

## **SECTION 23 – ON-SITE WASTEWATER MANAGEMENT SYSTEMS**

### **INTRODUCTION**

As a regulatory authority in the Muswellbrook Shire, Council is legally obliged to ensure that development does not detrimentally impact on the environment. Many waterways suffer environmental damage as a result of incremental pollution rather than from one pollution event. Both groundwater and surface water resources can be negatively influenced by discharged effluent which is emitted into the environment without appropriate treatment and control.

This Section of the Muswellbrook Shire Council DCP provides guidance to property owners and occupiers with the aim to protect our waterways from pollution and in particular pollution from on-site wastewater disposal, by setting minimum standards for the disposal of effluent in conjunction with relevant guidelines and legislation.

This Section contains the following subsections:

- 23.1 – Legal requirements
- 23.2 – Relationship with other standards
- 23.3 – Performance criteria
- 23.4 – System Selection
- 23.5 – Risk Assessment and Classification
- 23.6 – Commercial, tourist, agriculture and Designated development
- 23.7 – Installation and operation

### **OBJECTIVES & CONTROLS**

#### **Objectives:**

- To protect the health of the public within the Muswellbrook Shire through satisfactory onsite wastewater disposal;
- To protect the environment from negative impacts from inappropriate or mismanaged disposal of wastewater;
- To approve and condition all new wastewater management systems which are installed within the Shire;
- To ensure that all wastewater treatment systems installed throughout the Shire are suitable to the specific site and are accredited by the NSW Department of Health (where applicable);
- To promote the sustainable use of water and waste resources.

#### **Controls:**

- (i) All new wastewater treatment systems must be the subject of an application submitted to Council or other appropriate approval body for determination.
- (ii) Any existing systems should be registered in Council's database of wastewater management systems.
- (iii) Any proposed wastewater treatment systems must be accredited by the NSW Department of Health (where applicable).
- (iv) All wastewater management systems and associated disposal areas must be designed to suit the expected wastewater loads and system requirements.

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- (v) All development applications relevant to areas which are non- sewered should be assessed in relation to the accommodation of wastewater management systems and their disposal areas.
- (vi) All systems should be inspected by Council at regular intervals as determined by Council.
- (vii) All matters as to be considered during the assessment of wastewater management system applications as required by the Local Government Act 1993 and Local Government (General) Regulation 2005.
- (viii) The installation of systems which do not treat and disinfect effluent (such as septic tanks) are not permitted in areas within 200m of a watercourse.
- (ix) Onsite wastewater management systems are not permitted on properties which are less than 1200m<sup>2</sup> in area.
- (x) Geotechnical assessment reports and land capability assessments are required to be submitted to Council in relation to onsite wastewater disposal for all lots associated with proposed residential and commercial subdivisions which are not relevant to sewered areas.
- (xi) All Aerated Wastewater Treatment Systems (AWTS's) must be regularly maintained by an accredited service provider and records forwarded to Council on a quarterly basis.

## **DEVELOPMENT CONTROL ELEMENTS**

### **23.1 LEGAL REQUIREMENTS**

There are three categories of wastewater treatment systems being domestic, designated or scheduled. The legislation governing the installation, operation and maintenance of each is detailed below.

#### **(i) Domestic Wastewater Treatment Systems:**

- a) *The Local Government Act 1993:*  
The Local Government Act section 68 Table item C5 requires that the approval of Muswellbrook Shire Council is to be obtained prior to the installation, construction or alteration of a wastewater treatment system.
- b) *The Local Government (General) Regulation 2005:*  
Details the requirements relating to the approval of wastewater management systems and what matters which must be considered by Council during the assessment of applications to install and operate a system.  
Details regarding the regulatory management of all systems within the Shire are identified in Council's On Site Sewage Management Strategy which is available from Council's Administration Centre.

#### **(ii) Designated Wastewater Treatment Systems**

- a) *The Environmental Planning & Assessment Act 1979:*

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

If a wastewater management or sewerage system meets the criteria detailed in sections 29 or 32 of Schedule 3 of the EP & A Regulation 2000, the installation and operation of a new wastewater treatment system must be submitted in the form of a Development Application and be accompanied by an Environmental Impact Statement (EIS). The application must also be assessed within the provisions of the EP & A Act and Regulations.

**(iii) Scheduled Wastewater Treatment Systems**

For systems that are premises based and which fall within the classifications (sewage treatment systems or waste activities) contained in Schedule 1 of the Protection of the Environment Operations Act 1997 a license to operate subject to conditions is required from the Department of Environment and Climate Change (DECC).

