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Government Sewerage Policy

Explanatory notes

September 2019

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Overview

The Explanatory Notes provide guidance on the application of the *Government Sewerage Policy (2018)* (the Policy) and explanation of the policy measures.

For ease of use, these notes follow the structure of the Policy. It is intended that the notes will be updated from time to time.

1 Policy intent

The Policy intent is for reticulated sewerage to be provided during the subdivision and development of land. Where reticulated sewerage cannot be provided, the policy provides for on-site sewage disposal in accordance with *Australian/New Zealand Standard 1547:2012 – On-site domestic wastewater management (AS/NZS 1547)* and with consideration of Western Australian servicing conditions.

2 Introduction

The Policy replaces the *Government Sewerage Policy – Perth Metropolitan Region (1995)* and *draft Country Sewerage Policy (2002, amended 2003)*.
The *Government Sewerage Policy – Perth Metropolitan Region (1995)* was first established in 1981 to mandate the provision of reticulated sewerage to all new subdivisions in the Perth metropolitan region. It was revised in 1990 and 1995 to allow unsewered development at densities not greater than Residential (R) 5, as well as in some specific and defined circumstances. The draft *Country Sewerage Policy* was introduced in 2002 and amended in 2003. Similar to the metropolitan policy, it required reticulated sewerage for all subdivision or development, except where certain discretionary provisions may apply.

Government identified the need to undertake a policy review in light of the age of the previous policies, the ongoing draft status of the country policy, and the need to develop evidence-based policy that was consistent with the AS/NZS 1547:2012 – *Onsite domestic wastewater management*. The review reflects changes in on-site sewage treatment, disposal technologies and management. It also reflects the need for total water cycle management to sustain Western Australia's growing population as traditional water resources are being subjected to climate change influences and increased competition.

The policy provides guidance on the assessment of planning applications where new reticulated schemes are proposed. This will facilitate proposals that incorporate private service providers and reflects contemporary water services legislation. Policy

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measures are aligned with the planning process to provide guidance on what information is required at each stage. This ensures that land is provided with, and is able to be serviced with, the appropriate level of infrastructure.

2.1 Regulation of sewage treatment and disposal in Western Australia

The treatment and disposal of sewage in Western Australia is subject to a range of planning, health, environmental and economic regulation. **Figure 1** provides an overview of sewage regulation in Western Australia. The Government Sewerage Policy provides guidance on the assessment of planning proposals in accordance with the *Planning and Development Act 2005*.

The *Health (Miscellaneous Provisions) Act 1911* and supporting regulations are subject to major reform as part of the rollout of the *Public Health Act 2016*. **Figure 1** will be updated throughout this process. As it is intended that adoption of AS/NZ 1547 will be part of this transition, the policy includes the calculations based on this standard, which represents best practice and ensures that lots being created will be compliant with the future regulatory framework. Some policy requirements are more stringent than current requirements under the *Health (Treatment of Sewage and Disposal of Liquid Waste) Regulations 1974*. For example, the policy requires much larger land application areas than the 1974 regulations. These inconsistencies will be addressed through regulatory reform.

