



RESPECT



INNOVATION



INTEGRITY



TEAMWORK



EXCELLENCE

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1.0 Background

There are approximately 920 unsewered sites within the Kiama LGA. Whilst most of the systems designed to cater for these sites perform satisfactorily, some do not. Failure to maintain Onsite Sewage Management Facilities (OSMFs) in other LGAs over recent years has resulted in outbreaks of hepatitis, impacts on oyster and fishing industries and the contamination of rivers, streams and lakes. The reasons why these systems do not operate satisfactorily vary, but are often due to system failure, poor management or inappropriate installation.

OSMFs that are not operating satisfactorily often result in effluent entering neighbouring properties, street gutters and waterways. This situation represents a significant public health and environmental risk. We periodically receive reports from the community concerning effluent discharges into the environment.

We recognise the risk that these systems can pose to the community and the need for changes to be made to current policies and strategies, so that an effective and sustainable approach is developed. Whilst we endeavour to deal with these issues through sound policy and education, current legislation gives us authority to issue penalties, orders and instigate prosecutions, where applicable.

In addressing this issue, the NSW State Government introduced legislation to regulate the operation and performance of OSMFs. Council, as the local approving and regulatory authority for the majority of activities that impact on the environment, clearly has a responsibility in effectively managing OSMFs under its control.

We are also responsible for developing specific assessment programs to help improve management of these systems. An inspection/monitoring program exists for the Kiama LGA, aimed at reducing the environmental and public health risks posed by such systems. This approach targets performance (determined through inspections), maintenance, system design and community education, as a means of maintaining public health and protecting the environment.

2.0 The Kiama Local Government Area and applicable land

This document is our guideline for the regulation, operation and management of sewage in unsewered areas. It applies to all properties on building entitled land within the Kiama Local Government Area (LGA) that is unable to connect to the reticulated sewerage system of Sydney Water Corporation.

Kiama LGA is located approximately 120 kilometres south of Sydney and constitutes an area of approximately 260km².

The Kiama LGA has a population of approximately 21,000, located throughout a number of small towns and villages – much of which is within rural and semi-rural areas. The Municipality has three major towns (Kiama, Gerringong and Jamberoo) and several smaller villages. Most of the major centres are serviced by Sydney Water operated reticulated sewerage systems, however many of the fringing rural areas rely on individual OSMFs.

Whilst the majority of locations within the Kiama LGA are located in sensitive environments (close to waterways, vegetation of significant value or the ocean), only a small component actually lie within Sydney Drinking Water Catchment identified land (e.g. Knights Hill, Carrington Falls, Kangaroo Valley). WaterNSW has specific requirements and approvals relating to the installation, modification and operation of OSMF's in the Kiama Municipality that are located within the Sydney Drinking Water Catchment area. These requirements are outlined in *"Designing and Installing Onsite Wastewater Systems – A WaterNSW Current Recommended Practice"* (2019).

We require connection to sewer where premises are located within 75 metres of a reticulated sewer main of Sydney Water Corporation.

3.0 Purpose

The purpose of this guideline is to:

- Update the previous On-Site Sewage Management Strategy which was adopted 19 October 2004;
- Protect and enhance the quality of public health and the long term environment of the Kiama Municipality by pursuing best practice in on-site sewage management;
- Facilitate procedures to ensure that onsite sewage management within the LGA is environmentally sustainable and provide assistance in maintaining public health standards;
- Identify Council strategies to reduce the impact from OSMFs on the environment and, public health and public amenity;
- Outline Council's role and programs in managing, monitoring and regulating OSMF's;
- Identify the legislative framework and requirements for OSMFs;
- Provide information on Section 68 Applications for new, modifications and upgrades of OSMFs;
- Integrate and coordinate issues relating to onsite sewage management with Council management plans and Strategic Planning strategies.

4.0 Objectives

The objectives of this guideline are:

- Define our role in managing, regulating and monitoring on-site sewage management;
- Define landowners and occupiers' roles in operating and management of on-site sewage management facilities;
- Facilitate procedures, including matters such as issues of consent to install on-site sewage management facilities, issue of Permits to Operate and duration of Permits, upgrading and enhancements to existing systems, the plotting of locations within catchments of approved and permitted on-site sewage management facilities and the framework of the audit process;
- Encourage community ownership, awareness and acceptance of on-site sewage management facilities as a critical issues affecting public and environmental health;
- Maintain and enhance the local environment, through:
 - a) The promotion of ecologically sustainable development and appropriate reuse of natural resources;
 - b) the protection of regional waterways for drinking, ecological, recreational and aesthetic purposes;
 - c) the protection of groundwaters;
 - d) the maintaining of public health standards;
 - e) the maintenance and improvement of public amenity;
 - f) the prevention of vegetation and land degradation.

5.0 Scope

This guideline applies to all OSMFs that do not discharge to a public sewer system, and/or are not regulated by the Environment Protection Authority (EPA) or NSW Health.

Owners of properties in unsewered areas where an OSMF is being operated are legally required to submit an application to Kiama Council (“*Activity Application to Operate a Sewage Management Facility*”). Similarly, any property owner proposing to install an OSMF (or alter one), needs to make application to Council (see Section 8 for specific details).

The following systems are all classified as OSMFs under this Guideline:

- a) pump-out septic tanks;
- b) septic tanks with absorption trenches or evapotranspiration beds;
- c) aerated wastewater treatment systems (AWTS);
- d) composting toilets;
- e) chemical closets;
- f) greywater treatment systems;
- g) holding tanks and collection wells used for the receipt and storage of effluent (other than those intended to be emptied immediately);
- h) waste treatment devices that mechanically re-circulate sewage through a bed of sand (or other “*amended soil*” system) to produce treated effluent;
- i) waste treatment devices that receive and treat sewage before discharging effluent to a common effluent drainage scheme (located wholly onsite);
- j) any other kind of sewage management facility specified in a notice published in the Government Gazette by the Director General.

6.0 Legislative Framework

Our charter under the Local Government Act 1993 is to “*properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible and in a manner that is consistent with and promotes the principles of ecologically sustainable development.*” The Local Government Act also requires us to adopt a strategic approach to all of their activities. This includes the management of sewage disposal in areas that are not connected to a reticulated sewerage system.

6.1 Local Government Act 1993

Under Part C of Section 68 of the Local Government Act 1993, the installation, operation or alteration of an onsite sewage management facility (OSMF) requires council approval.

The Local Government Act 1993 also requires that any Section 68 application for the installation and operation of an OSMF, takes into account the principles of ecologically sustainable development (incorporating intergenerational equity).

Under Order No.24 of Section 124 of the Local Government Act 1993, a premises or proposed development located within 75 meters of a sewerage system of Sydney Water Corporation is required to be connected to the system by gravity, pumping or other means we consider suitable.

6.2 Local Government (General) Regulation 2021

The Local Government (General) Regulation 2021 sets out the requirements for accreditation of domestic type of OSMF systems that can only be installed with our approval for the purpose of storage and treatment of sewage.

Domestic grey water diversion system is defined as an activity under this regulation requiring prior Council approval, unless exempt and compliant with specific operational requirements.

Thus regulation also specifies matters for consideration in determining applications for installation, operation and alteration of sewage management facilities and includes operational performance standards that must be met when the facility is being used.

6.2.1 NSW Health Accreditation Requirements

Under Clause 40 and 41 of the Local Government (General) Regulation 2021, a local council must not approve the installation of certain sewage management facilities, unless the facility has been accredited by the NSW Department of Health.

Clause 40 also provides a list of the types of accredited and approved OSMFs suitable for domestic use for premises occupied by a maximum of 10 persons, or where the average flow of sewage is less than 2000 litres per day.

The key NSW Department of Health Accreditation Guidelines for OSMFs includes the following:

- a) Sewage Management Facility Vessel Accreditation Guideline (2016), which includes septic tanks, collection wells, septic closets, greywater tanks, common effluent drain (CED) pretreatment tanks and sewage ejection pump stations;
- b) Secondary Treatment System Accreditation Guideline Sewage Management Facility, Sewage Treatment Accreditation Guideline (incorporating AWTS, sand filters, reed beds) (2018);
- c) Waterless Composting Toilets (WCT) Accreditation Guideline (2010);
- d) Greywater Reuse in Single Domestic Premises (2000);
- e) Domestic Greywater Treatment Systems Accreditation Guidelines (2005).

Accreditation does not include the plumbing to or from the septic tank or other OSMF, the land application system or the final disposal method. We consider the provisions of the Plumbing Code of Australia and relevant Australian and New Zealand Standards, site assessments and recommendations from the Office of Local Government.

Similarly, accreditation does not apply to prototype models under test or development, or if the facility is specifically designed for a particular premises or one that is designed by an owner for installation on their own premises.

6.2.2 Performance Standards for Operation of an OSMF

Each site and its proposed or existing sewerage system must be considered on its own merit. The OSMF must be appropriate for the long term use on the site and must be operated to meet the following performance standards as specified in Clause 44(1) of the Local Government (General) Regulation 2021. These include:

- a) prevention of the spread of disease by micro-organisms;
- b) prevention of the spread of foul odours;
- c) prevention of the contamination of water;
- d) prevention of the degradation of soil and vegetation;
- e) discouragement of insects and vermin;
- f) ensuring that persons do not come into contact with untreated sewage or effluent (whether treated or not) in their ordinary activities on the premises concerned;
- g) minimisation of any adverse impacts on the amenity of the premises and surrounding lands;
- h) if appropriate, provision for the reuse of resources (including nutrients, organic matter and water).

The OSMF must also be operated in accordance with relevant operating specifications and procedures and to allow the removal of any sewage (and by-product of any sewage) in a safe and sanitary manner in accordance with Clause 44(3).

