

Appendix I

Wastewater Systems Maintenance Guidelines

Auckland Regional Council Technical Sheet I-1

HOW TO AVOID PROBLEMS WITH ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS – Key Maintenance Requirements

Domestic wastewater is wastewater generated in domestic dwellings, institutions, commercial and residential facilities, which predominantly originates from bathrooms, kitchens, and laundries. On-site disposal and is the discharge of wastewater to land within the property boundaries of its place of origin. The traditional on-site treatment system consists of a septic tank and a soil absorption field. A septic tank system includes all tanks, beds, drains, pipes, fittings, appliances and land used on the site in connection with the system. The septic tank through which effluent/domestic wastewater is passed, is the primary stage in any treatment process. It allows solid:liquid separation and retention of the settled solids and floating scum and the settled solids that then undergo anaerobic bacterial digestion.

To be effective septic systems must be adequately sized to accommodate the wastewater flows from the buildings being served and have been properly installed and maintained. The longer the resident time within the septic tank the better for providing optimum adequate separation and to reduce resuspension of solids when there are new plug flows into the tank. Tanks of 4 to 5 days peak flow volume are ideal.

Many conventional septic tank systems fail due to a variety of causes. A key reason is that they are undersized for wastewater flow volumes from modern facilities, connection of garbage grinders, and lack of maintenance. Lack of maintenance can lead to build up of sludge and scum in septic tanks, which can result in lack of separation in the tank, solids carryover, increased odours of raw sewage, clogged absorption fields. Problems with the land disposal area can also be a result of hydraulic overloading caused by increased occupancy and/or greater water use.

Malfunctioning on-site wastewater treatment and disposal systems can contribute to environmental pollution and can become potential health risks. Ignoring system maintenance requirements will lead to signs of system failures which can then lead to further significant problems such as health risks from pathogens, odours, contamination of groundwater and surface water, attraction of flies and rodents, and decreased property value. Proper maintenance of septic systems not only lessens environmental pollution and aesthetic value of a property, but also lessens potential costs that could be incurred when a damaged system needs to be repaired or replaced.

MAINTENANCE AND ENHANCEMENT OF EXISTING ON-SITE SEPTIC SYSTEMS:

All Septic Tank owners are strongly encouraged to:

- **PUMP-OUT SEPTIC TANK**
 - Check the respective depths of sludge, liquid wastewater and scum in the septic tank at least once per year.
 - Pump out the tank once the combined depth of sludge and scum occupies 50% of the tank depth. For a standard household, this should be in the order of once every 3 to 5 years. (This may be required more frequently where houses are fully occupied and/or there is no outlet filter and for tanks serving public toilets, and less frequently, up to once every 5 years or longer, where occupancy is low or intermittent, and/or where an effective outlet filter has been maintained).
- **INSTALL AND MAINTAIN AN OUTLET FILTER**
 - In the Auckland region, these are required to be installed on all new septic tank systems and are **STRONGLY** recommended to be retrofitted to old septic tanks. They are often the most effective and cheapest option for improving the performance and life of a wastewater system. They ensure all solids of 3mm diameter or greater are retained and biodegraded within the septic tank, and do not access or clog the soakage lines. Supplier details can be obtained from your local council).
 - Check the biomat build up on the filter regularly, at least once per month, and clean it as required to avoid excessive build up affecting filter performance.
 - To clean the filter, remove it from the septic tank and hose down, discharging the rinse water back into the septic tank, or elsewhere into dense vegetation where it will not cause any nuisance, and reinstate the filter into the septic tank.

- **AVOID USE OF TOXIC SUBSTANCES**
 - Non-biodegradable chemicals, e.g. don't use drain cleaners or disinfectants.
 - Sanitary napkins, other hygienic products, dental floss, kitty litter, etc.
 - Oil and fat flushed into the system.
 - Detergents (toxic detergents and other household cleaners should be avoided as they kill the bacteria in the septic tank).
 - Do not use or minimise use of garbage disposal units.
 - Compost food scraps or put them in the rubbish.

- **MINIMISE WATER USAGE / IMPROVE WATER CONSERVATION**
 - Particularly important on sites where area available for wastewater disposal and the system's capacity constrained, where any seepage or run off could access natural water and affecting water quality or where disposal areas may be accessed by children.
 - Install water reduction fixtures on water outlets and/or low flush toilets (This is particularly important on small sites and/or where there is high occupancy in the dwelling where the system disposal system capacity is threatened).
 - Do not leave taps running for long periods.
 - Install push button taps on public facilities.
 - Fix water leaks.
 - Do not connect rain gutters or stormwater drains to septic tanks.