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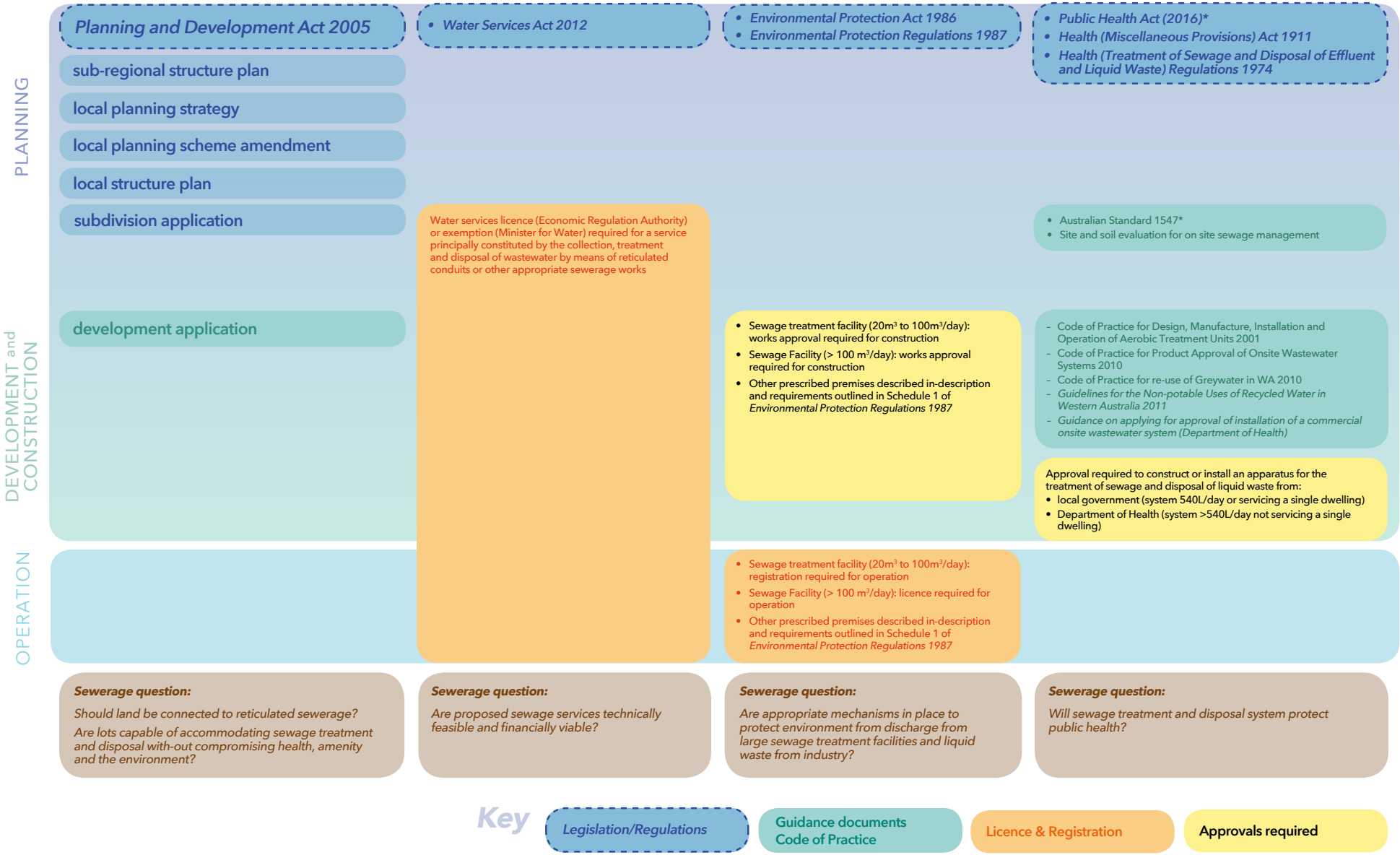
Figure 1: Regulation of sewage treatment and disposal in Western Australia



* The *Public Health Act* is being implemented in stages. AS1547 is planned to be adopted under new regulations to be developed

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3 Objectives

The policy objectives are based upon the principles of risk management. As outlined below, the requirement to connect to reticulated sewerage underpins the Government's management of risk related to sewage treatment and dispsosal and is therefore reflected as the first policy objective. The other objectives formed the framework to identify specific risks associated with both on-site and reticulated sewage disposal. The management of these risks has been incorporated into the policy measures.

Objective 1. To generally require the connection of new subdivision and development to reticulated sewerage

Reticulated sewerage provides the lowest risk to public health, environmental, social and economic, long term planning outcomes associated with sewage treatment and disposal. In consideration of the risks discussed below, the requirement to connect to reticulated sewerage is the fundamental risk management measure of the policy.

1. Public health, amenity, water resources and environment risks

Sewage may contain nutrients, metals, salts, endocrine (or hormone) disrupting chemicals, drugs, bacteria, viruses and other pathogens. If not adequately treated, these can affect water quality and result in water contamination and adverse impacts to public health and wildlife that rely upon the water for drinking or to support habitat.

Discharges from sewage treatment plants are regulated to ensure that the quality of treated sewage is satisfactory for release into the environment or for its beneficial re-use, without impacting on the environment and with the greatest regard for public health.

Onsite sewage disposal in Western Australia has resulted in widespread environmental issues. These impacts have been documented through a considerable body of research, including investigations supporting the development of water quality improvement plans (WQIPs) for the estuary and coastal catchments in the southwest of Western Australia – Peel-Harvey, Vasse-Wonnerup and Geographe Bay, Swan-Canning, Leschenault and Scott catchments (Environmental Protection Authority 2008; Department of Water 2009 and 2012a,b; Swan River Trust 2009). Policy measure 5.1.1.7 was developed to counteract unsewered development in areas of high groundwater where on-site sewage disposal has the greatest potential to adversely impact the environment and public health.

The impacts associated with on-site sewage disposal have been addressed at significant expense to the State and the broader community through the Infill Sewerage Program, which was established in 1994 as a consequence of the findings of the Select Committee appointed to inquire into effluent disposal in the Perth metropolitan region[1]. While this has improved outcomes in areas serviced, it still has not been possible to service many areas of the state.
In 2009, the Standing Committee on Environment and Parliamentary Affairs established the Inquiry into Deep Sewerage in the Cockburn Area.