Further conditions of approval in relation to the operation of OSMFs outlined in Clause 45 of the Local Government (General) Regulation 2021 are outlined below:

- a) The sewage management facilities used in the operation of the system must be maintained in a sanitary condition and must be operated in accordance with the relevant requirements of this Regulation.
- b) A sewage management facility used in the operation of the system must not discharge into any watercourse or onto any land other than its related effluent application area.
- c) The conditions (if any) of any certificate of accreditation issued NSW Health in respect of the plans or designs for any components of the sewage management facilities must be complied with.
- d) The person operating the system of sewage management must provide details of the way in which it is operated, and evidence of compliance with the relevant requirements of this Regulation and of the conditions of the approval, whenever the council reasonably requires the person to do so.

6.3 *Environmental Planning and Assessment Act 1979 and Regulation*

The Environmental Planning and Assessment Act (EP&A Act) 1979 and the Environmental Planning and Assessment Regulation 2000 identify criteria and procedures for the assessment of certain activities identified and defined as “*Designated Development*”.

“*Designated Development*” is defined as development for which a development application is to be submitted to Kiama Council in conjunction with an Environmental Impact Statement (EIS). A list of developments and criteria which are classified as “*Designated Development*” can be found in Schedule 3 of the Environmental Planning and Assessment Regulation 2000.

If an OSMF exceeds the threshold criteria detailed in Clause 29, Schedule 3 of the EP&A Regulation 2000, then a Development Application and supporting Environmental Impact Statement (EIS) must be lodged with the consent authority. The preparation of the EIS is required to be carried out in accordance with the requirements of the Director General of the NSW Department of Planning.

The Development Application and the supporting EIS will be assessed in accordance with the provisions of the EP&A Act and Regulation.

The provisions of Section 4.15(1) of the EP&A Act require that a consent authority take into account all relevant “*matters for consideration*”, including sub-section 4.15(1)(b), namely, “*the likely impacts of the development, including environmental impacts on both the natural and built environments and social and economic impacts in the locality.*”

Therefore, councils are required to consider the potential environmental impacts associated with the development of land in any unsewered parts of the local government area. This requires an assessment as to the suitability of the site to cater for the specific development and as part of this assessment, consideration as to the most appropriate OSMF upon the land.

6.4 *Protection of the Environment Operations Act 1997*

The Protection of the Environment Operations Act 1997 (POEO Act) states that it is an offence to pollute waters, or permit waters to be polluted, except where that pollution occurs in compliance with an environment protection licence. Other offences relating to land, air (including odour) and noise pollution are also covered in the POEO Act.

In addition, the POEO Act requires environment protection licences for certain activities listed in Schedule 1 of the Act (“*Scheduled Activities*”). The NSW Environment Protection Authority (EPA) issues these licences.

Some sewage treatment systems are defined as “*Scheduled Activities*”, defined under the Act as: “*Sewage treatment systems (including treatment works, pumping stations, sewage overflow structures and the reticulation systems) that have an intended processing capacity of more than*

2,500 persons equivalent capacity or 750 kilolitres per day and that involve the discharge or likely discharge of wastes or by-products to land or waters.”

NSW EPA will not generally license non-scheduled wastewater recycling systems, as these systems can typically be designed and operated to avoid pollution, e.g. by using all the recycled water, or by discharging surplus recycled water or untreated wastewater to the sewer.

6.5 Relevant Australian Standards/Guidelines for OSMF's

The current relevant Australian Standards and guideline documents for OSMFs are referenced in Appendix A to this document.

7.0 Regulatory program

7.1 Inspection of existing systems

Our aim is to have all existing and new sewage management facilities meet public health and environmental performance standards.

This will be achieved through:

- a) Implementation of the Council OSMF inspection program;
- b) ensuring all OSMFs in the LGA are registered with us;
- c) assessing and designing systems to meet applicable criteria and standards;
- d) education/instruction to residents to ensure that facilities are operating at an optimum level;
- e) carrying out inspections of Aerated Wastewater Treatment Systems (AWTS) to ensure that service agents are satisfactorily performing their functions;
- f) the auditing of AWTS service reports to ensure the mechanical functions and components of the treatment and disposal system are being properly maintained and serviced;
- g) use of legislative powers if cooperation between the owner and the Council has not succeeded in achieving the desired health and environment performance outcomes.

Our OSMF inspection programs will be underpinned by the principles of risk management, ecologically sustainable development, education and total quality management. Our aim is to have **all** unsewered sites within the LGA inspected regularly and upgraded as necessary.

Our Officers will undertake inspections of an individual OSMF in accordance with an inspection scheduled. Property owners are notified in writing of inspections and are asked to contact us if they would like to be present at the time of the inspection. Our Officers may make notes, take photos or obtain samples as part of these assessments.

All properties that have an existing onsite sewage management facility pay an annual charge that is included as a separate item on their rates notice. This covers all inspection and administrative costs and is subject to review annually. The applicable fees and charges are contained in Kiama Council Fees & Charges that are subject to review and change annually.

Should an OSMF be found to be defective, the re-issuing of an expired 'Approval to Operate' under the Local Government Act 1993 is withheld and we may direct the property owner in writing by way of defective letters, to complete rectification works, where it is deemed necessary. Where a modification or upgrade of an existing OSMF is required, an application to modify or upgrade an existing OSMF may be required.

Escalation of non-compliance with defective letters can lead to penalty infringement notices, orders or notices under applicable legislation. Follow-up inspections will also be carried out to ensure that remedial action is undertaken where systems are not operating satisfactorily and where works to upgrade have been directed. Fees may be charged in accordance with our Fees and Charges schedule, where more than one re-inspection is required.

If a notice is issued under the Protection of the Environment Operations Act 1997, additional mandatory administration fees and other costs may have to be paid by the property owner. If a property owner fails to comply with the requirements as specified in Orders under the Local Government Act 1993 or notice under the Protection of the Environment Operations Act 1997 and an environmental and health risk is occurring, then we can issue a penalty infringement notice.

We also monitor the servicing of Aerated Wastewater Treatment Systems (AWTS) and conduct inspections, to ensure that they are regularly serviced by licensed technicians and are not impacting upon the environment and/or public health. This is in addition to any private operational service agreement inspections, with the supplier and installer of AWTS. We will require the submission of any AWTS service inspection reports.

The frequency of the inspections we conduct is largely dependent on the risk (low or high) that is represented by the site and individual systems to public health and the environment. The allocated risk rating determines whether inspections are conducted annually, or every four years.

Following a satisfactory inspection a one or four year “*Approval to Operate*” will be issued. An approval will **not** be issued for failing systems or where works are required. Council will notify the property owner in writing detailing the nature of the works required and completion dates. An approval will be issued once these rectification works are satisfactorily completed.

Our officers conduct inspections/assessments against a number of performance standards (see Appendix A), but most notably, those specified in:

- a) Australian Standard 1547:2012 – “*Onsite Domestic Wastewater Management*”;
- b) Environment and Health Protection Guidelines for “*Onsite Sewage Management for Single Households*” (1998);
- c) “*Designing and Installing Onsite Wastewater Systems*” (WaterNSW, 2019); and
- d) Environmental Guidelines: “*Use of Effluent by Irrigation*” (EPA, 2003)

We may take enforcement action where appropriate under various legislation, including the *Local Government Act 1993* (and associated Regulations), *Environmental Planning and Assessment Act 1979* and the *Protection of the Environment Operations Act 1997*.

Where we have given a direction in the form of a notice or order, to upgrade or rectify a defective or non-compliant system (or where owners do so independently), property owners will be required to engage a licensed plumber or suitably qualified professional (e.g. AWTS installation & service agent) and submit a modification application and proposal in writing (plan), for review and approval prior to the commencement of any works.

A wastewater report and geotechnical investigation (completed by an appropriately qualified consultant) may also be required. Any proposal needs to be consistent with the requirements of any applicable legislation, standards and guidelines as they apply. This includes but not limited to performance standards as specified in Clause 44(1) of the Local Government (General) Regulation 2021.

7.2 Monitoring of OSMF Performance

Poorly designed or faulty OSMFs can have adverse public health and amenity outcomes. This can result in detrimental environmental effects, including reduced water quality in receiving water bodies such as farm dams, creeks, rivers, drainage channels, wetlands, ground water and groundwater wells. The impacts of climate changes resulting in increased rainfall intensity and storm events can alter the effectiveness of existing OSMFs and may result in the failure of the effluent disposal areas. As a result, we are required to review and evaluate the effectiveness of existing systems in various catchment areas and update onsite sewage management policies as required.

The evaluation of impacts from OSMFs may involve both long and short term selective monitoring of environmental parameters.

The evaluation of impacts from OSMFs will be used to gauge the effectiveness of onsite sewage management policies. It will also allow us to identify areas, which need to be improved, and those that require more resources.

This is best achieved through:

- a) development of a detailed database of local properties, with respect to the operation/performance of OSMFs;
- b) utilising our Customer Request Management system (complaints management system) to develop a database concerning the impact on public amenity/ health/ environment;
- c) conducting monitoring programs;
- d) accessing monitoring data gathered by other agencies (where available).

Maintenance requirements:

Aerated wastewater treatment systems (AWTS) require quarterly servicing to ensure they are operating efficiently. Service reports must be provided to Council after each service. Council cannot recommend specific service agents. It is recommended aerated wastewater treatment systems and septic tanks be pumped out every 3-5 years or more often if required.

Do:

- Use eco friendly cleaning products;
- Use low phosphorous laundry products;
- Be water wise and reduce water consumption;
- Limit use of the washing machine during peak times;
- Regularly mow the land application area;
- Move the sprinklers around the approved land application area (if relevant);
- Regularly check the tank and land application area for signs of failure;
- Keep children and pets away from the land application area;
- Prevent livestock from accessing the land application area; and
- Report any identified alarms, tank/hose breakages, odours, leaks, boggy areas and pooled liquid to your service agent or Council immediately.

