to grade, capped and secured to prevent unauthorized entry.

(b) Lift pumps shall meet the following specifications:

(1) Meet the standards in subsection (a)(1)—(5), (7) and (8).

(2) Be designed to discharge a minimum flood dose of 2 inches over the sand surface.

(c) Dosing pumps used to pressurize a spray field distribution system shall be designed in accordance with the specifications in subsection (a)(1)—(5) and (7).

(d) *Maintenance.*

(1) **All pumps and siphons must be inspected during an onlot sewage system inspection. Service must be performed in accordance with the manufacturer's maintenance recommendations.**

(2) **All operation level switches, and all alarms associated with the distribution system must be tested during an onlot sewage system inspection by a service provider.**

Subchapter F. [CONSTRUCTION OF] ABSORPTION AREAS

§ 73.51. General.

(a) **[In all systems, if an absorption area is proposed, the top of the limiting zone shall be at least 4 feet below the bottom of the aggregate. Coarse aggregate used in the distribution system shall meet the requirements of the Department of Transportation specifications, Publication #408 (1994) section 703 available from the Department of Transportation. The size and grading of the aggregate shall meet AASHTO No. 57 requirements from a PADOT certified stockpile and shall be of Type B quality requirements.**

(1) **Where the depth to the top of the limiting zone is 60 inches or greater, the**

system shall be installed so that the bottom of the aggregate is a minimum of 4 feet above the limiting zone.

(2) **Where the depth to the top of the limiting zone is less than 60 inches, an elevated sand mound is required. Isolation from the limiting zone shall be achieved as required by § 73.55(a)(3)—(5) (relating to elevated sand mounds).**

(3) **An absorption area may not be installed where less than 20 inches of suitable undisturbed mineral soil exists.**

(4) **When infiltration chambers or other devices which require no aggregate are used, adequate provisions to protect the infiltrative surfaces from dam- age by operation of pressure distribution systems shall be made.] {Reserved}.**

(a.1) ***Design.***

(1) **Absorption areas must be designed based on peak daily flows listed in § 73.17 (relating to sewage flows) for the type of facility to be served. When a flow-equalization unit is used, the absorption area must be designed using the equalized flow multiplied by 1.2.**

Commented [A99]: Moved from 73.16(b)(2) and revised

(2) **For nonresidential establishments, a volume of 200 gpd will be the minimum volume used in calculating the size of the absorption area.**

Commented [A100]: Moved from 73.16(b)(3)

(3) **Only the bottom of the aggregate area of the seepage bed or trench may be used in calculating absorption area to meet the requirements.**

Commented [A101]: Moved from 73.16(b)(1) and revised

(4) **Table 73-K must be used in calculating the minimum square footage of an absorption area required for final treatment of effluent when the absorption area is sized using percolation test results. Table 73-K includes allowances for garbage grinders, automatic washing machines and dishwashers, and water softeners.**

Commented [A102]: Moved from 73.16(c) and revised

(5) **Table 73-L must be used in calculating the square footage of an absorption area required for final treatment of effluent when the absorption area is sized using soil morphology. The following applies to the design of the absorption areas using Table 73-L:**

(i) **Determine the design sewage flow from § 73.17.**

(ii) **The gentlest slope measured across the proposed absorption area must be used in the design of the onlot sewage system.**

(iii) **The width of the absorption area is calculated by dividing the HLLR by the infiltration loading rate, both of which come from Table 73-L. Round the width value up to the nearest whole number; this is the minimum width.**

(iv) **The length of the absorption area is calculated by dividing the design**

sewage flow from subparagraph (i) by the HLLR, from Table 73-L. Round the length value up to the nearest whole number; this is the minimum length.

(v) **The minimum absorption area is calculated by multiplying the minimum width by the minimum length computed in subparagraphs (iii) and (iv).**

(6) **The absorption area must be placed on contour.**

(7) **Absorption areas may not be installed on sites deemed unsuitable as described in § 73.12 (relating to site location).**

(8) **Underdrains are prohibited.**

(b) **[Before and after installation, equipment, and vehicles shall be kept off the proposed absorption area, including the downslope area, to prevent undue compaction of the soil. Care must be exercised before, during, and after construction to prevent compaction or damage to the absorption area and the downslope area.] {Reserved}.**

(b.1) ***Construction.***

(1) **Before and after installation, equipment and vehicles shall be kept off the proposed absorption area, including the downslope area, to prevent undue compaction of the soil.**

(2) **Absorption areas may only be sited on undisturbed soil.**

(3) **Soil moisture levels during construction of the absorption area must be such that a sample of natural mineral soil taken from the level of the proposed installation will crumble if compressed into a ball.**

(4) **The bottom of the absorption area must be level to a tolerance of 2 inches per 100 feet.**

(5) **All aggregate must meet the requirements in § 73.171 (relating to general).**

(6) **Laterals must be level to a maximum tolerance of 4 inches of fall per 100 feet toward the terminal end of the lateral.**

(7) **The minimum depth of coarse aggregate material over the laterals must be 2 inches.**

(8) **The depth of the coarse aggregate must be uniform throughout the absorption area.**

(9) **The top of the coarse aggregate material must be covered with geotextile material to prevent backfill material from settling into the coarse aggregate.**

(10) **The minimum depth of soil cover over the coarse aggregate in all installations is**

Commented [A103]: Moved from (b) and revised

Commented [A104]: Moved from (c)

Commented [A105]: Moved from 73.52(b)(6)

Commented [A106]: Moved from 73.52(b)(10)

12 inches. Where the top of the coarse aggregate is less than 12 inches from the undisturbed soil surface, the soil cover must extend beyond the absorption area by at least 3 feet on all sides.

(11) The backfill material must consist of soil suitable for the growth of vegetation and be seeded to control erosion.

Commented [A107]: Moved from 73.52(11)-(16) and revised

(12) The area surrounding the absorption area must be graded or bermed to provide for diversion of surface runoff waters.

(13) Distribution piping must be constructed of material meeting the requirements of ASTM D 2665, as subsequently amended, for polyvinyl chloride Schedule 40 drain, waste and vent pipe.

(14) All distribution piping in the system must be marked with utility tape or other similar material detectable using a metal detector as a means of identifying the exact location of the distribution piping after the final cover is placed over the area.

(15) A cleanout must be provided at the terminal end of each lateral consisting of two 45º-elbows or a 90º-sweep elbow with a threaded end cap. The cleanouts must be accessible at the surface and be protected and have removable caps or plugs on the ends of the laterals to allow for cleaning. The cleanout must be constructed of material meeting the requirements of ASTM D 2665, as subsequently amended, for polyvinyl chloride Schedule 40 drain, waste and vent pipe.

(16) A minimum of two inspection ports, 4 inches or greater in diameter, must be installed in the absorption area and extend at least 1 foot above grade level. The inspection ports must have vertical slots on the bottom 6 inches of the pipe to allow free access of effluent in the coarse aggregate, be firmly anchored to prevent removal, and be secured or otherwise protected for accidental or unauthorized access.

(i) For an inground system, an inspection port must be placed in the absorption area down to the gravel-native soil interface at each end of the length of the absorption area.

(ii) For an elevated sand mound system, a minimum of two inspection ports must be placed in the absorption area, one of which must be placed in the mound down to the gravel-sand interface, and another placed on the downslope side in the sand slope as detailed in § 73.55(b)(5) (relating to elevated sand mounds), to the sand-native soil interface.

(iii) For an at-grade bed system, an inspection port must be place in the absorption area down to the gravel-native soil interface at each end of the length on the downslope side of the at-grade bed.

(iv) For an absorption area using a leaching chamber, an inspection port must

be place in the interior of the chamber at each end of the length of the absorption area.

(c) [Soil moisture levels during construction of the absorption area shall be such that a sample of natural mineral soil taken from the level of the proposed installation will crumble if compressed into a ball.] {Reserved}.

(c.1) ***Maintenance.***

(1) The absorption area must be inspected, a minimum of annually, for ponding of effluent and any downgradient seepage.

(2) The cleanouts must be inspected, a minimum of annually, to verify they are in good working order. Any cleanouts that are damaged or missing must be replaced, meeting the minimum requirements in subsection (b.1)(15).

(3) The inspection ports must be inspected, a minimum of annually, to verify they are in good working order. Any inspection ports that are damaged or missing must be replaced, meeting the minimum requirements in subsection (b.1)(16).

(4) The property owner must keep the absorption area free of structures, woody plants, or any other deep root plant that may damage the absorption area.

(5) The property owner must prevent any activity on the absorption area that may damage or compact the absorption area.

(6) Maintenance of surface contouring and other measures to divert stormwater away from the absorption area.

(7) Operations and maintenance must fallow the requirements in § 71.73 (relating to sewage management programs for sewage facilities permitted by local agencies).

TABLE 73-K
Minimum Aggregate Absorption Area Requirements for Treatment Tank Effluent

Average Percolation Rate Expressed as Minute Per Inch	*Square Feet of Coarse Aggregate Area Per Gallon Per Day*	
	Seepage Beds and Trenches	*Open-Bottom Subsurface Sand Filters Seepage Beds and Trenches and Elevated Sand Mounds*
Less than 3.0[C]	Unsuitable	Unsuitable
3 – 5	Unsuitable	1.50[AB]
6 – 15	1.19[B]	1.50[AB]
16 – 30	(Avg. Perc Rate - 15) × (0.040) + 1.19[B]	1.50[AB]
31 – 45	(Avg. Perc Rate - 30) × (0.030) +	(Avg. Perc Rate - 30) × (0.026) + 1.50[AB]

	1.79[B]	
46 – 60	(Avg. Perc Rate - 45) × (0.028) + 2.24[B]	(Avg. Perc Rate - 45) × (0.022) + 1.89[A]
61 – 90	(Avg. Perc Rate - 60) × (0.023) + 2.66[A]	(Avg. Perc Rate - 60) × (0.020) + 2.22[A]
91 - 120[A][C]	Unsuitable	(Avg. Perc Rate - 90) × (0.017) + 2.82[A]
121 - 150[C]	Unsuitable	((Avg. Perc Rate - 120) × (0.015) + 3.33) (1.05)[A]
151 - 180[C]	Unsuitable	((Avg. Perc Rate - 150) × (0.014) + 3.78) (1.10)[A]
Greater than 181[C]	Unsuitable	Unsuitable

A Pressure dosing required.

