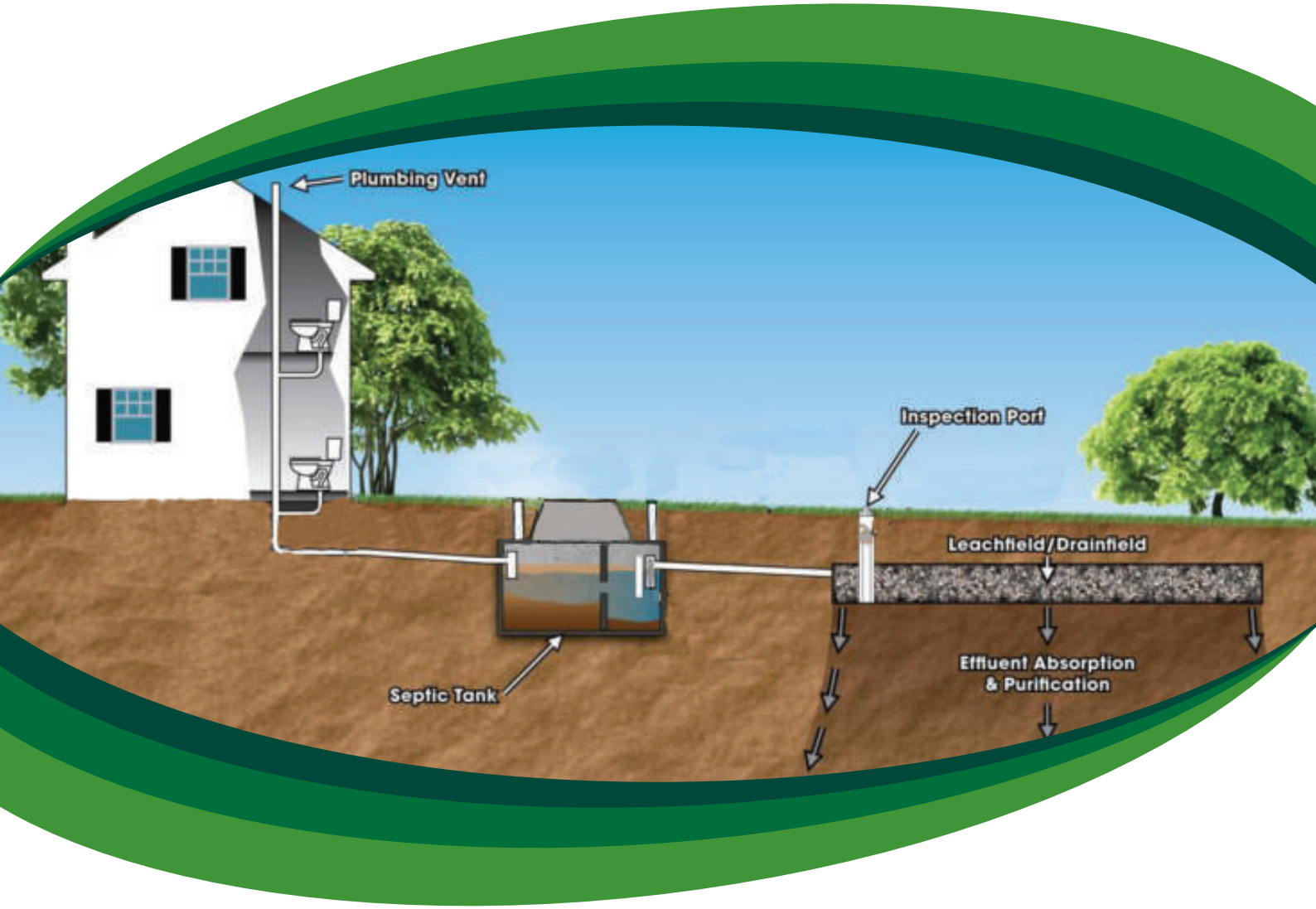
Installation and maintenance manual



Septic and holding tank systems

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How does a septic tank work?

Septic tanks are typically used in unsewered areas and are the most effective method for treating domestic wastewater.

A septic tank is an underground, watertight receptacle. Constructed of precast concrete and divided into at least two compartments, the septic tank receives wastewater from your home and separates any solids from liquids. The liquid portion (effluent) flows out of the tank after approximately 24 hours.