Don't:

- Turn off or unplug the power to the tank;
- Drink or cook with the treated sewage;
- Use the treated sewage to irrigate plants for consumption such as vegetable gardens or fruit trees;
- Allow children or pets to access the land application area or tank;
- Relocate the land application area without approval from Council;
- Drive or park vehicles on the tank or land application area;
- Use heavy machinery in the land application area;
- Allow sewage to be irrigated or discharged where it can enter any waterways or stormwater system;
- Ignore leaks, odours, overflows or breakages to the tank, land application area, hoses and sprinklers.

7.3 Risk assessment

We undertake a site specific environmental risk assessment using an adopted Risk Assessment Criteria when approving the installation and operation of individual OSMFs. This approach allows us to qualitatively differentiate between various sites and provide a practical approach, particularly in terms of targeting high risk locations (e.g. near waterways) and recommending strategies for problem systems.

Based upon the adopted risk assessment criteria, a low or high environment risk classification or rating is allocated to each individual system. The classification or rating determines the approval period that the OSMF can operate prior to a required audit inspection and subsequent renewal of the 'Approval to Operate' if satisfactory.

We have developed the following risk categories and approval periods for all system types:

- Low Risk 4 year approval
- High Risk 1 year approval

7.3.1 Risk assessment criteria

Relevant criteria in determining risk classification or rating includes assessment of the following:

- **Effluent disposal area**

Size of the site - is the site sufficiently large enough for the system being used (e.g. enough trenching or irrigation area)? Are there any reserve areas in the event of failure? Is the site able to be protected from heavy livestock and vehicular damage?

- **Hydraulic load**

Is a large volume of wastewater being produced (i.e. number of bedrooms/occupants)? Is the water supply reticulated or tank water?

- **Vegetation coverage**

Is the site well covered with either grass or established gardens or is it too heavily vegetated e.g. inadequate sunlight in maximising evaporation potential)?

- **Soil type**

Is the soil sub-strata a limiting factor/ what basic soil type is present (e.g. clay, loam, sand, shallow bedrock, shallow groundwater table etc.)?

- **Distance to water bodies and water supplies (including known groundwater)**

What is the distance to the nearest permanent water bodies or a water supply (e.g. river, creek, lake, bores etc. – see “recommended buffer distances” in Table 1)?

- **Distance to drains**

What is the distance to the nearest stormwater drain (e.g. kerb, intermittent drainage channel/ gully/ depression etc. – see “recommended buffer distances” in Table 1)?

- **Distance to adjoining properties, boundaries and structures**

What distance is the OSMF (tank, trench, irrigation area) to the nearest neighbouring property boundary, dwelling, swimming pools, driveways and other buildings – see “recommended buffer distances” in Table 1)?

- **Surface effluent/waterlogging**

Is there any evidence of either surface effluent or waterlogging of the surrounding ground?

- **Effluent migration off site**

Is any effluent migrating from the designated disposal area offsite and onto adjoining properties?

- **Presence of odours**

Are any odours detectable either from the tank or the disposal area?

- **Servicing/maintenance**

Is the system well maintained, serviced and easily accessible (e.g. has the tank been de-sludged regularly, broken inlet/outlet pipes, damaged lids, missing inspection caps, cracks,

evidence of movement, overgrown with vegetation or covered with debris, soil or other extraneous items etc.)?

- **Knowledge of system**

Does the owner or occupier reflect a good understanding of the operation and maintenance requirements for the system and effluent disposal area?

We refer to standards outlined in supporting publications (e.g. the Environment and Health Protection Guidelines for “*Onsite Sewage Management for Single Households*” aka Silver book (1998). This document highlights recommended “*buffer distances*” with respect to the location of OSMFs as indicated in Table 1.

Table 1: Recommended buffer distances for onsite sewage management facilities

System	Recommended Buffer Distances
All land application systems	<ul style="list-style-type: none"> • 100 metres to permanent surface waters (e.g. river, streams, lakes (see SCA requirements below) • 250 metres to domestic groundwater wells • 40 metres to other waters (farm dams, drainage depression/ drainage channels etc.)
Surface spray irrigation	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient 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	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, property boundaries, driveways and buildings
Subsurface irrigation	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, property boundaries, driveways and buildings
Absorption system	<ul style="list-style-type: none"> • 12 metres if area up-gradient and 6 metres if area down-gradient of property boundary • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, driveways and buildings

Source: Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998.

Council also uses additional guidelines e.g. “*Designing and Installing Onsite Wastewater Systems*” (WaterNSW 2019) when assessing OSMFs in the Sydney Drinking Water Catchment areas, which are somewhat more stringent than those above. The guideline also provides buffer distances for retaining walls and in ground potable water tanks.

7.4 Approval to operate an OSMF

All existing OSMFs (including septic tank and pump-out systems) in the LGA require a current Section 68 “*Approval to Operate*” an OSMF. This is renewed either annually or every four years, dependent on the environmental and public health risk represented by the system.

All OSMFs must be inspected by us and passed before any “*Approval to operate*” is issued.

For any new technology, the initial “*Approval to operate*” will be restricted to 12 months only, in which case we will review the performance of the system to determine whether the system requires alteration, or another system is required to be installed.

Renewal to operate letters shall be forwarded to property owners and occupants as the anniversary date approaches, advising of forthcoming inspections by Council officers.

Prior to the issuing of an “*Approval to operate*”, we will consider whether any alterations or upgrading are required. A risk classification will be given to each property based on the criteria outlined in Section 7.3 of this document.

The new OSMF should not be used until such time as the applicant receives an “*Approval to operate*” in writing. This approval indicates that we are satisfied that the installation of the facility is substantially in accordance with the initial Approval to Install and/or any previous “*Approval to operate*” consent conditions.

An “*Approval to operate*” assessment may also impose requirements to renew or repair defective systems or components of systems, upgrade system types and insist on better maintenance and monitoring requirements. For example, a septic tank and absorption trench system may be required to be converted into a septic tank with a pump-out system, if the current system is shown to be unsustainable.

Renewals may also require supporting documentation related to the maintenance of the system, including receipts of pump-outs, servicing by third party technicians (e.g. AWTS), repairs or upgrade works, etc.

7.4.1 Purchaser of Land (transfer of land)

An Approval to Operate issued by council is required under Clause 47 of the Local Government (General) Regulation 2021 to be re-applied for by the purchaser of land as the approval is personal and does not run with the land. Temporary exemptions are provided for a period of three months after the date on which the land is transferred or otherwise conveyed to the person (whether or not an approval is in force, as at that date) for the purchaser of the land to obtain an Approval to operate from us.

If an activities application is provided to us by the purchaser of land within two months after the date on which the land is transferred or otherwise conveyed to the person, the person may continue to operate that system of sewage management without approval until the application is finally determined. Details to be provided with the application as per C6 of the form includes details of the OSMF and servicing details including.

Once an activities application is provided to us, an inspection (with applicable fees under our Fees and Charges) will need to be conducted if the last Approval to operate certificate was issued greater than 12 months from the date of when the Approval was issued. If the previous Approval to Operate certificate was issued less than 12 months from the date of when the approval was issued, no inspection is required however, an admin fee is applicable under our Fees and Charges.

7.5 Education and consultation

Consultation and education relating to OSMFs will be conducted, ensuring that all stakeholders are aware of their responsibilities concerning the operation of OSMFs and to reduce the need for corrective actions and enforcement (e.g. notices, fines, prosecution). our Officers are available to assist with the management and operation of OSMFs and can provide literature on the subject on request.

We will also aim to further develop and foster partnerships with local plumbers to raise standards relating to the servicing and upgrading of OSMFs in the Kiama LGA.

The success of this strategy will be dependent on the active participation of all stakeholders, particularly in terms of each householder “*owning*” the issue of sustainable onsite sewage management. Consultation with stakeholders will help to reinforce cooperation between us and the community concerning this issue.

8.0 Development Application process

8.1 New Installations

All new developments in the Kiama LGA require development consent from Council. Where the development incorporates an OSMF, Council requires that the application (Activities Application form) for Approval to Install (and ultimately operate) the system be accompanied by a comprehensive wastewater management report from an appropriately qualified consultant (incorporating a detailed geotechnical assessment).

Council follows a structured assessment procedure for the installation of **new** sewage management facilities. In brief:

- a) locating the property on our maps and determining its position relative to watercourses and other sensitive areas e.g. catchment waters, intermittent streams, wetlands etc. The “*buffer distance*” (i.e. distance to sensitive environment) will in turn determine the type of effluent treatment required (e.g. primary, secondary, tertiary treatment – see “*recommended buffer distances*” in Table 1);
- b) completing a site inspection to gain a better understanding of the site specific constraints and intricacies involved;
- c) considering and addressing the physical limitations of the site with regards to the type of effluent disposal method, e.g. unsuitable soil types (heavy clay), steep slopes, shallow groundwater tables, shallow bedrock, unstable land, etc;
- d) assessing the most effective effluent disposal method with respect to the constraints, e.g. trenches, evapotranspiration beds, surface irrigation, amended soil mounds, etc;
- e) assessing backup areas required to minimise cumulative impacts associated with the long-term application of effluent (i.e. the site being able to satisfactorily cope with the expected hydraulic and nutrient load);
- f) determining the minimum requirements of Council, e.g. “*Simple Soil Report*”, “*Wastewater Management Report*”, “*Total Water Cycle Management Study*”, etc;
- g) working with owners and plumbers to achieve an effective and sustainable long-term strategy for individual sites.
- h) internal, external and final inspections are undertaken by Kiama Councils Building Assessment Officers in relation to *PCA Volume 3-2016 National Construction Code (NCC) Series Volume three – Plumbing Code of Australia*. A satisfactory final inspection letter is required by the certifying authority (whether PCA or Council) prior to the issue of an Occupation Certificate. A “*certificate of compliance*” and “*works as executed diagrams*” are required to be submitted to Council once installation is completed.
- i) in order to obtain an Approval to Operate certificate, an inspection by Kiama Councils Environmental Health Officer will occur to determine the risk rating (see section 7.3) and to issue an appropriate Approval to Operate certificate.

