

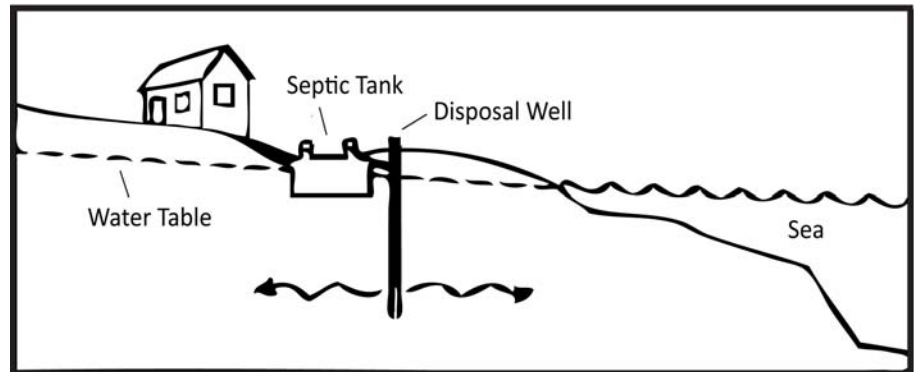


# Onsite Wastewater Management Programme

## Septic Tank Systems

### WHAT IS A SEPTIC TANK SYSTEM?

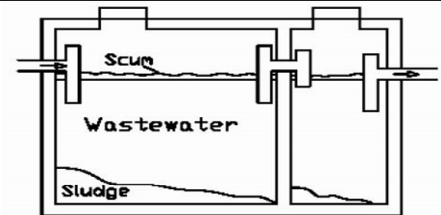
A septic tank system serves as an on-site system to treat and dispose of domestic wastewater. In the Cayman Islands, a septic system is made up of a structurally sound, two compartment watertight tank discharging to a disposal well (a drilled borehole with a grouted casing below which the liquid waste drains).



### HOW DOES IT WORK?

Sewage enters the tank through a pipe from the building. The tank is sized to hold the wastewater for 36 to 48 hours. This time allows the wastewater to separate: most of the solids settle to

the bottom, forming a sludge layer; grease, fats and hair float to the top, forming a scum layer; between these two layers is the liquid effluent which flows to the disposal well.



### INSPECTION & MAINTENANCE

Routine inspection and maintenance are essential to the proper operation of a septic tank system. Inspections detect signs of failure, leaks, broken pipes or baffles and determine the extent of solids buildup in the tank. As sludge collects on the bottom and scum accumulates on the top, the efficiency of the system decreases.

Frequency of pump-out depends on tank size, occupancy, water conservation, and use of garbage grinder. Solids levels should be measured to determine the required frequency of pump-out. Refer to procedure on next page.

#### Permitted Septage Waste Haulers:

- Entech Ltd.: 947-9253
- Industrial Services: 949-7245
- Professional Waste Management: 945-0535
- Watler & Hislop: 949-4880

## Best Management Practices

### DO

- Practice water conservation
- Limit the use of a garbage grinder or disposal
- Check household products for suitability for use with a septic tank
- Know the location of your septic system and keep all covers accessible for inspection and maintenance
- Have the sludge and scum pumped out by a permitted septage hauler as needed
- Keep a record of all inspections, pumping, and repairs

### DON'T

- Put fats and oils down the drain
- Flush indigestible materials such as diapers, dental floss, cigarette filters, feminine napkins, plastic or rubber
- Use excessive amounts of bleaches, disinfectants, or other harsh chemicals
- Put solvents, paints, thinner, pesticides, etc. down the drain
- Overload the system by scheduling several showers or loads of wash over a short period of time
- Allow rainfall to flow into the system

### Measuring Solids in Primary Treatment Tank/Section

A primary treatment tank / compartment is one that relies on gravity alone to separate solid from liquid matter. In an onsite treatment system this can be a grease interceptor, a septic tank, or an ATU pre-tank.

To establish a predictable pumping schedule, solids levels should be checked every three months.