- **ENHANCE EVAPOTRANSPIRATION AND DISCOURAGE ACCESS TO DISPOSAL AREAS**
 - Densely plant the disposal area, maintain plantings and check regularly for even wastewater distribution and even plant growth.
 - Where the disposal area is grassed, it should be regularly mowed to optimise growth and prevent the grass from becoming rank.
 - Do not pave the disposal area.
 - Use planting, low chain, signage and/or a small fence to discourage access in public areas.
 - Use signs, low fences and plantings to prevent any vehicle or stock access.

Records should be kept of all maintenance undertaken on the wastewater systems, particularly when contractors are involved. This includes tank pump outs, tank inspections, and access openings. **Do not** add or alter any part of your system without Council approval.

Auckland Regional Council Technical Sheet I-2

ON-SITE WASTEWATER SEPTIC TANKS.

KEY DOS & DON'TS FOR THE HOUSEHOLDER

All wastewater (toilets, shower, sinks, laundry) produced on the site is discharged to an on-site wastewater treatment and land disposal system. The wastewater treatment system is a fragile biological process and therefore requires care by all residents.

You can help maintain an effective wastewater system on your site, by ensuring no toxic chemicals are put down the sinks or toilets and use only environmentally friendly cleaning products. Toxic chemicals, drugs (e.g. antibiotics) kill the bacteria in the treatment system. These organisms are required to treat wastewater and if healthy populations are not maintained, the system will fail resulting in poorly treated wastewater discharging into the soil, odours, increased maintenance requirements and eventually the expense of upgrading the system. You should also minimise your water use as much as possible to protect the system from overloading.

Below is a list of hints for caring for your wastewater system.

DO

- **Minimise your water use.**
- **Minimise the length of showers.**
- **Use showers in preference to baths.**
- **Use bio-degradable soaps and cleaners**
- **Check all your cleaning products to see if they are suitable for septic tanks.**
- **Minimise use of strong toilet cleaners.**
- **Scrape all plates and dishes to remove as much fat and grease as possible. Clean with paper towels and place in the rubbish.**
- **Report/fix all leaking taps as soon as possible.**
- **Use phosphate free/low phosphorus based laundry detergents.**

DO NOT

- **Don't pour any toxic/strong chemicals (paint, oil, grease, paint thinners, pesticides down any drains).**
- **Don't flush any products down the toilet, other than standard toilet paper.**
- **Don't discard any drugs down the sink or toilet.**
- **Don't use strong cleaners.**
- **Don't tip chlorine cleaners or disinfectant based products into the system.**
- **Don't use huge amounts of cleaners.**
- **Don't use chemical drain cleaning products.**
- **Don't do all your laundry on one day.**
- **Don't install in-sink garbage grinders. If a grinder exists, don't discharge high volumes of scraps, especially carbohydrates or fats/oils down it.**
- **Don't put coffee grounds down the sink.**

Auckland Regional Council Technical Sheet I-3

ON-SITE WASTEWATER PACKAGE TREATMENT PLANTS.

KEY MAINTENANCE REQUIREMENTS TO BE UNDERTAKEN BY SYSTEM MAINTENANCE CONTRACTOR

Wastewater system owners are strongly encouraged to enter into a maintenance contract with the system supplier or other contractor experienced in wastewater treatment system operation and maintenance.

The minimum system maintenance requirements for the most basic on-site treatment and disposal systems include but are not limited to the following 3 monthly actions:

- **REMOVE AND CLEAN** (hose down) the effluent outlet filters from the outlet of the septic tank and in the outlet from the treatment system or the following rising main. Ensure appropriate protective clothing is worn and the rinse water is discharged to ground, ideally densely vegetated where it will not run-off.
- **MEASURE THE SLUDGE DEPTH.** This can be done by removing septic tank lid/vent and poking a stick into the tank and noting the change in density of material at the liquid:sludge layer interface within the tank. If the layer is more than one third total tank depth (this equates to more than 0.7m from top of a 2m septic tank), the tank needs to be pumped out.
- **CHECK ALL ELECTRICAL PARTS.** In particular check and test that all visual and audible alarms for pump chamber and aerator blower are working.
- **CLEAR THE AERATOR** by lifting the aerator out of the septic tank and checking for any material that would cause drag. Clean the aerator by hosing it.
- **FLUSH ALL THE DISPOSAL LINES** if the system consists of pressure compensating drip irrigation lines, remove the flush valves and flush with fresh water from the hose, then reinstall the valves.
- **WALK OVER THE DISPOSAL AREA AND LOOK CLOSELY FOR ANY SIGNS OF FAILURE.** This can include uneven vegetative growth, uneven effluent distribution, any wet patches and/or signs of effluent ponding, or clogging or channelling of the soils. In the even any such problems are identified, contract the installer and/or a maintenance contractor to remedy the situation. Also consider measures to reduce water usage.