The scope of the inquiry was expanded to cover the entire state when it became apparent that sewage issues were much more serious and widespread than originally thought. Findings included:

- serious health and environment risks still exist with existing septic systems; and
- the lack of reticulated sewerage adversely affects the quality of life of residents not provided with the basic infrastructure needs provided to most Western Australians.

It is acknowledged on-site sewage disposal technology has advanced considerably since the 1990s and early 2000s, mainly in the form of secondary treatment systems. However, there are still significant risks associated with the use of on-site systems and there is limited evidence that the advanced technology performs as described under real-life conditions (refer to section 6.2 for further information). The Government's policy position is that on-site systems are not to be considered as a comparable alternative to reticulated sewerage provision.

[1] Alexander, MLA, 25 August 1988

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2. Risks to long term planning outcomes and land supply

Reticulated sewerage supports the widest variety and changes of land use.
In March 2018, the State government released the Perth and Peel@3.5 Million suite of land use planning and infrastructure frameworks, which guides the future growth of the Perth metropolitan and Peel regions to 2050 through limiting unsustainable urban sprawl and encouraging greater housing diversity to meet changing community needs.

Some 800,000 new homes will be required to accommodate the projected population growth of 3.5 million by 2050. The provision of reticulated sewerage provides the most flexibility for land use planning and is fundamental to achieving the best use of existing and proposed infrastructure and protecting important environmental assets.

Onsite systems require land application areas for the disposal of treated sewage. This necessitates larger lots, resulting in low density development and urban sprawl that requires the extension of other basic infrastructure such as potable water, electricity and gas. This is an inefficient use of both infrastructure and land.

In some areas that have had on-site sewage disposal systems it has been necessary to retrofit reticulated sewerage to enable greater density of development and better environmental protection. The cost has been borne by the greater community. The general requirement to connect to reticulated sewerage in the first instance aims to ensure such retrofitting programs are not needed in the future.

The requirement to connect to reticulated sewerage services does not undermine land supply.
A number of submissions on the *draft Government Sewerage Policy* stated that the requirement to connect to reticulated sewerage, adopted by Government in 1981, would undermine the viability of providing urban and industrial land. The position has since been supported and expanded across the State by successive Governments through the *Government Sewerage Policy – Perth Metropolitan Region (1995)* and the *draft Country Sewerage Policy (2002)*. The provision of sewerage has been incorporated into the standard costs of developing urban land. The continued growth of the Perth metropolitan and Peel regions, and other regional towns demonstrates land supply has not been adversely affected.

Reticulated sewerage systems have been in operation for thousands of years worldwide (for example, Rome has had a reticulated system since AD100). State Government has recognised *'the earliest phase of Perth's deep sewerage system was a significant milestone in the development of Perth as a modern city'* [2] and is necessary to progress towards a water wise city.

[2] Jacobs, A May 20th 2015 https://www.mediastatements.wa.gov.au/Pages/Barnett/2015/05/Perths-history-recognised-down-in-the-sewer.aspx

Objective 2. Protection of public health and amenity

1. **Impacts on public health –** illness arising from exposure to pathogens contained in sewage. Exposure can result from a variety of causes including system malfunction, poor maintenance and natural disasters/ extreme events. Illness can be low-level ongoing such as gastrointestinal complaints and respiratory conditions; or high level, life threatening such as encephalitis, and bacterial infections such as e-coli, salmonella or campylobacteriosis.

   If sewage is discharged into waterways or the marine environment, diseases to humans can also be transmitted through eating sewage-contaminated shellfish or recreational activities such as swimming.

2. **Reduced amenity from sewage odour –** this may affect people at a household level from an on-site disposal system; or at a street or community level, where people live or work in proximity to a wastewater treatment plant or other wastewater infrastructure. It may occur as a result of unfavourable site and soil conditions, poor system management and/ or maintenance practices or uncommon events. The impacts and health effects from exposure to sewage odour (hydrogen sulphide (H25) gas, generally referred to as "Rotten Egg" odour) is found on the Department of Health website.[3]

[3] http://ww2.health.wa.gov.au/Articles/F_I/Hydrogen-sulfide-and-public-health

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3. Reduced development potential of land – this applies where a land application area is required for on-site sewage disposal. The area needs to be set aside for distribution of the treated effluent and cannot be built over with any permanent fixtures, or used for children's play areas or growing fruit and vegetables. The location also may interfere with where a landowner may want a dwelling to be built due to the slope of the land. Undertaking activities such as laundry need to be considered as overloading of the land application area can result if too much water is used at one time. The risk of purchasers not being aware of these limitations is very real if notifications on title are not placed at the time of subdivision.

Objective 3. Protection of the environment, land and water resources

4. Contamination of land and/ or buildings – this may occur from direct discharge of untreated or partially treated sewage to land; through poor maintenance; or mechanical failure of plant and/ or equipment.