Note: Pump-out systems will not be considered for domestic purposes and will only be considered where removal is required intermittently for an essential service (e.g. rural fire station). Pump-out systems may be considered for domestic purposes in locations which are in the process of becoming seweraged in the near future. Written confirming correspondence from Sydney Water is required to be provided with the application. Should no written confirmation be provided, the application will be refused.

No development consents and or Section 68 Approvals will be granted for any OSMF that is proposed to be installed within 75 metres of a sewer connection point of the Sydney Water Corporation and in a residentially zoned area.

8.2 Sydney Drinking Water Catchment areas

Special provisions also apply to developments within recognised Sydney Drinking Water Catchment areas, including possible referral to the WaterNSW for review. Under the Sydney Drinking Water State Environmental Planning Policy, new developments should incorporate current recommended practices (CRP) or performance standards endorsed by WaterNSW as best practice to help achieve a neutral or beneficial effect on water quality (NorBE). These practices are discussed in the “*Neutral or Beneficial Effect on Water Quality Assessment Guideline 2015*” (the NorBE Guideline, Sydney Catchment Authority (SCA) 2015) and “*Designing and Installing Onsite Wastewater Systems*” (WaterNSW, 2019).

8.3 Dwelling additions/alterations and property improvements

Where property owners propose the construction of dwelling alterations or additions, or the erection of other property improvements such as swimming pools or detached garages, then our requirement for new installations of OSMFs becomes applicable. We reserve the right to seek supporting documentation where it considers the proposed development may impact the existing OSMF performance including an increase in bedroom or potential bedrooms. **In this regard the existing effluent disposal area cannot be compromised or reduced.**

A potential bedroom is a room that could reasonably be used as a bedroom. It includes any room with a closable door, at least one window and a minimum of 8 square metres. A room in a separate building such as a studio could be a potential bedroom if it has a toilet and washing facilities or close access to same.

Note: proposals for dwelling alterations or additions, or the erection of other property improvements, such as swimming pools or detached garages (which may impact upon or necessitate alteration to the OSMF), are to be accompanied by a wastewater management report.

See section 8.1 RE: pump outs and OSMF in residentially zoned sewer areas with a connection point available.

8.4 Re-zonings and subdivisions

Any re-zonings and applications to subdivide land will require a detailed site assessment and wastewater management report. Such a report should demonstrate the suitability of each proposed lot to accept wastewater from a sewage management facility.

Note: any proposed subdivision that will be connected to an existing reticulated sewerage scheme is exempt from this Clause.

8.5 Approval Requirements

All OSMFs will require development consent to be issued in accordance with Section 78A of the NSW Environmental Planning and Assessment Act 1979 and a Section 68 approval in accordance with the NSW Local Government Act 1993, prior to its installation and operation.

The following two options are available in regard to obtaining the necessary approvals to install and operate an OSMF:

- A.** The lodgement of a Development Application under Section 4.12 of the NSW Environmental Planning and Assessment Act 1979. If the proposal is approved, the approval will include conditions of consent outlining what specific information is required to be lodged in order to obtain the approval under Section 68 of the NSW Local Government Act 1993;
- B.** The concurrent lodgement of a Development Application under Section 4.12 of the NSW Environmental Planning and Assessment Act 1979 and a Section 68 application for the proposed installation of an OSMF. In this case, the Section 68 “*Approval to Install*” (an OSMF) will be issued immediately after the date of development consent, subject to the proposed OSMF being deemed satisfactory. This option will require the lodgement of

sufficient information with the Development Application, to determine the site's suitability to operate an OSMF. Time delays may result if the level of detail is deemed insufficient.

8.6 Pre-lodgement discussions with our staff

Applicants are encouraged to consult with our staff before lodging any application for the installation of an OSMF. In particular applicants are encouraged to consult with our staff if the proposed OSMF:

- a) is located in an environmentally sensitive area;
- b) is for a rural residential subdivision;
- c) is within a Sydney Drinking Water Catchment area;
- d) is located on land that has a rural or environmental protection zoning;
- e) treats a commercial business or industrial development;
- f) involves new technologies which have yet to be widely adopted within NSW.

Applicants may apply to Council for a Development Assessment Meeting (DAU) where specific issues or non-compliances can be addressed with relevant Council staff prior to Development Application submission.

8.7 Minimum information required for a Section 68 Application for the installation and operation of an OSMF

The following is required prior to the installation of an OSMF:

- a) A completed Kiama Council Activities Application form;
- b) A site plan drawn to appropriate scale. The site plan must clearly show proposed effluent irrigation areas, area of land available, driveways, paved areas, pools, other structures, proximity to sensitive environments (creeks, drains, dams etc.), slope and aspect;
- c) Details (specifications/drawings) of the OSMF to be installed (incl. all specifications and NSW Dep't. of Health certification details);
- d) A detailed site soil and hydraulic assessment prepared by an appropriately qualified geotechnical or wastewater expert.

The 'Environment & Health Protection Guidelines: On-site Sewage Management for Single Households' (the 'Silver Book', Department of Local Government, 1998) includes a template for wastewater reports. The report should also refer to current references and standards including 'AS/NZS 1547:2012 On-site domestic wastewater management' and WaterNSW's '*Designing and Installing Onsite Wastewater Systems*' and Kiama Councils DCP 2020 and this Policy.

The assessment should include but is not limited to: Site constraints; soil information refer to AS/NZS 1547:2012); climate information; nutrient and hydraulic balances (refer to Appendix 6 of the 'Silver Book'); sizing the effluent management area (refer to AS/NZS 1547:2012); wastewater design loading (Table 2.3 of WaterNSW 2019 guide or AS/NZS 1547:2012); linear loading rate for beds trenches, sand and amended soil mounds (AS/NZS 1547:2012) and minimum separation requirements.

9.0 NSW Health Advisory Notes

9.1 Destruction, removal or reuse of septic tanks, collection wells, AWTS and other OSMF's

The alteration of an OSMF requires Council approval under Section 68 Part C of the Local Government Act 1993. We do not formally require an application for the destruction or removal of an OSMF's where the premises is already connected to sewer or to an alternative form of OSMF which has been approved by us. The owner must however comply with NSW Health

Guidelines set out in *Advisory Note 3 – Destruction, Removal or Reuse of Septic Tanks, Collection Wells, Aerated Wastewater Treatment Systems (AWTS) and other Sewage Management Facilities (SMF) - Revised January 2017*. The guidelines can be located on NSW Health’s website and provides requirements for circumstances identified in Table 2 below.

Table 2: Summary of contents located in NSW Health’s Guidelines Advisory Note 3

Septic Tanks/Collection Wells	AWTS
Demolition	Demolition
Reuse for Stormwater Storage	Used as Domestic Greywater Treatment System
Upgrade to AWTS	Removed and relocated

9.2 Effluent disposal areas based on the type of treatment

In considering applications for the installation of on-site sewage management facilities, Council requires that the proposed effluent disposal area must comply with the NSW Health’s Guidelines set out in *Advisory Note 4– Recommended Final Uses of Effluent based on the Type of Treatment*. The requirements are summarised in Table 3 below:

Table 3: NSW Health Recommended final use of treated effluent based on treatment

Treatment	Standard	Recommended final use/application
Primary Treatment (sewage or greywater) e.g., septic tank, greywater tank, wet composting closet system, greywater diversion device	Solids separation and digestion–no effluent standard	Sub-soil at greater than 300mm depth below finished ground level e.g., absorption trenches, mounds, and evaporation-transpiration beds.
Secondary Treatment without Disinfection	<ul style="list-style-type: none"> BOD < 20 mg/L TSS < 30 mg/L Service person performs compliance inspection and reports condition of land application system Local council develops risk management monitoring strategy 	<ul style="list-style-type: none"> Sub-soil > 300mm depth Sub-surface (300 mm to 150 mm) LPED Shallow Sub-surface Drip Irrigation
Secondary Treatment with Disinfection	<ul style="list-style-type: none"> BOD < 20 mg/L TSS < 30 mg/L <i>E. coli</i> <30 cfu/100mL 	<ul style="list-style-type: none"> Sub-soil > 300mm depth Sub-surface (300 mm to 150 mm) LPED ** Shallow sub-surface drip irrigation Surface and spray irrigation (100 mm to above GL)

Advanced Secondary Treatment without Disinfection	<ul style="list-style-type: none"> • BOD < 10 mg/L • TSS < 10 mg/L • Service person performs compliance inspection and reports condition of land application system • Local council develops risk management monitoring strategy 	<ul style="list-style-type: none"> • Sub-soil > 300mm depth • Sub-surface (300 mm to ground level (no spray)) • *LPED • ** Shallow Sub-surface drip irrigation
	<ul style="list-style-type: none"> • BOD < 10 mg/L • TSS < 10 mg/L • <i>E. coli</i> <10 cfu / 100mL 	<ul style="list-style-type: none"> • Sub-soil > 300mm depth • Sub-surface (300 mm to 150 mm) • *LPED • ** Shallow sub-surface drip irrigation • Surface and spray irrigation (100 mm to above GL) • Greywater may be used for toilet flushing and washing machines

* Low Pressure Effluent Distribution (LPED) Irrigation Lines if installed in accordance with AS/NZS 1547:2012 On-site domestic wastewater management.

** Shallow sub-surface drip irrigation if installed in accordance with AS/NZS 1547:2012 On-site domestic wastewater management.