There are three functions of a septic tank:

1. It serves as a settlement chamber for solids.
2. It allows some bacterial breakdown of organic solids to occur (anaerobic breakdown).
3. It stores undigested solids which must be periodically removed (about every 3-5 years).

Contents of a healthy septic tank

There are three layers to a healthy septic tank:

1. A layer of fats, called scum, which floats to the surface.
2. A clear layer, called effluent.
3. A layer of solids, called sludge or bio-solids, which sinks to the bottom.

In most septic systems, treated effluent flows out of the tank through an outlet pipe as the new wastewater enters. During this process the scum layer helps prevent odours from escaping and air from entering. The effluent gets discharged from the septic tank directly into the soil by pipes and trenches, into an absorption field. Special absorption fields can be constructed in areas where soil is shallow or unsuitable for trenches (eg. raised earth mounds, evapotranspiration beds or modified earth absorption fields).

Your responsibilities

As an owner of a septic system, you are responsible for making sure your septic system is safe and in good working order. Not only is a failing septic system a health risk, it can also harm the environment.

Your responsibilities include:

- Complying with all council requirements and paying any fees associated with installation, maintenance and operation.
- Keeping your system well maintained and getting it checked regularly.
- Maintaining and protecting the absorption field.
- Making sure the house drains and tank don't leak.
- Getting the tank pumped (de-sludged) when it's too full to process the flow going into it, generally 3-5 years.
- Getting things fixed by a licensed plumber if they are not working properly.

Please note that the installation of a septic tank or any alterations to an existing system must be carried out by a licensed plumbing contractor.

Maintaining your septic system

Your septic system must be installed according to SA Health Onsite Wastewater Systems Code regulations. This includes any alterations or changes to an existing system.

If you plan your septic system properly, this can substantially reduce your maintenance costs. The following tips will help you conserve resources, reduce expenses and limit pollution:

1 **Plan landscaping and irrigation carefully**
- Only plant grass near the absorption field (roots from larger plants such as trees and shrubs may damage the trench) and mow the area regularly.
- Choose nutrient-tolerant plants for drain fields and irrigation areas.
- Contact your council environment health officer before installing an irrigation system or doing landscaping around your trench area.

2 **Use household detergents and bleaches sensibly**
- If possible, use low-phosphorus or phosphorus-free detergents. Instead, use baking soda, vinegar, a mild soap solution or green-safe/septic-safe cleaning products. If you have questions about the safety of any household product, consult the product manufacturer.
- Install a lint filter on your washing machine (this can simply be a stocking over the outlet hose). This will extend the life of your trench and avoid blockages.

3 **Do not dispose of chemicals, oils, fats or other dangerous items in your system**
- Do not put chemicals (like pesticides or paints) or medicines into your septic system. These products can cause the tank to malfunction and can pollute groundwater.
- Do not pour fats or oils down the sink. These can solidify, block the system and build up in the tank. Instead, put small amounts in the compost or into a separate container with the rubbish.
- Use a sink strainer to prevent food particles from getting into the septic system. Food scraps can slow down the digestion process and make solids build up more quickly (meaning more frequent pump-outs).
- Instead of caustic soda or drain cleaners, use boiling water or a drain eel to clear a blocked line.
- Do not flush things down the toilet that could clog the system, such as tampons, condoms, paper towels, grease, plastics or cat litter.

4 **Remove accumulated sludge from the tank**
- Built-up solids can affect the performance of your system. Household pipes may back up with sewage and your subsoil trench system may become clogged, causing effluent to come to the surface, pool and smell. This can endanger the environment and is a public health risk.
- Accumulated solids in septic tanks need cleaning or pumping out usually once every 3-5 years.

5 Reduce and monitor the amount of water entering the system

- Divert roof water away from the effluent disposal area and make sure that water from roof downpipes does not enter the system.
- Check plumbing fixtures regularly for leaks and immediately repair any problems.
- Avoid large flows of water into the system at once, for example operate your dishwasher and washing machine at different times and spread large washing loads over several days.
- Install water-saving devices such as low-flow shower heads and dual flush toilet cisterns.
- Don't leave taps running (eg. when cleaning teeth)
- If the terrain slopes down to your absorption trench, install a stormwater diversion trench to ensure that surface water is diverted around the soakage area.