B One-third reduction may be permitted for use of secondary treatment units and advanced secondary treatment units.

C Unsuitable for open-bottom sand filters.

TABLE 73-L
Infiltration and Hydraulic Linear Loading Rates

Soil Characteristics			Infiltration Loading Rate (ILR), gal/ft²/d		HLLR, gal/ft/d					
					Slope					
					0 - <5%		≥5 - ≤10%		>10%	
Texture[A]	Structure		Primary effluent	Secondary or advanced secondary effluent	Infiltration Distance, Inch		Infiltration Distance, Inch		Infiltration Distance, Inch	
	Shape[B]	Grade[C]			≥10 - ≤12	>12 - ≤20	≥10 - ≤12	>12 - ≤20	≥10 - ≤12	>12 - ≤20
COS, S, LCOS, LS	--	0SG	0.8	1.6	4.0	5.0	5.0	6.0	6.0	7.0
FS, VFS, LFS, LVFS	--	0SG	0.4	1.0	3.5	4.5	4.0	5.0	5.0	6.0
CSL, SL	--	0M	0.2	0.6	3.0	3.5	3.6	4.1	5.0	6.0
	PL	1	0.2	0.5	3.0	3.5	3.6	4.1	4.0	5.0
		2, 3		Unsuitable						
	PR/BK/GR	1	0.4	0.7	3.5	4.5	4.0	5.0	5.0	6.0
		2, 3	0.6	1.0	3.5	4.5	4.0	5.0	5.0	6.0
FSL, VFSL	--	0M	0.2	0.5	2.0	2.3	2.4	2.7	2.7	3.2
	PL	1, 2, 3		Unsuitable						
	PR/BK/GR	1	0.2	0.6	3.0	3.5	3.3	3.8	3.6	4.1
		2, 3	0.4	0.8	3.3	3.8	3.6	4.1	3.9	4.4
L	--	0M	0.2	0.5	2.0	2.3	2.4	2.7	2.7	3.2
	PL	1, 2, 3		Unsuitable						
	PR/BK/GR	1	0.4	0.6	3.0	3.5	3.3	3.8	3.6	4.1
		2, 3	0.6	0.8	3.3	3.8	3.6	4.1	3.9	4.4
SIL	--	0M	Unsuitable	0.2	2.0	2.5	2.2	2.7	2.4	2.9
	PL	1, 2, 3		Unsuitable						
	PR/BK/GR	1	0.4	0.6	2.4	2.7	2.7	3.0	3.0	3.5
		2, 3	0.6	0.8	2.7	3.0	3.0	3.5	3.3	3.8
SCL, CL, SICL	--	0M		Unsuitable						
	PL	1, 2, 3		Unsuitable						
		1	0.2	0.3	2.0	2.5	2.2	2.7	2.4	2.9

	PR/BK/GR	2, 3	0.4	0.6	2.4	2.9	2.7	3.0	3.0	3.5
SC, C, SIC	--	0M		Unsuitable						
	PL	1, 2, 3		Unsuitable						
	PR/BK/GR	1		Unsuitable						
		2, 3	0.2	0.3	2.0	2.5	2.2	2.7	2.4	2.9
[A] C = Clay; CL = Clay Loam; COS = Coarse Sand; COSL = Coarse Sandy Loam; FS = Fine Sand; FSL = Fine Sandy Loam; L = Loam; LS = Loamy Sand; LCOS = loamy Coarse Sand; LFS = Loamy Fine Sand; LVFS = Loamy Very Fine Sand; S = Sand; SC = Sandy Clay; SCL = Sandy Clay Loam; SIC = Silty Clay; SICL = Silty Clay Loam; SIL = Silt Loam; SL = Sandy Loam; VFS = Very Fine Sand; VFSL = Very Fine Sandy Loam. Note: No value given for Silt.										
[B] BK = Blocky; GR = Granular; PL = Platy; PR = Prismatic										
[C] 0SG = Single Grain; 0M = Massive; 1 = Weak; 2 = Medium; 3 = Strong										

Adapted from Tyler, 2000.

§ 73.52. Standard trenches.

(a) *Design.* **[The maximum slope of the undisturbed soil of a proposed absorption area where a trench system may be permitted is 25%. For slopes between 15% and 25%, detailed design in relationship to elevation shall be provided. The designer shall inspect the installation and verify that, to the best of his knowledge and belief, the system was installed in accordance with the plans and specifications. Copies of the plans and specifications and the designer's report are to be attached to the applicant's copy, sewage enforcement officer's copy and the Department's copy of the application for sewage permit.]** **In addition to the requirements in § 73.51(a.1) (relating to general), trenches in an absorption area must be designed in accordance with the following:**

(1) **The maximum slope of the undisturbed soil of a proposed absorption area where a trench system may be permitted is 25%.**

(2) **For slopes between 15% and 25%, detailed design in relationship to elevation must be provided.**

(3) **Standard trenches may not be utilized on soils where the limiting zone occurs at less than 5 feet below the mineral soil surface.**

(4) **There must be a minimum of two trenches per field.**

(b) *Construction.* **[Trenches]** **In addition to the requirements in § 73.51(b.1) trenches** in an absorption area **[shall]must** be constructed in accordance with the following:

(1) **[There shall be a minimum of two trenches per field.]** **{Reserved}.**

(2) Trenches shall follow approximately the ground surface contours so that variations in trench depth shall be minimized.

Commented [A108]: Moved to (a)(1)

Commented [A109]: Moved to (a)(2).

Commented [A110]: Moved from (b)(1)

Commented [A111]: Moved to (a)(4)

(3) There shall be at least 6 feet of soil between the treatment tank or dosing tank and the nearest trench.

(4) The width of the bottom of the individual trench shall to 72 inches.

(5) **[The depth to the bottom of the absorption area shall be 12 to 36 inches.] From the original grade, the maximum depth of the trench is 36 inches on the upslope side and the minimum depth of the trench is 12 inches on the downslope side .**

(6) **[The bottom of the absorption area shall be level to a tolerance of 2 inches per 100 feet.] {Reserved}.**

(7) The minimum width of undisturbed earth between trenches shall be 5 feet. When elevated sand mound trenches are used, the distance between trenches shall be measured from the toe of the sand of each trench.

(8) The minimum depth of aggregate material under laterals shall be 6 inches.

(9) Laterals shall be placed in the center of the trench. The first or last discharge hole of a lateral may be no more than 5 feet nor less than 2 feet from the ends of the trench.

(10) **[Laterals shall be level to a maximum tolerance of 4 inches of fall per 100 feet toward the terminal end of the lateral.] {Reserved}.**

(11) **[The minimum depth of coarse aggregate material over the laterals shall be 2 inches.] {Reserved}.**

(12) **[The depth of aggregate shall be uniform throughout the absorption area.] {Reserved}.**

(13) **[The top of the aggregate material shall be covered with geotextile fabric, untreated building paper or a 2-inch layer of hay, straw or similar material to prevent backfill material from settling into the aggregate.] {Reserved}.**

(14) **[The minimum depth of earth cover over the aggregate in all installations shall be 12 inches. Where the top of the aggregate is less than 12 inches from the undisturbed soil surface, the soil cover shall extend beyond the absorption area by at least 3 feet on all sides.]**

(15) **[The backfill material shall consist of soil suitable for the growth of vegetation and be seeded to control erosion.] {Reserved}.**

(16) **[Trench laterals shall be fitted with end caps.] {Reserved}.**

(17) **The trench must be installed so that the bottom of the aggregate is at least 4 feet above the limiting zone.**

(c) ***Maintenance.*** **Trench absorption areas must meet, at a minimum, the maintenance**

Commented [A112]: Moved to 73.51(b.1)(3)

Commented [A113]: Moved to 73.51(b.1)(5)

Commented [A114]: Moved to 73.51(b.1)(6-10)

Commented [A115]: Moved and updated to 73.51(b.1)(15) Reference WA DOH 337-009 February 2022 publication.

Commented [A116]: Moved from 73.51(a)(1)

requirements in § 73.51(c.1).

§ 73.53. Seepage beds.

[Whenever seepage beds are employed, they shall meet the requirements of § 73.52(b)(5), (6), (8) and (10)—(16) (relating to standard trenches) in addition to the following specifications:

(1) **The maximum slope of the undisturbed soil of a proposed absorption area where a seepage bed may be permitted is 8.0%.**

(2) **The required absorption area may be provided by one or more seepage beds:**

(i) **The individual beds of a single onlot system shall be separated by a minimum of 5 feet.**

(ii) **When elevated sand mound beds are used, the distance between beds shall be measured from the toe of the sand of each bed.**

(3) **The bed shall contain a minimum of two laterals or two opposing sets of laterals when pressure distribution is used.**

(4) **Laterals shall be equally spaced a maximum of 6 feet on center, except as provided in § 73.44(c)(8) (relating to pressurized distribution design).**

(5) **Laterals shall be placed no further than 5 feet nor less than 2 feet from the sidewalls of the bed.**

(6) **Laterals shall be placed in the bed so that the first and last discharge holes may be no more than 5 feet nor less than 2 feet from the ends of the bed.]**

(a) ***Design.*** **In addition to the requirements in § 73.51(a.1) (relating to general), seepage bed absorption areas must be designed in accordance with the following:**

(1) **The maximum slope of the undisturbed soil of a proposed absorption area where a seepage bed may be permitted is 8%.**

(2) **Seepage beds may not be utilized on soils where the limiting zone occurs at less than 5 feet below the mineral soil surface.**

(3) **The required absorption area may be provided by one or more seepage beds:**

(4) **The individual beds of a single onlot system must be separated by a minimum of 5 feet.**

(5) **When elevated sand mound beds are used, the distance between beds must be measured from the toe of the sand of each bed.**

Commented [A117]: Moved from (1) with no changes.

Commented [A118]: Moved from (2) with no changes.