**23.2 RELATIONSHIP WITH OTHER STANDARDS**

Systems are to be designed, installed and constructed in accordance with the following standards:

- a) **AS/NZ 1546.1:1998** (or as updated)  
On-site domestic wastewater treatment units, Part 1 – Septic tanks
- b) **AS/NZ 1546.2:2001** (or as updated)  
On-site domestic wastewater treatment units, Part 2 – Waterless composting toilets
- c) **AS/NZ 1546.3:2001** (or as updated)  
On-site domestic wastewater treatment units, Part 3, Aerated wastewater treatment systems
- d) **AS/NZ 1547:2000** (or as updated)  
On Site Sewage Domestic Wastewater Management
- e) **AS/NZS 3500.5:2000**  
National Plumbing and Drainage Domestic Installations
- f) **Environment & Health Protection Guidelines for On-site Sewage Management for Single Households** (1998) (EHPG) or as updated.

**23.3 PERFORMANCE CRITERIA**

An application to install an on-site wastewater management system must be primarily assessed against the performance objectives outlined in this section of the DCP, legislation and other relevant standards and guidelines listed above. The performance objectives, as required by the Local Government (General) Regulation 2005 stipulates standards at which an on-site wastewater management system must operate and be maintained.

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Objectives:

- (i) Prevent the spread of disease by micro-organisms;
- (ii) Preventing the spread of foul odours;
- (iii) Preventing contamination of water;
- (iv) Preventing degradation of soil and vegetation;
- (v) The discouragement of insects and vermin;
- (vi) 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;
- (vii) The re-use resources (including nutrients and organic matter);
- (viii) The minimisation of any adverse impacts on the amenity of the land on which it is installed or constructed, and other land in the vicinity of that land.

### **23.4 SYSTEM SELECTION**

#### **Accreditation of Waste Treatment Devices**

The Local Government (General) Regulation 2005, provides that Council cannot approve an application to install a wastewater management system device unless the Council is satisfied that the device has been accredited by the Director General of NSW Department of Health or meet Council's requirements (including meeting the objectives of this DCP) in relation to system design and construction for a site specific system. The application form for the installation and operation of a new wastewater management facility is located in Appendix B.

#### **System Selection and Sizing**

Onsite wastewater disposal is not suitable for properties which are less than 1200m<sup>2</sup> in area. Council may consider alternate system designs which require offsite effluent disposal such as decentralised systems. Note that "pump out" systems are not permitted for residential applications.

Systems which Council will consider on a merits basis (providing that they are accredited by NSW Department of Health) the following systems subject to conditions:

- Conventional septic tanks, collection wells and holding tanks;
- Aerated wastewater treatment systems (AWTS');
- Waterless composting toilets;
- Wet composting toilets;
- Greywater diversion devices;
- Greywater treatment systems;
- Incinerating toilets

Council will not approve the installation or operation of conventional pit toilets.

The subdivision of land for residential or commercial purposes which are relevant to non-sewered areas must be the subject of geotechnical assessment reports and land capability assessments to investigate the individual lot suitability for onsite wastewater disposal.

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These reports will then be utilised by Council for the assessment of wastewater applications for the individual lots.

Some properties and sub-divisions may be subject to developer covenants (such as 88b instruments) which require a specific type of wastewater treatment system to be installed. To assess whether this is relevant to the property in question, it is advised that Council's Planning Department is consulted.

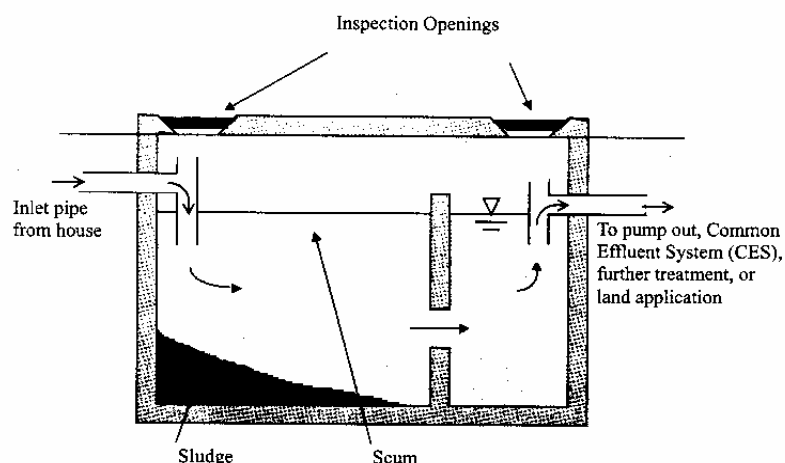
### (i) Conventional septic tank

A septic tank system usually comprises two chambers which can be separate or within the one tank. The first or primary chamber allows some of the solids to settle to the bottom of the tank and oils and fats to rise to the surface to form a scum layer. The solids that have settled to the bottom of the primary chamber undergo anaerobic bacterial digestion producing sludge. During this bacterial action, the composition of the effluent changes producing lower levels of chemicals and pathogens.