9.3 Servicing of Domestic Secondary Treatment OSMFs

Clause 45 of the Local Government (General) Regulation 2021 requires that conditions of accreditation must be complied with as a condition of 'Approval to Operate' a system of sewage management. The certificate of accreditation as well as Councils 'Approval to Operate' conditions provide the following requirements:

- a) The owner/occupier of the premises is to enter into an annual service contract with a representative of the installed system or an acceptable service contractor.
- b) the AWTS shall be serviced at three monthly intervals in accordance with the details set out in the owner's and service manual.
- c) each three monthly service shall include a check on all mechanical, electrical and functioning parts of the system including:
 - the chlorinator and replenishment of the disinfectant,
 - pumps, air blower, fan or air venturi,
 - the alarm system,
 - slime growth on the filter media,
 - operation of the sludge return system,
 - the effluent irrigation area,
 - on-site testing for free residual chlorine, pH and dissolved oxygen.
- d) We are to be provided with a copy of the service report sheet. The original shall be given to the owner and the triplicate retained by the service contractor. We are to be notified via the report when the OSMF requires de-sludging, that the alarms are working correctly and that the related land application system is performing well.

As of February 2018, NSW Health has applied new service conditions to accreditation which are applied to all on-site single domestic secondary treatment systems which are accredited under AS1546.3:2017 & AS1546.4:2016. These are not applied retrospectively to existing systems but

only those which have been approved and installed with updated certificates of accreditation after February 2018. The servicing requirements as stated in NSW Health’s *Advisory Note 5 – Servicing of Single Domestic Secondary Treatment Sewage Management Facilities (SMF)* are outlined in the table below:

Table 4: Roles and responsibilities in servicing requirements

Owner/Occupier	Attributes of service agent	Manufacturer
<ul style="list-style-type: none"> Ensure that the system is always subjected to a minimum 12 month service contract or agreement with the manufacturers employed service agent or a service agent authorised by the manufacturer 	<ul style="list-style-type: none"> Completed a course on servicing and maintenance of system; and have supervised servicing experience, or extensive un-supervised experience. register their name and credentials with Council as a service agent employed or authorised by the manufacturer to service SMF in their area 	<ul style="list-style-type: none"> Ensure service agents complete an orientation or training session to become authorised not unfairly withhold orientation opportunities to an independent service agent.
Owner/Occupier	Attributes of service agent	Manufacturer
<ul style="list-style-type: none"> Ensure that the system is always subjected to a minimum 12 month service contract or agreement with the manufacturers employed service agent or a service agent authorised by the manufacturer shall not service their own system unless they are an authorised service agent ensure that the system is serviced at regular specified intervals (quarterly) check with the manufacturer to ensure that any independent service agent is authorised by the manufacturer 	<ul style="list-style-type: none"> service agent shall report to the local council instances where the owner/occupier does not accept recommended remedial actions must service the system in accordance with the manufacturers service requirements specified in its manual. when maintaining or servicing a system, install replacement parts at least to the minimum specification not perform electrical work or enter confined spaces unless qualified to do so. submit a completed NSW Health standardised “Local Council Service Report” for the serviced system to Council. be either employed or authorised by the manufacturer 	<ul style="list-style-type: none"> must place the specifications, drawings, service manuals and service forms of the accredited system on its web site. commercial in-confidence documents may be provided directly to the service agent without uploading to the website

9.4 Self servicing of AWTS installations

Any owner/occupier wishing to undertake regular self-service must first apply to us. The application will only be considered if supportive evidence of authorisation, adequate training and competence by the manufacturer of the AWTS system is provided. The owner/occupier must comply with service requirements listed in the NSW Health Accreditation of the system and must

be prepared to report quarterly to us using NSW Health's standardised "Local Council Service Report". If authorisation from the manufacturer of the system is not provided, self-servicing will not be permitted.

10.0 Domestic grey water diversion

Greywater is defined as wastewater from washing machines, laundry tubs, showers, hand basins and baths. It does not include wastewater from a kitchen, toilet, urinal or bidet (blackwater). Greywater diversion means the installation and operation of a system for the diversion of greywater generated on a residential premises to a garden or lawn on those premises, but does not include the manual collection and re-use of greywater (for example, by means of a bucket or similar receptacle).

It is common particularly in non-reticulated (Sydney Water) supply areas for owners/occupiers with the increasing pressure on drinking water supplies. Greywater diversion may also ease the pressure on on-site sewage management systems and associated effluent disposal areas by decreasing wastewater loads. Section 68 of the *Local Government Act 1993* provides that domestic greywater diversions is an activity that requires Council approval. However, under Clause 75A of the Local Government (General) Regulation 2021, greywater diversion may be carried out without prior approval if:

- it is carried out in accordance with the Plumbing and Drainage Code of Practice
- an OSMF is not installed on the premises
- certain performance standards related to health and the environment are met.

The installation performance standards related to health and the environment are detailed below:

- a) wastewater is not diverted from kitchen or toilet plumbing.
- b) greywater is not stored in any way, or treated other than primary screening or filtration.
- c) a washing machine standpipe, or watermark licensed diversion device, delivers the greywater to a sub-surface irrigation system (>100m below ground or mulch)
- d) The standpipe or diversion device has a switching or selection facility so that greywater can be easily diverted back to the sewer
- e) any diversion device connected to, or modifying, the existing plumbing system is a WaterMark licensed device and must be installed by a licensed plumber
- f) Some form of non-storage surge attenuation is installed as part of the diversion system (*non-storage surge attenuation can be in the form of a tank system, a mulch basin or similar*).
- g) the local water utility is notified in writing by the installing plumber that greywater diversion device is in place
- h) the landowner complies with the Department of Water and Energies *NSW Guidelines for Greywater reuse in sewerred, single household residential premises 2008*
- i) the water must not be a risk of discharging into any watercourse or cause run-off to neighbouring properties. There should be no evidence of water logging, ponding of surface water or run-off.
- j) the water must not be used on ground vegetables or fruit. Root absorption of greywater for fruit trees e.g. apples & oranges may be considered if the requirements are met. The water must not be used directly on any fruit or vegetables.

In rural areas where an OSMF is installed, an Environmental Health Officer will consider the above standards on a case by case basis due to the varying nature of properties. In general environmental and health risks associated with greywater diversions are less of an environmental and health risk than in built up urban areas. We will consider: the type of wastewater to be reuse (e.g. washing machine); the proposed location for disposal (e.g. on the lawn, in a garden etc.);

distances to property boundaries; distance to environmentally sensitive areas (e.g. watercourses, drainage channels etc.) and the performance and type of the installed OSMF. Further control measures and requirements for greywater diversion and re-use is outlined in Appendix B.

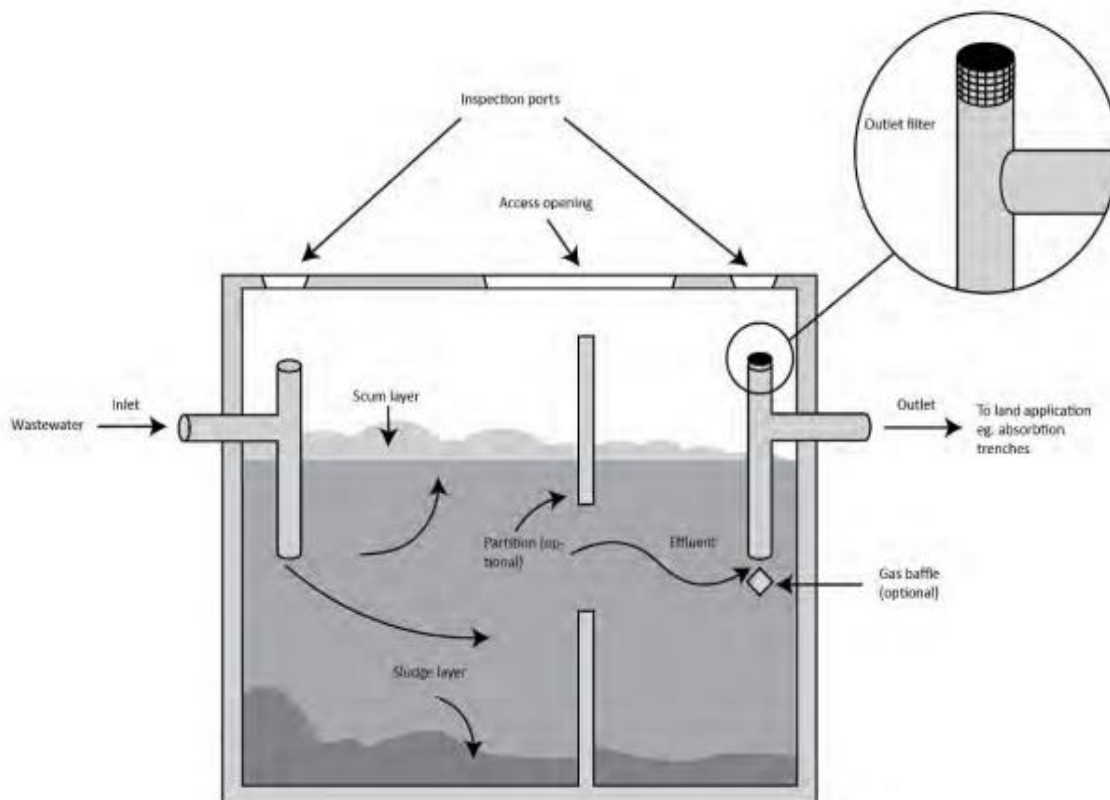
Note: Greywater Treatment Systems (GTS) is covered in section 11.