Commented [A119]: Moved from (2)(i)

Commented [A120]: Moved from (2)(ii)

(b) ***Construction.*** **In addition to the requirements in § 73.51(b.1), seepage bed absorption areas must be constructed in accordance with the following:**

(1) **From the original grade, the maximum depth of the absorption area is 36 inches on the upslope side and the minimum depth of the absorption area is 12 inches on the downslope side.**

(2) **The seepage bed must be installed so that the bottom of the aggregate is at least 4 feet above the limiting zone.**

(3) **The minimum depth of coarse aggregate material under laterals is 6 inches.**

(4) **Laterals must be equally spaced a maximum of 6 feet on center.**

(5) **Laterals must be placed no further than 5 feet nor less than 2 feet from the edge of the bed.**

(6) **Laterals must be placed in the seepage bed so that the first and last discharge holes may be no more than 5 feet nor less than 2 feet from the ends of the bed.**

(7) **The seepage bed must contain a minimum of two laterals or two opposing sets of laterals when pressure distribution is used.**

(c) ***Maintenance.*** **Seepage bed absorption areas must meet, at a minimum, the maintenance requirements in § 73.51(c.1).**

§ 73.54. [Subsurface] Open-bottom subsurface sand filter seepage beds and trenches.

(a) **[*General.* Subsurface sand filters without underdrains shall meet the following criteria:] *Design.* Open-bottom subsurface sand filter seepage beds must meet the design requirements in § 73.53(a) (relating to seepage beds). Trenches must meet the design requirements in § 73.52(a) (relating to standard trenches). Open-bottom subsurface sand filter seepage beds and trenches must also meet the following criteria:**

(1) **[Subsurface] Open-bottom subsurface sand** filters may not be utilized on soils where the limiting zone occurs at less than 6 feet below the mineral soil surface.

(2) The average percolation rate, as determined by § 73.15 (relating to percolation tests), shall be greater than 90 minutes per inch.

(3) The average percolation rate at a depth between 36 and 60 inches shall be within the range of 3—90 minutes per inch.

(4) **[The average percolation rate obtained from paragraph (3) shall be applied to § 73.16(c) (relating to absorption area requirements) for determination of the absorption area and other system requirements.] {Reserved}.**

Commented [A121]: Copied from 73.52 (b)(5) was previously referenced in existing regs.

Commented [A122]: Copied from 73.52(b)(8) was previously referenced in the existing regs.

Commented [A123]: Moved from (4) and revised

Commented [A124]: Moved from (5) and revised

Commented [A125]: Moved from (6) and revised

Commented [A126]: Moved from (3) and revised

(5) **[System design shall meet the requirements of § 73.52 (relating to standard trenches) or § 73.53 (relating to seepage beds) except as modified by subsection (b).] {Reserved}.**

(b) *Construction.* **[Subsurface sand filters shall be constructed as follows:] Open-bottom subsurface sand filter seepage beds must meet the construction requirements in § 73.53(b) (relating to seepage beds). Trenches must meet the construction requirements in § 73.52(b) (relating to standard trenches). Open-bottom subsurface sand filter seepage beds and trenches must also meet the following criteria:**

(1) The maximum depth of the excavation shall be 5 feet.

(2) Sand **[meeting the specifications of § 73.55(c) (relating to sand specifications) shall]must** be placed in the entire bed or trench to a minimum depth of 12 inches.

(c) ***Maintenance.*** **Open-bottom subsurface sand filter seepage beds and trenches must meet, at a minimum, the maintenance requirements in § 73.51(c.1) (relating to general).**

§ 73.55. Elevated sand mounds.

(a) *Design.* **In addition to the requirements in § 73.51(a.1) (relating to general), elevated sand mounds must be designed in accordance with the following:**

(1) The maximum slope of the undisturbed soil, to the extremities of the berm, of a proposed absorption area where elevated sand mound trenches may be permitted is 12%.

(2) The maximum slope of the undisturbed soil, to the extremities of the berm, of a proposed absorption area where an elevated sand mound bed may be permitted is 12%.

(3) The **amount of sand required will be calculated based on the difference between 48 inches and the amount of mineral soil above** the limiting zone**[is the base elevation for measuring the required depth of sand to achieve a minimum of 4 feet of satisfactory material between the bottom of the aggregate and the top of the limiting zone]**.

(4) A minimum of 1 foot of sand shall be placed under the aggregate in all elevated sand mound systems.

(5) Existing mineral soil shall be utilized. No mineral soil in the area of the elevated sand mound may be removed or disturbed for the purpose of adding or mixing fill material.

(6) **[Elevated sand mound trenches shall meet the requirements of § 73.52(b) (relating to standard trenches) and this section.] {Reserved}.**

(7) **[Elevated sand mound beds on slopes up to 8% [shall]must meet the requirements of § 73.53 (relating to seepage beds) and subsection (b). Other sand**

mound beds shall comply with subsection (d).] **{Reserved}.**

(8) **Elevated sand mounds may not be sited on soils where the limiting zone occurs at less than 20 inches below the mineral soil surface.**

(9) **Elevated sand mounds may not be sited where grading or excavating has occurred.**

(b) *Construction.* **Elevated sand mound seepage beds must meet the construction requirements in § 73.53(b) (relating to seepage beds). Trenches must meet the construction requirements in § 73.52(b) (relating to standard trenches). Elevated sand mound seepage beds and trenches must also meet the following criteria:**

(1) Vegetation shall be cut close to the ground throughout the area to be utilized for the absorption area and berm. Bushes and trees shall be cut flush with the ground surface; roots shall be left in place. Cut vegetation or organic litter shall be raked and removed from the absorption and berm areas.

(1.1) The area within the proposed absorption area obscured by rocks that are unable to be removed without disturbing the soil and the surface area of tree or shrub stumps greater than 3 inches must be measured. The sum of these areas must be added to the total square footage of the absorption area.

(2) The proposed absorption area not obstructed by stumps or other obstacles shall be roughed or plowed parallel with the contour to a maximum depth of 6 inches, using a multiple share chisel plow or similar implement attached to light-weight equipment. Rotary tilling is prohibited.

(3) Under no circumstances may equipment travel on the plowed soil surface until the sand is in place.

(4) Immediately after plowing, sand shall be placed over the exposed plowed surface. Sand shall be placed from the upslope side of the bed using only lightweight equipment.

(5) The slope of the sand not directly beneath the aggregate area shall be approximately 50%.

(6) The top of the sand directly beneath the aggregate shall be level to a tolerance of ±2 inches per 100 feet.

(7) The mound shall be surrounded by a berm consisting of mineral soil containing less than 20% coarse fragments with no coarse fragments greater than 4 inches in diameter, more stable and less permeable than the sand**,** and lightly compacted during construction to contain and protect the mound interior. The width of this berm shall be a minimum of 3 feet at the top of the aggregate.

(8) Upon completion, the outside slope of the berm may be no greater than 50% and shall

be seeded to assure the stability of the berm. The cover over the aggregate shall be a minimum of 1 foot of soil suitable for the growth of vegetation.

(9) No equipment may be permitted on the downslope side of the mound with the exception of lightweight equipment that is used to form the downslope berm. To the greatest extent possible, aggregate and the cover material shall be placed from the upslope side of the mound.

(10) When a mound system with trenches is used, the area between the individual trenches shall be filled with mineral soil. A minimum distance of 5 feet shall separate sand of individual trenches. This measurement shall be from the toe of the sand.

(11) **[The area surrounding the mound shall be grated to provide for diversion of surface runoff waters.] {Reserved}.**

(12) **Elevated sand mound seepage beds on slopes greater than 8% and less than or equal to 12% must meet the following additional requirements:**

(i) **The absorption area must have a minimum length-to-width ratio of 4:1.**

(ii) **The long axis of the absorption area must be on contour. The bed construction must follow the ground surface contours.**

(iii) **Upon completion, the outside slope of the berm may be no greater than 33.3%.**

(iv) **Designing the location of two or more absorption areas so that one absorption area is placed hydraulically upgradient or downgradient from the other may cause the lower absorption area to fail due to excessive hydraulic loading from the upper absorption area. Unless the potential for such an impact is shown to be nonexistent by the applicant through the alternative/experimental system process, this type of absorption area placement is prohibited.**

Commented [A127]: Moved from (d) and revised

(c) **[*Sand.* Sand suppliers shall provide certification in writing to the sewage enforcement officer and permittee, with the first delivery to the job site from every sand source listing the amount of sand delivered, and that all sand supplied meets the requirements posted in the Department of Transportation specifications Publication #408, section 703. The size and grading shall meet bituminous concrete sand Type B #1 or #3 requirements from a Department of Transportation certified stockpile. The sieve analysis shall be conducted in accordance with PTM #616 and #100.] {Reserved}.**

(c.1) *Maintenance.* Elevated sand mounds must meet, at a minimum, the maintenance requirements in § 73.51(c.1).

(d) **[*Elevated sand mound beds.* Elevated sand mound beds on slopes greater than 8% shall meet the requirements of § 73.53 and subsection (b). In addition, the following**

apply:

(1) **The absorption area shall have a minimum length to width radio of 4 to 1.**

(2) **The long axis of the absorption area shall be perpendicular to the slope. The bed construction shall follow the ground surface contours.**

(3) **Upon completion, the outside slope of the berm may be no greater than 33.3%.**

(4) **Designing the location of multiple absorption areas so that one absorption area is placed hydraulically upgradient or downgradient from the other may cause the lower absorption area to fail because of excessive hydraulic loading from the upper absorption area. Unless the potential for such an impact is shown to be nonexistent by the applicant through the alternative/experimental system process, this type of absorption area placement is prohibited.] {Reserved}.**

§ 73.56. At-grade absorption areas.