Auckland Regional Council Technical Sheet I-4 ON-SITE WASTEWATER TREATMENT & DISPOSAL SYSTEMS. GENERAL PROBLEM SOLVING GUIDE

The following is a list of suggested actions in the event of actual problems with your system:

Problem	Solution
Odour	<ul style="list-style-type: none"> ● Insert activated carbon filters into the septic tank vents. ● In the case of an aerobic treatment plant, contact supplier and ensure system is sufficiently aerated.
Septic tank bacterial breakdown	<ul style="list-style-type: none"> ● Use soft soap solutions or biodegradable cleaners for cleaning. ● Use only detergents low in alkaline salts, phosphorous, and chlorine levels. ● Avoid heavy use of detergents and the use of disinfectants and other household cleaners as they affect the bacterial action within septic tanks. ● Do not discharge any pharmaceutical medication or disinfectants into the wastewater system ● Minimise discharge of food waste and fats and oils into kitchen sink/ garbage grinders
Septic tank overflow/ odours	<ul style="list-style-type: none"> ● Engage drain layer/contractor to investigate any blockages immediately. ● Pump out the septic tank. ● Decrease water usage until problem is remedied. ● Mitigate by installing high level alarms, 24 hour storage in new tanks and 12 hour storage in existing tanks as a warning system. ● Mitigate initial problems by removing inspection covers annually to check the depth of the scum mat and sludge. The tank should be cleaned out when combined depth of scum and sludge occupy half the tanks volume or at least every 3 years. (Tea leaves & other kitchen wastes should be composted as they are slow to break down, filling your system more rapidly).
Blocked filter	<ul style="list-style-type: none"> ● Cleaning is required. (This often only involves a quick hose down of the filter. It should then be undertaken regularly at a frequency of once every 2 weeks to 3 months depending upon the type of filter in place).
Clogged disposal system	<ul style="list-style-type: none"> ● Pump out the tank and the disposal lines. ● Inspect and/or consider reconstruction of disposal system and/or individual lines. ● Upgrade the system to improve treatment system such as a pressure compensating drip irrigation system.

Problem	Solution
Overflow on disposal field	<ul style="list-style-type: none"> ● Pump out septic tank and reduce water usage in immediate term. ● Increase the disposal field area. ● Re-locate the disposal area further away from the house and trees or on the northern side of the house to increase evaporation (i.e. provide good exposure to sun and wind). ● Ensure the wastewater disposal area is densely planted to increase evapotranspiration. ● Restrict/avoid access to the field.
Excessively high volume wastewater discharge / Unknown usage	<ul style="list-style-type: none"> ● Install a water meter. ● Install water reduction fixtures. ● Decrease water usage. ● Increase the disposal field area.
Rainfall run-off causing water-logging of disposal field	<ul style="list-style-type: none"> ● Check that no roof downpipes discharge to gully traps or on land where it could drain onto the disposal area. ● Install stormwater cut-off drains upslope of disposal area (such drains need to be maintained over time).
Potential impact on groundwater/surface water	<ul style="list-style-type: none"> ● Ensure all wastewater drainage lines, and irrigation pipes are located at least 15m from any watercourse. ● Regular system maintenance. ● Regular pump outs. ● Install outlet filters. ● Clean filter. ● Avoid the use of phosphorous based household detergents.
Continuing Unresolved Problems	<ul style="list-style-type: none"> ● Engage a consultant experienced in wastewater treatment and disposal systems. ● Upgrade the whole system. ● Enter into a maintenance contract with a wastewater systems contractor/drainlayer/system supplier with a high level of experience in wastewater treatment and disposal system maintenance and operation.
ARC Discharge Consent Required	<ul style="list-style-type: none"> ● Contact ARC Enviroline on 09 3662000

WHO TO CONTACT IF YOUR SYSTEM IS FAILING OR YOU OBSERVE A FAILING SYSTEM:

- Engage an environmental or geotechnical consultant experienced in wastewater treatment and disposal systems.
- An Environmental Health Officer at your local council.
- ARC Enviroline on 09 3662000.
- ARC 24 Hour Water Pollution hotline on 09 377 3107 for water pollution (or ARC Wastewater Discharge Compliance Officer on 09 3662000 (working hours).

