Operation and Maintenance Manual

Jan 2020

Septic Tank & Absorption Trench

This manual was adapted from "The Easy Septic Guide" produced by the Department of Local Government.

For more information, call 9847 6666 or visit

hornsby.nsw.gov.au

HORNSBY SHIRE COUNCIL

DOES YOUR HOME HAVE AN ONSITE SEWAGE MANAGEMENT SYSTEM?

If your home is not connected to the sewer and you have any kind of onsite waste disposal system, this manual is for you. It shows how to manage your sewage within the confines of your property so that your family and the community are protected from disease and pollution.

Failing sewage management systems can:

- cause a serious health threat to family and neighbours;
- degrade the environment, especially waterways;
- reduce the value of your property; and
- be very expensive to repair.

Continued maintenance of your system will ensure efficient operation and will help minimise failure.

You might like to keep this manual somewhere handy. It contains lots of useful information on trouble-shooting, repairing and looking after onsite sewage management systems effectively.

In the back are log sheets for you to keep track of your system maintenance jobs and inspections.

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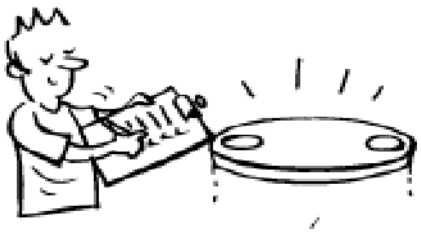
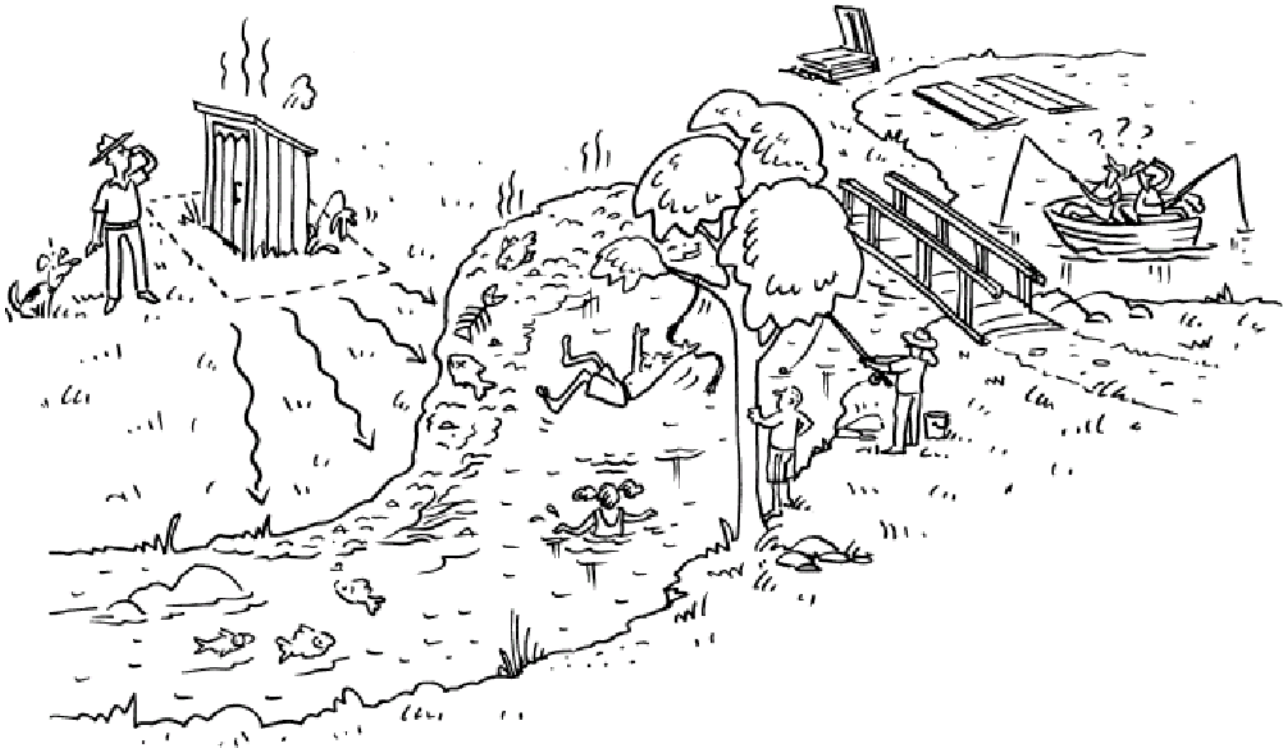


PART 1: SEPTIC SAFE

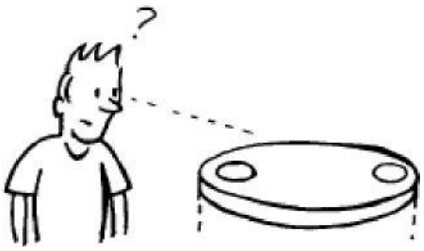
We are all starting to feel the impact of poorly managed onsite sewage management systems in our growing society. In 1997 several cases of hepatitis and a major crisis in the local oyster industry were attributed to leaking septic systems around Wallis Lake in NSW. Effluent leaking from sewage management systems can also have more insidious effects, seeping into and contaminating groundwater supplies, and mixing with the water in our favourite swimming holes without us even being aware of it. There is a growing crisis facing areas where old sewage systems predominate.

This manual is designed to help onsite sewage management system owners prevent pollution and health problems caused by poorly functioning systems.



Badly maintained onsite sewage management systems can cause environmental problems up to 50km downstream.

PART 2: WHAT YOU NEED TO KNOW



NSW state government laws now require that every onsite sewage management system is registered. You may be wondering why this is necessary.

