Clarence Valley Council

On-Site Wastewater Management Strategy 2025

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VALLEY COUNCIL

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Submissions and Comments

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List of Acronyms

ACT	Application in Council's electronic management system
ASS	Acid Sulphate Soil/s
ATO	Approval to Operate
AWTS	Aerated wastewater treatment system, also used for secondary treatment system
BOD/BOD_5	Biochemical oxygen demand (5-day BOD)
CC	Construction certificate
CDC	Complying development certificate
CES	Common effluent system
CID	Certified Irrigation Designer
DA	Development application
DCP	Development control plan
DIR	Design irrigation rate
DLR	Design loading rate
DWC	Drinking water catchment/s
EP	Equivalent population
ETA	Evapotranspiration absorption
FC	Faecal coliforms
FOG	Fats, oils and greases
GDD	Greywater diversion device
GIS	Geographical Information System
GPD	Greywater processing device
GPS	Global Positioning System
GTS	Greywater treatment system
HRT	Hydraulic retention time
LAA	Land application area
LEP	Local environmental plan
LGA	Local government area
LPED	Low pressure effluent distribution
NUA	Nutrient uptake area
OSM	On-site wastewater management, also known as on-site sewage management
OSMS	On-site wastewater management system/s
O&M	Operation and maintenance
POAA	Priority oyster aquaculture area/s
SSI	Subsurface irrigation
STS	Secondary treatment system
TSS	Total suspended solids
WCS	Wet composting system
WCT/WCTS	Waterless composting toilet system
Legislation (NSW)	
EP&A Act	*Environmental Planning and Assessment Act 1979*
LG Act	*Local Government Act 1993*
LG Regulation	Local Government (General) Regulation 2021
POEO Act	*Protection of the Environment Operations Act 1997*
Involved Government Agencies (at the time of publication)	
NSW Government Water	Department of Climate Change, Energy, the Environment and Water: Water
NSW EPA	NSW Environment Protection Authority
NSW Health	NSW Ministry of Health
OLG	Office of Local Government
WaterNSW	WaterNSW

1. INTRODUCTION

Clarence Valley Council Local Government Area (LGA) has approximately 10,000 on-site wastewater management systems (OSMS) and covers an area of approximately 10,500km^2. The LGA has over 54,000 residents, of which, it is estimated that 20,000 people are serviced by on-site wastewater management systems. This area is one of the largest regional LGAs in NSW and includes unsewered villages and rural settlements from the hinterland to the coast.

The LGA contains two drinking water catchments that supply water to Clarence Valley Council and the City of Coffs Harbour, along with Priority Oyster Aquaculture Areas (POAA) and various waterways popular for recreational use.

The regulation and management of OSM systems throughout the Clarence Valley contributes to the protection of human health and the environment. This On-site Wastewater Management Strategy (Strategy) aims to provide consistency for regulating and managing existing and new on-site wastewater management systems in the Clarence Valley. This Strategy is a review and update of the Strategy currently in use, that was published in 2019. This Strategy has been written in response to the internal audit completed on the OSM process. Council will review the technical material of this Strategy as required and undertake a detailed revision of this Strategy within 5 years of the time of adoption.

Many of the problems with existing OSMS may relate to the original design not addressing site constraints, the installation, the subsequent ongoing maintenance of the OSMS, and the age of the OSMS. There is pressure to develop properties that are located in environmentally sensitive areas with limitations such as flooding, high water tables, small lots and poor soil types for on-site wastewater management (OSM). It is critical that any development addresses the constraints of OSM in the short and long-term.

Through the implementation of this Strategy, Council aims to improve the design and installation of new OSM systems and the maintenance of all OSM systems in the LGA to improve the protection of human health and the environment.

To support this Strategy Council have produced OSM Technical Documents which provide additional information not included in this Strategy. These OSM Technical Documents are referred to in this Strategy and a list of them may be found Section 11 of this Strategy.

1.1. What is Wastewater?

Wastewater is waste transported by water, including human waste. On-site wastewater management is the collection, treatment and effluent application within the boundaries of the site it was generated within. An OSM system (OSMS) is used to manage wastewater.

The acronyms OSM and OSMS have been used in this Strategy for on-site wastewater management, as the terms on-site sewage management and OSM have been in use by Council and the community long-term, making them easier to identify and tying in with previous guidance documents and current Council electronic management systems. For Council, OSM includes more than just sewage, as businesses not connected to reticulated sewer services also generate wastewater that isn't sewage, which is generally regulated by Council.

One of the common treatment system types in the LGA is an aerated wastewater treatment system (AWTS). This is a type of secondary treatment system (STS). The acronym AWTS has been used to include other STS in this Strategy, as AWTS are the most common STS in the LGA.

In an OSMS, effluent is applied to the site in a land application area (LAA).

1.2. Statement of Purpose

The purpose of this Strategy is to provide a framework for Clarence Valley Council to regulate and manage the approval, installation and operation of on-site wastewater management systems to minimise the risk to public health and the environment.

This will ensure Council meets both its statutory obligations and duty of care in its role to regulate development while protecting the environment, public health and community amenity.

1.3. Objectives

The main objective of this Strategy is to provide a consistent approach in accordance with all regulations, standards and guidelines to manage new and existing on-site wastewater systems in the Clarence Valley LGA.

The general objectives of this Strategy are:

- To guide development that includes OSMS to ensure all designs submitted to Council for approval and installation align with industry best practices and legislation.
- To set out Council's approach to regulating and approving new and existing on-site wastewater management systems in the LGA.
- To encourage suitable development by setting out Council's minimum requirements for applications.
- To monitor the performance of OSMS using a risk-based monitoring program.
- To provide appropriate education information to the general community, consultants, designers, plumbers, installers and service agents to improve on-site wastewater management; and
- To reduce environmental and public health risk from on-site wastewater application.

1.4. Goals

To achieve the above objectives Council has set the following goals:

- To provide an OSM Wastewater Design Model, User Manual and all relevant information to the general community, consultants and plumbers to aid and improve the design of on-site wastewater management systems.
- To assess all on-site wastewater applications with consideration of the relevant regulations, standards and guidelines.
- To maintain a database of all on-site wastewater management systems including a risk-based classification.
- To consolidate information from the existing databases and external sources to Council's GIS system.
- To maintain and regularly update an on-site wastewater management page on Councils webpage.
- To delineate the risk-based classifications.
- To implement the risk-based monitoring program.
- To ensure that key stakeholders are aware of their responsibilities regarding OSM. Key stakeholders include owners, developers, designers, installers operators and service agents.
- To liaise with service agents to ensure that both the treatment system and land application areas are maintained and operating effectively; and
- To encourage connection to Council's existing reticulated sewerage system where new development is proposed or existing dwellings require upgrade work and are in close proximity.

1.5. Legislative and Guidance Framework

Councils are granted responsibilities and powers by NSW State legislation. In NSW the *Local Government Act 1993* (LG Act) and *Local Government (General) Regulation 2021* (LG Regulation) are the principal statutory source of local government on-site wastewater management duties, functions and powers. The *Environmental Planning and Assessment Act 1979*, *Protection of the Environment Operations Act 1997* (POEO Act), *Public Health Act 2010* and other special purpose legislation, also confer specific and general on-site wastewater management related functions and powers on councils, including environmental planning and pollution control.

The following documents, or the updated versions, provide additional guidance for OSM in the LGA:

- Onsite Wastewater Management Guidelines (2025) Department of Planning, Housing and Infrastructure: Office of Local Government.
- AS/NZS 1547:2012 - Australian/New Zealand Standard: On-site Domestic- Wastewater Management.
- AS 1546.1-4 (2008-2017) – Australian Standard: On Site Domestic Wastewater Treatment Units.
- Clarence Valley Council's Local Environmental Plan (LEP) (2011).
- Relevant Clarence Valley Council Development Control Plans (DCP) (various years).
- Clarence Valley Council's Enforcement Policy V3.0 (2015).
- Clarence Valley Council's Liquid Trade Waste Regulation Policy V5.0 (2022).
- NSW Health accreditation guidelines and advisory notes.

- Any updated versions of the above documents and any other guidelines and standards as they become relevant.

1.5.1. Local Government Act and Regulation

The LG Act and Regulation outline Council's functions, including regulatory matters, such as approvals and Orders, and the supporting steps required to complete these functions. Under Section 68 of the Act, a person seeking approval to install, construct, alter or operate an OSM system must make application to Council. The Act lists Orders that can be issued by Council and in what circumstances. The Regulation sets out performance standards for installation, alteration or operation of OSM systems, information to be provided with an application, and the processes to be taken to issue an Order.

The performance standards for the installation, alteration or operation of a "system of sewage management" underpin this Strategy and set the requirements for installation, construction and alteration and operation of OSMS. Section 44 of the LG Regulation states:

(1) A system of sewage management must be operated in a manner that achieves the following performance standards:

a) the prevention of the spread of disease by microorganisms.
b) the prevention of the spread of foul odours.
c) the prevention of contamination of water.
d) the prevention of degradation of soil and vegetation.
e) the 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) the minimisation of any adverse impacts on the amenity of the premises and surrounding lands; and
h) if appropriate, provision for the re-use of resources (including nutrients, organic matter and water).

1.5.2. Protection of the Environment Operations Act

Council has delegated power under the POEO Act to prevent, control and investigate pollution in the LGA under certain circumstances. Council authorised officers can issue environmental protection notices where there is a risk of environmental pollution.

1.6. Additional Information

There is a large amount of literature regarding on-site wastewater management available. Additional information can be found on the Office of Local Government and NSW Health websites. Information on the

accreditation of wastewater management facilities by NSW Health is also available on the NSW Health website (On-site Single Domestic Wastewater Management).

1.7. OSM Responsibilities

Council is the responsible authority for the regulation of the majority of OSM in the LGA. Council nominates authorised officers to complete regulatory tasks on their behalf. Table 1 sets out the responsibilities of each stakeholder. Every stakeholder in OSM has responsibilities to protect the environment and human health.

