

NAWT Standard Operating Procedures

SOP# NAWTHLTGSTA

Title: Hydraulic Load Test – Gravity Soil Treatment Area

Date: January 2011

Why perform an HLT: The hydraulic load test can determine if the Soil Treatment Area (STA) can adequately receive and disperse the design wastewater flow from an Onsite Wastewater Treatment System (OWTS) based on current, local, regulatory requirements, e.g. gallons per bedroom, fixture count, etc.

When to perform an HLT: A hydraulic load test should be performed when, during the course of a Point of Sale inspection, building or remodel permit application or system evaluation inspection for maintenance contract considerations, the following findings occur;

- The structure has been vacant for more than seven days
- The pretreatment tank has been pumped and cleaned in the past thirty days.
- Previously diverted or new greywater sources have been introduced into the system.
- There has been any type of STA remediation within the past thirty days, e.g. chemical additives, soil fracturing, root removal, etc.
- When initial inspection reveals that, for what ever reason, the pretreatment tank's liquid level is below the outlet pipe. The reason for this is that if the tank is leaking, then the soil around the tank is providing additional infiltration area to the field.
- After any repairs to the STA have been made, e.g. crushed outlet line, fouled or damaged D Box, etc.
- A Seepage Pit has received less than the average daily flow during the previous 24 hours. *Seepage Pits are covered in full in the NAWTHLTSP SOP document.*
- If the Inspector learns of any significant changes to the use of the system, e.g. increased occupancy, lack of use such as business activities or vacations that may impact the system, etc.

When NOT to perform an HLT: An HLT should not be performed if any of the following conditions are present;

- The STA has been in use less than six months, as new systems have no Biomat to control effluent flow.
- There are any signs of STA failure, e.g. fully saturated trenches or beds based on Inspection Port observation, surfacing effluent, hydrophilic vegetation at the surface of the STA, etc. Before an HLT is performed, based on ponding in the STA, the inspector should determine if there has been heavy use that has been normal in the operation of the system, such as many laundry loads in a single day, etc. If a heavy use has been conducted in the last 24-hours, the inspector should suspend the inspection/HLT and return the following day to observe the STA for ponding again, to determine if the ponding has subsided.

Alternate procedure: In lieu of an HLT, the STA can be reinspected if the Inspector verifies that the structure has been either fully occupied (max design) for a period of one week, or, full time partial occupancy for thirty days. In either case the exercise of installing Inspection Ports for monitoring is required (Refer to 1.5.b, following).

Equipment/materials:

- System design information
- Soil probe or optional locating device
- 6 inch soil auger
- Inspection Port materials as shown on recommended diagram fig. 1
- Calculator
- Measuring tape
- Stopwatch
- Water meter
- Dedicated garden hose, (not the homeowners)
- Backflow prevention device
- Latex gloves
- Digital camera
- Disinfectant for cleaning up equipment

1.0 Site Preparation:

- 1.1 As the HLT is a 24 to 48 hour test, it is important that the pretreatment tank(s) have been pumped and cleaned so any domestic wastewater flow can be stored and not interfere with the test flow rate or volume. It is important to communicate to the building occupants to be conservative in their water use, particularly during the test period.
- 1.2 Establish the HLT test volume as the total design flow. This can either be determined by as-built drawings, local authority records or by calculating the local design criteria of gallons per bedroom per day, fixture count, etc. If the inspector calculates the design flow, record the method and calculations for reference by future inspectors. Fixture count method can increase the design flow above the bedroom count method. For older buildings that have been remodeled, this can change the apparent STA size needed.
- 1.3 Determine flow rate based on peak one hour flow (50% of design flow in one hour); For example, if your local design criteria requires 150 gallons per day per bedroom, and you have a three bedroom home, the design flow would be 450 gallons per day. Your peak one hour flow would be 225 gallons. 225 gallons in one hour (60 minutes) represents a flow rate of 3.75 gallons per minute. Therefore, the timeline for adding water to the system is 3.75 GPM over two hours, representing the 450 gallon design flow.
- 1.4 Verify location and perimeter area of STA and location of Inspection ports by accessing as built drawings from the local authority. Locate and verify the specified point at which the water will be introduced into the system. This can be at the tank outlet pipe, at a cleanout between the tank and STA, in the D-box, or into an Inspection Port in the STA itself.
- 1.5 If no as built drawings or Inspection Ports are available
 - 1.5.a Verify STA by probing or electronic location, include each lateral end or bed perimeter.