11.0 Types of OSMFS

11.1 Septic tank & pump-out systems

A septic tank is a waterproof tank usually located below ground level and provides treatment of sewage by allowing solids to settle to the bottom of the tank and oils and fats to float to the top, to form a scum layer. Anaerobic (in the absence of air) bacterial digestion of the stored solids produces a sludge which accumulates at the bottom of the tank (See Figure 1 below). All septic tanks shall satisfy the structural performance requirements and criteria's established in AS/NZS 1546.1:2008 *On-site domestic wastewater treatment units – septic tanks*. The capacity of septic tanks must meet AS/NZS 1547:2012 *On-site domestic wastewater management* requirements. The minimum size of any septic tank is 3,000 litres with sludge pump-outs required every 3-5 years.

Figure 1: Cross section of a typical septic tank (SCA 2012)



The partly treated effluent flows from the septic tank to a holding tank for regular pump-out. Pump-out systems are unsustainable and are often the worse performing on-site systems due to misuse and poor practices associated with high pump-out costs. Pump-out systems will not be considered for domestic purposes and will only be considered where removal is required intermittently for essential services (e.g. rural fire station). Pump-out systems may be considered for domestic purposes location which is in the process of becoming sewerred in the near future. Written

confirming correspondence from Sydney Water is required to be provided with the application. Should no written confirmation be provided, the application will be refused.

Pump-out systems do not require a site and soil assessment to be performed. Consideration should be given to whether any structural or stability problems exist to installing tanks on the site. The septic tank and collection well must be sized according to the potential number of occupants in the building. The minimum capacity for a septic tank that is receiving all septic wastes is 4,500 litres, while the minimum size for collection wells based on a fortnightly pump out is 15,000 litres for a three bedroom premises and 23,000 litres for a six bedroom premises. Calculations based off Annexure 2 of NSW Health's "Sewage Management Facility Vessel Accreditation Guidelines" (2016) may also be considered for non-residential premises.

The system must be appropriately designed anchored equipped with a wastewater level indicator and a high-water alarm. A pump out stand with a 'kamlock' or similar cover as well as small spillage well with a valve for the pump-out pipe. All wastewater must be pumped out via a licensed liquid waste contractor with receipt provided to us on request. It should be noted that we do not have the facilities or infrastructure to perform pump outs. Kiama Council pump-out services ceased when Sydney Water sewerage schemes were installed in the non-rural zoned areas of Kiama, Gerringong, Gerroa and Jamberoo. Therefore, the cost of pump-outs with licensed liquid waste contractors must be considered.

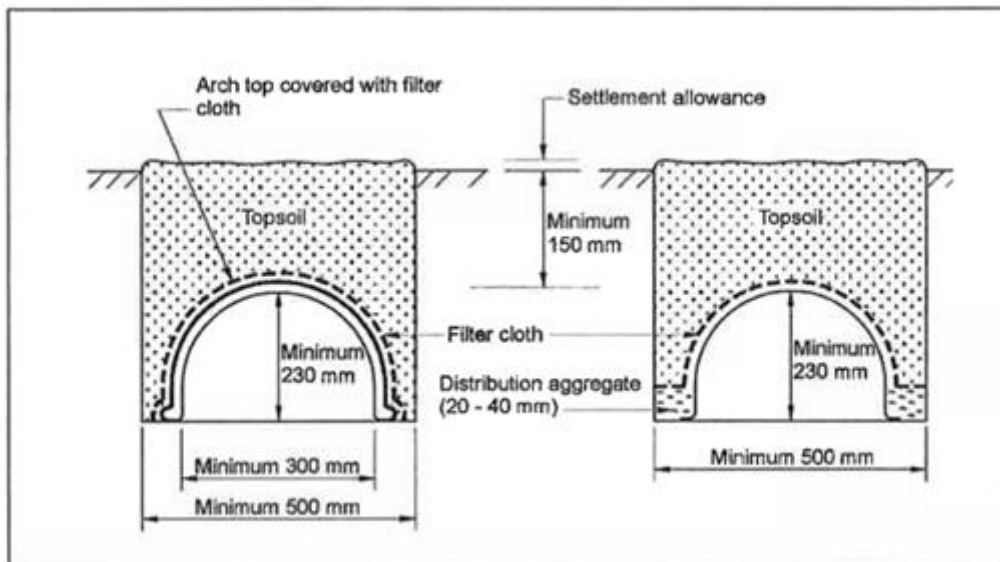
11.2 Septic Tanks with Soil Absorption Systems

There are two types of soil absorption system commonly used for the disposal of effluent from a septic tank, absorption trenches and evapotranspiration areas.

11.2.1 Absorption trenches

The absorption or sullage trench receives primary treated effluent from a septic tank. The role of the trench is to evenly discharge the effluent into the subsoil, which then filters the effluent as it percolates through the soil strata (See Figure 2 below).

Figure 2: Cross section of a typical self-supporting arch absorption trench (AS/NZS 1547:2012)



The design, sizing and construction of an absorption trench shall be undertaken in accordance with AS /NZ 1547:2012 *On-site Domestic Wastewater Management* and the *Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998*.

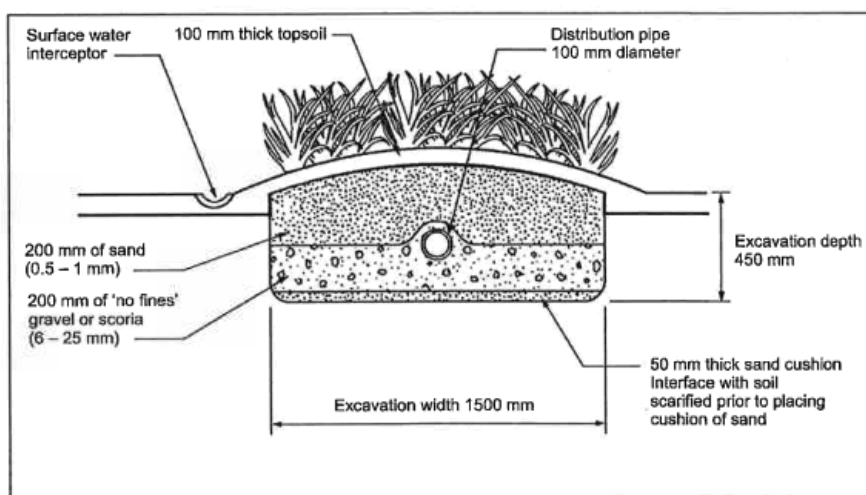
Absorption trenches are generally not suitable where the soil is medium or heavy clay. They may be considered in exceptional circumstances only and may require soil modification. Absorption

trenches are also not suitable in areas where there is less than 0.75 metres of soil. Each individual trench must not be longer than 20 metres. Although exceptions can be made where there are two separate inline trenches a central feeder, where trenches are pressure dosed from a pump well or there are site constraints and the trenches are laser leveled.

11.2.2 Evapotranspiration Absorption Beds (ETA Beds)

The ETA bed is an area made of sand and gravel, which is not sealed at the base and sides. The hydraulic load of ETA beds is taken up by evaporation and transpiration by vegetation, as well as disposal of some of the effluent through the permeable base of the bed. The beds are required to be designed so they are located to be well exposed to sunlight to ensure maximum evapotranspiration, well vegetated and mounded to prevent the ETA Bed filling with rainwater during rainwater events. They are located closer to the surface than absorption beds and can be used when limitations for absorption trenches are met deeper in the soil profile (e.g. heavy clays and shallow bedrock). Beds are usually no longer than 600mm's deep but may be several metres wide, as can be seen in Figure 3 below.

Figure 3: Cross section of a typical ETA Bed (AS/NZS 1547:2012)



The sizing and construction of the ET bed shall be undertaken in accordance with *AS /NZ 1547:2012 On-site Domestic Wastewater Management* and the *Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998*.

11.3 AWTS and Land Application Systems

11.3.1 Aerated Wastewater Treatment Systems (AWTS)

The aerated wastewater treatment system (AWTS) is an alternative to the conventional septic system which uses the processes of aeration, clarification and disinfection to treat the wastewater to a level which is suitable for above ground irrigation to Land Application Areas (LAA's) or subsurface disposal (SSD).

AWTS use aeration of wastewater as an integral part of the treatment process. A typical AWTS treats wastewater through the following process:

- settling of solids and flotation of scum in an anaerobic primary chamber (septic tank);
- oxidation and consumption of organic matter through aerobic biological processes;
- clarification - secondary settling of solids;

- disinfection using chlorine or other approved means, where surface land application of treated wastewater is to occur;
- regular removal of sludge to maintain the process.

All AWTS are required to have NSW Department of Health accreditation. The majority of AWTS have a 10 person capacity (i.e. expressed as a 10 EP system). Servicing requirements of AWTS systems are outlined in section 9.3

11.3.2 Surface irrigation

The irrigation of wastewater is applied to the designated Land Application Area (LAA) from the AWTS.

The most common method of application for surface irrigation is by sprayers or sprinklers with low pressure devices. The spray head plume radius should be restricted to not more than 2.0 metres, with a maximum plume height of not more than 400 millimetres. Drip and trickle systems may also be used to allow water to drip to the soil, below at least a 100 millimetres layer of bark, woodchip or mulch. The effluent which is applied to the area of irrigation is absorbed by the soil and is taken up by vegetation or evaporated.

However, surface irrigation systems will only be permitted upon sites with suitable geology/soil depth (i.e. with no waterlogging) and flat to gently sloping land. The minimum area for surface irrigation must be calculated in accordance with *AS/NZ 1547:2012 or the Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998*.

11.3.3 Sub-surface Irrigation

Sub-surface disposal is the method of discharging treated effluent below the ground to deal with onsite wastewater. Sub-surface or drip irrigation is the only acceptable method of reclaimed effluent disposal from an AWTS located within a high risk classification area.