Auckland Regional Council Technical Sheet I-5

HOUSEHOLD CLEANING CHEMICALS.

EFFECTS ON DISPOSAL SYSTEM RECEIVING SOILS

Use of many cleaning chemicals in facilities served by on-site disposal systems can result in high concentrations of the constituents in those cleaning agents being discharged into the receiving soils. These chemicals and constituents have a massive impact on the quality and condition of the receiving soils over time.

Many of the chemicals can disrupt soil structure and decreased hydraulic conductivity while others can act as bactericides, destroying the essential microorganisms required to achieve the high level of biodegradation in the treatment and disposal systems. This then increases the potential environmental impacts of the contaminants in the receiving environment.

Improved wastewater treatment technologies can only assist so much in reducing the composition and concentration of some cleaning agents, not the strong acids and strong alkaline agents.

The following matters need to be considered when using cleaning agents in a domestic situation:

- Laundry powders are often extremely high in sodium which will destroy the salt balance in the soils. Check the labels.
- Greywater consisting of washing machine wash cycle discharge water can have an alkaline pH of up to 10. Although this will be diluted in a septic tank, it will impact on microorganism populations and also lead to effects on soils structure
- Wastewater flows from dishwashing machines can have an impact on wastewater treatment systems, not only in terms of wastewater flow volumes and additional organic waste, but more importantly in terms of the strong cleaning chemicals.
- Highly corrosive cleaners (such as toilet and drain cleaners) that have precautionary labels warning users to minimise direct contact, are an indication that they can adversely affect the wastewater treatment system. Up to 1 cup of bactericides such as bleach can be sufficient to impact on all the microorganisms/bugs in a septic tank, severely affecting tank performance for some time.
- All cleaning chemicals must be used with care and in all cases, the less that is discharged, the better this will be for the receiving soils in the long term.
- The best solution of optimising the long term effectiveness of the soils within a wastewater disposal field is to minimise the use and discharge of strong cleaning chemicals at source.

Auckland Regional Council Technical Sheet I-6

ON-SITE WASTEWATER TREATMENT & DISPOSAL SYSTEMS: SUBSTITUTES FOR HOUSEHOLD CLEANING CHEMICALS

Use of the following readily biodegradable substitutes for common potentially harmful household cleaning chemicals will reduce the stress on a septic system, significantly enhance the performance of the whole system and increase the life of the disposal field, while reducing the potential effects of the receiving soils.

GENERAL CLEANERS:

Use soft soap cleaners and bio-degradable cleaners and those low in chlorine levels.

AMMONIA-BASED CLEANERS:

Instead sprinkle baking soda on a damp sponge. For windows, use a solution of 2-Tbs white vinegar to 1-litre of water. Place the mixture into a spray bottle.

DISINFECTANTS:

In preference use Borax: ½ cup in 4-litres of water.

DRAIN DECLOGGERS:

Avoid declogging chemicals. Instead use a plunger or metal snake, or remove and clean trap.

SCOURING CLEANERS AND POWDERS:

Instead sprinkle baking soda on a damp sponge or add 4-Tbs baking soda to 1-litre warm water. It's cheaper and won't scratch.

TOILET CLEANERS:

Sprinkle on baking soda, then scrub with toilet brush.

LAUNDRY DETERGENT:

Choose one with a zero phosphate content and low in alkaline salts (in particular, a low sodium level) and no chlorine.

Use of the following alternatives to standard chemicals is less likely to be of any consequence to the performance of the on-site wastewater system, but are included for completeness only:

CARPET/UPHOLSTERY CLEANERS:

Sprinkle dry cornstarch or baking soda or commercial dry cleaning spray, then vacuum. For tougher stains, blot with white vinegar in soapy water.

FURNITURE/FLOOR POLISHES:

To clean, use oil soap and warm water. Dry with soft cloth. Polish with 1 part lemon juice to 2 parts oil (any kind) or use natural products with lemon oil or beeswax in mineral oil.

METAL CLEANERS:

Brass and copper: scrub with a used half of lemon dipped in salt. Stainless steel: scouring pad and soapy water. Silver: rub gently with toothpaste and wet cloth.

OVEN CLEANERS:

Sprinkle salt on drips, then scrub. Use baking soda and scouring pads on older spills.