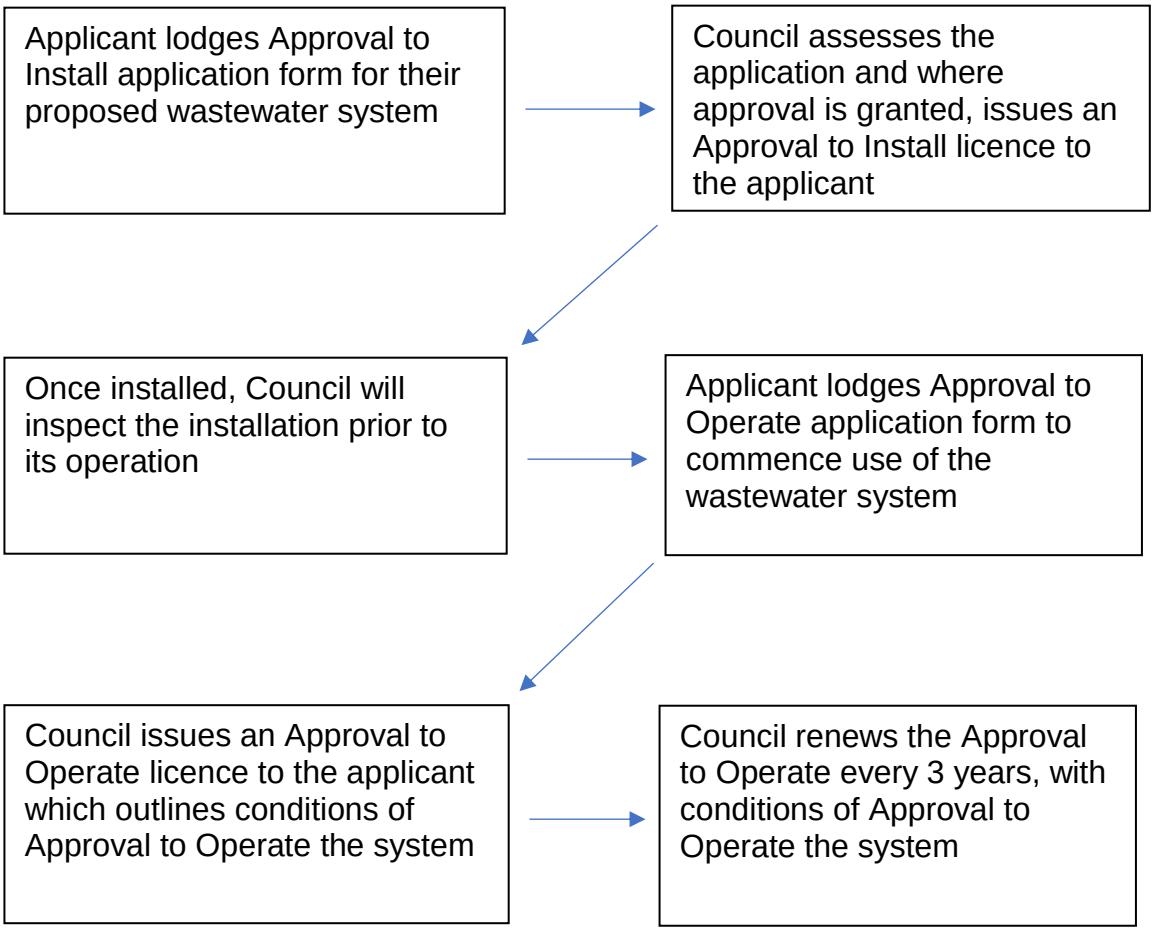
As a sewage management system owner, you are responsible for ensuring your system is working properly and not posing a health risk to your family and the wider community.

This manual shows you how to keep your system safe and well maintained.

The Approvals Process

Council is required to manage sewage pollution in a systematic way. This means looking at the potential impact of onsite systems through the assessment and approval of licences permitting a wastewater system to be installed and also operate.

HOW THE COUNCIL APPROVALS PROCESS WORKS



Owners are Responsible for:

- Ensuring the tank does not leak.
- Getting the system fixed promptly if it is not functioning efficiently.
- Ensuring the system is fully maintained.
- Ensuring it is inspected regularly.
- Getting the tank desludged when it becomes too full to process the flow going into it.
- Obtaining Council approval for onsite sewage management system installation and Operation.

Council is Responsible for:

- Regulating the installation and operation of sewage management systems under the *Local Government Act 1993.*
- Maintaining a register of all systems under the *Local Government (General) Regulation 2005*.
- Providing advice to system owners who need assistance in fixing or maintaining their system.
- Inspecting systems that are reported to Council that may be failing or operating poorly.

PART 3: HEALTHY ONSITE SEWAGE MANAGEMENT SYSTEMS

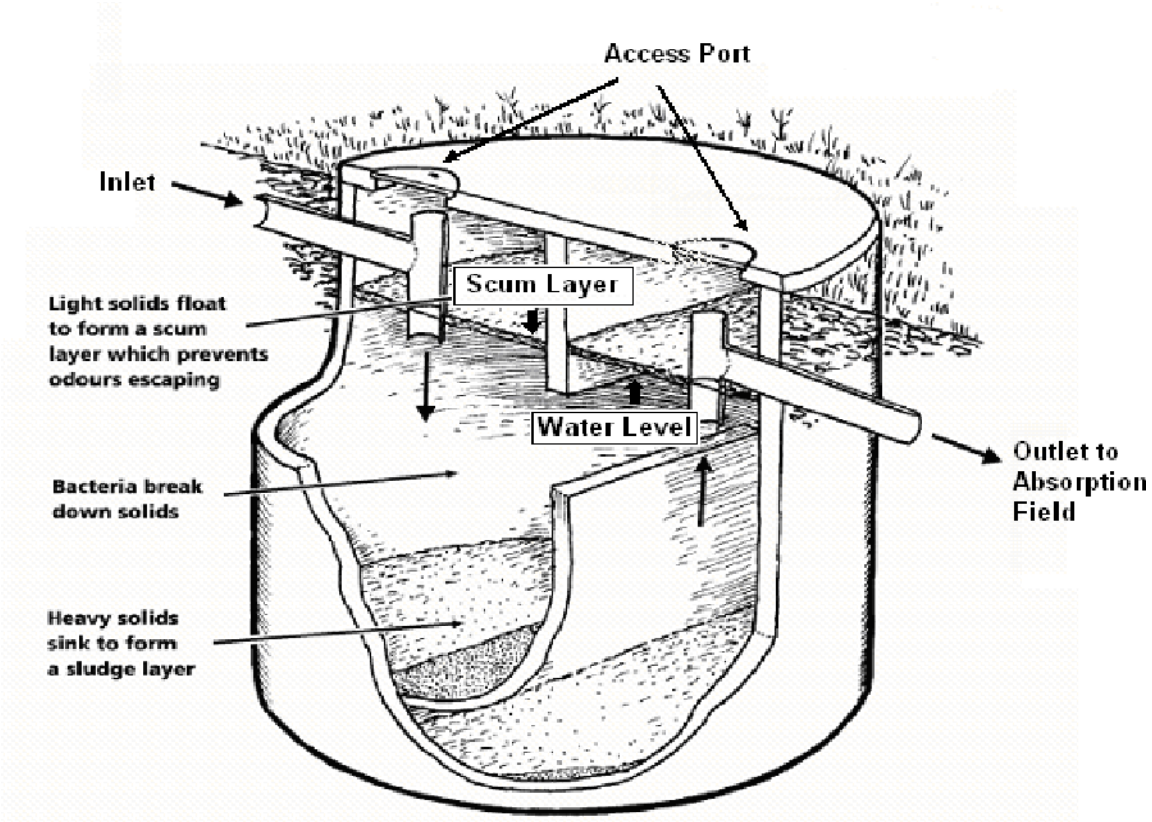
IS YOUR SEWAGE MANAGEMENT SYSTEM HEALTHY?

