Aerated Wastewater Treatment Systems (AWTS)

Owners Guide

While people living in sewered areas rarely think about what happens after they flush the toilet or drain the bath, people in un-sewered areas are responsible for treating and disposing of their own wastewater.

If your house is not connected to the sewer, you probably have a septic tank or aerated wastewater treatment system (AWTS) to treat the liquid waste, and an absorption field or irrigation area for disposal of the liquids.

This guide explains how the most commonly used Aerated Wastewater Treatment Systems (AWTS) work, and what you need to do to protect your family, your neighbours and the environment.

What is an AWTS and how does it work?

While an AWTS is designed to treat wastewater to a higher standard than a septic tank, most AWTS include a septic tank as the first stage in the treatment of the wastewater (ie waste from toilet, shower, bath, basin, kitchen and often laundry). The septic tank can either be a separate tank or incorporated into the larger AWTS. It is designed to store at least one days waste from an average 4 bedroom home with a maximum of 10 occupants. The electrical components and moving parts in an AWTS require regular servicing, and therefore they have a limited service life.

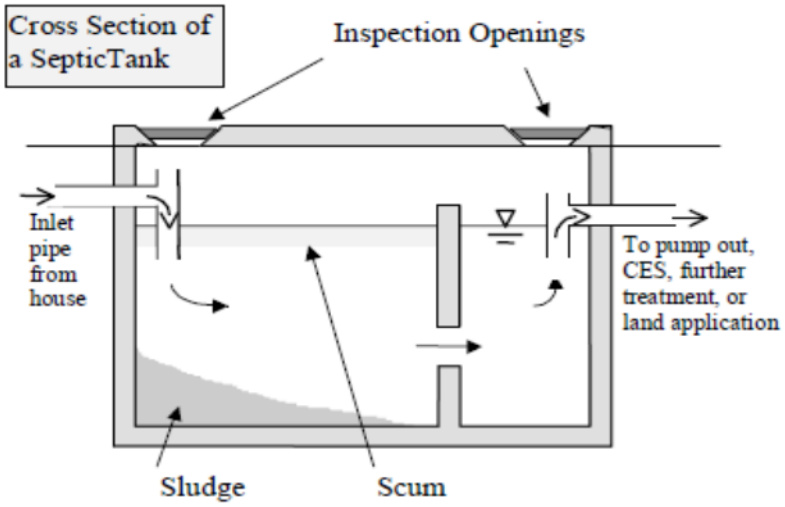
Three separate layers should form is the septic tank:

1. Solid matter settles to the bottom of the tank where naturally occurring bacteria convert the material into Sludge. These bacteria do not require oxygen to survive, and they produce methane gas, which is explosive if exposed to naked flame. These bacteria can be killed by strong chemicals such as bleach and sanitisers or caustic oven cleaners, so it is important not to flush excessive chemicals down the drain.

2. A scum layer, consisting of fat and grease forms on the surface of the water. This is normal and helps keep odours in, while keeping out oxygen. A vertical pipe or baffle at the inlet and outlet allows the scum to form.

3. The middle layer consists of clearer liquids than flow from the outlet of the tank each time wastewater enters the tank.