The second chamber or holding well accumulates smaller amounts of solids and scum prior to the effluent leaving the tank for discharge to the land application area (LAA). To ensure that solids do not reach the LAA an approved in tank filter must be installed in such a manner to enable easy removal for cleaning on a regular basis.

The tank must provide a retention time of at least 24 hours so that the effluent undergoes adequate anaerobic bacterial digestion and the flow of effluent to the LAA is controlled to avoid flooding.

Figure 1: Cross-section of a Septic Tank



(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

The wastewater from a septic tank is not disinfected and has high nutrient levels therefore it poses a health risk and is environmentally hazardous. Table 1 below provides a general overview of the expected effluent quality from a septic tank before it is discharged to the

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LAA. As the discharge is hazardous all primary treated effluent must be disposed of below ground. It is therefore important to maintain and monitor the LAA to ensure that water from the trench or transpiration area does not resurface.

This type of system relies on the soil completing the treatment process as the effluent moves through the strata. Not all soils or sites are suitable for septic tanks and/or absorption trenches, particularly in village areas with small blocks and soils with poor soil structures. Therefore these systems are not permitted to be installed within 200m of a water course or on any properties which are less than 1200m<sup>2</sup> in area.

Table 1: Septic Tank Expected Effluent Quality

Parameter	Concentration
Biochemical Oxygen Demand (BOD)	150 mg/L
Suspended Solids (SS)	50mg/L
Total Nitrogen (N)	50-60mg/L
Total Phosphorous (P)	10-15 mg/L
Faecal Coliforms	1000000-100000000 cfu/100ml

(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

For Council to be able to assess the installation of a septic tank the applicant must supply a copy of the NSW Health Department’s certificate of accreditation. In addition the tank itself must clearly marked by the manufacturer with the day, month and year of manufacture, the manufacturers name or registered trademark and the capacity of the unit in litres.

Septic Tank System Sizing

Council requires a 3000 litre tank as a minimum for a three-bedroom dwelling in accordance with the recommendations of AS1547:2000.

The following equation can be used to determine a specific tank size relevant to the number of persons (max) residing in the dwelling.

<b>STC = HLR x N + BA</b>
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Where:

- STC = Septic tank capacity (litres)
- BA = Basic allowance for sludge = 1550 litres
- HLR = Hydraulic loading rate (litres /person /day)
- N = Number of persons (max) in dwelling

The Hydraulic Loading Rate (HLR) is listed by AS 1547:2000 - On-site domestic wastewater management. The minimum number of people taken to reside in a dwelling must be five (5) to adequately size a system for future occupation of the dwelling.

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**(ii) Soil Absorption Systems or Land Application Areas (LAA's) relevant to septic tanks**

There are two types of soil absorption systems commonly used to dispose of effluent from a septic tank which are Absorption Trenches and Evapotranspiration areas.

Application of effluent must only be undertaken in non-recreational areas and must not be applied to edible fruit or salad vegetables. Dairy cows must not graze on any LAA's, however beef cattle may be provided they are slaughtered at an abattoir with an authorised Meat Inspector.

*a) Absorption Trenches*

The absorption or sillage trench receives primary treated effluent from a septic tank. The role of the trench is to evenly discharge this effluent to the subsoil which then filters the effluent as it percolates through the strata. It is therefore essential that the permeability of the soil in the LAA is limited to between 5mm/day (silty Clay) and 80mm/day (sandy loam). In addition if a seasonal or permanent water table is within 1 metre of the surface of the proposed LAA the land is not suitable for absorption trenches. If the site conditions are not within these parameters the effluent may impact on the health and amenity of the environment.

A full water balance calculation over a 12-month cycle shall be used to calculate the lineal trench length. The calculator is available from Council's website: <http://www.muswellbrook.nsw.gov.au/envIRON/Water%20Balance%20Calculator.xls>

The sizing and construction of an Absorption trench shall be undertaken in accordance with AS/NZ 1547:2000 and/ or Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998. The calculations utilised to size a trench or area must be submitted to Council with the wastewater management system application.