The principle of AWTS subsurface disposal is similar to an evapotranspiration area in that the effluent is evaporated from the ground and transpired by the vegetation on the surface area. The sub-surface system involves the use of a series of drainage irrigation pipes to discharge effluent evenly along the length of the pipeline (i.e. pressure compensating line).

11.3.4 Evapotranspiration Absorption Beds

Surface and subsurface irrigation generally require significant amounts of land based on design wastewater loads and design loading rates. It may be more suitable where space is limited to design an AWTS with an ETA bed for effluent disposal. Depending on the soil assessment, the total area for an ETA bed may be significantly smaller than that required for surface and subsurface irrigation. The ETA bed is to be designed by suitably qualified consultant in accordance with AS/NZ 1547:2012. Section 11.2.2 contains further information regarding ETA beds.

11.4 Composting toilets

There are two main types of composting toilets generally available in NSW, namely, dry composting toilets and wet composting toilets.

Composting toilets function with no flush toilet pedestal, or with moisture from a cistern. Toilet waste pass from the pan down the chute and into a chamber similar in size to a conventional septic tank. All faecal matter and other compostable matter produced, such as toilet paper, is broken down into compost by natural decomposing organisms. When fully broken down, the compost may be used in gardens but must be buried and covered.

Composting toilets have a fan connected to a vent pipe which produces negative air pressure within the composting chamber. The fan aims to draw odours away from the toilet pan and evaporate excess liquid from the composting chamber in dry composting toilets.

These systems will only treat toilet wastes and all other liquid wastes from the shower, kitchen and laundry must be disposed of via a separate grey water system. These systems discharge to subsurface absorption trenches or evapotranspiration areas. Compost needs to be buried at least 150 mm below ground and 40 metres away from any watercourse.

11.5 Wet Composting Toilets aka Biological Filter Systems

Biological Filter System's rely on microorganism, worms and beetles to break up the organic material in wastewater. A BFS generally consists of several layers of organisms on a finely structured humus, coco-peat and geotextile fabric. Aerobic processes occur in the system (provided by air pumps) that produce very little or no odour. Gravity outlet models do not require an air pump as they do not store treated effluent in the sump. Effluent is commonly treated to secondary standard without disinfection in models that have biolytic type beds. Biolytic type beds are designed to produce secondary effluent at start-up and included peat or coconut fibre or coir made from the husk of coconut. These systems generally do not include disinfection, so the effluent can only be irrigated via subsoil irrigation (300 millimetres depth minimum) or absorption systems (a NSW Health requirement). These systems require some maintenance that varies with the different system types.

Like AWTS systems, BFS are also required to be serviced by a service agent as per accreditation and manufacturer specifications. This is to ensure ongoing optimum performance and compliance with regulations. In most cases, the service requirement is annual.

11.6 Greywater Treatment Systems

Domestic Greywater Treatment Systems (GTS) treat greywater to a tertiary level, which is satisfactory for above ground land application (excluding high risk areas). The greywater treatment system involves a cycle of aeration and inactivity to achieve biological breakdown of the water through oxidation. The inactive period in the cycle results in a reduction in nitrogen levels in the water. Filtration of the wastewater removes any suspended solids and the water is then disinfected by a UV disinfection unit.

Greywater collected, treated and disinfected (to a standard of 20 mg/L BOD₅, 20 mg/L suspended solids and 10 colony forming units/100mL thermotolerant coliforms) in a DGTS, can be re-used for toilet and urinal flushing, cold water supply to washing machines or used in surface irrigation in dedicated non-trafficable areas, or other land application systems.

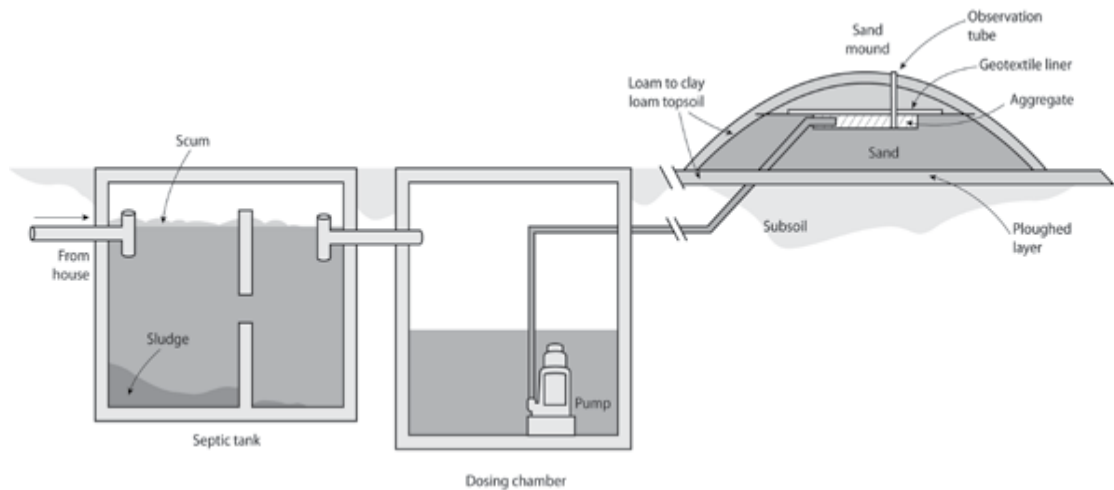
All GTS systems require our approval before installation under the Local Government Act 1993. The chosen system must be accredited by NSW Health. Any land application areas associated with GTSs must be designed in accordance with AS/NZS 1547:2012. Where a GTS is connected to internal fixtures for toilet flushing and washing machine use, a back-up water supply will be required to ensure a constant water supply to all fixtures should the GTS fail. Further control measures and requirements for greywater diversion and re-use is outlined in Appendix B.

11.7 Sand Mound Systems

Sand Mound Systems (SMS) are elevated absorption beds and utilise suitable sand fills to partially treat wastewater, before it reaches natural soil. SMS are used to augment natural soil for complete treatment and disposal.

A SMS generally consists of a septic tank, a pumping or dosing chamber, distribution pipes, and a mound, as shown in Figure 4. The septic tank allows the solids in wastewater to settle and degrade. The septic tank effluent is filtered by an effluent filter and discharged to a pumping/dosing tank. The pump dosing tank is equipped with a pump to deliver the septic tank effluent through the distribution system to the mound. The distribution system normally consists of small diameter pipes and allows for an even application of wastewater under low pressure to the mound.

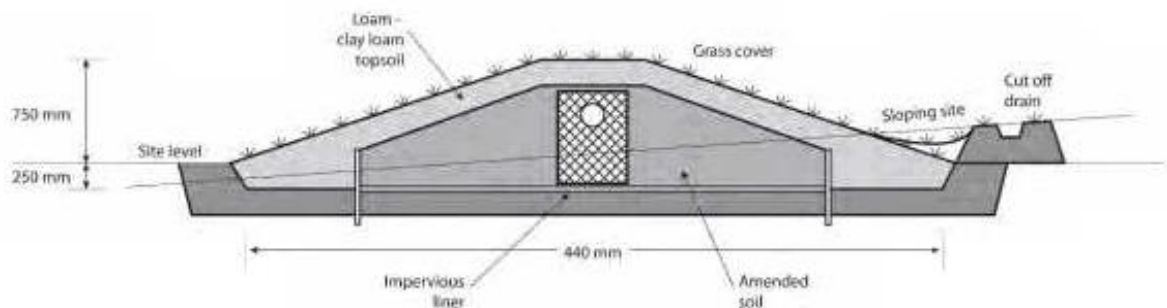
Figure 4: Schematic of a Sand Mound System (Sydney Catchment Authority, 2012)



11.8 Amended Soil Mounds

Amended soil mounds consist of a mound of important clean soil with a loam-clay loam topsoil and a grass cover on top and an impervious liner below, as shown in Figure 5. Amended soil mounds are constructed where there is limited area available for on-site effluent, where there is a high groundwater table or shallow bedrock, low permeable soils (e.g. heavy clays) or a sensitive surrounding environment. They are designed to treat and dispose of effluent and further remove phosphorus, nitrogen and microorganisms from the effluent. Any remaining water is directed to a separate land application system which usually an absorption trench. The mound and peripheral absorption system must be designed by a suitably qualified environmental consultant in accordance with AS/NZS 1547:2012. The mounds may be constructed with 2 mounds and a diverter valve. This allows one tank mound to be rested and rejuvenate. If the mounds are not routinely switched or regular pump outs of the attached OSMF is lacking, overloading failures can occur.

Figure 5: Cross-section of an amended soil mound (Sydney Catchment Authority, 2012)



11.9 Recirculating Aerobic Sand Filter Devices

A recirculating aerobic sand filter device further treats the effluent from a septic tank. The treatment process involves the collection of effluent from a holding well or sump, which is then pumped intermittently for distribution through a bed of coarse sand. The treated effluent is then redirected back to the sump for further recirculation and then directed to a land application system. The effluent may also be disinfected for above ground spray irrigation.

11.10 Other supplementary technologies

Other technologies that may considered include:

- treatment wetlands

- membrane systems
- textile filter systems
- sand filters
- subsurface media treatment systems
- buffering/balance tanks
- dosing mechanisms
- dosing siphon
- floating outlet™

Further information on these technologies can be obtained in the *Designing and Installing Onsite Wastewater Systems, 2019* – WaterNSW – updated guidelines prepared by WaterNSW to regulate OSMFs in the Sydney Catchment Area.

11.11 Other installation requirements

All OSMFS must be installed in compliance with AS/NZS 3500.2:2018 *Plumbing and drainage Part 2 Sanitary and plumbing and drainage* and PCA Volume 3-2016 *National Construction Code (NCC) Series Volume Three – Plumbing Code of Australia*.

All pipes and fittings are to be connected in accordance with plumbing practices in AS/NZS 3500 (Parts 0-4):2018 *Plumbing and drainage set* and manufacturer's specifications.