- 1.5.b Install lateral end or bed edge Inspection Ports by probing to find the vertical interface of the native soil and constructed media (sewer rock, etc.). Using a 6 inch soil auger, bore down along the interface to the bottom of the media. Insert an Inspection Port of an approved design into the bored hole. Be sure to consider anchoring of the Inspection Port prior to backfilling with clean drainrock. (See attached diagram) **Note: If the surface of the STA media is deeper than can be determined by probing, excavation could be required. If so, notify property owner of excavation needs and advise of possible relative damage to landscape.**
- 1.5.c Repeat this step at the end of each lateral or at two locations at opposite ends of a Bed.
- 1.5.d Identify and document each Inspection Port on the as built drawings or site plan.
- 1.5.e Establish the following reference points; grade at bottom of media, grade at top of media, grade at liquid, if there is any upon set up. These measurements will enable the inspector to determine the percent saturation of the media before and during the test period. **Note: if the liquid level upon set up is at the top of the media in all trenches or bed, discontinue the test as the STA is fully saturated, therefore “Unacceptable”.**
- 1.6 If the onsite water supply, (well, spring, holding tank etc) is to be used for the test, obtain approval in writing from the property owner.
- 1.7 Establish a point of application of the test water downstream of the pretreatment tank, e.g. clean out, distribution box, lateral end, etc.

2.0 Procedure:

Having predetermined the test flow rate and point of application of the test water, proceed as follows. Document all phases of the inspection and HLT with digital photos, before starting, during the test and after the test is completed.;

- 2.1 Record any Inspection Port liquid levels, if any, in reference to the as-built drawings or site plan.
- 2.2 Using a dedicated hose with backflow prevention, begin introducing water at the **specified point** at the specified flow rate.
- 2.3 Record the test start time.
- 2.4 Monitor and record the liquid levels in the Inspection Ports every 30 minutes for two hours. **Note: If the liquid level rises to the critical level, (top of the media in all laterals or the bed) before the end of the two hours, stop adding water and return the following day.**
- 2.5 Assuming the liquid level did not rise above the noted critical level, turn off the water after two hours.
- 2.6 If a gravity STA, wait thirty minutes for stabilization then record and document liquid levels in all Inspection Ports.
- 2.7 Return in 24 hours and repeat the test, first recording liquid levels in the Inspection Ports. **Note: if the HLT was discontinued on the first day due to high levels, yet on day two the full test volume was received, return a third day and rerun the test for verification.**

If on day two the full test volume cannot be added before reaching the top of the media, it is clear the STA is not infiltrating the intended design flow and the STA is “Unacceptable”.

- 2.8 Walk the entire STA and surrounding areas to verify no adverse conditions resulting from the HLT, e.g. surfacing effluent, saturated soils, downslope breakouts, etc.
- 2.9 Clean and sanitize all test equipment for return to your service vehicle.
- 2.10 Secure all Inspection Port covers, clean out caps and any other system access points that were opened for this inspection.
- 2.11 Clean any residuals that may contaminate the surrounding area of the OWTS system site.
- 2.12 Document all findings and test results into a formal report for filing with the appropriate parties.

Note: If the STA is within 100 foot of a waterway or waterbody, add one tablespoon of flourazine dye after one hour of adding test water. Walk the edge of the waterway/waterbody after the two hour test period and upon return the following day to verify no dye is present near the waters edge.