Table 1: Stakeholder Responsibilities

Stakeholder	Responsibilities
Council	• Producing Council strategies, policies and guidelines to strategically manage development at all levels, developing OSM and regulatory programs, including OSM Strategy. • Managing Council-owned and/ or operated OSMS.
Environmental Services	• Regulating OSM through applications, monitoring program and complaints management. • Educating the community.
Development assessors, being Council planners/ building inspectors, including Council and private certifiers	• Managing development approvals. • Implementing Council strategies, policies and guidelines to strategically manage development at all levels, including the OSM Strategy. • Managing complying development certificate and construction certificate applications, assessment and approvals regarding OSM requirements.
Developers, including development planners/ surveyors	• Following the relevant regulatory and legislative requirements and Council strategies, policies and guidelines. • Engaging and following advice of relevant professional services to meet their requirements.
Property owners	• Following the relevant regulatory and legislative framework, requirements, Council strategies, policies and guidelines relevant to the development. • Gaining and following relevant OSMS approvals (approval to install or approval to operate (ATO)). • Engaging and following advice of relevant professional services to meet their requirements, including designers, plumbers/ drainers and service agents. • Managing OSMS on their property to meet the required performance objectives and conditions of approval. • Suppling service reports (if relevant) to Council.

Stakeholder	Responsibilities
	• Retaining relevant records for the OSMS. • Educating occupants on safe operation of installed OSMS.
Occupants	• Safely operating the installed OSMS. • Identifying problems with OSMS and notifying relevant person to rectify (owner, real estate property manager).
Designers/ site and soil evaluators	• Having suitable and relevant qualifications and experience in OSMS design principles. • Having professional indemnity insurance. • Following the relevant regulatory and legislative requirements, standards, guidelines and Council strategies, policies relevant to the development. • Consulting with and advising their client regarding all steps in the design process, including option selection. • Completing a suitable site and soil assessment and preparing a compliant OSMS design including a site plan in accordance with this Strategy and considering installation constraints.
Installers	• Having relevant licenses, training, experience and agreement with the manufacturer to install the OSMS design. • Installing the approved design in compliance with conditions of consent and approved design. If changes to the design are necessary, liaising with the designer and Council to gain suitable authorisation to install an altered design. • Arranging Council inspections during installation. • Providing an “as built” plan to the owner and the Council following installation.
Service providers/ service agents/ pump-out contractors	• Maintaining suitable product knowledge and training in servicing and maintenance and experience in accordance with NSW Health Advisory Note 5 (2018), or as revised. • Maintaining systems to the manufacturer’s service manual, accreditation and Council approval. • Inspecting and maintaining any LAA in addition to the treatment system. • Reporting to owner and Council via supplying a service report on the condition of the treatment system and LAA using Council’s preferred electronic lodgement system within 14 days of the service.

Stakeholder	Responsibilities
	• Engaging a contractor for pump-out of OSMS and legal disposal of waste.
NSW Health	• Accrediting commercially available human waste treatment devices (secondary treatment systems, septic tanks, greywater treatment systems, etc.) of up to 2,000L/day treatment capacity. • Providing health advisory notes on various OSM issues. • Providing advice to councils regarding OSM.
Office of Local Government (OLG)	• Updating the NSW OSM Guidelines and legislation. • Supporting councils with their OSM regulatory responsibilities.
NSW IPART (Independent Pricing and Regulatory Tribunal)	• Licensing of private water utilities under the *Water Industry Competition Act 2006*

2. DEVELOPMENT IN UNSEWERED AREAS

2.1. Development OSM Assessment Requirements

OSM must be considered at all stages of development planning and the development processes to ensure the protection of public health and the environment and maintain inter-generational equity. Where OSM is considered at all stages of development, the risk of poor outcomes is reduced.

Where it is deemed that there is insufficient information to make a decision as to whether a proposal is sustainable in the long term (issues such as protection of surface water and groundwater, public health, aquaculture and adequate area for nutrient disposal) the onus is on the proponent to ensure all environmental and public health issues have been addressed and adequately managed. Where this isn't achieved the application will be rejected.

Table 2: Development Levels of Assessment

Stage in Planning Process	Possible Scale	Level of Assessment Required	Purpose
LEP/ DCP	• Rezoning • Specific site	• Broad evaluation and desktop analysis with representative testing of soil landscapes • Detailed site and soil evaluation to support rezoning/ development of specific sites (see OSM Technical Documents)	• Assess cumulative impacts and allow for more effective management • Identify areas that should be eliminated from development due to unsuitability for OSM and sewer servicing • Identify densities that can be sustained in different landscapes • Determine minimum and average lot sizes and identify minimum treatment technologies and OSM methods • Establish minimum performance standards/ criteria
Development application - subdivision	• Specific site	• Detailed site and soil evaluation to support DA (see	• Determine appropriate density, internal road and lot layouts based on constraints

Stage in Planning Process	Possible Scale	Level of Assessment Required	Purpose
		OSM Technical Documents) if not available from a previous LEP stage	• Large subdivisions – assess capacity to incorporate connection to reticulated sewer or community wastewater management rather than individual OSM • Assessments based on minimum 5-bedroom dwelling, conservative buffers and open space requirements separate to Land Application Area (LAA) • Select minimum treatment/ OSM method, nominate available LAAs and reserve areas • Consider placing restrictions on the title for OSMS and LAA
Development application or Complying Development – dwelling or multiple dwellings (new or alterations)	• Individual lot	• Consultant's site and soil evaluation and design (see OSM Technical Documents) • S68 application	• Indicate precise site layout including dwelling, other improvements, buffers, open space and LAA(s) and reserve areas, if required
Development application or Complying Development – single dwelling	• Individual lot	• S68 application – • Application checklist and "Deemed to Comply System"	• Simplified assessment and design process if requirements met (see Section 2.9.1) • Indicate precise site layout including dwelling, other improvements, buffers, open space and LAA(s) and reserve areas, if required

The definition of a single dwelling for the Deemed to Comply System options include new dwelling, replacement dwelling and increased load on an existing OSMS.

2.2. Rezoning

Any rezoning of unsewered areas to smaller minimum lot size will require comprehensive environmental assessments including the management of wastewater. The level of assessment for wastewater will be in accordance with Table 2 above and include:

- Desktop analysis based on available information such as soil landscape maps, GIS information, reports, studies and local knowledge.
- Representative testing of different soil types (as identified using soil landscape maps or other larger scale mapping);
- Identification of environmental climate constraints; and

- An analysis of opportunities for connecting to some form of centralised sewerage scheme.

Although on-site wastewater management is only one of the issues to be addressed in a rezoning strategy, it is an issue that will have major implications for the amount and location of land release and the resultant minimum lot sizes.

2.3. Subdivision

Where the LEP supports the subdivision of land, OSMS shall be designed in accordance with the requirements of this Strategy, Australian/ New Zealand Standard AS/NZS 1547:2012, the On-site Wastewater Management Guidelines (OLG, 2025), Council's DCP conditions and current best practice.

Where a subdivision is proposed, the minimum standards acceptable for OSM design are:

- A proposed lot size of at least the minimum lot size for the land zoning, provided it is supported by the below OSM design factors.
- A subdivision site plan with OSM LAA footprints (installed LAA and 100% reserve LAA) and buffers overlayed.
- OSM design using Council's OSM Design Model based on a minimum of five-bedrooms at an occupancy rate of 2 persons for the first two bedrooms and 1 person per bedroom for each additional bedroom.
- OSM design based on a minimum of a 150L/person/day wastewater design rate.
- OSM design based on a site-specific site and soil evaluation in accordance with Council's OSM Technical Documents.
- OSM design based on the larger of hydraulic or nutrient LAA sizing from Council's OSM Design Model.
- OSM design to include a 100% LAA reserve area. These areas are to be protected from building and access usage.
- Buffer setbacks in accordance with this Strategy.
- This Strategy considers that a minimum lot size for subdivisions in unsewered residential zones serviced by OSMS can be no less than 2,000m^2. This lot size assumes no other site constraints, such as existing development, shallow groundwater or steep slopes; and
- This Strategy considers that a minimum lot size for subdivisions in soil category 5 or 6 as defined AS/NZs 1547.2012 – On-Site Domestic Wastewater Management, can be no less than 4,000m^2. This lot size assumes no other site constraints, such as existing development, shallow groundwater or steep slopes.
- Where the lot size and layout does not support OSM design to the above specifications, altered lot layouts or larger lot sizes will be required. Any reductions to the above minimum standards must be supported by suitable reasoning.

2.3.1. Common Effluent OSMS

- Council may consider subdivisions with smaller lot sizes where common effluent collection, treatment and LAA systems are proposed.
- Council will not operate common effluent treatment systems or private systems.
- If a common effluent OSMS is proposed, the applicant will need to demonstrate to Council it's long-term feasibility, including the inclusion of adequate legal and financial arrangements to provide for the ongoing maintenance, unexpected failures and capital upgrade works. The application will include an OSM design and management plan that demonstrates that the wastewater system can be adequately operated and maintained by the intended management body, and clearly outline the operating and maintenance requirements of the system.
- Where a common effluent OSMS is proposed, the approval will require that a positive covenant be registered on the title to ensure ongoing maintenance, unexpected failures and capital upgrade works are completed.
- Applicants who wish to look at common effluent treatment systems are advised to discuss this with Council's 'Environment and Regulatory Services' and 'Development Land Use Planning' departments. Treatment would need to be a minimum of secondary treated and disinfected effluent.
- Application of effluent on agricultural land may be considered where there are reuse benefits, a viable ongoing management plan is provided, and a legal arrangement will be put in place between the owner of the OSM treatment system and the owner of the LAA.

