

**Commonwealth of Pennsylvania**  
**Department of Environmental Protection (DEP)**  
**Bureau of Point and Non-Point Source Management**  
**Harrisburg, PA**

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**Technology:** Leaching Chambers

**Classification Type:** Alternate technology (A2014-0016-0002)

**Classification Date:** February 6, 2004 (ASG)  
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In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the leaching chambers for use as an alternate onlot sewage treatment system. This classification permits the leaching chamber as part of a treatment system used for the specific purposes of distributing sewage at either the primary treatment level (exceeding 30 mg/l CBOD<sub>5</sub> and exceeding 30 mg/l TSS), the secondary treatment level (not exceeding 30 mg/l CBOD<sub>5</sub> and not exceeding 30 mg/l TSS) or at the advanced treatment level (not exceeding 10 mg/l CBOD<sub>5</sub> and not exceeding 10 mg/l TSS) onto an absorption area.

#### I. Technology Description

The leaching chamber is a component used in an onlot sewage treatment system which distributes wastewater by maximizing the infiltrative surface area where the wastewater is distributed. The plastic leaching chambers allows for the wastewater to be discharged from the leaching chamber and onto the absorption area. Leaching chambers may be utilized as a substitute for aggregate.

#### II. Design Requirements

- A. Location: Leaching chambers may be installed for the treatment of domestic strength wastewater serving a new construction or as a repair.
- B. Size: Leaching chamber ratings described by Table 1 are used to properly size systems. The reduction in area allowed only pertains to the absorption area directly beneath the leaching chamber. Thus, the area between the chambers is not included in calculating the absorption area. No absorption area credit is given for the sidewall.
- C. Construction:
  - (1) Tank installations must consist of either a two-compartment rectangular tank, two rectangular tanks in series, and otherwise conform to meet the requirements of Section 73.31. Vertically aligned circular (round) tanks are not permitted. Aerobic treatment tanks must be in compliance with Section 73.32.

- (2) Leaching chambers shall be installed per the manufacturer's Design and Installation Manual for the State of Pennsylvania. The manual can be obtained from the manufacturer's website.
- (3) To maintain the manufacturer's product warranty, leaching chambers may not be cut, drilled, or altered except as recommended in the manufacturer's Design and Installation Manual for the State of Pennsylvania.
- (4) The sidewall area of the leaching chambers must be filled to the top of slots with suitable native soil and then covered with suitable native soil. The use of hay or filter fabric over and/or around the chambers is prohibited.
- (5) At least one inspection port shall be installed for each absorption area.
- (6) Requirements for Pressurized Distribution Design
  - a) In accordance with the manufacturer's installation guidelines, endplates may be drilled to accept pressurized pipe.
  - b) Laterals should be suspended from the top of the chamber with a 30-pound tensile strength weather-resistant polypropylene tie.
  - c) Laterals must enter from a manifold through an endplate and continue through the length of the chamber run per design. Laterals which extend outside the chamber shall be secured in earth.
  - d) If the design includes a cap or cleanout at the end of the lateral, then it shall be supported by earth.
  - e) Orifice hole sizing and equivalent flow standards shall be as required in Chapter 73. Orifice spacing standards established by 73.44(c)(8) is not necessary.
  - f) The requirement of the last spray orifice being placed at the end of the lateral is not possible for leaching chambers. Therefore, continue the lateral beyond the last orifice to the end of the chamber run. The extra pipe length does not add to the piping systems friction loss and therefore need not be calculated into the system's lateral length.
  - g) Orifice flow may be inspected by observing flow on the sand surface as it exits the chamber and/or by observation through chamber louvers.
  - h) Orifices shall be placed at the 12 o'clock position. This configuration allows for the effluent to spray into the top of the chamber creating droplets that will rain down onto the absorption interface. To drain the piping and protect from freezing the first and last orifice shall be placed at the 6 o'clock position. A patio block or other suitable material shall be placed to protect the trench bottom from erosion.
- (7) Requirements for Gravity Distribution
  - a) Gravity flow designs do not require the use of perforated pipe within the chambers. The solid pipe transferring the effluent from the distribution box to the absorption area shall be installed per the manufacturers installation manual.
  - b) Either a plastic splash plate supplied by the manufacturer or one (1) ft<sup>2</sup> of gravel shall be placed on the soil where effluent enters the chamber as a means of dissipating the energy from the effluent flow.
- (8) Requirements for Standard Trenches or Beds
  - a) Effluent may be distributed to leaching chambers by either gravity flow or pressurized flow in accordance with the requirements of Chapter 73.