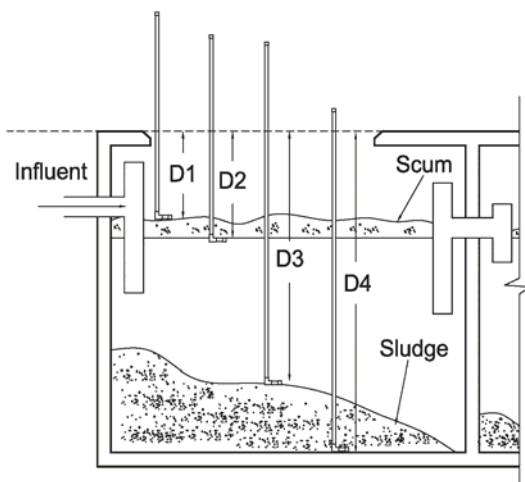
It is good practice for the service provider to observe/supervise the pump out service to ensure that:

- the correct tanks/compartments are pumped at the correct frequency and to the proper level,
- the inlet and outlet structures are not damaged during the service, and
- “before and after” levels can be measured to verify established frequency and adequacy of pump-out service.

A “solids stick” is an effective tool for measuring scum and sludge levels in a primary tank. It can easily be made from a 10 foot length of 1/2 inch PVC pipe, two end caps and one 90° elbow: Cut a 6 inch section for the bottom of the “L”; join it to a length of 6 or more feet using a 90° elbow, place end caps on open ends; use PVC cement to glue elbow and end caps. Use a waterproof marker to mark 1 foot increments from bottom to top of stick.

To use the “solids stick”:

- Open access cover over inlet end of pre-tank.
- Refer to Diagram below and record reading at level of dotted line for:
  - D1: Lower solids stick, leading with elbow end, until it rests on top of the scum.
  - D2: Gently push the solids stick through the scum layer, turn it 1/2 a turn and gently pull the stick up until you feel the bottom of the scum layer.
  - D3: Continue lowering the stick until you feel the top of the sludge layer.
  - D4: Gently push down, through the sludge, until you feel the bottom of the tank.
- Extract the stick using a disposable rag to wipe the stick as you withdraw it. Sanitary wipes or another rag with bleach can be used to disinfect the stick for storage. Place used rags/wipes in a plastic bag for disposal in a waste bin.
- Calculate Depth of Scum (SC), Depth of Sludge (SL) and Wet Depth (WD) of tank as shown in the text box to the right of the Diagram below.
- Document results on Standard Service Report and indicate whether solids removal is required.



$$\begin{aligned} \text{Depth of Scum (SC)} &= D2 - D1 = \_\_\_ \text{ inches} \\ \text{Depth of Sludge (SL)} &= D4 - D3 = \_\_\_ \text{ inches} \\ \text{Wet Depth of Tank (WD)} &= D4 - D2 = \_\_\_ \text{ inches} \end{aligned}$$

#### WHEN TO PUMP

**Pump the tank when (SC + SL) is greater than (WD / 3)**

For example, if:

depth of scum (SC) = 8 inches and  
 depth of sludge (SL) = 10 inches and  
 wet depth of tank (WD) = 48 inches, then

$$(SC + SL) = 8 + 10 = 18 \quad \& \quad (WD / 3) = 48 / 3 = 16$$

Since 18 is greater than 16, it is time to have accumulated solids pumped from both compartments.

## Septic Tank and Grease Trap Pump-out

### PRECAUTIONS

- Septage pumping can be dangerous; operators are responsible for their personal safety.
- Septic tanks contain toxic gas and / or oxygen deficient air. Never enter a septic tank.
- Septage is infectious material. Wash hands frequently, and especially before eating, drinking, or smoking.
- In areas of high groundwater levels, enough liquid must be left in the tank to serve as ballast and prevent floating. It is not necessary to empty the tank; the objective is to remove as much of the accumulated solids (scum and sludge) as possible.
- In the event of a spill, use a squeegee or a muck rake and suction hose for clean up. Apply lime to areas that have been cleaned up. Notify the Water Authority and/or the Department of Environmental Health.
- Septic tank additives offer little or no benefit and can be detrimental to the operation of the system and/or groundwater. The use of additives is discouraged.



### PROCEDURE

- Don personal protective equipment; e.g., safety glasses and gloves.
- Locate and open both access hatches.
- Examine inlet and outlet baffles or tees, noting damage, loose connections and/ or plugging. Advise owner of necessary replacement/repairs.
- Take care, throughout the pumping procedure, not to damage internal structures and parts within the tank.
- Lower liquid level below the invert (bottom of the inside of the outlet pipe) of the outlet to prevent grease and scum from being washed into the well.
- Break up the scum layer (floating layer) with a muck rake, then vacuum the scum layer out, continuously moving both the vacuum line and the muck rake during the pumping operation, to break up and guide solids to the vacuum nozzle.
- Loosen the sludge layer (settled layer) with the muck rake and remove as much of solids as possible, starting at the inlet side of each compartment where accumulation is the greatest.
- Secure all access hatches and clean up any drips/spills.

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