*b) Evapotranspiration/Absorption Areas (ETA's)*

The Evapotranspiration area or 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 should be designed so that they are well vegetated and mounded to prevent the ETA filling with rainwater during rainwater events. The surrounding soil may also need to be conditioned by adding sand like material to improve water movement throughout the structure. The vegetation on the structure must be maintained requiring constant good ground cover and the eradication of weeds.

The sizing of the ETA shall be undertaken in accordance with AS/NZ 1547:2000 and/ or Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998. The calculations utilised to size a bed must be submitted to Council with the wastewater management system application.

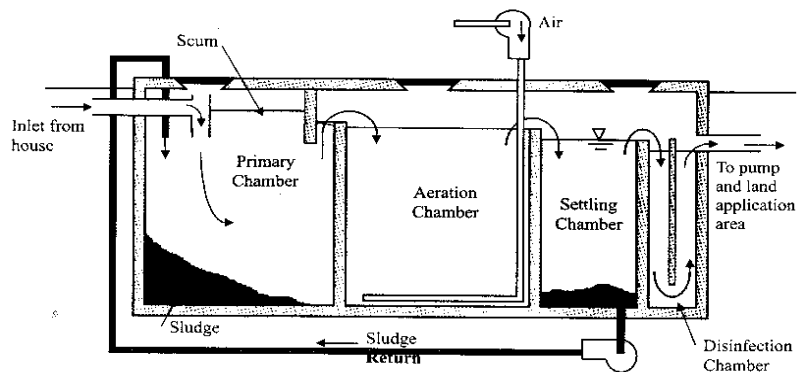
**(iii) Aerated Wastewater Treatment Systems (AWTS) and Land Application Areas**

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 LAA's.

The system firstly settles out the solid waste within the primary chamber. The effluent then flows into the aerobic chamber where the secondary treatment occurs. Aerobic and anaerobic bacteria process the effluent.

The effluent then passes into the settling chamber where any remaining solids settle out of the effluent. The remaining wastewater is then pumped into the disinfection and clarification chamber where pathogenic organisms are reduced to a safe level and additional Biochemical Oxygen Demand (BOD) removal is achieved. The expected quality of effluent after treatment in an AWTS is outlined in Table 2 below.

Figure 2: Cross- section of a typical AWTS



(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

Table 2: Expected AWTS Effluent Quality

Parameter	Concentration
Biochemical Oxygen Demand (BOD)	<20 mg/L
Suspended Solids (SS)	<30mg/L
Total Nitrogen (N)	25 - 50 mg/L
Total Phosphorous (P)	10 - 15 mg/L
Faecal Coliforms	< 30 cfu/100mL

(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

Because the effluent is treated to a higher standard than the conventional septic tank, it contains fewer potential harmful pathogens and as such its impact on the health and amenity of the local environment is not as great.

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The exception is when an AWTS is not regularly maintained. Without regular maintenance by a suitable qualified person, significant public health and pollution problems can eventuate. Council and the NSW Health Department require that the system is serviced every quarter by a qualified service technician to ensure the proper functioning of the system. Service records must be forwarded to Council for each quarter by service providers.

All AWTS are required to have NSW Health accreditation. Most AWTS accredited in NSW have a 10 person capacity (expressed as a 10 EP system), which will cater for most residences. Should the situation require a system greater than 10 EP a special design would be required.

#### Irrigation Systems

Application of effluent must only be undertaken in non-recreational areas and must not be applied to edible fruit or salad vegetables. Dairy cows must not graze on any LAA's, however beef cattle may provided they are slaughtered at an abattoir with an authorised Meat Inspector.

##### a) Surface irrigation

Surface irrigation utilises a specific area of land for the disposal of effluent from an AWTS. The irrigation of wastewater is applied to the LAA area which has been identified and designed through the site assessment process which has been chosen as the most appropriate space to dispose of effluent on the site. Within this area the distribution line is laid which comes from the outlet of the AWTS. Along this line is a series of sprayers, drippers or soaker attachments that discharge the treated effluent.

The most common method of application for surface irrigation is by sprayers or sprinklers which must be low pressure devices. To ensure effluent does not detrimentally effect the environment and public health the spray head plume radius of the device should not exceed 2 metres and with a plume height not greater than 400 mm. **Sprinklers and fixtures compatible with normal garden fittings are not to be used for surface irrigation.**

Drip and trickle systems may also be utilised which apply water by a drip or trickle fitting to an irrigation line to the soil below at least a 100mm layer of bark, woodchip or mulch. The effluent which is applied to the area of irrigation is absorbed by the soil, taken up by vegetation or evaporated. Suitable vegetation types can be found in the *Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households (1998)*.