2.3.2. Subdivisions with Retained Existing Dwellings

- For subdivisions which include existing dwellings that are to be retained following the subdivision, the following minimum standards are required for the lot containing any existing dwelling to be retained:

- <1ha (10,000m^2) lot – Where the lot containing the existing dwelling is less than 1ha, the applicant is required to upgrade the OSMS in accordance with current regulations as set out in this Strategy.
- >1ha (10,000m^2) lot – Where the lot containing the existing dwelling is more than 1ha, the applicant is required to provide an assessment of the operational condition of the existing OSMS in accordance with performance standards set out in section 44 of the Local Government Regulation.
- Compliance with the buffer distances required in this Strategy; and
- Provision of a 100% reserve area based on current design requirements.

2.4. Single Lot

Development on a single lot that will require an application to install or alter an OSMS will include:

- Single dwelling – construction of a new dwelling, replacement of an existing dwelling, increased load on an existing dwelling (additional bedrooms or habitable rooms).

- Change in use of an existing building to alter wastewater flow or contaminants;
- Increased occupancy density on a lot – construction of duplex or dual occupancy by adding to an existing dwelling or a new development.
- Addition of a tiny home or other type of movable dwelling on a lot with an existing dwelling is to be considered as an increase in lot density; or
- Increased development footprint density on a lot, including sheds, pools, decks, etc. that impact the existing LAA or reserve LAA. This includes buffers around the existing LAA or reserve LAA. This includes the provision of a reserve LAA on lots that don't have a nominated reserve area where the development is likely to impact a likely reserve LAA. This is to ensure OSMS can continue to be catered for within the boundaries of the lot following any proposed development.

A summary of typical effluent treatment systems and land application areas is provided in Council's OSM Technical Documents. This is provided as basic information to the public about the options of each type of wastewater management system.

2.4.1. Coastal Villages – Nutrient Exemption

Council acknowledges the pressure to redevelop existing small lots in coastal villages with existing dwellings in unsewered residential zones across the LGA. As many of these existing developments are serviced by primary treatment systems, which have minimal reduction in pathogens or nutrients, it is possible that these may negatively impact groundwater in these areas. In the interests of human health and environmental benefit, Council has decided to accept redevelopment of existing dwellings on existing small lots with the following requirements:

- A consultant's report is required.
- Treatment will be a minimum of secondary treatment with disinfection.
- LAA sizing will be based on the Council OSM Design Model and a flow allowance of 150L/person/day, regardless of whether reticulated town water is available or not.
- Where the OSM Design Model nutrient sizing is larger than the hydraulic sizing, this will not limit the development, provided a NSW Health accredited secondary treatment system with nutrient reduction and disinfection is used and the LAA installed is the hydraulic size plus 25%;
- Where the OSM Design Model nutrient sizing is larger than the hydraulic sizing, but less than the hydraulic size plus 25%, a NSW Health accredited secondary treatment system with nutrient reduction and disinfection is to be installed and the LAA installed is based on the nutrient sizing;
- No reserve area is required; and
- Where shallow groundwater or other major constraints are identified, these are to be addressed in the design.

2.5. Upgrade of a Failed OSM Servicing an Existing Dwelling

- Where Council has deemed a system to have failed, that system will be required to be upgraded in alignment with the requirements of this Strategy.

2.6. Minimum OSMS Standards

Any application to install or alter an OSMS must comply with the following minimum standards. Any variation to these will require a fully justified consultant's report to support the variation.

The minimum standards are:

- Upgrade of the OSMS in accordance with current regulations as set out in this Strategy.
- Water Use Fittings – Upgrade of all water use fittings that feed into the OSMS to water saving fittings of a minimum 3-star WELS rating, excluding bathtub and laundry tub, and 3-star WELS rating for all appliances;
- >1ha – Properties of at least 1ha (10,000m^2) can have primary treated effluent with a suitable land application area design, provided the site constraints are addressed, soils are not category 5 or 6 (light, medium or heavy clay) and the OSM application checklist requirements have been met.
- <1ha – Properties of less than 1ha (10,000m^2) are required to have at least secondary treated effluent. Minimum secondary standard includes:
    - BOD not greater than 20mg/L.
    - TSS not greater than 30mg/L.
    - Faecal coliforms not more than 30cfu/100mL (if disinfection is required).
    - Free residual chlorine not less than 0.5mg/L (if chlorine disinfection is required).
- Land application area options – The following LAA options are acceptable for installation, with consideration for suitable design, buffers and constraints:
    - Evapotranspiration absorption trenches or beds (ETA trenches or beds).
    - Pressure compensating subsurface irrigation (SSI).
    - Pressure compensating dripper under mulch.
    - Surface spray irrigation in accordance with Section 2.7.1; or
    - Mound systems.
    - Additional information and example design of ETA trenches and beds, mound systems and subsurface/surface irrigation systems are shown in Council's OSM Technical Documents.
- Distribution – Pressurised distribution of effluent over the entire nominated LAA is preferred. The key to effective land application of effluent is to evenly distribute the effluent throughout the LAA. This is why pressurised SSI systems are preferred. Where ETA beds/ trenches, standard arch trenching and mound systems are proposed, these should be fed either by low-pressure dosing (dosing siphon or other passive dosing system) or pressure fed using a pump. Where low-pressure dosing is proposed, it must provide suitable head to service the design.

- Absorption trenches and beds are acceptable only on suitable soil, being category 1 to 4 (sand to clay loam), with sand and sandy loam soils requiring pressurised distribution. Absorption trenches and beds are not encouraged. A suitable alternative are ETA trenches or beds, especially on clay-based soils.
- Septic tank minimum size for single households must have a minimum capacity of 3,000 litres and comply with Appendix J of AS/NZS 1547:2012.
- Outlet filter – Septic tanks and greywater tanks must have an effluent outlet filter fitted to reduce total suspended solids entering the LAA.
- Subsurface Drip Irrigation – Council will require detailed designs of subsurface drip irrigation systems to be designed and/or certified by a Certified Irrigation Designer (CID) or other suitably qualified person; and
- Treatment tank clearance – Adequate access must be provided and maintained around all treatment systems to allow safe installation; allow access for maintenance and inspection; and suitable ventilation to prevent risk to human health by gases released from the treatment system. Council requires a clearance of 1.8m in all directions surrounding the treatment system (including overhead clearance). The base of the treatment system must not be within 45° (angle of repose) from the base of any footing or foundation. Allowances must also be made for easy access to the tank in order for the pump-out contractor to get a truck near the treatment tank so that the contents of the tank can be periodically pumped out (desludging the tank).

2.6.1. Land Application Area Sizing

The LAA must be sized based on hydraulic and nutrient sizing from the Council OSM Design Model for the specific site and soil conditions.

The LAA must be hydraulically sized on the most restrictive soil layer identified at the proposed LAA location and within 600mm below the proposed effluent application point. This means an ETA bed of 450mm deep will be impacted by soils of up to 1.05m below the ground level. This 600mm depth ensures a minimum 600mm of freely draining soil exists beneath the effluent application point, mitigating the risk of LAA failure due to any limiting soil layers.

Where the hydraulic size is smaller than the nutrient size, the area where nutrient assimilation occurs surrounding the hydraulic area is called a Nutrient Uptake Area (NUA).

An NUA is the area set aside around the surrounding and downslope area of an LAA system that allows for further nutrient reduction to background levels before reaching any sensitive receptors. NUAs should not be located within OSMS buffers. This is to ensure nutrients are sustainably assimilated before reaching sensitive receptors or property boundaries (WaterNSW 2023). Vegetation cover should be maintained on NUAs at all times. NUAs should be protected from future development.

Where the NUA can't be retained inside the property and with regard to suitable buffers, mitigation in the form of nutrient reduction must be undertaken. This may include nutrient reduction treatment systems or additional treatment stages following the treatment system, such as recirculation through reed beds or use of amended media.

2.7. Restricted OSMS Options in LGA

The following OSMS are not considered suitable for installation in the Clarence Valley LGA:

- Pan toilets or pit toilets, also known as cesspits.
- Incinerating toilets.
- Biogas OSMS.
- Polishing pond treatment in OSMS.
- Pump out systems. The high costs, isolated nature of many sites, travel costs and high risk of non-compliance mean that in most situations the use of a full pump out system is not possible or practical. On that basis, Council will not consider this option as a sustainable option unless it is used as an interim measure while centralised sewerage is provided.
- Reed bed treatment systems with application to subsurface irrigation. Reed bed treatment systems with effluent application to trench or bed systems are acceptable.
- Bottomless sand filter systems or similar combined treatment and LAA style OSMS; and
- Any other domestic treatment systems not accredited by NSW Health.

2.7.1. Limited OSMS Options in LGA

The following OSMS are only considered suitable for installation in limited situations in the Clarence Valley LGA:

- Surface irrigation – is not suitable in a DWC, in a POAA, or on lots of less than 4,000m^2. Where surface irrigation is used, it must be separated from recreation areas, i.e. a separate LAA must be set aside. Surface irrigation is only permitted where slopes are <10%. Additional detail is provided in the OSM Technical Documents.

2.8. Sensitive Receivers

Sensitive receivers located in the LGA include Priority Oyster Aquaculture Areas, drinking water catchments and recreational waterbodies. High quality water is critical in the POAA and DWC areas. OSMS design and performance is critical, due to the direct impact OSMS can have on water quality.

Applications for identified sensitive receiver areas will require the following minimum standards adapted from the Department of Primary Industries (DPI) 'Healthy Estuaries for Healthy Oysters – Guidelines for development near waterways' (2023):

- A consultant's report with full site and soil assessment will be required to support any application.
- A minimum of secondary treatment system (AWTS or similar) with disinfection.
- A quarterly servicing contract with a suitable service contractor.
- LAA – pressure dosed subsurface application of effluent.
- Minimum 100m from the LAA to all waterways, water bodies or drains (perennial or intermittent).

- Treatment tank – where the tank is located within 100m of a waterway, an audible/visual high-water alarm must be installed.
- Have a minimum of 600mm to the water table or bedrock from the point of application of effluent.
- Be located to be not impacted by flooding, surface wetness or erosion; and
- Where the above can't be achieved, suitable risk mitigation measures must be proposed.