CLUES

- ✓No odours outside the house
- ✓Toilet flushes easily and quickly
- ✓Water goes quickly down drains
- ✓Tank has been pumped out in the past five years
- ✓Tank has been checked in the past two years
- ✓System is not too small for wastewater load from house
- ✓No rampant weed growth downhill of the absorption trench

HOW AN ONSITE SEWAGE MANAGEMENT SYSTEM WORKS

Healthy septic systems are almost like a living ecosystem, where the right bugs thrive in the right proportions to keep the system working.

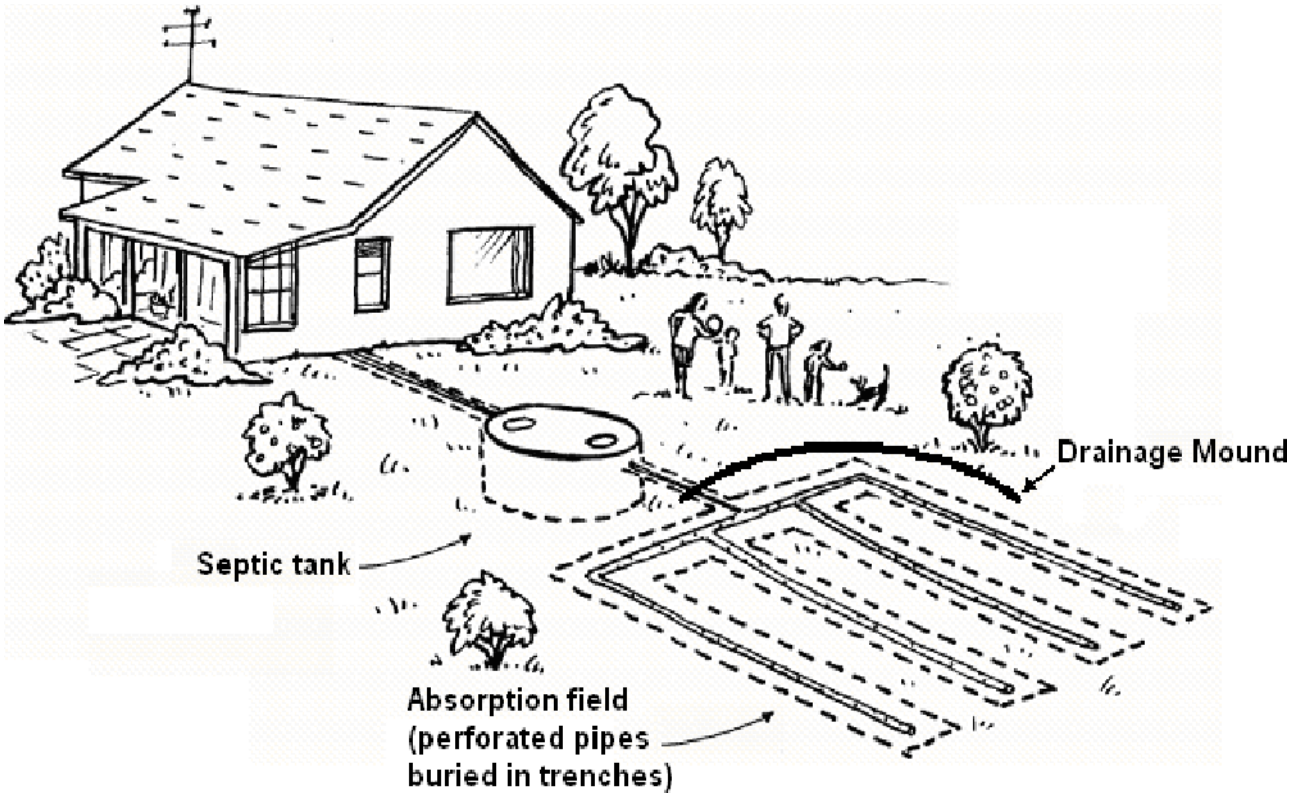


HOW YOUR SEPTIC TANK WORKS

The standard septic tank in some ways is like a big stomach. It is fed through an inlet pipe with **sewage** from the toilet and **greywater** from the washing machine, kitchen sink and bathroom. What goes into the tank is usually a mixture of human waste, water, washing detergents, chemicals and other materials. This wastewater is digested by a host of different bacteria. When the system gets too full, some of the wastewater flows out of the tank into an absorption trench.

Once in the tank, the wastewater separates into a floating **scum** layer composed of fats and grease, and a **sludge** layer of solids on the bottom, with a **clear** layer in between. The scum helps prevent odours escaping and stops air entering. The wastewater continually flows slowly out of the tank through an **outlet pipe** and into an **absorption field**, usually a trench.