- b) Chambers should be laid out with the same requirements as a gravel trench or bed
  - c) Each row of chambers shall be connected directly to the distribution box.
  - d) Side-by-side combinations of chambers may be used. Two standard chambers may be placed side-by-side in a 6-foot wide trench. Two Equalizer 24 chambers may be placed side-by-side to provide the same allowable absorption area as a 4-foot wide trench. When using a side-by-side combination of different width chambers, place the narrower chamber on the uphill side of the trench.
  - e) Shallow placement trench depth shall be a minimum of 12 inches on the downslope side of the trench.
  - f) The use of the narrower leaching chambers may be better suited for sites with steep slopes.
  - g) In bed systems, the recommended chamber edge-to-edge separation in seepage beds is 0 to 6 inches.
- (9) Requirement for Elevated Sand Mounds (ESM)
- a) Pressure distribution is required.
  - b) The minimum bed width is comprised of three leaching chambers wide.
  - c) Design parameters shall meet the requirements of Section 73.55.
  - d) Sand must meet the requirements of Section 73.55(c).
  - e) Sand placement for leaching chambers: To prevent differential settlement for the system, the sand must be placed in 12-inch lifts and compacted by running equipment (tracks or tires) over the sand surface. Water may be added to aid in compaction. Proper compaction of the sand is the responsibility of the installer.
- D. Installation: An onsite preconstruction conference attended by the sewage enforcement officer, designer, installer, and the property owner prior to construction is recommended.
- E. Use of the Component/System and Siting Requirements:
- (1) When determining the number of chambers needed for the absorption area, the chamber rating must be equal to or less than the chamber ratings listed in Table 1. The chamber ratings in Table 1 represent a 40% reduction in the absorption area. The reduction in absorption area only pertains to the absorption area beneath the chamber. If the chamber rows are spaced apart from one another, the area between the chambers is not included in calculating the absorption area required. Where sizing reductions are proposed, they are not cumulative. No additional sizing reductions are allowed when the leaching chambers are used in conjunction with an aerobic treatment tank, composting toilet, or other system components that would allow for sizing reductions.
  - (2) Soil profile evaluation and percolation tests must document that there is sufficient area for installation of a full-sized absorption area (prior to the calculation of the up to 40% reduction)

### III. Minimum Maintenance Standards

- A. The manufacturer's certified contractor must meet with the property owner and the local agency's SEO within one (1) month of system start-up and/or occupancy of the dwelling, to explain the operation and maintenance of the system and provide written instructions to the property owner that includes:
  - (1) Instructions on the operation and maintenance of the system;
  - (2) The locations of all parts of the system;
  - (3) A commitment that the manufacturer's certified contractor will investigate and troubleshoot system problems;
  - (4) Contact information for the manufacturer and manufacturer's certified contractor;
- B. Warranty: The manufacturer of the leaching chambers must provide a minimum 5-year warranty on all defects due to materials or workmanship.
- C. Inspection:
  - (1) Inspection of the area around the soil absorption area every 6 months by the homeowner to ensure that there is no ponding of effluent or downgradient seepage.
  - (2) The certified contractor shall inspect at least the following items at an interval frequency recommended by the manufacturer's requirements:
    - a) Inspect septic tanks, dosing tanks, and lift pump tanks for structural integrity of the tank, inlet and outlet baffles, solids retainer, pumps, siphons, and electrical connections;
    - b) Inspect aerobic tanks for structural integrity of the tank, inlets, and outlet baffles, buoyed solids retainer, pumps, siphons, and electrical connections.
    - c) Ensure that the pumping system is operational;
    - d) Ensure that the absorption area cleanouts and/or vents are in proper working condition;
  - (3) The certified contractor shall inspect and pump excess solids in accordance with the manufacturer's requirements.

### IV. Permitting Requirements

- A. A sewage enforcement officer who has successfully completed an appropriate Department sponsored training course that included this specific technology or has received review delegation in writing from the Department may independently review the design and issue the permit for components under this listing. All other proposals under this listing must be submitted to the Department for review and comment.
- B. The sewage enforcement officer shall include on both the *Application for An Onlot Sewage Disposal* permit (Part III, Section 1) and the permit, the classification number itemized in the Classification Type of this listing.

### V. Planning Requirements

Not applicable.

Table 1

<i>Product</i>	<i>Chamber Dimensions</i>	<i>Chamber Rating</i>
Arc 18	5.0' x 1.25' = 6.25 ft <sup>2</sup>	10.42 ft <sup>2</sup>
Arc 24	5.0' x 1.833' = 9.17 ft <sup>2</sup>	15.28 ft <sup>2</sup>
Arc 36	5.0' x 2.833' = 14.17 ft <sup>2</sup>	23.62 ft <sup>2</sup>
Arc 36LP	5.0' x 2.833' = 14.17 ft <sup>2</sup>	23.62 ft <sup>2</sup>
Equalizer 24	8.333' x 1.25' = 10.41 ft <sup>2</sup>	17.35 ft <sup>2</sup>
Equalizer 36	8.333' x 1.833' = 15.27 ft <sup>2</sup>	25.45 ft <sup>2</sup>
Quick 4 Plus Equalizer 36 LP	4.0' x 1.833' = 7.33 ft <sup>2</sup>	12.22 ft <sup>2</sup>
Quick 4 Plus Standard	4.0' x 2.833' = 11.33 ft <sup>2</sup>	18.88 ft <sup>2</sup>
Quick 4 Plus Standard LP	4.0' x 2.833' = 11.33 ft <sup>2</sup>	18.88 ft <sup>2</sup>
Quick 4 Standard	4.0' x 2.833' = 11.33 ft <sup>2</sup>	18.88 ft <sup>2</sup>
Standard Infiltrator	6.25' x 2.833' = 17.71 ft <sup>2</sup>	29.50 ft <sup>2</sup>
Standard Sidewinder	6.25' x 2.833' = 17.71 ft <sup>2</sup>	29.50 ft <sup>2</sup>

### Absorption Area Sizing Guidelines

The following method should be used when sizing onlot sewage disposal designs for leaching chambers.

Step #1: Calculate square footage of absorption area per Chapter 73 requirements.

Step #2: Calculate the number of chambers required.

$$\text{Number of Chambers Required} = \frac{\text{Absorption Area in Step \#1}}{\text{Chamber Rating}}$$

Step #3: Round the number of chambers required in Step #2 up to the nearest whole number.

Step #4: Calculate the absorption area required using the number of chambers calculated in Step #3 and the chamber rating.

Absorption Area required, ft<sup>2</sup> = (# of Chambers Required in Step #3) (Chamber rating)