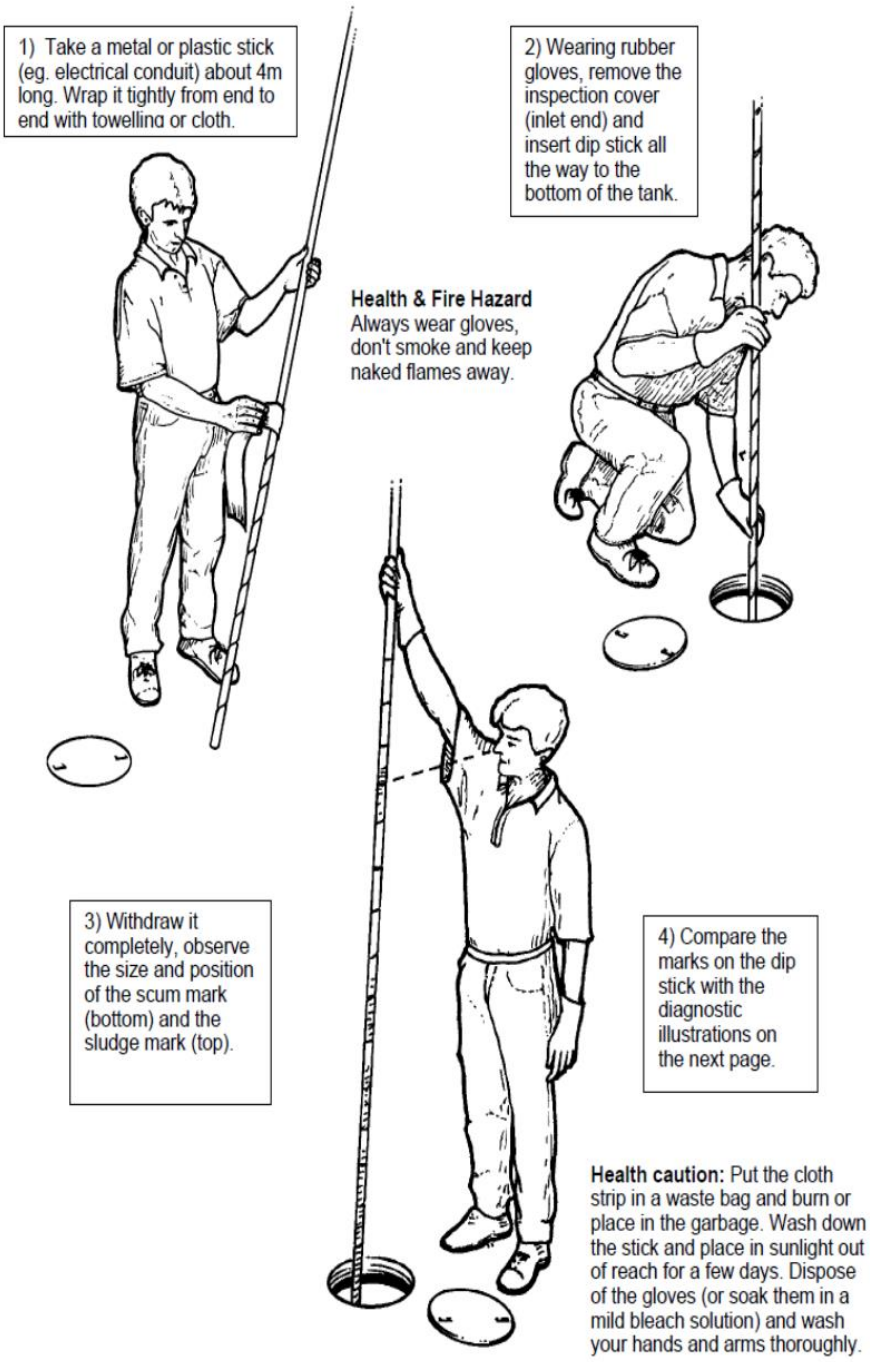
It is important that the sludge and scum layers do not become too thick as the liquid capacity will be reduced.



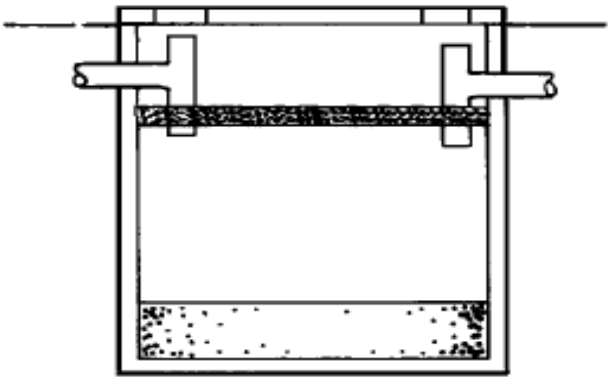
Servicing of Septic Tanks

Some Septic tanks may have a filter installed in the outlet. If It is not cleaned regularly, the house drains may become blocked. Follow the manufacturer's instructions and always wear gloves when cleaning the filter.