(a) ***Design.*** **In addition to the requirements in § 73.51(a.1)(1), (2), (5), (6), (7), and (8) (relating to general), at-grade absorption areas must be designed in accordance with the following:**

(1) **At-grade absorption areas may be utilized on any suitable soil as determined in § 73.51, Table 73-L.**

(2) **Soil morphology and Table 73-L in § 73.51 must be used when designing an at-grade bed.**

(3) **The steepest slope of the original ground surface across the absorption area may not exceed 15%. The slope must be measured at the steepest portion of the proposed absorption area when assessing site suitability.**

(4) **For sites with slopes greater than 4% and not exceeding 15%, measured at its steepest point, an absorption area with a downslope-facing, concave-shaped design may not exceed 10% deflection. The Department may require additional square foot of absorption area to address the loss of soil treatment due to deflection.**

(5) **For a site with slopes between 0% and 4%, concave-shaped absorption areas are prohibited.**

(6) **The length of absorption area must be placed on contour.**

(7) **For sites with slopes greater than 4% and not exceeding 15%, the total width of the absorption area will be the width as determined by 73.51(a.1)(5)(iii) plus 2 feet of aggregate on the upslope edge of the minimum absorption area that was determined by using calculation in § 73.51(a.1)(5)(v).**

(8) **The width of the absorption area must not exceed 15 feet.**

(9) **The maximum number of laterals is two.**

(10) **The treatment performance standards are established under § 73.18 (relating to onlot sewage system treatment performance standards).**

(11) **The distribution system must be designed to meet the pressure distribution requirements established at § 73.44(a) and (b) (relating to pressurized distribution design).**

(b) ***Construction.*** **At-grade absorption areas must meet the construction requirements in § 73.51(b.1) and the following:**

(1) **Vegetation must be cut close to the ground throughout the proposed absorption area. Bushes and trees must be cut flush with the ground surface; roots must be left in place. Cut vegetation or organic litter must be raked and removed from the absorption area and berm areas.**

(2) **The impermeable area within the proposed absorption area must be measured. The sum of the impermeable area must be added to the overall absorption area.**

(3) **The downgradient area of the absorption area must be protected during testing, prior to and during construction and for the life of the system, to prevent compaction or disruption of the soil that may alter the lateral flow of effluent and cause system to malfunction.**

(4) **A minimum of 6 inches of coarse aggregate must be placed across the aggregate area. Measurements for depths of coarse aggregate must be made from the plowed ground elevation.**

(5) **For absorption areas on uneven terrain, measure the ground surface elevation from the highest point of the plowed ground elevation within the absorption area. The surface of the aggregate area must be flat to correct for elevation variations of the plowed ground.**

(6) **A minimum of 4 inches of coarse aggregate must be placed over the laterals.**

(7) **A minimum slope of 2:1 slope must be maintained on all sides of the coarse aggregate area.**

(8) **Designing the location of two or more absorption areas so that one absorption area is placed hydraulically upgradient or downgradient from the other may cause the lower absorption area to fail due to excessive hydraulic loading from the upper absorption area. Unless the potential for such an impact is shown to be nonexistent by the applicant through the alternative/experimental system process, this type of absorption area placement is prohibited.**

(c) ***Maintenance.*** **At-grade absorption area systems must meet, at a minimum, the maintenance requirements in § 73.51(c.1).**

Subchapter G. RETAINING TANKS

§ 73.61. General.

Retaining tanks are individual sewage systems and require permits. They shall only be used where the Department finds and gives written notice to the approving body that the requirements of Chapter 71 (relating to administration of sewage facilities planning program) have been met.

§ 73.62. Standards for holding tanks.

(a) A holding tank **[shall]must** be constructed to meet the specifications of § 73.31(b)(1) (relating to standards for septic tanks).

(b) The minimum capacity of a holding tank is 1,000 gallons or a volume equal to the quantity of waste generated in 3 days, whichever is larger.

(c) The holding tank shall be equipped with a warning device to indicate when the tank is filled to within 75% of its capacity. The warning device shall create **[an audible and visual] a visible and audible** signal at a location frequented by the **[homeowner] property owner** or responsible individual.

(d) Disposal of waste from a holding tank shall be at a site approved by the Department.

(e) **The holding tank must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(d) (relating to general), to bed the tank.**

(f) **Tanks must be anchored to prevent floatation when the proposed installation site is below a SHWT, actual water table, or is prone to flooding.**

(g) **All inlet and outlet pipes must be connected to tanks by means of a flexible watertight seal. Use of grouting is not permitted.**

(h) **Tank access must meet the requirements in § 73.31(b)(8).**

§ 73.63. Standards for privies.

(a) *Location.*

(1) The privy shall be located so as to minimize any danger of contamination of water supplies. Where possible, the privy shall be downgrade and at least 50 feet from any source of water supply.

(2) The structure shall be accessible to the user, and at least 10 feet away from any building served.

(3) Consideration shall be given to the direction of prevailing winds to reduce odor

nuisances.

(b) *Construction.*

(1) The superstructure shall be constructed of substantial materials.

(2) The vault shall be large enough to provide for several years' use and be constructed to meet the specifications of § 73.31(b) (relating to standards for septic tanks).

(3) The vault shall be equipped with a roof-ventilating stack that is screened to prevent entrance of flies.

(4) An exterior cleanout shall be provided for the vault.

(5) The superstructure shall be fly tight, well ventilated and fastened solidly to the vault.

(6) The door shall be self-closing and provided with weatherstripping to make it insect proof.

(7) The seat and cover shall be constructed of smooth and easily cleanable material, and the cover shall be self-closing.

(8) An earth mound shall be placed around the privy, or a surface water diversion must be constructed to keep surface water from flooding the vault.

(9) **The vault must be installed using a minimum of 4 inches of aggregate, as detailed in § 73.171(d) (relating to general), to bed the vault.**

(10) **Vaults must be anchored to prevent floatation when the proposed installation site is below a SHWT, actual water table or is prone to flooding.**

(c) ***Maintenance.***

(1) **The property owner is required to inspect the privy annually, and must verify the following:**

(i) **The roof-ventilation stack is screened.**

(ii) **The exterior cleanout is accessible.**

(iii) **The superstructure is insect tight, well ventilated and fastened securely to the vault.**

(iv) **The door is self-closing.**

(v) **The seat and cover are in good repair and self-closing.**

(vi) **Surface or ground water is not entering the structure. Maintenance of surface contouring and other measures to divert stormwater away from the**

privy.

(vii) **The total volume of sewage of the vault does not exceed 2/3 capacity of the vault.**

(2) **When total volume of the sewage exceeds 2/3 capacity of the vault, the vault must be pumped and contents disposed of in accordance with applicable requirements. The vault must be visually inspected to verify the vault is watertight and structurally sound.**

§ 73.64. [Chemical toilet or other portable toilet.] {Reserved}.

(a) **[When proposed for use at temporary construction sites, facilities providing temporary recreational or sporting activities (such as a special event) or temporary seasonal facilities other than those intended for human habitation, chemical toilets or other portable toilets may be exempt from the onlot permitting requirements of Chapter 72 (relating to administration of sewage facilities permit ting program) at the discretion of the local agency but improper installation or maintenance of these toilets shall constitute a nuisance under section 14 of the act (35 P. S. § 750.14) and be enforceable by the local agency.**

(b) **If multiple chemical toilets or other portable toilets are proposed for temporary use at construction sites, recreational activities or seasonal facilities, all units proposed for installation shall be included under one permit.]**

Commented [A128]: Requirement is existing language in 72.22

§ 73.65. Recycling [toilet], incinerating [toilet, or]and composting [toilet]toilets.

(a) Recycling**[, incinerating]**and composting toilets **[shall]must** bear the seal of the NSF/**ANSI** indicating testing and approval by that agency under Standard No. 41 or **as subsequently amended**.

(a.1) Incinerating toilets must bear the seal of the NSF indicating testing and approval by that agency under NSF Protocol P157 or as subsequently amended, or a similar ANSI accreditation.

(b) The device utilized shall meet the installation specifications of the manufacturer and shall be operated and maintained in a manner that will preclude any potential pollution, or health hazards.

(c) When the installation of a recycling toilet, incinerating toilet or composting toilet is proposed for a new residence or establishment, an onlot sewage system or other approved method of sewage disposal shall be provided for treatment of washwater or excess liquid from the unit, except as provided in subsection (e). Both sewage disposal facilities shall be included under one permit.

(d) When the installation of a recycling toilet, incinerating toilet, composting toilet, or another type of water conservation device is proposed for an existing residence or facility and no alteration of the onlot system is proposed, a permit is not required.

(e) When a composting toilet or incinerating toilet is proposed for installation on a lot meeting the requirements of § 71.63 (relating to retaining tanks), it shall be deemed equivalent to and permitted as a privy. The device shall be operated and maintained in accordance with the manufacturer's specifications. Discharges of liquids from these units, except to onlot sewage systems meeting the requirements of this part or other method of sewage disposal approved under this chapter or approved by the Department are prohibited.

(f) **Waste material from the composting toilets must be disposed of in accordance with Chapter 271 (relating to municipal waste management—general provisions).**

Subchapter H. EXPERIMENTAL AND ALTERNATE SEWAGE SYSTEMS

§ 73.70. General.

Experimental and alternate sewage systems allow for the use of onlot sewage treatment technologies and components that are not specifically provided for in this chapter. The Department will review the design, siting, construction, operation and maintenance documentation of proposed experimental and alternate sewage systems and components. Experimental and alternate system proposals that are consistent with this chapter will be approved for use through a permit issued under Chapter 72 (relating to administration of sewage facilities permitting program).

§ 73.71. Experimental sewage systems.

(a) Experimental sewage systems may be considered for individual or community **onlot sewage systems to be tested on specific sites in this Commonwealth** in any of the following cases:

(1) **[To solve an existing pollution or public health problem.] {Reserved}.**

(2) **[To overcome specific site suitability deficiencies, or as a substitute for systems described in this chapter on suitable lots.] {Reserved}.**

(3) **[To overcome specific engineering problems related to the site or its proposed uses.] {Reserved}.**

(2.1) To address a malfunctioning onlot sewage system on an existing lot where a conventional or alternate sewage system cannot be sited.

(3.1) To overcome horizontal isolation distance requirements in § 73.13 (relating to minimum horizontal isolation distances) when addressing a malfunctioning onlot sewage system.

(4) To evaluate new concepts or **innovative** technologies applicable to onlot **sewage treatment and** disposal. **Experimental sewage systems approved by the Department under this provision are site specific and may only be used on the site where it was approved.**

(5) **[To evaluate the applicability to onlot disposal of established concepts or technologies having successful use in comparable applications in the field of engineering.]** **{Reserved}.**

(6) **[To demonstrate a design having successful use in other jurisdictions under environmental conditions similar to or more restrictive than those in this Commonwealth.]** **{Reserved}.**

(7) **[To utilize under varying site conditions an experimental design, either in whole or in part, which has been deemed successful by the Department.]** **{Reserved}.**

(8) **To verify performance of a proposed alternate onlot sewage system or component under § 73.72a (relating to performance verification of proprietary alternate sewage systems and components).**

(b) A person desiring to install an experimental sewage system or alter a component of an existing system using a method, technology or design determined to be experimental by the Department shall submit complete preliminary design plans and specifications to the sewage enforcement officer and the Department for review and comment prior to submitting an application for a permit. The Department will determine if classification as an experimental system, method, technology or design is appropriate for the submission and provide review comments to the sewage enforcement officer.

(c) The following criteria shall be considered in the design of experimental systems:

(1) The volume and rate of sewage flow, including reductions attributed to water conservation devices and recycling devices.