All electrical work must be carried out by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000:2018, *Electrical installations*.

APPENDIX A - References and Relevant Australian Standards and Guidelines for Onsite Sewage Management Systems

The following Australian Standards and guideline documents are recommended to be reviewed and considered for the selection of an appropriate on-site sewage management system for a specific site:

AS/NZS 1546.1.2008: *On-site domestic wastewater treatment units – septic tanks.*

AS/NZS 1546.2 2008: *On-site domestic wastewater treatment units – waterless composting toilets.*

AS/NZS 1546.3 2008: *On-site domestic wastewater treatment units – aerated wastewater treatment systems.*

AS/NZS 1547:2012: *On-site domestic wastewater management.*

AS 2698.2-2000: *Plastic pipes and fittings for irrigation and rural applications - Polyethylene rural pipe.*

AS 2698.3-1990: *Plastic pipes and fittings for irrigation and rural applications - Mechanical joint fittings for use with polyethylene micro-irrigation pipes.*

AS/NZS 3500:2003: *Plumbing and Drainage.*

AS/NZS 3500.2:2018 *Plumbing and drainage Part 2 Sanitary and plumbing and drainage*

PCA Volume 3-2016 *National Construction Code (NCC) Series Volume Three – Plumbing Code of Australia*

AS/NZS 3000:2018, *Electrical installations*

Note: the standards are recognized as industry best practice and are enforceable.

Australian Guidelines for Water Recycling: *Managing Health and Environmental Risks (Phase 1) 2006* – The Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) 2006 (subsequently referred to as “*The Australian Guidelines for Water Recycling*”) has been produced by the Environment Protection and Heritage Council, Natural Resources Management Ministerial Council and the Australian Health Ministers Conference to provide guidance on best practices for water recycling.

The guidelines provide a risk assessment framework that is applicable to the recycling of water from stormwater, grey water and treated sewage sources. The guidelines are not mandatory, but are designed to provide an authoritative reference that can be used to support beneficial and sustainable recycling. The guidelines are intended to be used by anyone involved in the supply, use and regulation of recycled water schemes.

Note: the guidelines are available to download from the EPA website.

ANZECC Guidelines for Fresh and Marine Water Quality (2000) – The Australian and New Zealand Guidelines for Fresh and Marine Water Quality do not apply directly to recycled water; however, they provide an outline for setting water quality criteria. Specifically they provide guidance on designing and implementing water quality monitoring and assessment programs for irrigation that may be useful in the development of recycled water schemes.

The document covers the broad framework, principles, objectives and best management practices that should be considered when establishing an irrigation system that uses effluent. This information can be used in the design and operation of effluent irrigation systems and can also be relevant and useful for meeting environmental requirements under the POEO Act and in negotiations for premises-specific environment protection licences.

Designing and Installing Onsite Wastewater Systems, 2012 – NSW Sydney Catchment Authority (SCA) - guidelines prepared by SCA to regulate OSMFs in the Sydney Catchment Area.

Designing and Installing Onsite Wastewater Systems, 2019 – WaterNSW – updated guidelines prepared by WaterNSW to regulate OSMFs in the Sydney Catchment Area.

Neutral or Beneficial Effect on Water Quality Assessment Guideline 2015 – NSW Sydney Catchment Authority (SCA) - the NorBE Guideline

Environmental Guidelines: *Use of Effluent by Irrigation (2004)* – produced by the former NSW Department of Environment and Conservation (now the NSW Office of Environment and Heritage (OEH)) has been adopted in NSW for the use of effluent for irrigation in non-domestic applications.

Environment & Health Protection Guidelines: *On-site Sewage Management for Single Households (1998)*, prepared by the NSW Department of Local Government, NSW Environment Protection Authority, NSW Department of Health, NSW Department of Land and Water Conservation and NSW Department of Urban Affairs and Planning – this document provides information and guidelines on the selection, design, installation, operation and maintenance of single household on-site sewage management systems.

NSW Code of Practice: *Plumbing and Drainage (3rd Edition) 2006* – The NSW Code of Practice, Plumbing and Drainage (3rd Edition) 2006 (the Code) provides cost-effective, efficient and safe plumbing and drainage solutions that protect public health and the environment. The Code details the administrative requirements for plumbing and drainage works in NSW, and adopts and varies the Australian Standard AS/NZS 3500:2003, to meet the requirements of the major urban and regional water supply authorities.

NSW Department of Water and Energy - NSW Guidelines for *Greywater Reuse in Sewered, Single Household Residential Premises (2008)* prepared by the– this guideline provides direction on the use of grey water diversion devices in single households and additional advisory information to the owners and/or occupiers of sewered residential premises on grey water treatment systems and manual bucketing of grey water.

NSW Health Guidelines for *Greywater reuse in sewered single domestic premises (2000)* – this document provides advise similar to and was succeeded by the NSW Guidelines by NSW Department of Water and Energy above.

NSW Health Sewage Management Facility Vessel Accreditation Guideline (2016)

NSW Health Secondary Treatment Accreditation Guideline (AWTS, Sand Filter, Reed beds) (2018)

NSW Health Waterless Composting Toilet Accreditation Guideline (2010)

NSW Health Domestic Greywater Treatment Systems Accreditation Guidelines (2005)

NSW Health – Advisory Note 3 – Destruction, Removal and Reuse of Septic Tanks and AWTS (2017)

NSW Health – Advisory Note 4 – Recommended Final Uses of Effluent Baed on the Type of Treatment (2017)



NSW Health – Advisory Note 5 – Servicing of Single Domestic Sewage Management Facilities (2018)

Protection of the Environment Operations Act, 1997 – chief piece of NSW legislation concerning environmental offences.

Schedule 1 of the Local Government (General) Regulation 2021 – states that water supply work, sewerage work and stormwater drainage work must comply with the Plumbing and Drainage Code of Practice.

APPENDIX B - Greywater Diversion Devices and Greywater Treatment System control measures and guidelines

Grey Water Diversion Devices (NSW Department of Water and Energy 2008)

COMPLIANCE 	NON-COMPLIANCE 
<ul style="list-style-type: none"> • Install a greywater diversion device that has a WaterMark licence and is listed by NSW Health • reuse diverted untreated greywater only for sub-surface irrigation (at least 100 mm below the surface of soil or mulch) • ensure the greywater diversion device is switched back after irrigation periods so that greywater is diverted to sewer • undertake a water balance to estimate the amount of water that can be reused by the household • select garden-friendly detergents that are biodegradable and low in phosphorus, sodium, boron and chloride • select washing detergents that are low in salt – consider using a powder concentrate, or a liquid washing detergent • monitoring plant and soil response to greywater irrigation • occasionally irrigate with drinking water to disperse salts from the soil (only necessary during extended periods of zero rainfall) • consider applying a soil rewetting agent every six months • use a filter to screen solids when using a diversion device • ensure that regular maintenance is undertaken, including cleaning out the Greywater diversion device filter weekly and maintaining the sub-surface irrigation system • mark and label all pipes and use signs to indicate greywater reuse 	<ul style="list-style-type: none"> • Leaving a diversion device on all the time • reusing toilet or kitchen wastewater. • reusing greywater during rain • storing of untreated greywater • over-watering application area • reusing greywater from the washing of nappies or contaminated clothing. • reusing greywater when a resident is sick, e.g. has diarrhoea • reusing greywater generated by cleaning in the laundry or bathroom, or when using hair dye or other chemicals. • reusing greywater generated by washing rags used for painting or for maintaining machinery and vehicles. • reuse greywater to top up rainwater tanks or swimming pools. • reusing greywater on plants that will be eaten raw or where fruit has fallen to the ground and could be eaten. • using greywater to wash paths, driveways or cars • allowing direct contact or ingestion of the greywater • using greywater to irrigate on dune sand or shallow rocky soil unless the soil has been enriched to a minimum 300mm in depth. • reusing greywater so that it flows into the streets or down stormwater drains. • installing drippers of a sub-surface irrigation system within one metre of boundary lines, inground pools and inground potable water tanks and buildings. • letting greywater go beyond the property boundary and cause a nuisance to neighbours • using greywater in households where immuno-suppressed occupants are present.

Greywater Treatment System (GTS) (NSW Department of Water and Energy 2008)

COMPLIANCE	NON-COMPLIANCE
<ul style="list-style-type: none"> • obtain Council approval and install a GTS that has been accredited by NSW Health. • reuse treated greywater (from a GTS) only for irrigation (including surface irrigation), toilet flushing and washing machine use • undertake a water balance before installing a GTS to calculate the amount of water that can be reused by the household • select garden-friendly detergents that are biodegradable and low in phosphorus, sodium, boron and chloride • select washing detergents that are low in salt – consider using a powder concentrate, or a liquid washing detergent • monitor plant and soil response to greywater irrigation. • occasionally irrigate with drinking water to disperse salts from the soil (only appropriate during extended periods of zero rainfall). • consider applying a soil rewetting agent every six months. • ensure that regular maintenance of the greywater system is undertaken. • mark and label all pipes and use signs to indicate greywater reuse 	<ul style="list-style-type: none"> • irrigating with greywater during rain • reusing greywater generated by cleaning in the laundry or bathroom, or when using hair dye or other chemicals • reuse greywater generated by washing rags used for painting or for maintaining machinery • reusing greywater to top up rainwater tanks or swimming pools • over-watering (waterlogging soils) • reusing greywater on plants that will be eaten raw or where fruit has fallen to the ground • using greywater to wash paths, driveways or cars • reusing greywater so that it flows into the streets or down stormwater drains • installing drippers of an irrigation system within one metre of boundary lines, inground pools, and inground potable water tanks and buildings • letting greywater go beyond the property boundary and cause a nuisance to neighbours

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