(1) How to check the sludge and scum depth of your tank

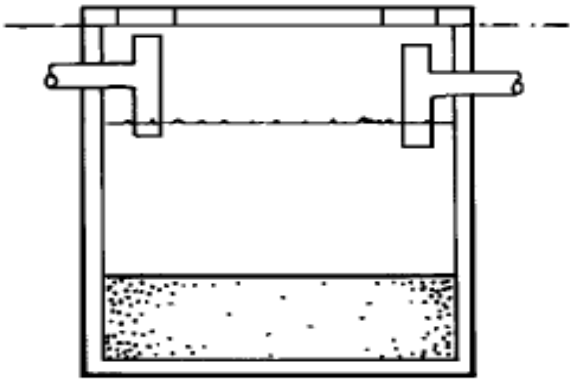


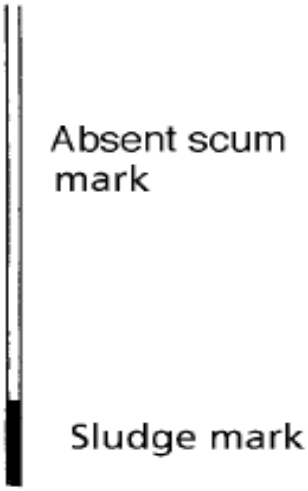
Healthy tank



Sick tank

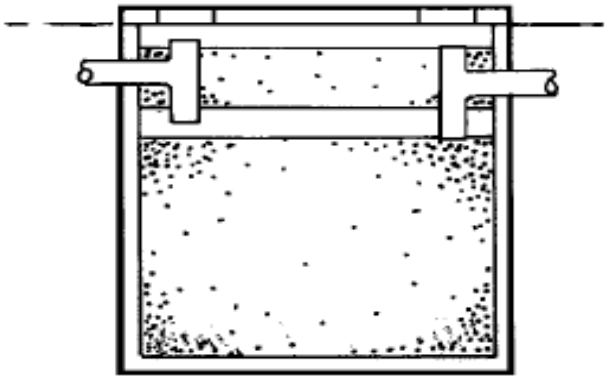
Bacteria have died.
Needs pumping out, filling with clean water and addition of lime.