(2) The chemical and bacteriological characteristics of the flow, including the varying nature, if any, of the contributing sources.

(3) The treatment of the sewage flow, including, if appropriate:

(i) The type of treatment, that is aerobic, anaerobic, chemical, or other.

(ii) The degree and extent of treatment afforded, including the chemical and biological characteristics of the effluent.

(iii) The hydraulic design, including flow rates, retention time, settling rates, and sludge and scum storage.

(4) The materials of construction including durability and chemical resistance of all system components.

(5) The characteristics and limitations of the disposal site, including, if appropriate:

(i) The depth, composition and projected effects of any limiting zone identified through extensive onsite evaluation of the soils present.

(ii) The determination of the soil permeability through percolation tests, hydraulic conductivity tests or other acceptable testing procedures conducted on the site.

(iii) The chemical and bacteriological characteristics of the subsurface or other waters.

(iv) The natural and modified slope of the disposal site and contiguous areas, with particular attention to downslope areas.

(v) The relationship of the disposal site to existing and proposed drainage patterns, including surface and subsurface flows.

(vi) The stability and renovative abilities of controlled fill areas.

(6) The design of the absorption area, including:

(i) Dimensions.

(ii) Method of distribution and hydraulic design considerations of the distribution system.

(iii) Rate of application.

(iv) Relationship to other sewage disposal systems or features, water supply sources, surface waters, recharge areas, rock outcrops and other site improvements.

(v) Determination of hydraulic loading limitations—that is, interface acceptance rate of hydraulic conductivity of receiving soils—in accordance with accepted principles of hydraulic flow.

(7) The effect upon the groundwater, including:

(i) Fecal coliform.

(ii) Chlorides.

(iii) Nitrates.

(iv) Nutrients.

(v) Other degrading material.

(8) Other considerations as may be appropriate to comply with the **Clean Streams Law (35 P. S. §§ 691.1—691.1001) and** the act.

(d) Except as provided in subsection (f), experimental designs will be approved for use only when it has been determined that an individual or community sewage disposal system meeting the requirements of this chapter**[or another successful experimental design]**, or that sewage services meeting the requirements of the Clean Streams Law and Article II

(relating to water resources), may be installed if the experiment is deemed a failure.

(e) **[Except as provided in subsection (f), monitoring]Monitoring**, observation, testing or other requirements **[which]that** are deemed necessary to verify the success of the experiment **[shall]will** be required.

(f) A replacement area, as specified in subsection (d)**[, and monitoring as specified in subsection (e), may not be] is not** required where the experimental **[design is an attempt to solve an existing pollution or public health problem] system is proposed to address a malfunctioning onlot sewage system**.

(g) An application for an experimental system **shall be submitted to the Department and** shall include the following:

(1) Detailed plans and specifications sufficient to comply with this section.

(2) A description of the system, device, or process; its capabilities; and scheduled maintenance, if any, which are necessary for continued function.

(3) The identity of the person responsible for the design of the system; performance of scheduled maintenance, if required; and responsibility for repair or replacement in event of failure of the system.

(h) Each application for an experimental system shall be accompanied by a statement acknowledging the requirement that the sewage enforcement officer **and the Department** be notified of any malfunction or modification of the original system design.

(i) Prior to issuing a permit for an experimental sewage system, the sewage enforcement officer shall consider the comments of the Department.

§ 73.72. Alternate sewage systems and components.

(a) **Use of alternate sewage systems and components allows for implementation of proven concepts or technologies applicable to onlot sewage systems in this Commonwealth.** Alternate **sewage** systems **[shall]may** be considered for individual **[onlot]**or community onlot **sewage** systems **[in any of the following cases:] consistent with the Department's approval.**

(1) **[To solve an existing pollution or public health problem.] {Reserved}.**

(2) **[To overcome specific site suitability deficiencies, or as a substitute for systems described in this chapter on suitable lots.] {Reserved}.**

(3) **[To overcome specific engineering problems related to the site or its proposed use.] {Reserved}.**

(4) **[To utilize under varying site conditions an experimental design, either in whole or in part, which has been deemed successful by the Department.] {Reserved}.**

(b) **[A person desiring to install an alternate sewage system shall submit complete preliminary design plans and specifications to the sewage enforcement officer and the Department for review and comment prior to submitting an application for a permit. The Department will determine if classification as an alternate system is appropriate and provide review comments to the sewage enforcement officer.]** **{Reserved}.**

(b.1) Proposed proprietary alternate sewage systems and components intended to meet the standards in § 73.18 (relating to onlot sewage treatment performance standards) shall complete the alternate onlot system and component performance verification process under § 73.72a (relating to performance verification of proprietary alternate sewage systems and components).

(b.2) Proposed proprietary alternate sewage systems and components that meet the standards in § 73.72a may be approved for use through a permit issued by a sewage enforcement officer under Chapter 72 (relating to administration of sewage facilities permitting program).

(b.3) The Department's approval of proposed proprietary alternate sewage systems and components will include applicable siting, design, construction, and operation and maintenance standards which will provide sewage enforcement officers with the standards for the use of the system or component.

(b.4) The manufacture of the proposed proprietary alternate sewage system or component shall provide a course to train sewage enforcement officers on the siting, design, construction, and operation and maintenance of the system or component, subject to the Department's approval.

(b.5) The Department will develop an alternate onlot system and component performance verification process for proposed non-proprietary alternate systems intended to meet the standards in § 73.18 (relating to onlot sewage system treatment performance standards) and for proposed alternate sewage systems and components intended for purposes other than meeting the standards in § 73.18. The performance verification process may include third-party certification, field testing and on-going monitoring.

(b.6) Alternate sewage systems and components approved by the Department for use prior to (*Editor's Note*: The blank refers to the effective date of this proposed rulemaking.).

(1) **Sewage enforcement officers may permit the use of proprietary alternate sewage systems and components approved for use by (*Editor's Note*: The blank refers to the effective date of this proposed rulemaking.) when both of the following are met:**

(i) **A permit application proposes the use of the alternate to meet a treatment standard in § 73.18.**

(ii) **The manufacturer of the proposed alternate sewage system or component has submitted documentation justifying verification of system performance in**

accordance with § 73.18 and § 73.72a by _____ (*Editor's Note*: The blank refers to 180 days after the effective date of this proposed rulemaking.).

(2) **Non-proprietary alternate sewage systems or components and alternate sewage systems or components other than those used to meet the treatment standards in § 73.18 may be reviewed by the Department for approval as an alternate sewage system and component without undergoing the performance verification program at the Department's discretion.**

(3) **Performance of all proprietary alternate sewage systems or components used to meet treatment standards in § 73.18 that were approved for use by the Department by _____ (*Editor's Note*: The blank refers to the effective date of this proposed rulemaking.) will be verified in accordance with § 73.72a (relating to performance verification of alternate onlot sewage systems and components) within 5 years of the effective date of this chapter or in accordance with another timeframe approved by the Department. When the performance of a system or component has not been verified by the end of year 5 or another timeframe approved by the Department, the system or component will no longer be considered approved.**

Commented [A129]: Potential CR to 73.72a?

(c) **[The following criteria shall be considered in the design of alternate systems:**

(1) **The volume and rate of sewage flow, including reductions attributed to water conservation devices and recycling devices.**

(2) **The chemical and bacteriological characteristics of the flow, including the varying nature, if any, of the contributing sources.**

(3) **The treatment of the sewage flow, including, if appropriate:**

(i) **The type of treatment—that is, aerobic, anaerobic, chemical or other.**

(ii) **The degree and extent of treatment afforded, including the chemical and biological characteristics of the effluent.**

(iii) **The hydraulic design, including flow rates, retention time, settling rates and sludge and scum storage.**

(4) **Materials of construction, including durability and chemical resistance of all system components.**

(5) **The characteristics and limitations of the disposal site, including, if appropriate:**

(i) **The depth, composition and projected effects of any limiting zone identified through extensive onsite evaluation of the soils present.**

(ii) **Determination of the soil permeability through percolation tests, hydraulic conductivity tests or other acceptable testing procedures conducted on the**

site.

(iii) **The chemical and bacteriological characteristics of the subsurface or other waters.**

(iv) **The natural and modified slope of the disposal site and contiguous areas, with particular attention to downslope areas.**

(v) **The relationship of the disposal site to existing and proposed drain- age patterns, including surface and subsurface flows.**

(vi) **The stability and renovative abilities of controlled fill areas.**

(6) **The design of the absorption area including:**

(i) **Dimensions.**

(ii) **Method of distribution and hydraulic design considerations of the distribution system.**

(iii) **Rate of application.**

(iv) **Relationship to other sewage disposal systems or features, water supply sources, surface waters, recharge areas, rock outcrops and other site improvements.**

(v) **Determination of hydraulic loading limitations—that is, interface acceptance rate or hydraulic conductivity of receiving soils in accordance with accepted principles of hydraulic flow.**

(7) **The effect upon the groundwater, including the following:**

(i) **Fecal coliform.**

(ii) **Chlorides.**

(iii) **Nitrates.**

(iv) **Nutrients.**

(v) **Other degrading material.**

(8) **Other considerations as may be appropriate to comply with the act.] {Reserved}.**

(d) **[An application for an alternative system shall include the following:**

(1) **Detailed plans and specifications sufficient to comply with this section.**

(2) **A description of the system, device or process; its capabilities; and**

scheduled maintenance, if any, which is necessary for continued function.

(3) **The identity of the person responsible for the design of the system and performance of scheduled maintenance, if required.] {Reserved}.**

(e) **[Each application for an alternative system shall be accompanied by a statement acknowledging the requirement that the sewage enforcement officer be notified of any malfunction or modification of the original system design.] {Reserved}.**

(e.1) Ongoing monitoring of the alternate sewage system and component performance shall be conducted as follows.