6 Protect your septic tank and disposal area from damage

- Prevent vehicles driving over the tank and soakage area, which could cause damage and result in expensive repairs.

7 Prevent mosquito breeding

- Fit all system vents with mosquito-proof mesh and make sure all access openings are sealed properly.

8 Be sure the system is easy to access for maintenance

- If your tank is difficult to access you will need to install an approved access shaft to minimise future maintenance difficulties.
- Do not construct driveways, buildings or paved areas over the septic and soakage area. These can result in damage and cause access problems when the tank needs to be pumped.

Septic tanks use bacteria to help digest waste, therefore they are a living ecosystem.

Checking your septic system

Septic tanks use bacteria to help digest waste, therefore they are a living ecosystem. Excess water, chemicals or a lack of care can quickly make your septic tank unhealthy and smelly.

If you notice any of the following, **your septic system may need attention**:

- The toilet or household drains are slow or they back up.
- You notice the air around the tank smells of rotten eggs.
- You see dark green grass growing on or around the absorption area.
- Lots of weeds begin to grow downhill from the absorption area, in nearby drainage channels or alongside a nearby waterway.
- The ground around it becomes soggy, or small pools form downhill.
- The tank has not been checked in over 12 months.

The most common cause of problems is not de-sludging the tank regularly – be sure to get it pumped out every 3-5 years.

What to do

If you are concerned, it is important to act quickly so that any damage or associated repair cost doesn't get any worse.

Please contact a plumber or septic system specialist immediately for advice.

There are things you can do yourself, to stop septic problems before they get out of hand. Make sure you do the following at least once a year:

1. **Check the fluid level near the outlet**
   Carefully open the inspection cover and then stand clear. Check the fluid level near the outlet, using a torch if necessary. The fluid should not be higher than the outlet pipe at the wall of the tank (there should only be floating 'scum' above this level). Reminder – wear protective gloves and wash hands afterwards. Keep any open flames well away from the tank.

2. **Make sure your effluent filter is working, if you have one**
   If the filter is clogged, rinse it clean with a hose so the drainage goes back into the septic tank. If this doesn't remove the clog, replace the filter cartridge. Reminder – wear protective gloves and wash hands afterwards.

3. **Check the absorption trenches**
   If your system has absorption trenches, check the area carefully. It should not be soaked or smell and there shouldn't be abundant grass growth. Mow grass regularly and remove cuttings. If the area is soggy, smelly or overgrown, there may be too much water flowing into your septic system or the trenches may be exhausted. Call a plumber or septic system specialist.

4 **Make sure all drains and toilets are working properly**
If drains and toilets are slow to empty, the system may be full, the pipes may be blocked, or the system or the trenches may be clogged or exhausted. Call a plumber or septic system specialist.

When doing any work on your septic system, please note the following:

- Septic tanks can be hazardous, so plan carefully and take proper safety precautions
- Approach the opening only after the lid has been left open for a little while
- Wear gloves and wash your hands immediately after checking the system
- Beware of flammable and toxic gases and ensure the site is well ventilated
- Never smoke or use any exposed flame near an open septic tank
- Have a second person available to watch you and to call for assistance if necessary
- Let your doctor know if you suffer any injuries during checking.

If you have any concerns or doubts, contact a plumber or septic system specialist in your area.

How to check the sludge and scum depth of your tank

1 Take a metal or plastic stick (eg electrical conduit) about 4m long. Wrap it tightly from end to end with a towel or cloth to create a dip stick.

2 Put on rubber gloves, remove the inspection cover (inlet end) and insert the dip stick all the way to the bottom of the tank.