Surface irrigation of effluent has drawbacks particularly when the LAA is inadequate to deal with the effluent or where the prevailing conditions are not favourable. Poor soil, land slope, overland water flow and inclement weather may cause effluent to leave both the LAA and the site. The wayward effluent is discharged into the receiving environment causing cumulative effects and environmental damage.

Surface irrigation will only be accepted as a suitable method of effluent disposal for properties located in Low and Medium Risk Classification Areas (see 23.5). Surface

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irrigation on properties located within High Risk Classification Areas will not be approved by Council as an acceptable method of disposal of reclaimed effluent.

The minimum area for surface irrigation must be calculated in accordance with AS/NZ 1547:2000 or the *Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households 1998*.

The minimum area calculation can also be completed using the calculator located on Council's website:

<http://www.muswellbrook.nsw.gov.au/enviro/Minimum%20Area%20Calculation.xls>

Nutrients including phosphate and nitrogen may be limiting factors in surface disposal area size. To determine the area required by nitrogen limiting, the following formula may be used:

$$A = \frac{C \times Q}{L_x}$$

Where:

A = Surface Irrigation Area

C = concentration of nutrient or BOD (mg/L)

Q = treated wastewater flow rate (L/d)

N = maximum number of persons in dwelling

$L_x$  = Critical Loading Rate of nutrient or BOD (mg/m<sup>2</sup>/d)

The largest area calculated for surface irrigation (ie for minimum area calculation and nutrient loading calculation) must be utilised.

*b) Sub Surface Disposal*

Subsurface disposal is the method of discharging effluent below the ground to deal with onsite wastewater. Subsurface or drip irrigation is the only acceptable method of reclaimed effluent disposal from an AWTS located within a High Risk Classification Area (see 23.5).

The system entails an arrangement of plastic irrigation pipes designed to discharge effluent evenly along their length (pressure compensating line). Chemicals are included in the irrigation pipe to inhibit root intrusion into the pipe work and bacterial growth inside the line.

The principle of AWTS subsurface disposal (SSD) is similar to that of an ETA in that the effluent is evaporated from the ground and transpired by the vegetation on the surface area. It is essential that the pressure compensating line is situated at the right depth being at least 100 mm below the surface.

**(iv) Composting Toilets**

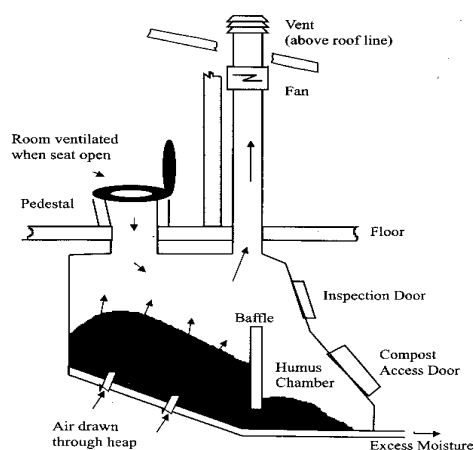
There are two types of composting toilets currently available in New South Wales, dry composting and wet composting. They function with a no flush toilet pedestal or alternatively with moisture from cistern flushing.

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In these systems, toilet wastes pass from the pan down a chute and into a chamber similar in size to a conventional septic tank. All faecal matter and other compostable matter produced in the dwelling, such as toilet paper, may be disposed of to this system where it 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.

A fan connected to a vent pipe 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.

Figure 3: Diagram of composting toilet



(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

These systems treat only toilet wastes, and all other liquid wastes from the shower, kitchen and laundry (sullage wastes or grey water) must be disposed of via a separate grey water system. These systems discharge to subsurface disposal areas such as absorption trenches or Evapotranspiration areas. The dry composting toilet itself produces only a small amount of liquid waste when operated in accordance with the manufactures specifications.

### (v) Greywater Diversion Devices and Treatment Systems

A number of greywater treatment systems are accredited by NSW Health Department due to the growing demand for the reuse of natural resources and water efficiency.

Greywater has the potential to limit the amount of potable water used, however has some implications concerning its reuse including odour generation, deoxygenation of the soil, and health risks (due to the presence disease causing bacteria). In order to reduce the potential impacts of greywater reuse, a greywater diversion device or treatment system must be operated and maintained in a manner which is consistent with the objectives of this DCP, legislation and relevant guidelines.