Where specific requirements are set by Council's Water Cycle Department, these will also be taken into account for all applications in the inner DWC.

2.8.1. Priority Oyster Aquaculture Areas and Drinking Water Catchments

POAA are areas identified as being where oyster farming is a desired outcome and are mapped on the DPI Fisheries Spatial Portal available at:

https://www.dpi.nsw.gov.au/fishing/fisheries-research/spatial-data-portal

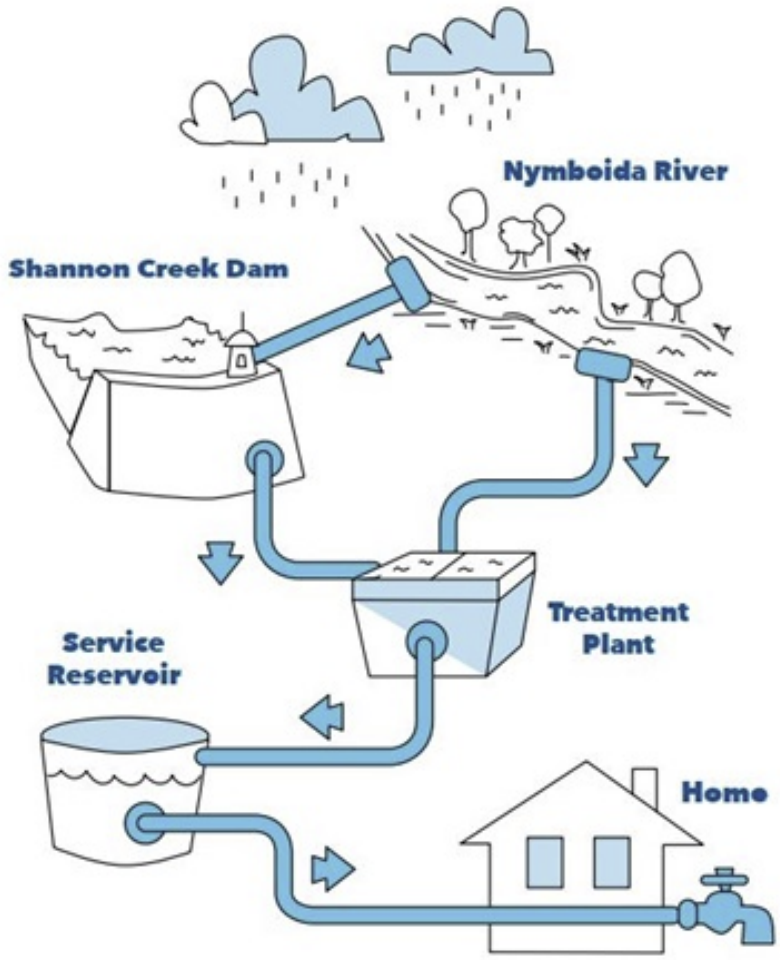
Two currently mapped POAA are located in the LGA. One at Wooli and surrounds, which is unsewered. A second POAA is located at Yamba. The areas surrounding this POAA are mostly sewered. See Section 12 for maps.

Drinking water catchments in the LGA are located in the Shannon Creek Dam catchment and upstream of the Nymboida Weir water offtake point. The high priority areas for OSM within each DWC are those areas known as the inner drinking water catchment. See Section 12 for maps.

The inner DWC for the Nymboida Weir is defined as "All properties serviced by an OSMS within 350m of the river or second order and higher waterways from the Weir up to Clouds Creek and the end of Bennetts Road".

Where an application for subdivision or development, including installation or alteration of an OSMS, is made for a site in the:

- POAA (or within 200m of a waterway and 10km upstream or downstream of an oyster lease), the application will be referred to DPI Fisheries for their feedback; or
- Within the inner catchment of a DWC, the application will be referred to Council's Water Cycle team for their feedback.



2.8.2. Cakora Lagoon – Brooms Head

Cakora Lagoon is a recreational waterbody surrounded by OSMS located on sand soils with seasonal shallow groundwater. As such, there is a high risk of poorly performing OSMS impacting water quality in the Lagoon.

2.9. Application Standards

Where an application is made to install or alter an OSMS under Section 68 of the Local Government Act, the following minimum standards for the application set out in the sections below must be met.

- To ensure consistency when consultants' reports are provided, Council has specified requirements for consultants to follow in Council's OSM Technical Documents.

2.9.1. Exemption for Single Dwellings

For an application for installation or alteration of an OSMS for a single dwelling, provided it meets the requirements of the current Council On-site Wastewater Management Application form, being checklist and confirmation by a Council OSM assessing officer, Council will allow an applicant to apply for a “Deemed to Comply System”. The Deemed to Comply Systems are set out on the application form. The Council assessing officer will confirm if the checklist answers are correct and the selected Deemed to Comply System is suitable for the situation. Applicants are to read the OSM Technical Documents for further details on site and soil assessment required to determine if a Deemed to Comply system is suitable.

2.9.2. Details to Accompany All On-site Wastewater Applications

The details below are to accompany all OSM applications made under s68 of the Local Government Act. Where this information is not provided, the application may be rejected, or additional information requested from the applicant.

- A completed OSM application on the approved Council form.
- Application fees, as set out in Council’s current Fees and Charges.
- All documents specified under Section 26 of the Local Government (General) Regulation 2021, including as described below.
- A site plan drawn to scale indicating location for on-site wastewater management system (treatment tanks, LAA) any buildings, facilities or environmentally sensitive areas on the site or neighbouring properties within 100m of the OSMS, distances to buildings, boundaries, any environmentally sensitive areas (water courses, drains, dams, vegetation, groundwater bores, etc.), any related drainage lines or pipework, whether natural or constructed), a north arrow and scale;
- Specifications of the OSM treatment system proposed to be installed, including NSW Health accreditation certificate, make/model or a suitable exemption.
- A cross section of the proposed method of effluent application in the ground and layout of effluent transfer lines.
- A site assessment including details of the climate, geology, hydrogeology, topography, soil composition and vegetation of any LAA, together with an assessment of the site in relation to those details and any mitigation measures to address the site constraints.
- Details of the numbers of persons expected to reside in the dwelling, at minimum based on the number of bedrooms or habitable rooms (second lounge rooms, rumpus rooms, etc.).
- Details of any other factors relevant to the capacity of the proposed OSMS (treatment and LAA).

- Operation and maintenance details required for the proposed OSM treatment system and LAA and how these are to be met, and action to be taken in the event of a breakdown.
- A copy of the completed CVC OSM Design Model sizing (which is available on the Clarence Valley Council website (www.clarence.nsw.gov.au) along with the OSM Design Model User Manual.
- Hydraulic assessment for proposed pumped systems, including subsurface irrigation system that must be designed or certified by a Certified Irrigation Designer (CID) or other suitably qualified person; and
- The application must nominate the selected OSMS to be approved and installed. The application is not to provide options available to be installed without making a selection.

2.10. Consultant Report Requirements

Where the requirements for a Deemed to Comply System are not met, a site and soil assessment and design by a suitably qualified and experienced consultant is required. Consultants are to follow the requirements detailed in Council's OSM Technical Documents, as well as the requirements below:

- For full details of what is to be incorporated into a wastewater report for a dwelling, refer to; *AS/NZS 1547:2012* (Appendix D Site and Soil Evaluation for Single Lots); the *On-site Wastewater Management Guidelines (OLG, 2025)* and this Strategy, including OSM Technical Documents.
- Any deviation from the Standard, Guidelines, Strategy or Council's OSM Technical Documents must be justified by the consultant.
- Clarence Valley Council encourages wastewater consultants to use the CVC OSM Design Model (which is available on the Clarence Valley Council Website (www.clarence.nsw.gov.au). Please see the OSM Design Model User Manual, also available on the website. Any changes to the model's parameters or results must be justified accordingly.

2.11. Buffers

To ensure protection of public health, the environment and amenity, buffers should be maintained between OSMS and sensitive receptors both on and off the site.

- The buffer distances shown in the On-site Wastewater Management Guidelines (OLG, 2025) (Table 3 and Table 4 below) are adopted in this Strategy.

A risk-based approach to buffer distances should consider the level of constraint imposed by a range of relevant site and system features to determine appropriate buffer distances to sensitive receptors. The overall buffer distance should be commensurate with the level of risk to public health and the environment. Consideration should be given to of the level of treatment of wastewater or greywater in determining the associated risk.

Buffers have been set in consultation with Council's Water Cycle team for drinking water catchment and the NSW Food Authority in Priority Oyster Aquaculture Areas.

Buffers should be at the upper end of the prescribed range for any surface application of effluent.

Vertical separation is from the point of effluent application at the base of the effluent application system to the highest limiting layer.

Table 3: Appropriate Buffer Ranges for Sensitive Receptors

Sensitive receptor	Buffer range (m)
Horizontal separation	
Property boundaries[1]	1.5 – 15.0
Buildings	2.0 – 6.0
Retaining walls, embankments and cuttings	3.0 or 45° angle from toe of wall (whichever is the greater)
Drives, paths and walkways	1.5 – 6.0
Swimming pools, recreational areas[2], market gardens	3.0 – 15.0
In-ground water tanks and services (water, electrical, telecommunications and plumbing)	3.0 – 15.0
Permanent surface water bodies[3]	50.0 – 100.0
Intermittent water bodies, farm dams, roadside drainage, drainage depressions, stormwater systems[3]	15.0 – 40.0
Bores and wells[3 4]	15.0 – 100.0
Vertical separation[5]	
Groundwater	0.6 – 1.5
Bedrock and hardpans	0.6 – 1.5

NOTES:

1. Buffers for subsurface drip irrigation of a minimum of secondary treated effluent downslope of an upslope property boundary may be reduced to 0.5 metre.
2. Buffers to recreational areas on existing lots may be removed if no suitable alternative area is available within the lot boundary and provided subsurface or subsoil application and a minimum of secondary treated effluent are used.
3. See Section 2.8 for buffers in drinking water catchment and priority oyster aquaculture areas.
4. This includes bores and wells with water used for potable use (e.g. within a dwelling). Reduced buffers must be justified by viral die-off modelling.
5. Vertical separation is from the point of effluent application at the base of the effluent application system to the highest seasonal water table as evidenced by soil mottling, or another limiting layer. Where the separation distance is less than 0.6 metre the point of application should be raised by importation of soil or sand to create a raised bed or mound.