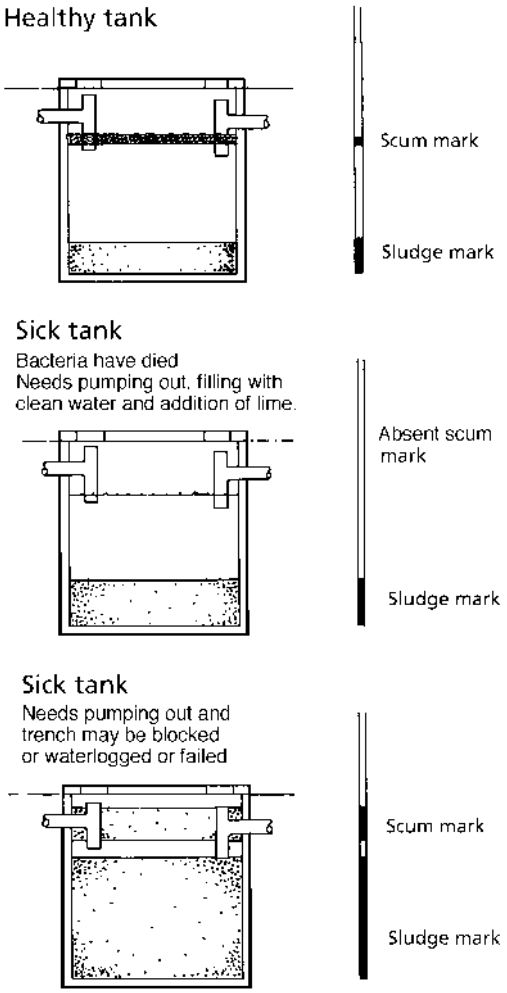
3 Withdraw the stick completely. Observe the size and position of the scum mark (bottom) and the sludge mark (top).

4 Compare the marks on the dip stick with the diagnostic illustration.

While still wearing gloves, put the used cloth strip in a waste bag and either burn it or place in your rubbish outside. Wash the stick and place in the sunlight out of reach for a few days. Dispose of the gloves (or soak them in a mild bleach solution) and wash your hands and arms thoroughly.

Remember to always wear gloves, don't smoke near the septic system, and keep all flames away.

Tank diagnosis



How to install a septic system

1 **Assemble all tools and equipment necessary for excavation**
The excavation tools you will need are a backhoe/excavator, shovel, laser level, PVC glue and PVC fittings, a hand saw and a course file.

2 **Be sure you are compliant with all local council and SA Health regulations and have obtained any necessary permits**
The permit process will probably include a test to determine the soil type and drainage field size you will need for your system. Once approval has been granted, you can begin installation.

3 **Plan for the flow to go downhill**
A gravity-fed system does not use any mechanical means other than gravity to discharge waste from the tank.

4 **Dig a hole big enough to set the concrete tank below ground**
Your septic tank will be divided into at least two compartments. The tank receives wastewater (the inlet area) and separates all solids from the liquid. The liquid (effluent) will pass out of the tank into the soakage area after approximately 24 hours.

5 **Place the tank into the hold on top of 75mm of 10-12mm screenings**
Using your spirit level, make sure the tank is facing the correct way and is level in the hole. There should not be any sharp rocks under the tank. Gently backfill the area around the tank with clean dirt, filling evenly on each side and ensuring that the tank will not roll from side to side in the hole. Once the tank is in place, you can install your saddle riser and increments, if needed. You should also start to fill the tank with water to prevent floating of the tank. This is where the tank lifts out of the ground.

Installation tips to ensure your absorption trench stays in good working order:

- Consider installing a dual trench system so trenches and soil areas can be rested alternately. Dual disposal areas should be switched every 12 months. They typically perform better and last much longer.
- Conduct proper soil tests to determine the type and size of absorption system you need. A reserve effluent application area should also be identified in case a new trench system is needed later.
- Build a small earthen wall (a small ridge about 15 cm high) that is longer than and uphill from, your trench area. This helps divert surface runoff water and reduces the load on your trench in wet weather.
- Plant small trees or shrubs downhill and away from your trench system to help absorb effluent. Water-loving and shallow rooted plants, such as tropical palms, banana palms, poplars, paperbark trees and wetland plants are good choices.

If your trench fails, please contact your local plumber or a septic system specialist.

Glossary

Absorption field
A designated area where effluent gets released into the soil. Natural soil processes, organisms and plants in the absorption field help to further purify the effluent before it enters the larger environment.

Effluent
The liquid that is discharged from a septic system or sewage treatment facility.

Greywater *(also known as sullage)*
Wastewater that comes from domestic laundry and or other washing areas (and sometimes kitchen sinks), but not from toilets or bidets (which is wastewater known as 'blackwater').

Septic system
Any type of sewage management system that stores, treats and/or discharges sewage on or adjacent to the premises on which it was generated.

Sewage
The waste matter from a premises that is normally discharged to a sewer.

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