The wastewater at this stage may still contain dissolved pollutants such as salt, phosphorous, viruses and bacteria. Once in the absorption field, soil bacteria breaks down pollutants such as phosphorous, nitrogen, faecal bacteria, and metals. It is important not to overwhelm the soil with too much wastewater. Eventually the water evaporates from the soil, is absorbed by the soil or is taken up by plants growing on the absorption area.



PART 4: UNHEALTHY ONSITE SEWAGE MANAGEMENT SYSTEMS.

IS YOUR SEWAGE MANAGEMENT SYSTEM SICK?

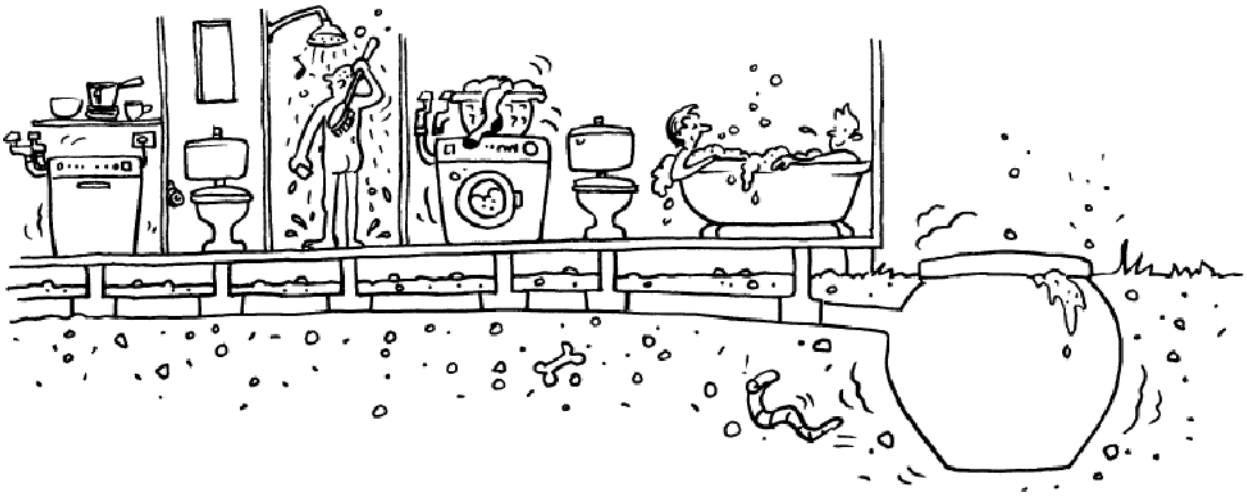
CLUES

- ✓ The air around it smells – usually like rotten egg gas.
- ✓ The ground is damp or soggy downhill of the absorption field.
- ✓ There's lots of dark green grass growing around the absorption area.
- ✓ The toilets are slow to clear or keep backing up and overflowing.
- ✓ There are lots of weeds growing down slope of the absorption field.

COMMON CAUSES OF SEPTIC TANK PROBLEMS

Overuse of water

Sewage management systems do not respond well to shock loads. In the case of a trench system, for example, three or four loads of washing completed in quick succession will flood the tanks and ultimately flood the absorption trench. Additionally, with all systems, shock loads result in the transfer of solids through to the absorption trench.



Detergents and chemicals going into the system

The bacteria within the system can't break down detergents and chemicals and may in fact be killed by them. This stops the tank being able to digest effluent and may result in odour. Hospitals and nursing homes reliant on onsite sewage management systems often inadvertently introduce substances such as antibiotics and other drugs into the system.

Compaction

The movement of vehicles, pedestrians or animals over trench areas before, during or after construction will have an impact on the operation of the absorption field. Adequate treatment of effluent can only be achieved in uncompacted, well-draining soils.

SEPTIC TANK AND ABSORPTION TRENCH TROUBLE SHOOTING

Desludging

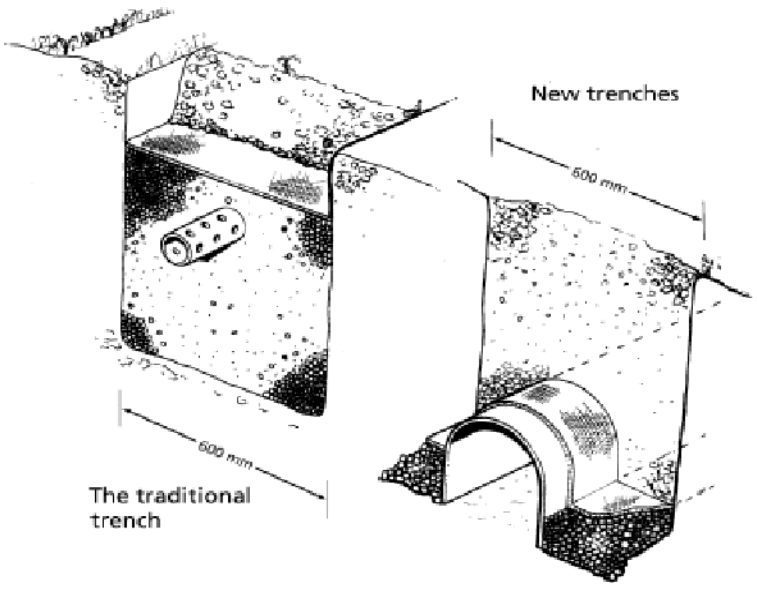
If your system is smelly or the toilet is backing up, this is often a sign that the tank is overdue for a desludge. The tank needs desludging if the levels of scum and sludge are high. You can check levels by using the technique described in Appendix Two.

An onsite sewage management system should be inspected every 1-2 years and pumped out every 3-5 years. Tanks need desludging because as the level of the solids rise in the tank the wastewater has less time to settle properly and so solids flow into the absorption field and clog it up. How often you desludge depends on how large the tank is and how many people use the system. Check with Council for guidelines. It is important that you do not wait for the system to fail before having the tank desludged – once a system has failed desludging will not necessarily make it work again.