Site and system constraints and scale descriptors are outlined below in Table 4. The buffer for a particular site feature or sensitive receptor should be selected from the buffer distance range according to a risk assessment which considers where each of the relevant site and system constraints lie on the respective constraint scale.

Justification of the selected buffer should be based, where possible, on quantitative evaluation of the relevant site or system features.

Table 4: Constraint Scale Ranges

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
Property Boundaries			
1.5m – 15.0m	Effluent quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Method of application	Subsurface or subsoil application	Surface/ above ground application
Buildings			
2.0m – 6.0m	Effluent quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Method of application	Subsurface or subsoil application	Surface/ above ground application
Retaining Wall/ Embankment Cutting			
Greatest of 3.0m or 45° angle from toe of wall	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Flood potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
	Geology/ Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
Path/ Walkway			
1.5m – 6.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and	Primary treated effluent

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
		contractual service agreement)	
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Method of Application	Subsurface or subsoil application	Surface/ above ground application
Swimming Pool/ Recreational Area/ Market Garden			
3.0m – 15.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Method of Application	Subsurface or subsoil application	Surface/ above ground application
In-ground water tanks and services (water, electrical, telecommunications and plumbing)			
3.0m – 15.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
Permanent Surface Water Body			
50.0m – 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 100m; low rainfall area	Category 4 to 6 soils permanent surface water <50m down gradient; high rainfall; high resource/ environmental value

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Flood Potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
	Application Method	Subsurface or subsoil application	Surface/ above ground application
Intermittent water bodies, farm dams, roadside drainage, drainage depressions			
15.0m – 40.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Surface water pollution hazard	Category 1 to 3 soils no surface water down gradient within 40m; low rainfall area	Category 4 to 6 soils intermittent surface water <20m down gradient; high rainfall; high resource/environmental value
	Slope	0-6% (surface effluent application), 0 -10% (subsurface effluent application)	>10% (surface effluent application), >30% (subsurface effluent application)
	Fall direction	Downgradient of surface water body, property boundary, recreational area	Upgradient of surface water body, property boundary, recreational area
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Flood Potential	Above 1 in 20-year flood contour	Below 1 in 20-year flood contour
	Method of Application	Subsurface or subsoil application	Surface/ above ground application

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
Bore/ Well			
15.0m – 100.0m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Geology / Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
Groundwater			
0.6m – 1.5m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Drainage	No visible signs of saturation	Visible seepage; moisture tolerant vegetation; low lying area
	Geology/ Soil	Category 3 and 4 soils, low porosity regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, high porosity regolith
	Landform	Hill crests, convex side slopes, and plains	Drainage plains and incised channels
	Method of Application	Subsurface or subsoil application	Surface/ above ground application
Bedrock/ Hardpan			
0.6m – 1.5m	Effluent Quality	Minimum of secondary treated effluent (with disinfection and contractual service agreement)	Primary treated effluent

Buffer distance range	Relevant site and system constraints	Constraint scale	
		Low	High
	Groundwater pollution hazard	Category 5 and 6 soils, low resource/ environmental value	Category 1 and 2 soils, gravel aquifers, high resource/ environmental value
	Method of Application	Subsurface or subsoil application	Surface/ above ground application

When determining buffer distances, consideration should also be given to:

- The type of effluent application system to be used.
- Surface and subsurface drainage pathways and adjusted flow paths.
- Site factors - soil permeability, geology, vegetation buffering.
- Sensitive environments - drinking water catchments and extraction areas, national parks, rainforests, estuaries, oyster aquaculture leases, wetlands, groundwater, vegetation.
- Groundwater extraction areas, and areas with poor tidal flushing.
- Existing development including EAA, buildings, driveways.
- How the site is to be used.
- Surrounding land uses, including food production; and
- Development density.

2.12. Wastewater Generation

Wastewater generation is calculated as the daily hydraulic load (L/day) for wastewater produced by a development based on the design occupancy and flow allowance relevant to the development.

Wastewater Generation Summary

Daily Hydraulic Load (L/day) =
Design Occupancy (EP) x Design Flow Allowance (L/person/day)

Design occupancy in domestic settings can be defined as the maximum potential future occupancy of a household based on the number of bedrooms, i.e. the 'Equivalent Persons' (EP), and is not the number of people living or intending to live in a household, unless that number will be higher than the design occupancy.

Design occupancy in commercial settings may refer to the maximum total number of staff, visitors, or guests intended to occupy a development on any given day.

Design flow allowances can be defined as the daily water use of a development per EP (L/person/day) that will be converted to wastewater. Where specific figures for non-residential settings are required, these may be available in AS/NZS 1547:2012 or codes and guidelines of other States.

A design occupancy rate of 2EP in the first two bedrooms with 1EP for each bedroom thereafter is considered a conservative approach to the calculation of EP for a household.

Bedrooms are defined as any room that possesses the potential to be used as a bedroom in the future. Generally, any room that contains a door and window is considered a potential bedroom and includes rooms such as studies, games/ media rooms, home gyms and studios. It is up to the discretion of Council to determine whether or not a room is considered a bedroom for design purposes.

Where a building has its own toilet and laundry facilities, or close access to the same, it should be considered a separate household. As such, the occupancy would start at 2EP, as for the first dwelling.

Short-term accommodation occupancy should be based on available beds, not bedrooms.

Table 5: Design Flow Allowances

Residential households with standard water fixtures	Design Flow Allowance (L/person/day)	
	Onsite tank water supply	Reticulated or bore water supply
Wastewater	120	150
Greywater	80	100
Blackwater	40	50

NOTES

Deviations from the flow allowances in

- Table 5 should only be accepted where evidence supports their use. That is, either specific water usage data recorded by a flow/ water meter or data presented in reputable scientific literature can be demonstrated as appropriate.
- Design flow allowances are based on basic water reduction fixtures (3-star WELS water rating efficiency), including dual flush water closet, taps, shower, dishwasher and washing machine.
- Where basic water reduction fixtures are not installed, flow allowances must be increased.
- Non-standard water fixtures include spa baths and kitchen food-waste grinders or other fixtures that generate significantly more water than standard household fixtures. These are not recommended to be installed in unsewered areas. Where they are included, flow allowances must be adjusted based on twice the specific capacity of the spa bath or waste application unit as per the manufacturer's information and the intended usage pattern.
- Short-term accommodation flow allowances should be based on a reticulated water supply.

2.13. Special Issues

2.13.1. Unauthorised Structures

An existing OSMS that services an unauthorised structure can be assessed and approved for operation, but this does not provide approval for the unauthorised structure.

2.13.2. Decommissioning Old Tanks

Where an OSMS or a component of an OSMS is no longer required, it must be decommissioned in accordance with NSW Heath Advisory Note 3: 2017: Destruction, Removal or Reuse of Septic Tanks, Collection Wells, Aerated Wastewater Treatment Systems (AWTS) and other Sewage Management Facilities (SMF). Situations where this would be required includes:

- Upgrade works where an existing tank is being replaced.
- Where development on the site that makes a tank redundant; or
- Where the site is connected to reticulated sewer.

2.13.3. Flood Zones

Any OSMS to be installed in a flood zone is to meet the following requirements:

- All electrical and control components of OSMS should be located above the 1 in 100-year flood level.
- Where possible, treatment systems should be located above the 1 in 100-year flood level;
- Where a treatment system can't be located above the 1 in 100-year flood level, the system must be sealed to prevent flood water ingress and uncontrolled wastewater discharge.
    - Any tanks located below the 1 in 100-year flood level must be anchored to offset buoyancy.
- LAAs should be located above the 1 in 20-year flood level. LAAs located in flood prone areas should be pressure dosed rather than gravity fed.
- In flood prone areas, consideration should be given to raising LAAs above the likely flood level; and
- A flood recovery plan must be developed for any system installed in a flood zone. This plan must be implemented at any time that any part of the OSMS is inundated.

See the NSW Heath Advisory Note 8: Floods and On-site Wastewater Management Systems (2021).

2.13.4. Acid Sulfate Soils and OSMS Installation

Where a domestic wastewater treatment system (tank) or land application area is to be installed on land shown as being Class 1-5 on the Acid Sulfate Soil Planning maps (NSW Department of Land & Water Conservation, 1997), or Council's LEP Acid Sulfate Soils Map, consideration of the impact on the mapped ASS material by the proposed works is required. This relates to the table below from the Council LEP (2011). If the installation of a domestic wastewater treatment system or land application area exceeds the limits of the table below, but will disturb less than 30m³ of soil, not reduce the water table and not remain open for more than 24 hours, they are classed as minor works.

Class of land	Works
1	Any works.
2	Works below the natural ground surface. Works by which the water table is likely to be lowered.
3	Works more than 1 metre below the natural ground surface. Works by which the water table is likely to be lowered more than 1 metre below the natural ground surface.
4	Works more than 2 metres below the natural ground surface. Works by which the water table is likely to be lowered more than 2 metres below the natural ground surface.
5	Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

The Acid Sulfate Soil Manual produced by the Acid Sulfate Soil Management Advisory Committee (1998) requires soil and water assessment, including chemical analysis, to develop a detailed management plan. However, the guidelines note that the level of assessment undertaken, or the complexity of an acid sulfate soil management plan, should match the level of risks to the environment from the proposed activity. The risk to the environment from the defined minor works is very low and the conservative liming rates and dewatering controls adopted will address any likely negative impacts.

