

Hydraulic Load Test

The purpose of this fact sheet is to introduce and provide information about the Hydraulic Load Test, which is included as a component of the PSMA On-Lot Wastewater Inspection (Fact Sheet F-166) often employed to protect both the home buyer and home seller during real estate transactions.

During those On-lot Wastewater Inspections when conditions are found in the soil absorption area that raise questions about whether the absorption area is satisfactorily absorbing the effluent delivered to it on a daily basis, the inspector is encouraged to conduct an Hydraulic Load Test (HLT). The HLT is a procedure by which the Inspector can determine if an absorption area can satisfactorily receive and allow to enter into the soil/environment the Design Daily Volume (DDV) of sewage effluent that the prevailing regulatory authority assigns to a structure based on occupancy, number of bedrooms, or other regulatory factors. In its simplest form, the Inspector adds the DDV to the absorption area, then comes back in 24 hours and determines if the liquid-level in the absorption area has returned to its previous level. To prove the absorption area has absorbed the DDV, water is added to bring the liquid level up to the Day 1 final level. If the volume added is equal to or greater than the DDV, the absorption area is satisfactory.

Hydraulic Load Test Procedure

Preparation

- During the HLT no effluent may enter the absorption area. Typically the newly pumped, empty septic tank can serve as an interim holding tank for the two days while the HLT is conducted.
- If rain is forecast for the 24 to 48 hours required for the HLT, the test may be delayed.
- The HLT test should be conducted using the Design Daily Volume (DDV) prescribed by PA-DEP Chapter

73 based on the number of bedrooms in the house.

- The water added during the HLT should be introduced to the adsorption area from a point downstream of the treatment tank.

Day 1

- Prior to starting the Hydraulic Load Test, an observation port must be located in the center of a seepage bed, or in the center of each trench. This/These observation ports can be created by boring or digging into the aggregate until the underlying soil/sand is reached.
- The elevation of water ponded in the observation port is measured and recorded; this is the initial water elevation. In addition, the elevation of the “top of aggregate” and the “bottom of aggregate” is also measured and recorded.
- The Hydraulic Load Test is started by introducing the Design Daily Volume (DDV) of water for the house to the absorption area to determine if there is sufficient storage in the aggregate to hold or store the DDV.
- If after adding the DDV to the absorption area, the elevation of the water in the aggregate is below the top of the aggregate, the elevation of the water surface in the aggregate is measured and recorded and the absorption area is left, untouched, for 24 hours.
- If at any time during the HLT, the liquid level rises above the top of the aggregate, the HLT should be stopped and the absorption area declared unsatisfactory.

Day 2

- At the end of 24 hours, the inspector returns and measures and records the water elevation in each observation port.
- Then the Inspector should add enough water to the absorption area to bring the water level up to the Day-1-water-added elevation. The volume added on Day 2 is considered to be the absorption area’s

sustained daily loading volume. If this loading volume is greater than or equal to the DDV, the absorption area is assumed to be working satisfactorily. If the absorption area cannot take the DDV before the water elevation reaches the Day-1-water-added elevation, the Inspector must consider the absorption area unsatisfactory because the absorption area was not able to absorb the DDV in 24 hours.

Note: The HLT may be repeated the third day if there is any question about the results from Day 2.

When Should the HLT Be Performed?

A HLT should be performed when, during the course of a PSMA Inspection, any of the following conditions are discovered:

- The structure has been vacant for more than 7 days.
- The treatment tank, cesspool, or seepage pit has been pumped less than 30 days prior to the inspection.
- New gray water sources have been directed to the system within the last 30 days.
- Soil fracturing activity has occurred within the last 30 days.
- The initial inspection of the treatment tank reveals that, for whatever reason, the treatment tank's liquid level is below the tank's outlet pipe invert.
- A broken or clogged pipe, a dysfunctional D-box, or other condition that would result in atypical flows reaching all or part of the system.
- There is less than 24 hours' volume capacity in a cesspool or seepage pit.
- If the inspector is informed that the system will be subjected to increased daily flows due to increased occupancy or change in use.
- Standing liquid is observed in an absorption area or gravelless chamber as follows:
- There is liquid standing in the aggregate of a gravity distribution system of an in-ground absorption area such that there is less than 5 inches of dry aggregate above the liquid level.
- There is liquid standing in the aggregate of a pressure distribution system of an in-ground absorption area such that there is less than 3 inches of dry aggregate above the liquid level.
- There is more than 5 inches of dry aggregate and liquid is present in a gravity distributed subsurface sand filter.
- There is more than 3 inches of dry aggregate and liquid is present in a pressure distributed subsurface sand filter.

- There is less than 5 inches of clear space in a gravelless chamber.

Re-inspect and Re-evaluate

The HLT may not be necessary if the house has been reoccupied for 14 continuous days and the tank was not pumped, or if the house has been occupied for 30 continuous days after the tank was pumped. If the HLT is not elected by the homeowner, the system must be re-inspected and re-evaluated.

Newly Installed, Never Used Absorption Areas

An HLT is not recommended for absorption areas that have been in use for less than 30 days.

Cesspools and Seepage Pits

On sites served by cesspools or seepage pits, the HLT can be conducted by assuming the invert of the wastewater-entry pipe is equivalent to the "top of aggregate" described above.

At-Grade Absorption Areas

When conducting an HLT on an At-Grade absorption area, the observation port should be located one foot downslope of the lower pressure distribution pipe. All other components of the HLT remain the same.

For More Information,

refer to the following related Fact Sheets:

- F-161, Septic Tank Pumping
- F-162, Keeping On-Lot Wastewater Systems Healthy
- F-163, Site Evaluations
- F-165, Septic Tank-Soil Absorption Systems
- F-166, On-Lot Wastewater Inspections During Real Estate Transactions
- F-167, Use of Dyes and Tracers to Confirm Septic System Failures
- F-169, Individual Residential Spray Irrigation Systems (IRSIS)
- F-171, At-Grade and Shallow At-Grade On-Lot Systems
- F-173, PSMA On-Lot Wastewater Treatment Inspection vs. A Regulatory Inspection
- F-174, Aerobic Treatment Units (ATU)
- F-266, Geotextile Sand Filter (GSF) On-Lot Systems

For additional assistance contact your local Sewage Enforcement Officer or County Extension Agent

[Pennsylvania Association of Sewage Enforcement Officers \(PASEO\)](#) 4902 Carlisle pike #268 Mechanicsburg, PA 17050 Telephone: 717-761-8648

[Pennsylvania Septage Management Association \(PSMA\)](#) Box 144 Bethlehem, PA 18016 Phone: 717-763-PSMA

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