

# Large On-site Sewage Systems – How to Calculate Your Wastewater Flows Using Your Dose Counter

Please note the dose counter method isn't as accurate as using your elapsed time meter (ETM) but it's a useful way to calculate wastewater flows to your LOSS if you don't have an ETM or if you have a siphon. You should determine your dose drawdown and dose volume (Steps 2 and 3) each year to make sure your pump performance hasn't changed.

## You will need the following items:

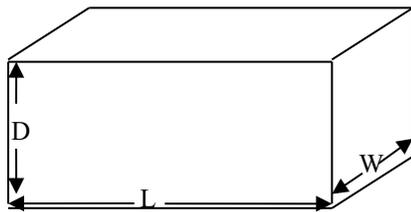
- Hose and water source
- Tape measure
- Latex gloves (wear when accessing the pump chamber)
- Flashlight
- Notepad and/or Logbook
- Pencil
- Calculator
- Access to the control panel
- Access to the pump chamber

## Step 1 Determine the Gallons Per Inch of Depth in Your Pump Chamber

You may find this information on your Record Drawings or "As-builts", in your Operation and Maintenance Manual, or from the tank manufacturer.

You can use the following steps to determine the gallons per inch of your pump chamber if it has a rectangular cross-section.

- A. Determine the total volume (V) of your pump chamber.



D = Depth or Height in feet (ft)

L = Length (ft)

W = Width (ft)

V = Volume (gallons)

$$D \times L \times W \times 7.48 = V \text{ (gallons)}$$

- B. Determine the gallons per inch ( $\Lambda$ ) in your pump chamber.

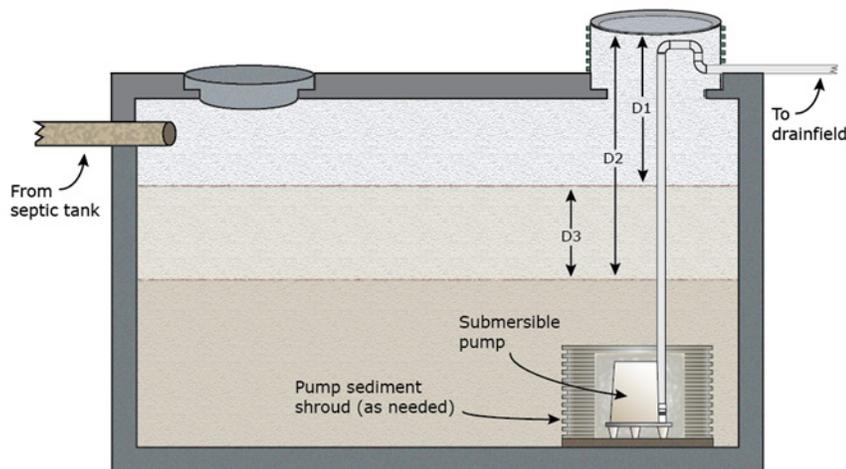
$$\frac{V}{D \times 12} = \Lambda \text{ (gallons /inch)}$$

If you have a round or cylindrical pump chamber and the gallons per inch information isn't in your records, contact the tank manufacturer for the information for your specific septic tank model or contact your design engineer to determine it for you.

## Step 2 Determine Your Dose Drawdown

Take all water depth measurements from a fixed point such as the top of the riser to reduce errors. See the drawing below. Use your flashlight if it's difficult to see the liquid surface.

- A. Leave the toggle switches for your pumps in the control panel on AUTO. If the pump switch is not on AUTO, the pump is not being used to dose your system. Please talk with your qualified operator to find out why this pump is not in use. (Toggle switches to control each pump should have these settings: AUTO – OFF – MAN (manual)).
- B. Use a hose to run water into the pump chamber. Do not put the end of the hose directly into the effluent to prevent any cross connection to the potable water source. Minimize water disturbance to the floats by placing the hose as far away from the float tree as possible.
- C. Using the tape measure, take a liquid depth measurement (D1) from the liquid surface to your fixed point as soon as the pump turns on. Write it down.
- D. Quickly turn off the water source to the pump chamber.
- E. Measure the liquid depth (D2) in the pump chamber again when the pump turns off. Take the measurement from the same fixed point the measurement was taken in Step C. Write it down.
- F. Subtract  $D2 - D1 = D3$  (inches of water pumped per dose)



Pump Chamber Drawing

- G. Repeat steps A through F three more times, so you have done it twice for each pump. Use the four values to calculate an average drawdown.

$$\frac{D3_1 + D3_2 + D3_3 + D3_4}{4} = D3_{\text{average}}$$

## Step 3 Determine the Dose Volume (Dv) in Gallons/Dose

- A. Multiply the average D3 from Step 2 G by  $\Lambda$  from Step 1.

$$D3_{\text{average}} \left( \frac{\text{inches of water}}{\text{dose}} \right) \times \Lambda \left( \frac{\text{gallons}}{\text{inch}} \right) = DV \left( \frac{\text{gallons}}{\text{dose}} \right)$$

## Step 4 Calculate the Wastewater Flow Rate From the Dose Counter Readings

Your dose counters (one per pump) must be read every month. For each pump, record the reading for that month and the date read in your logbook. This logbook should be maintained for the life of the system and be available upon our request.

- A. Subtract your previous reading from the current reading to determine the number of times the pumps have run (Doses).

For example, if your previous reading was 78 and the current reading is 202:

$$202 - 78 = 124 \text{ Doses}$$

- B. Add the number of Doses from each pump for Total Doses (TD). Write the Total Doses number in your logbook.
- C. Multiply the Total Doses (TD) by Dose Volume (DV) calculated in Step 3 to determine the monthly wastewater flow (Flow).

$$\text{TD (doses)} \times \text{DV} \left( \frac{\text{gallons}}{\text{dose}} \right) = \text{Total Flow (gallons)}$$

- D. Divide the Total Flow by the number of days (d) between the dose counter readings to determine the Average Daily Flow.

$$\frac{\text{Total Flow (gallons)}}{d \text{ (days)}} = \text{Average Daily Flow (gallons per day)}$$

- E. Record the Average Daily Flow (gallons/day) in your logbook and on the LOSS Annual Maintenance and Monitoring Report form. You'll send the LOSS Annual Maintenance and Monitoring Report form to us each year when it's time to renew your operating permit.

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