Where the land is shown as being Class 1-5 on the Acid Sulfate Soil Planning map and potentially impacting ASS, the following management strategies are deemed satisfactory. Agricultural lime (aglime) is recognised as a cost-efficient method of neutralising acid generated by ASS. The suggested rates assume 98% pure aglime, a soil bulk density of 1.7 t/m³, and incorporate a safety factor of 1.5. The table is taken from the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines, Version 5.1 (2024).

Table 6: Nominal liming rates for small-volume (<30m³) distances of ASS (minor works)

Type of material		95th percentile Net Acidity	Kg of aglime/m³ of soil
Texture range	Approx. clay content (%)	Equivalent acidity (mol H+/t) Equivalent sulfur (%S)	
Coarse: sands	<10	449 mol H+/t 0.72 %S	58
Medium: loams	10-35	1067 mol H+/t 1.71 %S	139
Fine: clays	>35	1634 mol H+/t 2.62 %S	213
Peats	-	1478 mol H+/t 2.37 %S	192

Agricultural lime is to be used to treat ASS. Hydrated or slaked lime must not be used without specific approval from Council. Lime is to be thoroughly mixed with the excavated material. Treatment is to occur on-site unless previous approval has been obtained from Council's 'Environment and Regulatory Services' and 'Development Land Use Planning' departments for alternative arrangements.

The following measures are to be put in place for any excavated material:

1. Provide a bed of agricultural lime to place all excavated material on as it is excavated; and
2. Treat all excavated material within 24 hours of excavation.

Where excavated material can't be treated within 24 hours of excavation:

1. Provide a bed of agricultural lime to place all excavated material on as it is excavated.
2. Provide non-ASS bunds around the excavated material to contain any leachate.
3. Cover any non-treated excavated material with builder's plastic; and
4. Treat excavated material within 14 days of excavation.

Where the excavation is located in sand or highly permeable soils and likely to impact groundwater, dewatering time and volume will be limited by the use of barriers around the excavation to minimise the volume of water removed from the excavation. Barriers may include coffer dams, sheet piling or similar. The reason for the additional restrictions relates to the high likelihood of any high permeability soil with shallow groundwater to slump readily during excavation. In addition, groundwater extraction will result in large volumes being extracted quickly, with highly permeable soils being highly reactive due to high air exchange in these soils.

Where these measures can't be undertaken, a full ASS management plan may be required to mitigate the risk to the environment from disturbance of ASS.

2.13.5. Connection to Sewer

Where new development or upgrade of existing development is proposed, consideration must be given to connection to Council's reticulated sewer system where the connection is located within 75m of the property. For commercial developments, connection to Council's reticulated sewer system is recommended, where practical.

2.14. Non-domestic OSM (Industrial, Commercial, >10EP OSMS)

Non-domestic development that generates non-standard domestic wastewater, including home businesses, can have significantly different wastewater characteristics to domestic development, regardless of size. This can influence the volumes, flow rates and proportions of constituents and can include differing constituents, including biological oxygen demand (BOD), fat, oil and grease (FOG) and chemicals, and will influence the suitable pre-treatment and treatment required.

The design of an OSMS for non-domestic wastewater must be completed by a suitably qualified and experienced wastewater consultant due to the higher level of investigation required.

If these differences are not addressed and a domestic treatment system is used, the performance of the treatment system may be impacted, as domestic systems are designed for a limited range of characteristics.

Applications to install or alter a non-domestic OSMS, being industrial, commercial or development resulting in greater than 10EP will require the following additional design details:

- Non-domestic OSMS applications are required to have at least secondary treated effluent. Minimum secondary standard includes:
    - BOD not greater than 20mg/L.
    - TSS not greater than 30mg/L.
    - Faecal coliforms not more than 30cfu/100mL (if disinfection is required); and
    - Free residual chlorine not less than 0.5mg/L (if chlorine disinfection is required).
- Where usage is highly variable, either throughout the day, week or seasonally, the design must include balancing of wastewater flows prior to treatment.
    - Balancing must be via timed transfer, not float operated switches or gravity.
    - Balance tanks must be of sufficient size to cater for 12 hours of power outage at peak flow without any release to downstream or 1.5 times the size of the treatment capacity of the treatment plant, or whichever is larger.
    - Balance calculation sheets must be provided to support the size of the balance tank and downstream components of the OSMS.

- Flow analysis must provide anticipated peak loads as well as seasonal and average loads. Designs must demonstrate how they cater for peak loads, whether they are balanced or unbalanced.
- The design must identify and take into account the contaminants of concern in the wastewater and how these are to be treated and mitigated.
- The soil assessment must include laboratory analysis of soil samples from the proposed LAA, not published data.
- A flow meter suitable for use with effluent must be installed on the effluent pump line, or equivalent, and readings taken every month and provided to Council quarterly; and
- Flow rates must be based on either water meter data for the existing development, or published data for similar developments.

2.14.1. Trade Waste and OSM

There are potential implications for Council sewage treatment plants that could be receiving effluent and residuals produced by an OSMS servicing non-domestic development. An OSMS that services premises that produces wastewater that meets the definition of Liquid Trade Waste in Council's 'Policy for Liquid Trade Waste Regulation V5.0' (CVC, 2022), or as amended, is required to undergo suitable pre-treatment in accordance with the Policy, especially Section 2.3. From the Policy, "Liquid trade waste means all liquid waste other than sewage of a domestic nature."

Council's Policy aligns with the NSW Department of Planning, Industry and Environment 'Liquid Trade Waste Management Guidelines' (2021), specifically Section 7.6. These provide details of the required pre-treatment prior to discharge and recommended conditions of approval for many business types, with the intention of minimising the impact of the liquid trade waste on the Council's sewage treatment system.

Any applications that are to include trade waste flows should be discussed with Council's OSM Officer prior to lodgement with Council. Applications that include trade waste must include a consultant's report that addresses the pre-treatment of the trade waste as for a sewer trade waste application, as well as the OSM design for the Section 68 application.

2.15. Application Assessment

OSM applications submitted to Council on the approved application form, with the adopted fee and following the guidance of this Strategy will be assessed by the OSM Technical Officers. Internal referrals to the Environmental Officer and other Council departments will be completed as required. Assessment of applications will include a desktop assessment with regard to this Strategy, current legislation, standards and guidelines. A site inspection will be completed to confirm site conditions prior to issue of an Approval to Install an On-site Wastewater Management System to the applicant.

During the installation of the OSMS, additional inspections are required to confirm that the conditions of installation have been met. These must be arranged with Council 48 hours prior to the inspection. Following a satisfactory final inspection and compliance with all conditions of the Approval to Install an OSMS, an Approval to Operate an On-site Wastewater Management System will be issued by Council.

Assessment of applications will include up to three inspections. If any additional inspections are required, these may be charged a reinspection fee, in accordance with the current fees and charges.

3. MONITORING PROGRAM

Council's OSM monitoring program aims to monitor and improve the ongoing management and operation of OSMS through targeted inspections and public education.

3.1. OSMS Performance Standards

Existing OSMS must comply with the performance standards set out in Section 44 of the Local Government Regulation and any installation approval still in force for the system. Existing systems are not required to meet current design standards unless there is a failure of the system, an alteration to the buildings associated with the system or an alteration to the OSMS, including the buffers to its LAA. The performance standards are set out in Section 1.5.1.

3.2. OSMS Risk Classification

All OSMS in the LGA will be allocated a risk classification. The risk classification will relate to the risk to public health and the environment from the OSMS and aid in setting inspection priorities and efficiency of resourcing. The risk classification for an OSMS will relate to the highest risk rating that the OSMS meets, even if it also meets lower risk ratings. See maps in Section 12.

- Very high risk (annual inspection)
    - Located in the mapped inner catchment of a drinking water catchment.
    - >10EP and commercial OSMS in the Wooli or Yamba Areas in the POAA zone within 200m of a waterway.
- High risk (3-year inspection)
    - <10EP OSMS in the Wooli or Yamba Areas in a POAA zone within 200m of a waterway.
    - Cakora Lagoon – any OSMS within 250m of the high tide mark of Cakora Lagoon estuary.
    - Cakora Lagoon – any commercial OSMS within Brooms Head area.
    - Large capacity OSMS >20kL/day (Domestic or Commercial System).
- Medium risk (6-year inspection)
    - Small lots of less than 2,000m^2.
    - All OSMS that serve a commercial or non-domestic premise
    - All OSMS that serve dual occupancy or multi residential dwelling.
    - Located on lots that are unsewered and zoned Residential in the Council LEP.
- Low risk (12-year inspection)
    - All remaining OSMS in the LGA.

Where a system has been inspected by Council, consideration may be given to the current risk classification of the OSM. This will be considered in conjunction with the performance outcome of an inspection. Charges may apply for any additional inspections.

3.3. Inspection Priorities

Council's monitoring program will incorporate inspections and monitoring of OSMS in the LGA on a targeted risk-based approach. Inspections will prioritise the following systems as resources permit inspections to be completed:

- Very high-risk systems from the adjusted risk classification, including all OSMS in the inner drinking water catchment and >10EP OSMS in the Wooli Area in the POAA zone.
- Systems that have previously failed a Council operational inspection, especially in sensitive locations.
- Complaints investigation.
- Outstanding registered systems without previous Council inspection.
- Unregistered and unapproved OSMS; and
- All high to low classified OSMS.

OSMS will not be inspected based on expiry of the ATO or change of ownership.

3.4. Approval to Operate

Each OSMS requires an approval to operate. The initial application is included in the application for approval to install an OSMS, or the approval of a previously unapproved OSMS.

Payment of the annual OSM charge is considered an application to renew an existing ATO approval.

The ATO is valid until:

- Annual charges are unpaid.
- The system is altered (see Section 2.4);
- The associated buildings serviced by the OSMS are altered.
- The system does not satisfactorily pass a Council inspection; or
- Council becomes aware of a problem with the OSMS and Council takes compliance action.