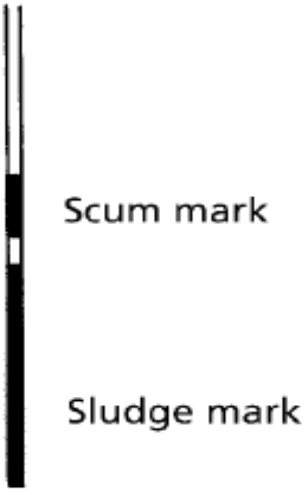




Sick tank

Needs pumping out and trench may be blocked or waterlogged or failed





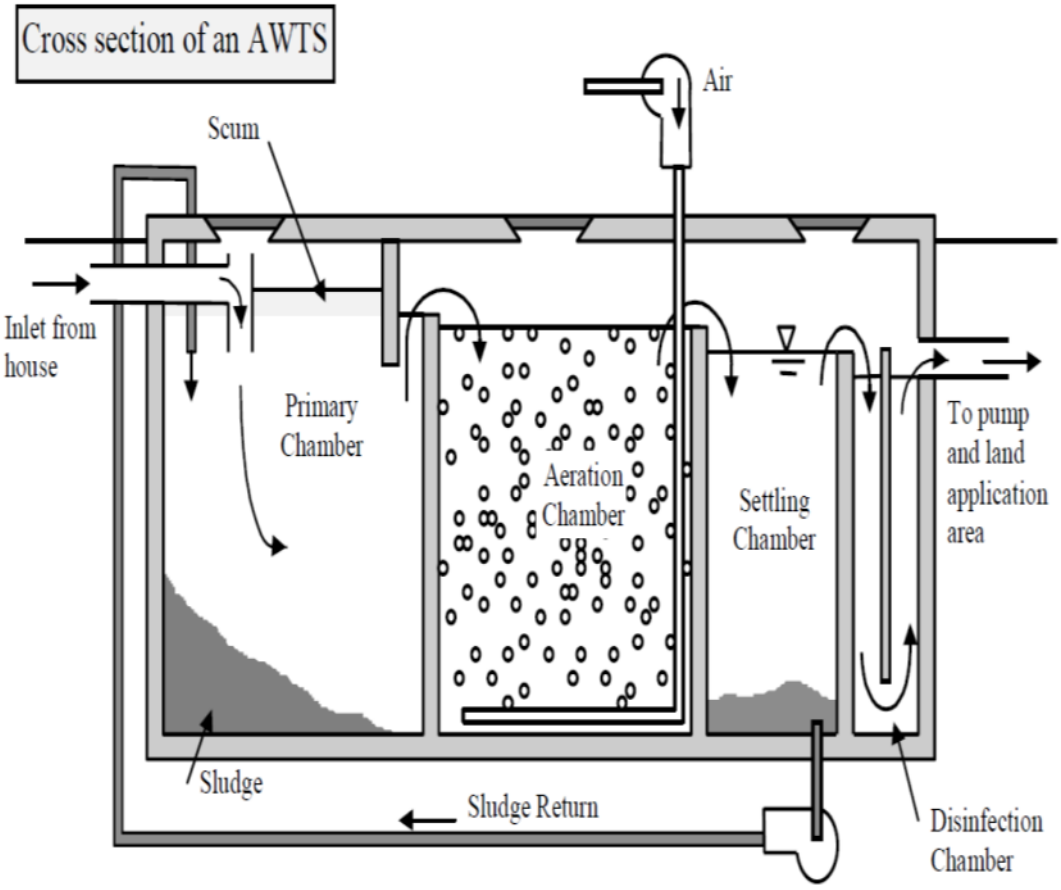
After Primary treatment in the septic tank the wastewater receives further treatment in the AWTS. These processes generally include:

1. Air is pumped into the wastewater in an aeration chamber. Naturally occurring bacteria in
2. the waste digest the organic matter, and give off Carbon dioxide.

2. Sludge from the wastewater is allowed to settle to the bottom of the clarification chamber.

3. The effluent then passes through a chlorine contact chamber (or Ultraviolet Light disinfection unit) where bacteria or viruses are destroyed.

4. The irrigation chamber is where a pump transfers the treated wastewater to the irrigation area.



One Tank System

1. Manufacturer's Responsibilities

The AWTS manufacturer must provide the owner/occupier with an Operation & Maintenance Manual that includes (but not limited to):

- An overview of the AWTS and intended use
- Warranty and service life
- Servicing requirements
- Trouble shooting and signs of failures
- A list of toxic substances / loads to be avoided
- Desludging requirements
- Safety information
- Spreading of hydraulic loads
- Alarm information and use restriction

2. Service Technicians Responsibilities

The service technician must carry out the prescribed servicing in accordance with the Conditions of system accreditation which generally include:

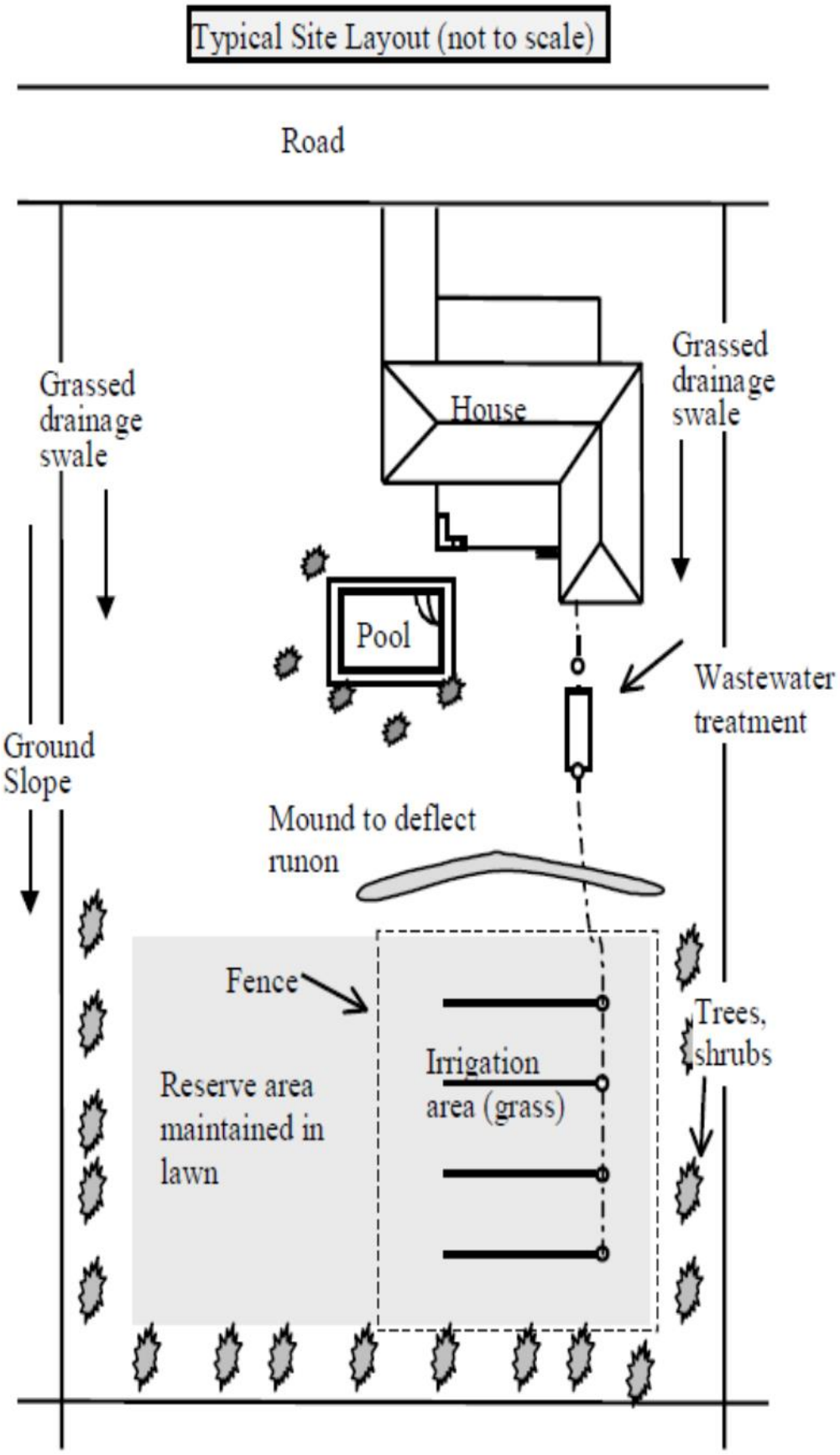
- Replenish the disinfectant (usually chlorine)
- Check pumps air blower, fan or venturi
- Check alarm system
- Check slime growth on filter media
- Measure Sludge depth in the primary and clarification chambers
- Check operation of sludge return
- On-site testing of free residual chlorine, pH and dissolved oxygen
- Check the Irrigation area
- Provide the owner/occupier and Council with a fully completed Service Report.

3. AWTS Land application Areas

Effluent from an AWTS has received advanced treatment and may be suitable for systems fail, the effluent may be a health risk to anyone who comes into contact with it. Drip irrigation or subsurface are preferred as they eliminate the risk of spray drift.