(1) **Manufacturers shall monitor system performance through inspection and sampling of installed alternate sewage system and components. The following are the minimum requirements for the ongoing inspection and sampling.**

(i) **An annual system sampling event shall be performed by a third-party testing organization. The systems or components to be sampled will be randomly selected by the Department from a list of installed systems or components. The Department will establish the initial list of systems based on a manufacturer supplied list of alternate systems installed in this Commonwealth.**

(ii) **The Department will randomly select up to ten installed alternate sewage systems to be inspected and sampled. The Department may require any system that has failed to conform with approved performance standards be retested in addition to the ten selected systems.**

(iii) **The manufacturer shall submit an inspection and sampling plan, including an implementation schedule to the Department for approval.**

(iv) **After the performance monitoring is complete for the selected alternate sewage systems, the manufacturer shall provide a report to the Department. The report shall contain the following information:**

(A) **A summary of the results of the inspection and sampling.**

(B) **The date and time of sampling.**

(C) **The address of the alternate sewage systems.**

(D) **The temperature and weather on the days of sampling.**

(E) **The lab reports for each sample.**

(F) **Whether operation and maintenance was performed on the alternate sewage system in the last 365 days including during the**

days of the inspection and sampling. If it was performed, the report shall describe the operation and maintenance performed, when it was performed and the reason it was performed.

(G) **A description of any exceedances of the performance standard. When the sample data shows the alternate sewage system effluent exceeds two times the system's approved performance standard, corrective actions shall be taken to address the nonconformance of the system. Resampling of the system shall be completed to verify conformance with the performance standard. If the results of the resampling continue to show nonconformance, the Department may require the manufacturer to submit a corrective action plan for approval.**

(H) **Any additional documentation the Department determines is necessary to evaluate the ongoing performance of the approved alternate sewage system.**

(v) **Testing method and parameters for influent and effluent sampling will be based on the approved treatment standards of the technology as detailed in § 73.72a, Table 73-N.**

(2) **Every 5 years, the data collected during annual performance monitoring and field testing will be statistically analyzed by the Department as detailed in § 73.72a(f).**

(i) **When the result of the statistical analysis determines that the technology meets the performance standards the technology is approved under, provided for in § 73.18 (relating to onlot sewage treatment performance standards), the Department may reduce the occurrence of the annual inspection and testing for the upcoming 5-year period.**

(ii) **When the result of the statistical analysis determines that the technology is not meeting the treatment standards the technology is approved under, as provided for in § 73.18, the Department may increase the frequency of the sampling at selected sites or the frequency of the inspection and testing, or both.**

(e.2) The following conditions will result in the system no longer being approved for use as an alternate sewage system:

(1) **Failure to maintain the certification required in § 73.72a(b)(1) unless the manufacturer develops a plan for recertification approved by the Department.**

(2) **Failure to perform ongoing monitoring of the systems performance.**

(3) **When the Department determines that the alternate sewage system is not capable of consistently meeting the performance standards of the system's**

approval based on an evaluation of the data collected from the ongoing performance monitoring of the system.

(4) **Non-proprietary alternate sewage systems or components and alternate sewage systems or components other than those used to treatment standards in § 73.18 may be reviewed by the Department for approval as an alternate sewage system and component without undergoing the performance verification program at the Department's discretion.**

(e.3) When a system is no longer approved as an alternate sewage system, the Department will provide notice to the manufacturer and publish notice of the decision in the *Pennsylvania Bulletin*.

(f) **[Prior to issuing a permit for an alternative sewage system, the sewage enforcement officer shall consider the comments of the Department.] {Reserved}.**

Commented [A130]: Moved to 72.25(c.1)(3)

§ 73.72a. Performance verification of proprietary alternate sewage systems and components.

(a) ***General*. Manufacturers proposing alternate systems or components intended to meet the onlot sewage treatment performance standards in § 73.18 (relating to onlot sewage treatment performance standards) must verify the performance of the proposed system or component through the following performance verification requirements. Performance verification requirements include third-party certification and field testing.**

(b) ***Third-party certification of the system or components.***

(1) **The manufacturers of the onlot sewage systems or components shall provide proof of certification through product testing conducted by a testing facility accredited by ANSI using an NSF/ANSI standard or by a BNQ standard. The following table lists approved certifications applicable to the onlot sewage treatment performance standards in § 73.18:**

TABLE 73-M

Third-Party Certification [A]	TS-2	TS-3	TN-1	TN-2	TN-3	FC-1	FC-2	FC-3	FC-4
NSF/ANSI 40	X	X							
NSF/ANSI 245	X	X	X	X	X				
NSF/ANSI 350	X	X							
CAN/BNQ 3680-600 B-II	X	X							
CAN/BNQ 3680-600 B-III	X	X							
CAN/BNQ 3680-600 B-IV	X	X							
CAN/BNQ 3680-600 N-I			X	X	X				
CAN/BNQ 3680-600 N-II			X	X	X				
NSF/ANSI 385						X	X	X	X
CAN/BNQ 3680-600 D-I						X	X	X	X
CAN/BNQ 3680-600 D-II						X	X	X	X
CAN/BNQ 3680-600 D-III						X	X	X	X

Acceptable Third-Party Certifications

[A] Or later version of product certification as approved by the Department.

(c) ***Field test plan.*** **The manufacturer shall submit a field test plan for the proposed alternate technology to the Department for approval. The field test plan must:**

(1) **Identify at least 12 field test sites, serving residential establishments that are each occupied year-round by a minimum of 2 persons that produce only domestic strength sewage. The following information must be provided for each field test site:**

(i) **Site location address.**

(ii) **Site property owner phone number and email address.**

(iii) **Number of year-round residences at the site.**

(iv) **Site system design and specifications.**

(v) **Site system global positioning system coordinates.**

(2) **Identify the selected testing organization that will implement the field test plan.**

(3) **Identify the environmental laboratory accredited under Chapter 252 (relating to environmental laboratory accreditation), that will analyze the sampling data.**

(4) **Identify field test sampling protocols under the following requirements:**

(i) Sampling at each site occurs at a minimum of once every 60 days, over the course of 365 consecutive day period.

(ii) **Sample data must be representative of an established operating system or component. Data collected during a system startup will not be considered as part of the field test data.**

(iii) **Sample data representative of the full range of temperatures experienced at the site. A sufficient number of the data points generated during sampling period must reflect the technology's performance in cold weather conditions to ensure the efficacy of the technology in cold weather. Field test sites must include six sites proposed in the coldest areas of this Commonwealth.**

(iv) **Identification of the sample point and laboratory analysis under Table 73-N. Table 73-N shows the sampling collection type and the parameters to be analyzed based on the requested onlot sewage treatment performance standard of the proposed alternate sewage system or component.**

TABLE 73-N
Treatment Performance Standard Sampling and Analysis

Treatment Standard	*$CBOD_5$ (mg/L)*	*TSS (mg/L)*	*TKN (mg/L)*	*NO_2-N (mg/L)*	*NO_3-N (mg/L)*	*Ambient Air Temp (°F)*	*Fecal Coliform (MPN/100mL)*
TS-2/TS-3	X [A]	X [A]				X	
TN-1	X [AB]	X [AB]	X [AB]	X [AB]	X [AB]	X	
TN-2/TN-3	X [A]	X [A]	X [A]	X [A]	X [A]	X	
FC-1/FC-2/ FC-3/FC-4							X [C]

[A] **24-hour composite effluent sample**

[B] **24-hour composite influent sample**

[C] **Grab sample**

(5) **Identify how the following data will be recorded and reported in the final field test plan report:**

(i) **Sample date.**

(ii) **Sample time.**

(iii) **Sample method.**

(iv) **Sample point.**

(v) **The name of person performing sampling.**

(6) **Any other requirement the Department deems necessary to ensure the**

sufficiency of the data of collected and supporting documentation.

(d) ***Implementation of a field test plan.*** **The Department-approved field test plan shall be implemented under the following minimum requirements:**

(1) **The manufacturer-selected testing organization shall implement the field test plan.**

(2) **Documentation of corrective actions and maintenance performed during the field testing on the system.**

(3) **The manufacturer shall provide the results and supporting documentation from any additional sampling completed during field testing to the Department.**

(4) **Final report of the field testing that documents that the field test plan was implemented under the approved plan.**

(5) **If the manufacturer believes that sample data from the field test is not representative of the technology's performance the rationale for this belief may be provided to the Department for consideration.**

(e) ***Prior field test data.*** **The Department may accept field testing data generated prior to the manufacturer applying for approval as an alternate onlot technology whether or not the data was generated within this Commonwealth. The Department may accept prior field test data to fulfill the requirements in subsection (c) or (d). The manufacturer shall indicate if the prior field test data or data collection effort does not comply with the requirements in subsection (c) or (d).**

(f) ***Field test data evaluation*****. Upon completion of the field testing, the Department will verify compliance with the field testing requirement and statistically evaluate the field test data to verify conformance of the system or component to the treatment performance standard.**

(1) **The statistical evaluation of field test data shall apply small sampling theory. The Student's t distribution will be used, and the associated 90% confidence interval will be calculated based on the sample size. The Department will calculate the one-sided confidence interval and determine compliance with the upper or lower limit of the performance standards in § 73.18.**

(2) **The field test requirement will be completed when the data within a one-sided 90% confidence interval meets the treatment standards the proposed alternate system is intending to meet.**

(3) **If the data within a one-sided 90% confidence interval does not meet the treatment standards the proposed alternate system is intending to meet, the manufacturer may continue field testing of the system or component until sufficient data is collected to verify conformance with the treatment standard as required under § 73.18.**

Subchapter I. BONDED DISPOSAL SYSTEM

§ 73.77. General requirements for bonded disposal systems.

(a) The local agency shall authorize the performance of a percolation test at the owner's expense, when one is requested in writing by the owner of the property if the local agency determines soil mottling is present.

(b) If the sole reason for a property not meeting the requirements for the installation of an individual residential onlot sewage system is the presence of soil mottling, the local agency shall issue a permit for an individual residential onlot sewage system designed to meet the Department's standards when the property owner meets the following conditions:

(1) A qualified soil scientist, qualified registered professional geologist, certified sewage enforcement officer or qualified registered professional engineer, not employed by the local agency with jurisdiction over the property in question, confirms in writing that the soil mottling observed in the test pits is not an indication of either a regional or perched seasonal high water table.

(2) The property owner provides evidence of financial assurance satisfactory to the local agency in an amount equal to the cost of replacement of the individual residential sewage system proposed and the reasonably anticipated cost of remedial measures to clean up contaminated groundwater to replace any contaminated water supplies and to repair or replace a malfunction of the onlot system. The local agency may not approve financial assurance in an amount less than $20,000 or 15% of the appraised value of the lot and proposed residential dwelling. The terms of the financial assurances shall be for up to 3 years. The local agency may require a continuation of up to 2 additional years of financial assurance. The local agency may terminate the financial assurance requirement at the end of its term consistent with the act.