Where an OSMS is upgraded, replaced, or inspected as part of Council's monitoring program, the ATO conditions will be updated and a new ATO certificate issued.

3.5. Change of Ownership of OSMS

When a property with an OSMS changes ownership, Council will send an approval to operate an on-site wastewater management system to the new owner when they are advised of a change of ownership.

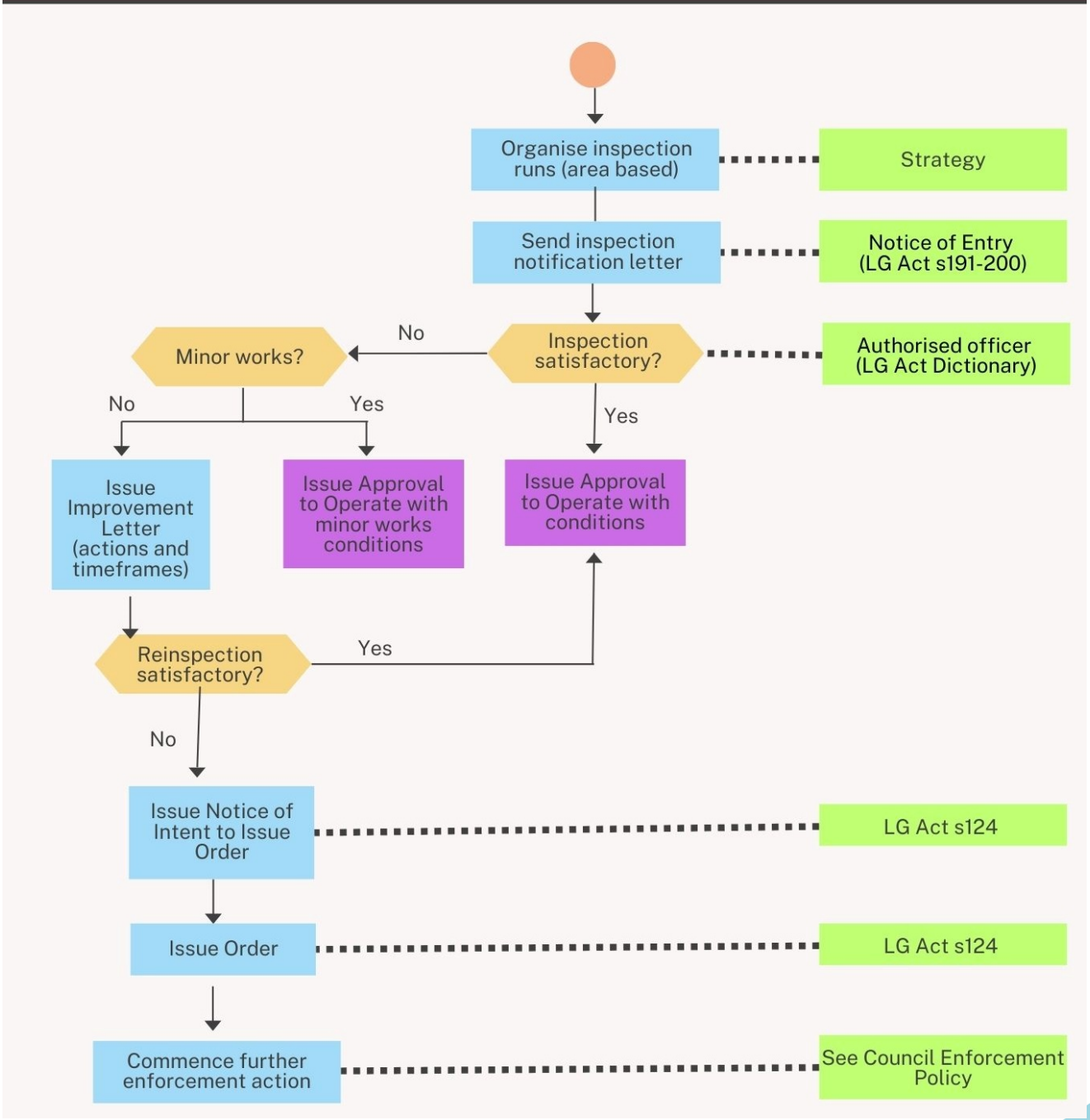
3.6. Monitoring Program Process

Owners will be notified in writing of a planned monitoring inspection. Once completed, the Council will issue further correspondence to the owner, depending on the result of the inspection.

- Satisfactory – An Approval to Operate with updated conditions will be issued for the OSMS. The Approval will remain valid in alignment with the conditions in Section 3.4.
- Unsatisfactory – If the OSMS is not suitable for approval at the time of inspection, Council will issue correspondence outlining the required action and timeframe to complete any works.
    - Minor failures – Council may issue an Approval to Operate with special conditions to complete minor works.
    - Major failures – Council will issue an Improvement Letter to complete any works.

Where an Improvement Letter or conditions of an Approval to Operate are not complied with in the timeframe allowed, or other situations as necessary, Council may take further compliance actions. These are further detailed in the Compliance and Enforcement section of this Strategy.

INSPECTION PROCESS



3.7. AWTS Service Reports

Where an OSMS is required to be serviced due to the conditions of its certificate of accreditation or conditions of approval for installation or alteration issued by the Council, suitable evidence of servicing is required to be provided to the Council. Servicing of accredited systems must be completed by a suitably trained and qualified service agent. Training requirements are outlined in NSW Health Advisory Note 5.

The contract signed between the owner/ occupant and the service agent will generally require that a copy of each service report is provided to the owner/ occupant as well as the Council within 14 days of a service. It is the owner's responsibility to ensure this service report is received by the Council and that the service and any repairs are completed. If the receipt of the service report is a condition of the operation of the OSMS, the Council is able to take further regulatory action against the owner if the reports are not received.

Council requires that service reports are received from service agents directly using the Council's nominated electronic lodgement system.

4. COMMUNITY EDUCATION

As part of the OSM program, Council will update their website to include additional information on OSM for owners and operators of OSMS to be able to understand their OSMS and manage it more successfully. Information will include: OSMS options; application and inspection processes; and operation and maintenance.

Where practical, Council will provide information to owners and operators of OSMS directly to improve the operation and maintenance of OSMS.

5. REVENUE AND RESOURCING

The Council OSM program will be self funded by OSM application fees and an annual charge to owners of properties that operate on-site wastewater management systems. The annual charge will be based on a general program cost and the risk classification of the OSMS, wastewater generation rates, and associated inspection frequency.

Where a reinspection of an OSMS is required, the reinspection fee will be charged.

Revenue collected will be allocated to the program:

- Inspection staff – This will fund Technical Officers to assess OSM applications, monitor operational OSMS, investigate complaints and conduct compliance inspections as required.
- Environmental staff – A percentage of Environmental staffing will be funded from the program for specialist advice and supervision and environmental monitoring.
- Administration staff – Administration staffing will be funded from the program to manage administration of the program including applications, approvals, compliance, correspondence and monitoring servicing reports and developing and maintaining the OSM database.
- Vehicle running expenses for the operational staff, which includes Technical Officers and a percentage of the Environmental Officer's vehicle use.
- Inspection equipment – purchase, replacement and operational costs of suitable equipment for OSM inspections including communication and data recording equipment and personal safety equipment for remote location inspections and environmental monitoring equipment.
- OSM Design Model for Sizing Effluent Disposal Areas – Maintenance and upgrades of the Model.
- Website – Redevelopment, maintenance and upgrades to the OSM pages of the Council website.

The levying of fees is to be set annually in conjunction with Council's annual budget based on the costs of maintaining an efficient system to implement this Strategy.

6. COMPLIANCE AND ENFORCEMENT

Council can initiate compliance and enforcement action in three ways. First, through identifying a failing system during an inspection conducted under the council's monitoring program. Second, when the council receives a Customer Request from a resident reporting a system failure that leads to pollution and third notification of a report received by a state agency for example the EPA (Environment Protection Authority).

In all instances, Council will uphold procedural fairness in line with the Enforcement Policy as outlined in figure under Section 3.6 -Inspection & Enforcement Process. The process may lead to the issuance of an Improvement Notices or Notices and Orders under the relevant legislation, Penalty Infringement Notices, or the initiation of legal action under either the Local Government Act or the Protection of the Environment and Operations Act. This could occur for non-compliance with orders or direct prosecution following a significant pollution incident.

Typically, the first step in engaging with the system owner will be to encourage voluntary compliance, ensuring the system is repaired, upgraded, or replaced as needed.

Where voluntary compliance is not successful, or there is little likelihood of achieving it, formal action will be taken through the issue of the Notices or Orders under the relevant legislation.

7. ACTION PLAN

The following table indicates actions that Council will undertake following the acceptance of this Strategy.

Item	Description	Timeframe
1	DCP – Modify DCPs to include OSM into relevant development considerations including drinking water catchments	6 Months
2	Update of the OSM application form and all OSM Technical Documents including the OSM Design Model to bring in line with Strategy	Immediate once strategy is adopted
3	Update the Council OSM Fees and Charges to incorporate the annual charges associated with risk ratings and non-domestic systems	December 2025
4	Development and implementation of internal procedures and checklists for OSM applications, inspections for enforcement action	3 months
5	identify and classify all OSM systems and implement the risk-based monitoring program	3 months
6	Update Councils GIS system to include risk-based categories of OSM systems	6 months
7	Website – update information available to the public through Council's website	July 2025 and ongoing
8	Identification risk classification and registration of non-registered OSMS	Ongoing

8. REVIEW

Council will review the technical material of this Strategy as required and undertake a detailed revision of this Strategy within 5 years of the time of adoption.

9. GLOSSARY

Absorption: absorption and/or uptake of effluent into soil by gravity and capillary action.

Absorption area/trench/bed: a land application system which uses soil absorption to distribute, treat and manage effluent.