Some greywater diversion devices do not require approval to install, however all greywater diversion devices require an approval to operate (except those which are installed and

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operated in accordance with Section 75A of the Local Government Regulation 2005). For those systems which require approval this may be undertaken using the same process of approval as a wastewater management system and the application form included in Appendix B. The approval for installation and operation of greywater diversion devices or treatment systems will be on a merits basis, based upon the assessment of available land area for disposal and consistency with the objectives of this DCP.

#### Greywater Diversion overview

A greywater diversion device is designed to allow greywater from the shower, bath, basin or laundry to be diverted to an alternative disposal site rather than through the effluent management system. Gravity fed diversion devices incorporate a hand activated valve, switch or tap and is fitted to the outlet of the waste pipe of the plumbing fixture (eg laundry tub) directly to a disposal area. Pump diversion devices incorporate a surge tank to cope with sudden influxes of greywater for distribution to a disposal area. The surge tank does not operate as a storage tank.

Greywater diversion devices do not treat the greywater therefore is not suitable for application above ground. Hence **diverted greywater must be disposed of by subsurface methods** using the calculations for the required area detailed by this Section of the DCP for subsurface irrigation.

Greywater disposal must only be undertaken in non-recreational areas and must not be applied to edible fruit or salad vegetables and must not be stored for more than a 24 hour period.

#### Greywater Treatment System Overview

Greywater treatment systems treat greywater to a tertiary level which is satisfactory for above ground land application (excluding those systems located within High Risk Classification Areas which must use subsurface disposal). The systems utilise a cycle of aeration and inactivity to attain biological breakdown of the water through oxidation. The inactive period results in a reduction in nitrogen levels in the water. Filtration of the water removes any solids and the water is then disinfected by a UV disinfection unit.

Sizing of the land application area is to be undertaken in accordance with those methods in this Section of the DCP for surface irrigation. Greywater disposal must only be undertaken in non-recreational areas and must not be applied to edible fruit or salad vegetables.

#### **(vi) Incinerating Toilets**

Incinerating toilets are a waterless system which relies on energy or gas to incinerate human waste to an ash form. They are useful in areas which have limited land application area available.

In these systems, waste is deposited into a bowl liner which is then discharged to a burn area. After approximately 4 uses, the burning of the waste product commences. As the burn area is a completely separate area to the deposition areas (separated by a flap) there are no odours or smoke associated with the process.

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These systems treat only toilet wastes, and all other liquid wastes from the shower, kitchen and laundry (sullage wastes or grey water) must be disposed of via a separate greywater system. These systems discharge to subsurface disposal areas such as absorption trenches or Evapotranspiration areas. The dry composting toilet itself produces only a small amount of liquid waste when operated in accordance with the manufactures specifications

**(vii) Alternative Systems**

Increasing awareness of environmental issues has seen significant changes to domestic effluent disposal in the last decade. This trend is likely to continue with new products coming onto the market. As such, certain installations are not described in the above information. This does not mean that Council will not assess an application for an alternative system however; it does mean that Council must assess the proposal on its merits and ensure that all calculations included in the design of the proposal are accurate.

In such cases the applicant must provide designs, calculations and reports acceptable to Council, demonstrating how the system will meet all relevant standards and legislation and the objectives of this DCP.

An example of an alternative system may be constructed reed beds or wetlands which receive and process wastewater. These types of systems are purpose built and designed to accommodate specific wastewater loads on specific sites. These systems must be designed in accordance with relevant legislation, guidelines and standards.

## **23.5 RISK ASSESSMENT & CLASSIFICATION**

All existing systems within the Muswellbrook Shire Council local government area have been classified as to the risk they pose to health, amenity and their potential impacts on the environment.

In order to determine the likely impact a new onsite wastewater management system will have on the environment and the health of the surrounding residents, an assessment will be undertaken similar to that carried out on existing systems. The categories of assessment are high risk, medium risk and low risk and are determined by the following criteria:

**(i) Low risk Indicative Criteria**

- A system used for no more than 10 people
- Located on a property with a total land area of at least 40 hectares
- located so that any part of the system is at least 100 metres from any property boundary
- located so that any part of the system is at least 250 metres from a domestic ground water well used for domestic water supply
- located so that any part of the system is at least 200 metres from any permanent surface waters or any other waters (e.g. farm dams, intermittent waterways and drainage channels)
- not located in an area with a known high water table (less than 1.5 metres)
- not located within an area prone to flooding in a 1 in 100 year flood