When contractors desludge tanks, a small volume of effluent is left in the tank to ensure tanks “don’t float”. Bacteria levels in the tank will be restored as soon as wastewater enters the system again. It may be helpful to add a handful of lime to the tank to adjust the pH level.

Trench Warfare

The absorption trench is where the effluent flows after it leaves the tank. A perforated pipe is laid in a gravel trench and covered with soil. Effluent seeps through the holes in the pipe and is absorbed by the soil or evaporates from it. Bacteria within the soil treats the pollutants and pathogens in the effluent.



The failure of the trench is a common cause of problems with onsite sewage management systems. Trenches usually fail if the holes in the pipes that run through the trenches get blocked up, or if the effluent is unable to evaporate or drain away. **You can tell if the trench has failed because the area will be soggy, smelly and covered with profuse grass growth.**

Disposal trenches should last 15-25 years, however if they are not built and maintained properly the trench life can be reduced to as little as two years.

TIPS TO AVOID TROUBLE

Absorption Trenches

What can you do to fix a failed trench? Often, if effluent is surfacing, trench reconstruction is called for. It's best to contact Council's Officers to seek advice. In the meantime, here are some do's and don'ts s to keep your trench working well.

Do:

- Ensure that the proper soil tests are done to determine how long your trench should be.
- Plant small trees down-slope of your trench to absorb effluent, provided they are water-loving and shallow rooted.
- Consider installing an alternative trench. This allows the soil to rest.
- Install stormwater diversion devices upslope of the trench to divert runoff water around the actual disposal area. This will help to reduce the load on your trench in wet weather.
- Install trenches in a sunny, well exposed area.
- Fence off the trench area from hoofed animals, and cars
- Mow grass over surface of absorption area regularly and remove grass from area once cut. This will allow the nutrients to be taken up more readily.
- Contact Council for advice prior to extending trench areas, or reconstructing trenches.

Do Not:

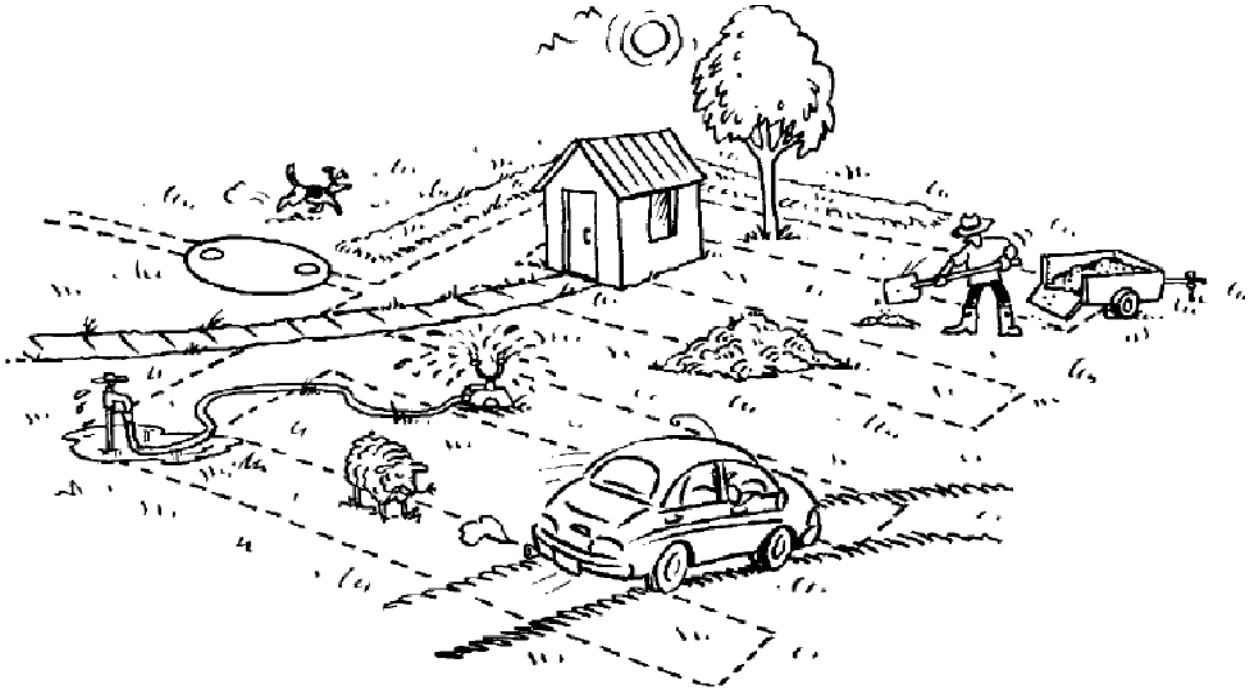
- Do not level diversion contour mounds
- Do not build structures or plant trees that will shade the disposal area – it should be in full sun to help aid breakdown and evaporation. Small trees should be planted at least 5 m away, large trees should be 20m away; otherwise the roots will get into the trench and pipework.
- Do not flood the disposal area with sprinklers or hoses.
- Do not drive cars over disposal area or graze animals there. Any movement of vehicles over the trench may break the pipework or the dome cover and compress the soil. A small fence will let visitors know which areas to avoid.
- Do not cover trenches with concrete, pavers etc.
- Do not store loads of soil or other materials on your disposal area.
- Do not place extra topsoil on top of your trench to "soak up" overflowing effluent if the trench is failing. If there is water pooling over the trench, it's best to call a licensed plumber and have it checked.

Magic enzymes ... do additives work?

There are many septic system additives such as enzymes and cleansers available on the market. The truth is, these are not necessary and may harm the system. A well-maintained system which has the correct amount of wastewater entering the system for its capacity should not need these additives. No amount of additives will help a tank if what it really needs is to be pumped out.

I've Done Everything I Can and I Still Have Problems

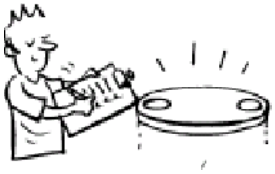
If you have attempted all suggested trouble shooting tips and you are still having problems with your system, it may be time to replace it. Contact Council's Officers for information on available system types, and for advice on what system will suit your needs.