(3) The property owner provides notification to the local agency 7 working days prior to conducting soil evaluations under this section and a representative of the local agency may observe the soil evaluations and may review resulting reports and correspondence.

(4) The property owner produces evidence of a clause in the deed to the property that clearly indicates soil mottling is present on the property and that an individual residential onlot sewage system meeting the requirements of this section was installed on the property.

§ 73.151. Standards for financial assurances for bonded disposal systems.

(a) Financial assurance shall be sufficient to meet the requirements of section 7.2 of the act (35 P. S. § 750.7b).

(b) The local agency may establish an amount of financial assurance above the minimum established by § 73.77(b)(2) (relating to general requirements for bonded disposal systems).

(c) A local agency may accept forms of financial assurance that establish, to the satisfaction of the local agency, its full and unconditional right to demand and receive any sum due it under section 7.2 of the act. A local agency may authorize a property owner to use the financial assurance for the sole purpose of repair or replacement of the onlot system, for remedial measures to clean up contaminated groundwater and to replace contaminated water supplies.

(d) The local agency will forfeit the financial assurance when it determines that one or more of the following apply:

(1) The property owner has violated or continues to violate one or more of the terms or conditions pertaining to the financial assurance.

(2) The system has malfunctioned.

(3) The permittee has violated a condition of the permit or submitted false information.

(4) The property owner or permittee has failed to properly perform the remedial action required.

Subchapter J. INDIVIDUAL RESIDENTIAL SPRAY IRRIGATION SYSTEM STANDARDS

§ 73.161. General.

(a) Copies of the plans and specifications along with the designer's report shall be attached to the applicant's copy, local agency's copy and the Department's copy of the application for sewage permit.

(b) Standards for individual residential spray irrigation systems described in the following sections shall also be met: §§ 73.1, 73.12—73.14,**[73.16,]** 73.17, 73.21, 73.31, 73.32, 73.41 and 73.43.

(c) **Pretreatment of the sewage shall be through either an intermittent sand filter, as described § 73.162 (relating to intermittent sand filters) or through an approved technology meeting the advanced secondary treatment standard in § 73.18 (relating to onlot sewage system performance standards). The disinfection requirement in § 73.165 (relating to disinfection) must be met before discharge to the spray field.**

§ 73.162. Intermittent sand filters.

(a) There are two types of intermittent sand filters available for use with individual residential spray irrigation systems. The standards for free access sand filters and buried sand filters are included in this section.

(b) Free access sand filters shall meet the following standards:

(1) *Filter.* The filter shall be constructed in a tank meeting the following specifications:

(i) The surface area of a filter tank shall be a minimum of 40 square feet for systems using an aerobic treatment tank and serving a single family residence of three bedrooms or less. The filter area shall be increased by 10 square feet for each additional bedroom over three.

(ii) Systems proposing the use of a septic tank to serve a single family dwelling of three bedrooms or less shall be designed using two filter tanks or a single tank with two chambers. Each tank or chamber shall have a surface area of 40 square feet. The filter area of each filter shall be increased by 10 square feet for each additional bedroom over three.

(iii) Tanks shall be watertight and made of a sound, durable material which is not subject to excessive corrosion or decay.

(iv) Concrete tanks shall have a minimum wall thickness of 2 1/2 inches and be adequately reinforced.

(v) If precast slabs are used as tank tops to support the access covers, the slabs shall have a thickness of at least 3 inches and be adequately reinforced.

(vi) Tanks shall be designed and constructed so that the depth from the cover to the top of the sand layer provides sufficient freeboard to allow for maintenance of the sand surface.

(vii) Access shall be provided by a minimum of two access openings. These access openings shall be a minimum of 36 inches by 36 inches and provide access to the entire surface of the filter.

(viii) The tank wall shall be extended a minimum of 6 inches above final grade.

(ix) Access covers shall be insulated against severe weather, secured by bolts or locking mechanisms, prevent water infiltration and the entrance of debris, and be lightweight to facilitate routine maintenance.

(2) *Media.* Sand suppliers shall provide certification, in writing to the sewage enforcement officer and permittee, with the first delivery to the job site, that the sand to be supplied meets the following specifications:

(i) The fine aggregate shall have an effective size of between 0.3 to 0.6 **[mm]** **millimeter**, a uniformity coefficient of less than 3.5 and less than 4% of the coarse aggregate passing the #100 sieve. The sieve analysis shall be conducted in accordance with Department of Transportation PTM #616 and the uniformity coefficient shall be determined by using Department of Transportation PTM #149.

(ii) The sand may not contain more than 15% by weight deleterious material as determined by Department of Transportation PTM #510.

(3) *Contents of certification.* The written certification shall include the name of the supplier,

the testing results, the testing date, the amount of mate- rial purchased under this certification and the delivery date.

(4) *Construction.* The sand filter shall be constructed according to the following standards:

(i) A 4-inch diameter perforated underdrain pipe with a minimum 2,500 pound crush test specification shall be placed on the bottom of the tank.

(ii) Two rows of perforations between 1/2 to 3/4 inch in diameter shall be drilled in the underdrain pipe at 6 inch intervals and the pipe shall be placed so the perforations face downward and the rows are approximately 45° from each other.

(iii) Aggregate shall be placed around the underdrain to a total depth of 5 inches from the bottom of the tank. Coarse aggregate used in the underdrains and distribution system shall meet the Type B requirements posted in the Department of Transportation specifications Publication #408, section 703, Table B and uniform size and grading of the aggregate shall meet AASHTO No. 57 requirements, as described in Form 408, section 703.2, Table C from a Department of Transportation certified stockpile.

(iv) A minimum depth of 4 inches of aggregate shall be placed over the aggregate underdrain material. Coarse aggregate used in the transition layer shall meet the Type B requirements posted in the Department of Transportation specifications Publication #408, section 703, Table B. The size and grading shall meet AASHTO No. 8 requirements, as described in Form 408, section 703.2, Table C from a Department of Transportation certified stock- pile.

(v) Sand shall be placed over the aggregate to a depth of at least 24 inches.

(vi) The sand in the filter may not be greater than 36 inches deep.

(vii) The central distribution system shall be designed and installed to convey a minimum 2 inch flood dose of effluent to the surface of the sand filter. A high water alarm shall be installed in the filter tank which produces an audible and visual alarm when effluent backs up on the filter surface to 12 inches above the surface of the sand.

(viii) When two filters or chambers are required to treat septic tank effluent, the duplicate units shall, at the discretion of the designer, be flooded alternately, periodically by using valves, or simultaneously.

(ix) The central distribution piping may not be more than 2 inches in diameter.

(x) The height of the central distribution system's effluent outlet above the sand surface shall allow for the installation of a splash plate and the maximum flooding depth of the sand filter.

(xi) A concrete splash plate or other suitable material shall be located under each

effluent outlet to prevent scouring of the sand surface. Movement of the splash plate during the flooding operation shall be prevented.

(c) Buried sand filters shall meet the following standards:

(1) *Location.*

(i) When buried sand filters are proposed to be installed in areas where bedrock is encountered above the proposed depth of the sand filter, or where the seasonal high groundwater table rises above the proposed depth of the sand filter, the designer should consider measures to prevent filter and liner damage and groundwater infiltration.

(ii) A buried sand filter may not be constructed in unstabilized fill.

(2) *Size.*

(i) The size of the sand filter shall be determined on the basis of the appropriate application rate and the estimated daily sewage flow in accordance with **[§ 73.16(a) (relating to absorption area requirements)]** **§ 73.17 (relating to sewage flows)** but the sand filter area shall be at least 300 square feet for use with either an aerobic treatment tank or septic tank with solids retainers units.

(ii) For a single family residence, the minimum sand filter area shall be based on a maximum hydraulic loading of 1.15 square feet per gallon per day.

(iii) Where aerobic treatment precedes the sand filter, a 1/3 reduction to the filter area may be used to size the filter.

(3) *Media.*

(i) At least 2 inches of clean aggregate meeting subsection (b)(4)(iii) shall surround underdrains and distribution pipes. A minimum of 4 inches of aggregate meeting subsection (b)(4)(iv) shall be placed over the underdrain. A layer of porous geotextile material may be placed on top of both layers of aggregate to prevent migration of soil or sand into the aggregate.

(ii) At least 24 inches of clean sand shall be placed over the underdrain aggregate. The sand shall meet the specifications in § 73.55(c) (relating to elevated sand mounds).

(iii) The minimum depth of earth cover over the coarse aggregate in all installations shall be 12 inches. When the top of the aggregate is less than 12 inches from the undisturbed soil surface, the soil cover shall extend beyond the filter area by at least 3 feet on all sides. The soil over the sand filter shall be so graded that surface water will run off, consist of soil suitable for the growth of vegetation and be seeded to control erosion.

(4) *Underdrain piping.*

(i) Underdrain piping shall be laid on a grade of 3 to 6 inches per 100 feet sloped to the outfall pipe.

(ii) Underdrain piping shall be positioned between the distribution laterals to maximize effluent travel through the filter sand.

(iii) Underdrain piping holes shall be equal or greater in number and size to the distribution piping holes.

(iv) Underdrain piping shall have two rows of holes placed at approximately 45° angle from each other along the bottom half of the pipe.

(v) The outfall pipe from the underdrain header shall have an antiseep collar and bentonite clay plug or a leak proof boot sealed as per manufacturer's instructions to the subsurface sand filter liner.

(5) *Filter base and liner.* The base of the filter shall be sloped to the underdrain pipe a maximum of 1%. An impervious liner of hyplon, polyvinyl chloride or polyethylene sheeting of 20 millimeter thickness or equal shall be installed on a tamped earth base to prevent seepage to the groundwater. A concrete bottom and sides may also be used at the discretion of the designer. A 2-inch layer of sand or a layer of 10 ounce porous geotextile material shall be provided on each side of the liner to prevent punctures and tears. Seams shall be made according to manufacturer's specifications.

(6) *Distribution of effluent.* Distribution of effluent to the buried sand filter shall meet the requirements of §§ 73.44—73.46 (relating to pressurized distribution design; dosing **and effluent lift** tanks; and dosing pumps**, siphons and lift pumps**).

§ 73.163. Spray fields.

(a) The maximum slope of the undisturbed soil where a spray field may be permitted is 25%.