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- located so that any part of the system is at least 20 metres from any swimming pool
- (ii) **Medium Risk Indicative Criteria**
- Located on a property within a rural or residential zone having an area between 2 and 40 hectares
  - Aerated wastewater treatment system (AWTS)
  - located so that any part of the system is between 100 and 200 metres from any permanent surface waters or any other waters (e.g. farm dams, intermittent waterways and drainage channels)
  - Within 100m of another system
  - System defined as a “chemical closet”
  - >50m but <100m from a well or bore
  - >20m but <50m off a property boundary
- (iii) **High Risk Indicative Criteria**
- Located on a property which is located within a village zone within Muswellbrook Shire Council’s Local Environment Plan (1985) or as updated;
  - Located on a property with a total land area less than 2 hectares.
  - Located so that any part of the system is less than 20 metres from any property boundary
  - Located so that any part of the system is less than 100 metres from any permanent surface waters or any other waters (e.g. farm dams, intermittent waterways and drainage channels)
  - Located in an area with known high water tables (less than 1.5 metres)
  - Located within an area prone to flooding in a 1 in 100 year flood
  - Located so that any part of the system is less than 20 metres from any swimming pool or dam
  - Pump out installations either by tanker (are not permitted by Council for residential applications) or to a public reticulated sewer system
  - A type of a sewerage management system which serves more than 10 people.

**23.6 COMMERCIAL, TOURIST, AGRICULTURAL & DESIGNATED DEVELOPMENT**

Onsite wastewater management systems proposed for developments of this nature which are proposed to cater for more than 10 persons, must produce effluent quality of at least a secondary standard however they shall be classified as high risk systems. Prior to the lodgement of an application for these types of systems, it is advised that the applicant consult with Council to determine any other additional information that may be required.

A development application for development within these categories will require a report addressing the following matters:

- Outline the type and configuration of the system proposed for the development including tank capacities and specifications;

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- Provide information including calculations as to how the system will cater for the proposed loading and effluent disposal. The information must reference hydraulic and soil capacities in the system design;
- Provide a water balance analysis for the site;
- Advise of the expected wastewater quality;
- Advise of any adverse chemical or biological inputs into the system and how the treatment device will process these inputs and achieve the accepted effluent quality;
- Demonstrate that the proposed system meets the objectives of this DCP, guidelines and related legislation;
- Provide a design including sizing calculations and construction design regarding the system and LAA which also includes the details of nearest potential receptors;
- Provide a copy of the service agreement or contract for the ongoing maintenance and servicing of the system. If the system is proposed as a pump out system then a procedure for identifying the need to pump out is required;
- Detail the mitigation measures proposed regarding protection of the system in the event of flood if the land is susceptible.

### **23.7 INSTALLATION & OPERATION**

#### Pre- installation

To assess a wastewater application, Council must consider the suitability of the specific site to manage wastewater disposal. It is recommended that a site and soil assessment, in accordance with AS 1547, completed by a suitably qualified person, accompany the application.

#### Installation

The applicants of approved systems with consent from Council are required to be aware of all requirements of the approval by reviewing the stamped plans, details and specifications and the conditions of consent.

The approval describes the conditions that must be followed when installing and operating the wastewater management system. In most cases the conditions imposed are standard pertaining to the particular system chosen however in some circumstances site and system specific conditions may be imposed.

To determine compliance with these conditions Council Officers must carryout at least two (2) inspections during the system application and installation process. The first inspection is undertaken as a preliminary site inspection which requires the completion of the soil assessment procedure as detailed above. The second inspection is undertaken after the system has been installed but before the connection pipes have been back filled.

Prior to the system being used Council must undertake a final inspection of completed works. Should the system be satisfactory and installed as per the conditions of the approval, the system will be required to operate under the conditions issued with the approval.

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Operation

The approval obtained from Council for installation and operation outlines the requirements that must be complied with throughout the life of the system by imposing conditions pertinent to the type of system that has been installed.

**23.8 SYSTEM MAINTENANCE**

To ensure that a wastewater system performs to the designed standard, adequate maintenance must be regularly undertaken. A large part of satisfactory operation of a wastewater management system is general maintenance that must be undertaken to ensure that the system operates in accordance with the conditions of approval. Requirements for maintenance vary according to the type of system installed, average wastewater loads and the performance of the effluent disposal area.

Conventional Septic Tank Systems

Conventional septic tank systems are not maintenance free. Solids levels will build up in septic tanks over a number of years and accordingly, these systems require regular desludging or pump outs. The frequency of desludging is dependant upon the number of people using the system but generally systems will be required to be desludged every three to five years.

The following items should be inspected by the owner of the system on a 6 monthly basis:

- Condition of internal baffle if installed;
- Condition of grease trap if installed;
- Height of tank above surrounding ground level;
- Condition of tank lid;
- Whether the lid and inspection openings in the lid are appropriately sealed;
- The state of repair of the tank;
- The condition of the inlet and outlet squares;
- The level of sludge and scum in the tank;
- Whether there is evidence of effluent resurfacing on the site; and
- Whether there are odours present.