Don't treat your absorption area like this!

PART 5: HOW TO MAINTAIN A HEALTHY SYSTEM

EASY TIPS



If you don't mind planning ahead a little, you can save thousands of dollars in maintenance costs to your septic system ... here's how. Many of these tips help reduce the volume of water going into the septic system and avoid putting in any chemicals which could interfere with how well the system does its job.

In the House

- Repair leaking taps and toilets as soon as possible to reduce water load on system.

In the Laundry

- Do laundry in small doses - this will avoid flooding the system with large amounts of water at one time.
- Use low-phosphorous detergents (see Appendix Five). Phosphorous is a major pollutant of waterways and causes algal blooms.
- Avoid blockages in the system by installing a lint filter on the washing machine.
- If you've got a blocked drain, use boiling water or an electric eel to clear the line, rather than pouring down caustic soda.
- Use front loading washing machines, as they use less water.
- Wash only full loads. Hand washing of small items saves water.
- Use liquid detergents, or highly biodegradable powder detergents if liquid is not available.

In the Kitchen

- Use a sink strainer - this prevents particles of food getting into the septic system and slowing down the process.
- Don't pour oils and fats down the sink - they solidify and may block the system. Instead, put them into a container such as a milk carton and throw out with the rubbish.
- Wash only full-loads in the dishwasher.
- Install low-flow taps.
- Don't use a garbage disposal unit – no food products should be disposed of in the sewage management system.
- Use a minimal amount of drain cleaners.

In the Bathroom

- Install a low-flow shower head to save water.
- Consider installing a dual flush toilet.
- Minimise the use of commercial cleaners - these can interfere with the bacterial breakdown in the tank. Instead, try using baking soda, or a very mild detergent solution
- Don't flush anything down the toilet that could clog up the system, e.g. grease, tampons, condoms, paper towels, plastics, or cat litter. These items will quickly fill up the tank, decreasing its efficiency and making it necessary to pump out more often.

- Verify that the toilet isn't leaking by placing a small amount of food dye in the cistern. If it appears in the toilet bowl within 30 minutes, your cistern is leaking. Contact a plumber to have this fixed.

Around the Tank and Trench Area

- Avoid planting trees within 4 metres of your septic tanks. Roots could, in the future, create cracks in the tank sides.
- Keep water from roof downpipes away from the trenches. If the field is flooded, the soil won't be able to cleanse the wastewater coming through from the septic system.
- Don't connect 'clean water' outlets, such as stormwater drains, to tanks.
- Add filters to the tank outlet to extend life of trenches.
- Only plant grass around the absorption field - roots from larger plants such as trees and shrubs may clog and damage the absorption field.
- Don't drive or park over any part of the system. This can compact soil and crush the system.
- Grow nutrient-tolerant plants near the absorption field.
- Check baffles and T-junctions within tanks. Replace as necessary (material can be purchased from nearby hardware stores).
- Keep tanks clear of vegetation.
- Ensure the tank is sealed and that all air vents are covered with gauze, to prevent mosquito and insect access to the tank.
- Don't build any structure, including house additions and pools, within 6 metres of your absorption trench.

MANAGING GREYWATER AND GREASETRAPS

Septic systems may also have a separate tank for greywater, the wastewater which comes from the kitchen, laundry and bathroom. There may also be a greasetrap, for collecting oil and grease from the kitchen. Studies have shown that greywater can contain pollutants which are harmful to health and the environment. Subsequently, all greywater must be directed to a septic tank or trench, or alternatively disinfected before being utilised for irrigation or reuse. To keep all systems operating as efficiently as possible:

- Clean the greasetrap every six weeks. Carefully remove all solids, ensuring that preventative measures are taken (i.e. wearing gloves). These solids can be buried or disposed of in the general garbage stream.
- Clean the holding/collection well and pumps at least twice a year. Engage a licensed plumber to assist.
- Spread your washing over a few days, to reduce the volume of wastewater flowing through the tanks and to the disposal field.
- Use strainers in the sink to prevent food going into the system.
- Wipe grease out of pans before washing.
- Use hot water to wash dishes to prevent buildup of grease in the sink.