Adsorption: physical or chemical attachment of substances to the surface of soil particles.

Aerobic/Anaerobic: In the presence/absence of oxygen. Biological break-down occurs by different micro-organisms adapted to the aerobic or anaerobic conditions.

Aerated Wastewater Treatment System (AWTS): an oxygenated wastewater treatment process typically involving settling of solids and flotation of scum; oxidation and consumption of organic matter through aeration; clarification - secondary settling of solids, and disinfection of wastewater before irrigation.

Bedroom: Bedrooms are defined as any room that possesses the potential to be used as a bedroom in the future. Generally, any room that contains a door and window is considered a potential bedroom and includes rooms such as studies, games/ media rooms, home gyms and studios. It is up to the discretion of the Council to determine whether or not a room is considered a bedroom for design purposes. In Clarence Valley Council, the calculations for number of persons for which an OSMS is expected to cater for is 2 persons for the first two bedrooms and 1 person per bedroom after the first two bedrooms.

Best Management Practice: practices currently employed and recommended by government and industry as preferred and affordable approaches. In domestic on-site wastewater management, current best management practice generally includes secondary treatment and broadly dispersed application of effluent to soils in the root zone.

Biochemical Oxygen Demand (BOD): the amount of oxygen required for the biological decomposition of organic matter, usually measured over a period of 5 days (BOD_5).

Blackwater: human excreta and water grossly contaminated with human excreta, for example toilet wastewater.

Certified Irrigation Designer (CID): An individual who holds a current certified irrigation designer (CID) certificate as issued by Irrigation Australia Ltd, and who can provide evidence of design work completed using treated wastewater in domestic, landscape, horticultural and/or agricultural projects.

Compost Toilet: a treatment unit which breaks down faeces and organic material into a compost like material through the action of micro-organisms and invertebrates.

Constructed wetland: also known as **Reed Beds**, these comprise a constructed basin in which water or effluent is kept below the surface of the gravel substrate. The effluent is treated as it moves slowly through the root zone of densely planted water-plants (usually reeds).

Crop factor: a value utilised in water balance modelling to estimate variations in evapotranspiration due to crop type, seasonal conditions and age of crop.

Design Irrigation Rate (DIR)/ Design Loading Rate (DLR): the soil dependent effluent loading rate for soil irrigation or absorption area calculations expressed in $L/m^2/day$ or mm/day. This rate is influenced by effluent

quality, method of dosing, the soil permeability and by the slime layer which builds up at the interface with the receiving soil.

Disinfection: The treatment of wastewater to reduce pathogen concentrations through die-off or inactivation.

Dispersive soil: a soil that tends to disperse and erode, especially in presence of high-sodicity effluent.

Drinking water catchment (adapted from EP&A Regulation 2021): land in a restricted area prescribed by a controlling water authority, including WaterNSW and councils. Also includes the surface water inner catchment or 'reservoir protection zone'. Australian Drinking Water Guidelines 6 Version 3.8 (National Health and Medical Research Council 2011, updated 2022) Table 5.2 note 2 on page 84 says 'Typically, surface water inner catchment reservoir protection zones, including feeder streams, within Australia are 2 to 3 km from reservoir highwater level'.

Durable aggregate: aggregate, metal or stones which are graded to AS 2758.1 for single size coarse aggregate for nominal sizes, usually ranging from 20mm to 50mm.

Effluent: the liquid discharged from a wastewater treatment unit (treated wastewater).

Equivalent population (EP): a measure typically used in the design of wastewater management systems. Because there are differences in wastewater generation rates between premises with and without reticulated water supplies, and premises with dry composting toilet technologies, it is usually easier to stipulate design limits by an 'equivalent' number of people rather than the total flow.

Evapotranspiration: removing water from soil by evaporation and from plants by transpiration. Evapotranspiration can be calculated by multiplying evaporation by an appropriate crop factor.

Evapotranspiration/absorption (ETA) bed or trench: a specially prepared bed or area which promotes evaporation, transpiration and absorption of effluent.

Faecal Coliforms (FC): a type of bacteria that live only in the gut of warm-blooded animals. Can be detected in the general environment if that environment is contaminated with human or animal excreta, and therefore can act as an indicator of recent faecal contamination, possibly by humans.

Geotextile: a water-permeable fabric used mainly to retain and stabilise soils. Care must be taken to ensure that suitable geotextile spacing sizes and thickness are selected for the particular task.

Greywater: (sullage) domestic wastewater from sources other than toilets or urinals, including hand-basins, showers, washing machines, dishwashers and kitchens.

Groundwater: the body of water held in the soil and rock pores; includes water above (unsaturated conditions) and below (saturated conditions) the water table and seepage from springs etc.

Hydraulic Retention Time (HRT): the average amount of time that wastewater spends within a chamber or tank.

Indexing Valve: a device (also called a sequencing valve) which allows for up to 6-8 separate land application area zones to be irrigated in sequence.

Infiltration: the downward passage of water into the soil.

Land Application Area (LAA): the land area over which effluent is applied.

Liquid trade waste: all liquid waste other than sewage of a domestic nature.

Nutrients: chemical elements that are essential for sustained plant or animal growth. The major nutrients essential for plant growth are nitrogen, phosphorus and potassium. In excess, nitrogen and phosphorus are potentially serious pollutants encouraging nuisance growths of algae and aquatic plants in waters and (in the case of nitrate) posing a direct human health risk.

Nutrient uptake area (NUA): the area downslope of and adjacent to the LAA in which nutrients (nitrogen and phosphorus) are further assimilated in the receiving environment and which is set aside from future development.

On-site wastewater management: the management of wastewater treatment and effluent application within the boundaries of the site it was generated within.

On-site wastewater management system (OSMS): a wastewater system that treats and land applies wastewater within the boundaries of the site the wastewater was generated within. Includes all types of human waste storage and treatment facilities, e.g. septic tanks, cesspits, compost toilets, urinals. Also includes the wastewater application (dispersal) area, e.g. absorption trenches, irrigation fields.

Outlet filter: a device fitted to the outlet of a septic tank or greywater tank which retains total suspended solids (TSS) typically greater than 3mm size in the tank to prevent carry-over to the LAA or next step in the treatment train.

Pan Evaporation: the loss of water by evaporation measured in a “Class A” pan. The nearest weather station collecting Pan Evaporation data is at Alstonville.

Pathogens: micro-organisms that may potentially cause disease or sickness. These include, but are not limited to bacteria, protozoa and viruses.

Percolation: a general term describing the downward rate of water movement through a soil or through a biological mat within an effluent dispersal system.

Permeability: a calculated value derived from the rate at which a head of liquid is absorbed into soil, usually measured in m/d as Saturated Hydraulic Conductivity (K_{sat}).

Primary Treatment: In On-site wastewater management, primary treatment is taken to mean the initial reduction of suspended solids and organic matter from the household by means of settlement, anaerobic digestion and/or floatation in septic tanks or the primary settling chambers of AWTS.

Reed-beds: see Constructed Wetlands.

Run-on: surface water flowing on to an irrigation area because of run-off occurring higher up the slope. Usually managed by installation of a diversion berm or cut-off trench.

Septage: The semi-liquid material that is pumped out of septic (or interceptor) tanks, consisting of liquid, scum, and sludge.

Septic Tank: effluent storage container in which primary treatment of household effluent occurs under anaerobic conditions. Septic-tank treatment process comprise sedimentation of settleable solids, flotation of oils and fats and anaerobic digestion of sludge.

Sewage: Untreated or partially treated human wastes generated from toilets, baths, sinks, lavatories, laundries, and other plumbing fixtures in places of human habitation, employment, or recreation.

Sewage management facility: a human waste storage facility, or a waste treatment device intended to process sewage, including a drain connected to such a facility or device.

Sewerage: The network of collection drains carrying domestic wastewater or effluent away from properties for off-site treatment.

Sludge: mainly organic semi-solid product produced by wastewater treatment processes.

Split system: wastewater management system in which multiple treatment and LAA are used for different components of the wastewater. This can include a treatment device that accepts waste directly from the toilet and possibly kitchen, where treated wastewater is directed to a LAA; whilst the remainder of the wastewater is drained to another LAA through a sullage tank or greywater processing system.

Subsurface Irrigation: pressurised effluent dispersal system. Irrigation lines are buried 100-150mm below the ground surface and effluent is emitted slowly and widely. Emitters should be pressure compensating for even distribution.

Sullage: another term for greywater (see definition above).

Treatment Level - Primary: processes and unit operations that remove suspended solids (organic and inorganic) from wastewater by sedimentation, floatation and anaerobic digestion processes.

Treatment Level - Secondary: processes and unit operations that follow primary treatment and are designed to remove biodegradable dissolved and colloidal organic matter by aerobic biological processes. Typically achieving BOD_5 ≤20mg/L and TSS ≤30mg/L.

Treatment Level - Secondary (Advanced): processes and unit operations that further reduce BOD_5 and TSS to BOD_5 ≤10mg/L and TSS ≤10mg/L.

10. REFERENCES

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WaterNSW (2023a) Designing and installing on-site wastewater systems: A WaterNSW Current Recommended Practice.

WaterNSW (2023b) Water Sensitive Design Guide for Rural Residential Subdivisions: A WaterNSW Current Recommended Practice.

11. LIST OF OSM TECHNICAL DOCUMENTS

To support this On-site Wastewater Management Strategy there have been a number of OSM Technical Documents produced. These OSM Technical Documents are called up in this Strategy and are as follows:

- OSM Technical Document Number 1 – On-site Wastewater Application
- OSM Technical Document Number 2 – On-site Wastewater Design Guidelines
- OSM Technical Document Number 3 – Example Standard Designs of Wastewater Disposal Systems

12. MAPS

- Map of inner drinking water catchment for Nymboida Weir
- Map of inner drinking water catchment for Shannon Creek Dam
- Map of POAA for Wooli
- Map of POAA for Yamba
- Map of Cakora Lagoon high risk classification area