Aerated Wastewater Treatment Systems (AWTS')

AWT systems are by nature of their design complicated and may not operate effectively should they not be maintained regularly to ensure that all aspects of the system are operating to the required standard. Council requires that a quarterly maintenance regime be implemented in accordance with the accreditation requirements of the NSW Department of Health. The quarterly service must be carried out by a suitably qualified and approved service provider who must record and report their maintenance recommendations to Council on a quarterly basis.

The quarterly service report must address the following criteria:

- Condition of internal baffle if installed;
- Condition of grease trap if installed;
- Height of tank above surrounding ground level;

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- Condition of tank lid(s) and whether the lid and inspection openings in the lid are appropriately sealed;
- The state of repair of the tank;
- The condition of the inlet and outlet squares;
- The level of sludge and scum in the tank;
- Operating standard of the pump, blower, electrical component, alarms, air lines and clarifier ;
- Whether the sludge return is operating;
- Operating standard of the chlorinator;
- Whether there are signs of effluent resurfacing on the site;
- Whether there are odours present;
- Levels of total nitrogen and phosphorous being discharged from the system;
- Total free chlorine;
- pH levels;
- Number of and operating standard of irrigation sprinklers;
- Whether effluent is evident on the site or is leaving the site.

#### Composting Toilets

The following items should be inspected by the owner of the system on a 6 monthly basis:

- Fan operation and maintenance;
- Filters to air intakes;
- Any heating elements;
- Any rotation or turning of the compost;
- Levels of composted material;
- Presence of flies or other disease transmitting insects within the composting chamber;
- That wastes have been allowed to compost for the period recommended for the type of unit;
- That the permanent construction notice is still affixed within the closet compartment;
- Any liquid discharge from the unit and accompanying disposal location; and
- The grey water disposal system including inspection of the disposal area.

#### Greywater Diversion Devices and Treatment Systems

Greywater diversion devices and treatment systems must be maintained in accordance with the accreditation of the system from the NSW Department of Health. Servicing of greywater diversion devices and treatment systems must also be undertaken in accordance with NSW Department of Health guidelines for accreditation of the systems.

#### Incinerating Toilets

Incinerating toilets must be maintained in accordance with the conditions of accreditation of the system from NSW Department of Health. Servicing of incinerating toilets must also be undertaken in accordance with NSW Health guidelines for accreditation of the systems.

### **23.9 COUNCIL AUDITING**

Council has put in place an auditing system which is identified in Muswellbrook Shire Council's On-Site Sewage Management Strategy. In compliance with state legislation,

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Council has undertaken an audit program of existing systems and will continue to monitor and audit approved systems in accordance with this DCP.

If the system does not comply with these approvals and current legislation, Council will require that remedial works are undertaken to bring the system to a satisfactory operating standard.

Should the remedial works not be completed within an agreed timeframe, further action may be taken by Council to ensure the system is not an environmental or health threat.

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**23.10**     **APPENDICIES**

**Appendix A: Required Buffer Distances For Onsite Wastewater Management Systems**

<b>System</b>	<b>Recommended Buffer Distances</b>
All land application areas	<ul style="list-style-type: none"> <li>• 100m to permanent surface waters (eg river, streams, lakes etc),</li> <li>• 250m to domestic groundwater well,</li> <li>• 40m to other waters (eg farm dams, intermittent waterways and drainage channels).</li> </ul>
Surface spray irrigation	<ul style="list-style-type: none"> <li>• 6m if area up-gradient and 3m if area, down gradient of driveways and property boundaries,</li> <li>• 15m to dwellings,</li> <li>• 3m to paths and walkways,</li> <li>• 6m to swimming pools.</li> </ul>
Surface drip and trickle irrigation	<ul style="list-style-type: none"> <li>• 6m if area up-gradient and 3m if area down gradient of swimming pools, property boundaries, driveways and buildings.</li> </ul>
Subsurface irrigation	<ul style="list-style-type: none"> <li>• 6m if area up-gradient and 3 m if area down gradient of swimming pools, property boundaries, driveways and buildings.</li> </ul>
Absorption System	<ul style="list-style-type: none"> <li>• 12m if area up-gradient and 6m if down gradient of property boundary</li> <li>• 6m if area up-gradient and 3m if area down gradient of swimming pools, driveways and buildings.</li> </ul>

(Source: Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households 1998)

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