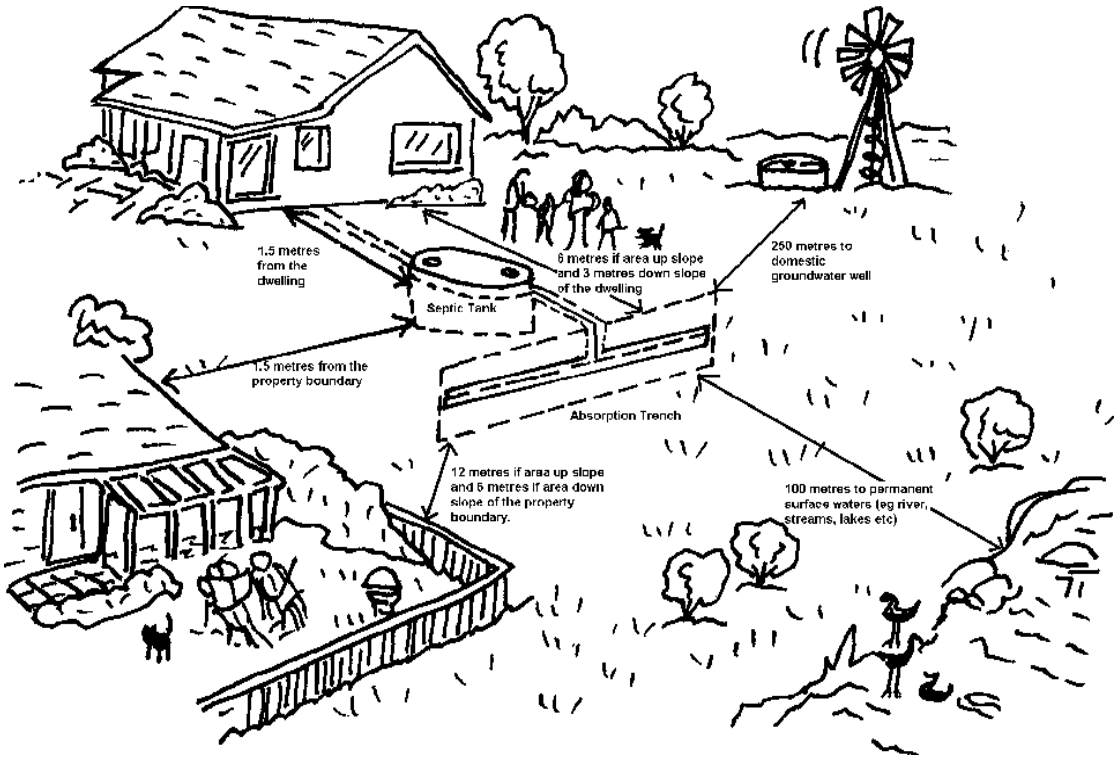
IDEAS FOR LANDSCAPING AND IRRIGATION

How the area around a septic system is managed is just as important as how the system itself is maintained. Planning and planting the right kind of vegetation can help keep the system in tip top condition.

When choosing what to plant, consider which plants will do best in the local soil type and which ones can cope best with regular daily doses of nutrient-rich wastewater. These plants must be able to cope with nutrients such as sodium, chloride, nitrogen and phosphorous. Many Australian natives can't cope with high levels of these nutrients. Generally speaking, the best plants to grow on the disposal area are a mix of summer and winter grasses. Appendix Three has a list of suitable vegetation to be planted down slope of the trench area.

HOW TO PROTECT GROUNDWATER

Groundwater (usually from bores) has been tapped for decades, but only recently have we started to understand how vulnerable it is to contamination from surface activities. Pesticides can find their way into groundwater, as can contaminated water leaking from septic systems. Therefore, it is vital to locate the system a safe distance from wells, bores, creeks and lakes and to keep it well maintained.



Systems functioning inadequately can leak medicines, pesticides, paints, varnishes, thinners, bacteria and viruses into the local groundwater. Some chemicals, even in small amounts, can be dangerous both to the environment and public health. Even if the system itself is functioning properly, these contaminants can still find their way into the groundwater under certain geological conditions. Fractured bedrock and shallow groundwater tables may allow these bacteria and viruses to be transported very rapidly and could contaminate nearby watercourses.

APPENDIX ONE

The DO IT YOURSELF CHECK ONCE A YEAR

30-minute Septic CHECK-UP

1. Check the level of the tank, wear rubber gloves
(see Appendix 2).

2. Check that the filters (if installed) are clean and working.

3. Check the absorption trench area is not soggy, doesn't smell and doesn't have prolific grass growth.

4. Check all drains and toilets in the house are working properly.

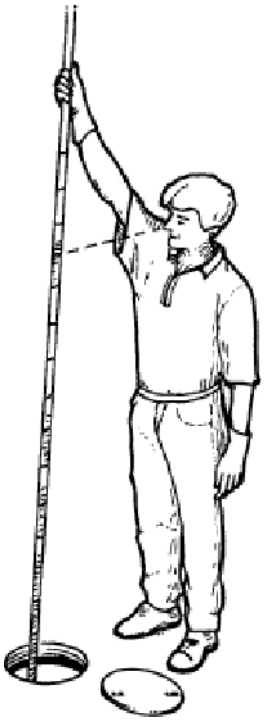
APPENDIX TWO

How to diagnose the health of your septic tank

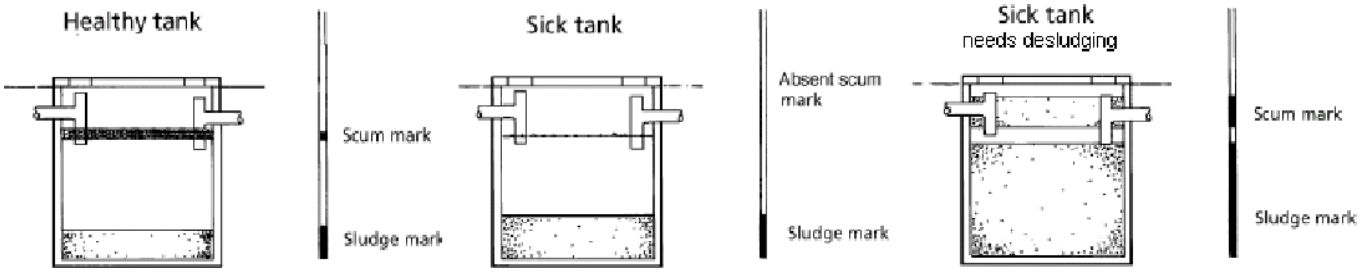
1) Take a stick or length of electrical conduit about 4 metres long. Wrap it tightly With old toweling or cloth.

2) Wearing rubber gloves, insert it all the way to the bottom of your tank.

3) Withdraw it completely, noticing the size and position of the scum mark and the depth of the sludge.



4) Compare the marks on your stick to the diagnostic illustrations below.



APPENDIX THREE
What to plant in irrigation areas

These species have been selected as plants that will tolerate a moderate degree of moisture and nutrients. Most would be unsuitable for areas of permanent water logging.