Owners must ensure that:

- The land application area/s are installed in accordance with conditions of Council's approval **(prior to occupation of a new home).**
- The installation complies with conditions of council's "approval to operate"
- Surface irrigation is not located in areas where contact with humans and/or domestic animals are likely to occur.
- Treated wastewater is not used to irrigate fruit or vegetable crops for human consumption.
- Domestic type garden hoses, taps, fittings, sprinklers and pipework are not used.
- Wastewater runoff does not enter adjoining properties or any watercourse (drain, creek, gully or river) causing water pollution.
- The size of the irrigation area, number and type of sprinklers or drippers is sufficient to prevent saturated soil conditions.
- Sprinklers produce coarse droplets and not a fine mist like aerosols that could be inhaled. The use of "micro-sprays" is not permitted.
- Purple pipe is used for all distribution lines, fittings and fixtures.
- Any modifications to the land application area must receive the prior approval of Council.


Typical Site Layout (not to scale)
Road
Grassed drainage swale
House
Grassed drainage swale
Pool
Wastewater treatment
Ground Slope
Mound to deflect runon
Fence
Trees, shrubs
Irrigation area (grass)
Reserve area maintained in lawn

Recommended Buffer Distances from Land

System	*Recommended buffer distances*
All land application systems	• 100 metres to permanent surface waters (e.g. river, stream, lake) • 250 metres to domestic groundwater well or bore • 40 metres to other waters (e.g. farm dams, intermittent streams, drainage channels etc)
Surface spray irrigation	• 6 metres uphill, and 3 metres downhill of driveways and property boundaries • 15 metres to dwellings • 3 metres to paths and walkways • 6 metres to swimming pools
Surface drip and trickle irrigation; Sub-surface irrigation	• 6 metres uphill, and 3 metres downhill of swimming pools, property boundaries and buildings
Septic tank absorption trench area	• 12 metres uphill, and 6 metres downhill of property boundary • 6 metres uphill and 3 metres downhill of swimming pools, driveways and buildings. • 3 metres to paths and walkways

USEFUL HINTS

Do's

- ✓ Only use laundry detergents that are low in Sodium. High levels of sodium in powdered detergents will reduce the life of land applications area and restrict plant growth (refer Lanfax website – ww.lanfaxlabs.com.au)
- ✓ Conserve Water. The more water used, the more wastewater you have to treat and dispose of. Install shower flow restrictors, use front loading washing machine & avoid small loads
- ✓ When purchasing or moving to a property that is not connected to sewer, always check the on-site sewerage system and seek advice from a licensed plumber, council or an experienced AWTS technician
- ✓ Understand how your system works, and seek immediate help if drains block, odours are evident, or water is ponding in the absorption field or irrigation area
- ✓ Keep a record of inspections, services, desludging, filter cleaning etc
- ✓ Make tenants aware of their responsibility to maintain the wastewater treatment and disposal system
- ✓ Keep grass mown in the irrigation area and remove grass cuttings for mulching
- ✓ Divert roof water and surface water away from absorption fields & land application areas
- ✓ Use natural cleaning products such as bi carb soda and vinegar
- ✓ Use kitchen sink strainers and lint filters on laundry outlet

Don'ts

- Never flush antibiotics or other medications down the drain. They can destroy the bacteria that break down the waste.
- Don't pour fats oils or grease down the sink
- Don't flush excessive amounts of chemical such as bleach, nappy sanitizer, caustic chemicals, corrosive fluids, pesticides down the drain. These can also destroy the bacteria that break down the waste.
- Don't use garbage disposal units or put food scraps down the drain
- Don't flush nappies, tampons, condoms or another large items down the toilet as they don't break down
- Don't drive or park motor vehicles on a land application area or absorption field
- Don't allow livestock on the irrigation as they can damage absorption trenches
- Don't drink water from a bore located within 250 metres of an absorption field or land application area as it may be contaminated with faecal matter.
- Don't plant large trees in or near the land application area as they can shade the disposal area and the roots can damage the absorption trenches.

Useful Resources:

https://www.olg.nsw.gov.au/public/about-councils/laws-and-regulations/onsite-sewage-management-septic-tanks/

https://www.health.nsw.gov.au/environment/domesticwastewater/Pages/default.aspx

https://www.greaterhume.nsw.gov.au/Your-Greater-Hume-Council/Building-and-Development/Building-and-Renovation/Plumbing-Approvals-and-on-site-Sewage-Management-Systems

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