(b) Individual residential spray irrigation system spray fields are not permitted on:

(1) Soils with evidence of a **[seasonal high water table]** **SHWT** at less than 10 inches from the surface.

(2) Soils with rock formations at less than 16 inches from the surface.

(3) Floodplain soils or floodprone areas unless any required encroachment permits have been obtained from the Department and the encroachment is in compliance with local ordinances pertaining to flood areas.

(4) Agricultural areas in active production of food for human consumption.

(c) Slopes shall be as follows:

(1) Open, grassed areas—limited to 12%.

(2) Forested areas—limited to 25%.

(3) Nonfood producing agricultural areas—limited to 4%

(d) Spray field sizing based upon soils characteristics **[shall]must** be in accordance with **[Table B in § 73.16(e) (relating to absorption area and spray field requirements)]** **Table 73-O**.

TABLE 73-O
Spray Field Sizing

Soil Characteristics		Slope	Required Spray Field Area (ft^2)	
Depth To Rock	*Depth To Water Table*		*3 Bedroom Home*	*Additional Area Per Bedroom*
16 to 20 inches	10 to 40 inches	≤12%	40,000	10,000
		>12%	80,000	20,000
	>40 inches	≤12%	15,000	3,750
		>12%	30,000	7,500
>20 inches	10 to 20 inches	≤12%	20,000	5,000
		>12%	40,000	10,000
	>20 inches	≤12%	10,000	2,500
		>12%	20,000	5,000

Commented [A131]: Moved from 73.16

(e) Construction shall be as follows:

(1) The area upslope of the spray field shall be graded or bermed to divert upland drainage from the spray field site.

(2) The downslope portion of the permitted spray field shall be graded or bermed to retain effluent on the permitted spray site.

(3) The permitted spray field shall be covered with vegetation.

(4) Construction activity within the spray field site shall be conducted in a manner which will minimize earth disturbance and compaction.

§ 73.164. Chlorine contact/storage tanks.

(a) The minimum liquid capacity of an individual residential spray irrigation system storage tank serving a three bedroom dwelling, excluding chlorine contact volume, is 2,000 gallons. The tank size shall be increased an additional 500 gallons for each additional bedroom over three. Additional increases in size may be required where more than 5 days storage is needed due to climatic conditions or when spray fields are located in floodplain or floodprone areas.

(b) Storage tanks used in individual residential spray irrigation systems shall meet the construction standards in **[§ 73.45(1) and (4)—(6) (relating to dose tank)]** **§ 73.45(b)(1) and (b)(4)—(6) (relating to dosing and effluent lift tanks)**. When more than one tank is used, the tanks shall be connected together at the bottom to equalize the liquid level in the

tanks.

§ 73.165. Disinfection

(a) Disinfection of effluent is required prior to spraying. The disinfection shall be by chlorination **or a UV unit meeting the requirements of § 73.36 (relating to standards for ultraviolet radiation units)** and shall produce an effluent which will contain a concentration not greater than 200 fecal coliform organisms per 100 milliliters in a single sample. Disinfection units shall be installed in accordance with the manufacturer's specifications. Disinfection units shall be reliable, able to disinfect sewage effluent and be easily maintained by the property owner.

(b) A chlorinator shall be designed to maintain a chlorine residual of 0.2 PPM to 2 PPM and provide for a 30 minute contact time.

(1) When an erosion chlorinator is proposed, the base of the unit may be placed no deeper than 36 inches below finished grade.

(2) When a lift pump is used to keep the unit no deeper than 36 inches below finished grade, the pump shall have a discharge rate that does not exceed the manufacturer's specifications for the erosion chlorinator and shall meet the appropriate specification of § 73.46 (relating to dosing pumps, siphons and lift pumps).

(3) Chlorine contact time may be obtained using a separate chlorine contact tank or in-line chlorination followed by the storage tank.

(4) Chlorinators shall be housed separately from chlorine contact tanks or storage tanks unless the tanks are specifically designed to house chlorinators.

§ 73.166. Design of pressure distribution for individual residential spray irrigation systems.

(a) Design of pressure distribution in an individual residential spray irrigation system shall comply with the following:

(1) Conveyance of effluent from the storage tank to the spray field shall be through a delivery pipe sized to minimize friction loss.

(2) Check valves shall be prohibited on delivery lines. Air relief valves may be placed at high points in the delivery lines to prevent air locks.

(3) The delivery line and laterals shall be designed so that the effluent will drain back to the storage tank or otherwise designed to prevent freezing of the lines and sprinkler heads.

(4) Individual laterals shall be sized to minimize friction loss. The hydraulic loss (friction and elevation changes) within a lateral shall be less than 20 % of the operating head of the sprinklers.

(5) Design of laterals should include consideration of measures to prevent freezing of lines.

(6) Spacing of laterals and sprinklers shall provide for distribution of the effluent over the spray field using a design nozzle pattern that does not overlap adjacent spray nozzle wetted perimeters.

(7) Design of the spray field shall be based on the manufacturer's sprinkler specifications listing operating head, wetted diameter, nozzle size and discharge rate which shall be attached to the system design.

(8) Sprinklers shall be installed on risers 18 inches to 5 feet above grade level.

(9) Sprinklers shall be kept clear of obstructing vegetation for a radius of 5 feet.

(10) The design head of the sprinkler may not exceed the manufacturer's specifications for each system component.

(11) The minimum pump capacity shall equal the total discharge from all sprinklers when operating at design head.

(12) Total pump head shall be calculated by addition of all losses incurred due to elevation changes, pipe and fitting friction losses and the design head of the sprinkler.

(13) The effluent shall be discharged to the spray field once per day. A manual override shall be installed in the system to allow interruption of this spray cycle when weather conditions are not conducive to spraying.

(14) The permittee shall conduct a test pressurization of the completed spray field in the presence of the sewage enforcement officer prior to covering the piping system from view. During the test, the sewage enforcement officer shall confirm that all joints are water tight, the design head is achieved and the manual override is functional.

§ 73.167. Operation and maintenance.

Individual residential spray irrigation systems require periodic maintenance by the property owner and entity established under **[§ 72.25(h) (relating to permit requirements for operation and maintenance of individual residential spray irrigation systems)]** **§ 72.25(e.1)(2) (relating to issuance of permits)**. Without proper maintenance, system components will fail and pollution or a public health hazard will occur. This may result in costly repairs and civil penalties. The system designer shall provide an operation and maintenance manual, which may be supplemented with manufacturer's manuals and instructions, to the permittee that includes, as a minimum, the following required standards for operation and maintenance to be met by the permittee:

(1) Septic tanks, dosing tanks, lift pump tanks and chlorine contact/storage tanks shall be inspected every 6 months for structural integrity of the tank, inlet and outlet baffles, solids retainer, pumps, siphons and electrical connections.

(2) Aerobic tanks shall be inspected every 6 months for structural integrity of the tank, inlets and outlet baffles, buoyed solids retainer, pumps, siphons and electrical connections. The inspection and concurrent pumping of excess solids shall be conducted in accordance with manufacturer's and NSF requirements.

(3) Free access sand filters, buried sand filters, chlorinators, the pressurized spray irrigation plumbing and spray nozzles and the spray fields shall be inspected periodically by the property owner and every 6 months by the maintenance entity established under **[§ 72.25(h)]** **§ 72.25(e.1)(2)**. Each component shall be inspected for compliance with the following standards:

(i) Chlorine residual sampled after the contact/retention tank shall be maintained at a concentration of at least 0.2 PPM.

(ii) The chlorinator shall be functioning within the specifications of the manufacturer. Bridging of chlorine tablets may not be occurring.

(iii) Solids may not be accumulated on the surface of the sand in the free access sand filter nor may 12 inches to effluent be ponded over the sand. The high water alarm shall be functional.

(iv) The surface of the free access sand shall be raked and porous and any sand removed shall be replaced with sufficient clean sand to maintain the depth at a minimum of 24 inches.

(v) The plumbing in the free access sand filter tank shall be functional and free of leaks and splash plates shall be in place.

(vi) The free access sand filter tank and cover shall be structurally sound and unauthorized access equipment shall be in place. Insulation shall be in place.

(vii) The areas of the buried sand filter shall be free of ponded effluent and downgradient seepage.

(viii) The plumbing to the spray field shall be functional and free of leaks.

(ix) The spray nozzles shall be functioning within the design specifications and the extent of the designed wetted perimeter and each nozzle.

(4) **[A laboratory]** **An accredited laboratory, meeting the requirements of Chapter 252 (relating to environmental laboratory accreditation),** shall test the discharge to the system for fecal coliforms, **[carbonaceous biological oxygen demand (CBOD)]** **CBOD**, suspended solids and chlorine residual to determine compliance with Chapter 72 (relating to the administration of sewage facilities permitting program). At least annually, a copy of the tests results along with the most recent inspection of the system by the maintenance entity established under **[§ 72.25(h)]** **§ 72.25(e.1)(2)** shall be sent to the local agency.

Subchapter K. CONSTRUCTION COARSE AGGREGATE AND SAND

§ 73.171. General.

(a) **Prior to use of an aggregate or sand, or both, in an onlot sewage system, a written certification from the supplier that confirms the aggregate and sand meet the requirements in this section shall be provided to the sewage enforcement officer and the permittee. The written certification must include the name of the supplier of the aggregate and sand, testing standard achieved, testing date, amount of material purchased and the delivery date.**

(b) **Coarse aggregate must meet the following specifications:**

(1) **All coarse aggregate testing must be conducted within 1 year prior to the delivery date.**

(2) **Coarse aggregate must be washed and meet the uniform size and grading requirements of AASHTO No. 3, 467, 5 or 57 size except as noted in paragraph (3) and (4).**

(3) **Coarse aggregate placed over an underdrain must be washed and meet the uniform size and grading requirements of AASHTO No. 8.**

(4) **Coarse aggregate used to bed tanks and sewer lines must meet the uniform size and grading requirements for AASHTO No. 2A.**

(c) **All sand must be washed and meet the following specifications:**

(1) **Sand must have been gradation tested within 90 days prior to the delivery date and have passed soundness testing within 1 year prior to delivery.**

(2) **Sand must meet or exceed the Fine Aggregate, Type A (Section 703.1), Pennsylvania Department of Transportation Publication 408, the ASTM C33 standard, or as subsequently amended.**

(d) **A substitute aggregate may not be used without prior approval by the Department and must meet the standards for the coarse aggregate or sand being substituted.**