SPECIES	COMMON NAME	HEIGHT (m)
LARGE TREES		
Acacia elata	Mountain Cedar Wattle	20
Acmena smithii	Lillypilly	15
Ceratopetalum apetalum	Coachwood	15
Eucalyptus robusta	Swamp Mahogany	25
Eucalyptus saligna	Blue Gum	30
Syncarpia glomulifera	Turpentine	25
Melaleuca quinquenervia	Paperbark	10
Glochidion ferdinandi	Cheese Tree	15
SMALL TREES		
Acacia decurrens	Green Wattle	10
Acacia parramattensis	Parramatta Wattle	8
Acacia schinoides		
Allocasuarina tortulosa	Forest Oak	8
Backhousia myrtifolia	Grey Myrtle	6
Callicoma serratifolia	Black Wattle	5
Casuarina glauca	Swamp She-Oak	10
Ceratopetalum gummiferum	Christmas Bush	6
Hakea salicifolia	Willow-leaved Hakea	5
Melaleuca ericifolia	Swamp Paperbark	6
Melaleuca lineariifolia	Snow-in-summer	8
Melaleuca styphelioides	Prickley-leaved Paperbark	10
Tristaneopsis laurina	Water Gum	10
SHRUBS		
Acacia longifolia	Sydney Golden Wattle	3
Austromyrtus tenuifolia	Narrow-leaf Myrtle	1
Baeckea imbricata	Heath Myrtle	1
Baeckea linifolia		2
Baeckea virgata		2.5
Bauera rubiodes	Dog Rose	1
Callistemon citrinus	Crimson Bottlebrush	2
Callistemon linearis	Narrow-leaved Bottlebrush	2
Dillwynia floribunda	Parrot Pea	1.5
Kunzea capitata		1.5
Leptospermum polygalifolium	Lemon-scented Tea Tree	2.5
Leptospermum trinervium	Tea Tree	3
Lomatia myricoides	River Lomatia	4
Rapania variabilis	Mutton Wood	3
Synoum glandulosum	Scentless Rosewood	3

VINES

Hardenbergia violacea	False Sarsparilla	
Hibbertia dentata	Twining Guinea Flower	
Hibbertia scandens	Golden Guinea Flower	
Cissus antarctica	Kangaroo Grape	
Cissus hypoglauca	Native Grape	
Kennedia rubucunda	Dusky Coral Pea	
Morinda jasminoides	Jasmine Morinda	
Pandorea pandorana	Wonga Wonga Vine	

FLAXES/RUSHES

Dianella caerulea	Blue Flax Lily	0.5
Lomandra longifolia	Mat Rush	1
Juncus usitatus	Common Rush	1

FERNS

Adiantum aethiopicum	Maidenhair Fern	0.4
Blechnum cartilagineum	Gristle Fern	1
Calachlaena dubia	False Bracken Fern	1.5
Christella dentata		0.5
Cyathea australis	Rough Tree Fern	4
Cyathea cooperi	Straw Tree Fern	4
Doodia aspera	Rasp Fern	0.3
Hypolepis muelleri	Harsh Ground Fern	1

GROUNDCOVERS

Blandfordia nobilis	Christmas Bells
Lobelia alata	Guinea Flower
Oplismenus sp.	Basket Grass
Viola hederacea	Native Violet
Wahlenbergia gracilis	Native Bluebell

APPENDIX FOUR

Maintenance record sheet

	CONTACT	COMMENTS
SYSTEM INSPECTION		
DATE:		
TANK DESLUDGE		
DATE:		
APPROVAL TO OPERATE		
DATE:		
REPAIRS		
DATE:		

APPENDIX FIVE

Phosphorus Levels in Laundry and Washing Detergents

Laundry Products

Sample Name	Powder or Liquid	Manufacturer	%Total Phosphorus by Weight
Bushland Laundry Powder	P	Bushland Products Pty Ltd	<0.05
Savings	P	GJ Coles & Coy P L	<0.05
Velvet	P	L & K Rexona Pty Ltd	<0.05
Aware	P	Bionomics Australia Pty Ltd	<0.05
Blue Advance	P	Preservene	<0.05
Excel Blue	P	Wolseley Castle	<0.05
BIO Z	P	KAO	<0.05
Down to Earth	L	Samuel Taylor	<0.05
Country Homestead Wool mix	L	Kiwi Brands Pty Ltd	<0.05
Greencare Liquid	L	Valvalene Products	<0.05
Savings Laundry Detergent	L	GJ Coles & Coy Pty Ltd	<0.05
Aura	L	Samuel Taylor	<0.05
Puren	P	Puren Australia	<0.05
Pental	P	Pental Soap Products Pty	<0.05
Lux	P	L & K Rexona Pty Ltd	<0.05
Hurricane	P	Wolseley Castle	<0.05
Amway Kool Wash	L	Amway	<0.05
No Frills Soap	P	Franklins Limited	<0.05
Earths Choice	L	Earths Choice Pty Ltd	<0.05
Drive Power Liquid	L	L & K Rexona Pty Ltd	<0.05
Dominant Booster	P	Dominant Pty Ltd	<0.05
Dominant Laundry	P	Dominant Pty Ltd	<0.05
Black and Gold	L	Amalgamated Aust. Wholesalers	<0.05
Omo Micro	L	L & K Rexona Pty Ltd	<0.05
Fund Raiser – Clean River	P	MTG Trading Associates	<0.05
Alpha Plus Pre-Wash Soaker	P	Tri Nature	<0.05
Alpha Plus Laundry Detergent	L	Tri Nature	<0.05
Ark Concentrate Laundry Liquid	L	Ark Australia	<0.05
Ark Concentrate Laundry Powder	P	Ark Australia	<0.05
Green Choice Washing Powder	P	Southern Cross Packaged Goods	<0.05
Chux – Superbase	L	NationalPak Limited	<0.05
Bushland Laundry Detergent	L	Bushland Products Pty Ltd	0.06
Aware Concentrate	P	Bionomics Australia Pty Ltd	0.09
Preservene Soap	P	Preservene	0.12
Amway SAS Super	L	Amway	0.20

FURTHER INFORMATION

Organisations

Hornsby Shire Council, Regulatory Services Branch, Phone 9847 6829, or email compliance@hornsby.nsw.gov.au

NSW Department of Health www.health.nsw.gov.au

NSW Office of Local Government www.olg.nsw.gov.au

Books

- On-site Sewage Management for Single Households. Environment and Health Protection Guidelines. February 1998. NSW Government.
- AS1546:2017 Onsite Domestic Wastewater Treatment Units and AS1547:2012 Onsite Domestic Wastewater Management.
- The Green Consumer Guide. John Elkington and Julia Hailes. Penguin Books 1988.
- AS1546:2008 Onsite Domestic Wastewater treatment units' septic tanks.

Internet sites

NSW Health search for Wastewater and Accredited Systems
www.health.nsw.gov.au

Local Government Act 1993
www.legislation.nsw.gov.au

Local Government (General) Regulation 2005
www.legislation.nsw.gov.au

NSW Government Office of Local Government

www.olg.nsw.gov.au