5. Contamination of groundwater – resulting from rising groundwater or infiltration of rainfall through soils contaminated from untreated or treated wastewater discharge. This is particularly relevant to public health if the sewage discharge contaminates an aquifer used for drinking water supply. Detrimental impacts on the groundwater ecosystem (for example, stygofauna) may also result.

6. Contamination of surface water – through direct discharge of treated or untreated wastewater from wastewater infrastructure to stormwater drains, waterways or wetlands; runoff passing over contaminated land; or discharge of contaminated groundwater to surface waters, including wetlands and estuaries. Diminishing the water quality of a surface water source may result in loss of a resource. The quality of treated wastewater can also be too fresh for the receiving environment. Eutrophication of water bodies results in algal blooms, fish kills, and increased breeding of mosquitoes and midges. Non nutrient contaminates in sewage, including endocrine disrupting compounds, have been observed to impact receiving ecosytems.

7. Impacts on health of flora/ fauna – from exposure to contaminated land and/ or groundwater or surface water (including fresh and marine water). Sewage discharged into waterways causes oxygen depletion which reduces the amount of oxygen available to fish and other aquatic animals and plants which can result in their death. As sewage also contains high levels of nutrients, it can elevate algal growth and bacteria. Conversely, it also impedes the growth of native plants.

8. Wasting of water resources – this occurs where treated wastewater is discharged into the environment without being beneficially reused. It is increasingly recognised that wastewater is an untapped resource. Total water cycle management is more easily implemented with centralised systems such as through sewer mining, aquifer recharge, watering for public open space and using the biosolids for energy generation.

Objective 4. Efficient use of infrastructure and land

9. Low density development resulting in less efficient urban form – where reticulated sewerage is not provided, larger lots are required to accommodate on-site sewage disposal systems and their associated land application areas. As part of the risk management process, AS/NZS 1547 recommends a reserve area be made available in the event of the land application area becoming unusable for its purpose (for example, through soil salinisation), which further impacts on lot size.

10. Reduced flexibility to change or intensify land use in future – where land is subdivided and developed without reticulated sewerage, the potential for increasing density of development in the future is greatly reduced. Similarly, unsewered areas that may have originally been used for one land use, but have now been identified to transition to another (for example, light industrial to urban), are difficult to retrofit to enable reticulated sewerage.

11. Unsewered development undermines provision of reticulated sewer to local area – may occur through reduced viability of infrastructure extension due to limited number of existing unsewered lots. In regional areas there may be

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no financial incentive to develop sewered lots in towns where R10 unsewered subdivision is allowed.

12. Reduced performance of treatment system from uncontrolled discharges – this is generally a result of the unauthorised discharge of trade waste but can also occur as a result of household chemicals being disposed of into sewage systems. This applies to both reticulated schemes as well as on-site systems, which are likely to require additional aspects to pre-treat waste (for example, oil separators).

13. Restriction on type and intensification of land use – future land uses, and/or intensification of land uses may be precluded through a lack of reticulated sewerage.

14. Loss of opportunity to reuse/ recycle energy generated from sewage – a by-product of sewage is biogas – mostly methane, which can be used to generate heat and electricity. Co-locating infrastructure that services both these basic needs enables use of this resource. Currently, there are no domestic on-site treatment systems with this capability approved for use in Western Australia.

Objective 5. Cost to the broader community

15. Remediation of soil and/or surface waters and/ or groundwater – long-term on-site sewage disposal in sensitive areas contaminates the soil profile, groundwater and receiving surface water bodies, such as rivers, wetlands, estuaries and embayments. At a local level this may result from an on-site system failure, pipe breakages, or at a larger scale from discharges, or failure of larger infrastructure such as a pump station or wastewater treatment plant.

    Over time, all systems will leak and require replacement, however this may not always be immediately evident and contamination of land and water occurs. Remediation of eutrophied water bodies is expensive and a cost borne by the broader community.

16. Retrofit of failed treatment system – magnitude of costs and works is largely reflective of the scale of the system. In some instances, the costs may be borne by the broader community, such as through the Water Corporation's 'Infill Program' whereby progressive conversion of unsewered areas has been undertaken.

17. Increased health costs – to the broader community as a result of these costs being subsidised with public funding. This is linked to illnesses arising from exposure to pathogens from sewage, both from reticulated and on-site systems and the treatment required to address/ remedy the effects.

18. Reduced employment opportunities – which may occur if low cost industrial development is not supported through the release of appropriately zoned unsewered land. This generally occurs if there are businesses with few employees yet require large lots for the type of business activities undertaken.

19. Ongoing maintenance – applies to both reticulated and on-site disposal systems but is more onerous for individual landowners as they have to inspect and ensure maintenance of a system themselves. Onsite systems are also resource intensive for local governments as they are required to inspect and audit systems to ensure compliance with the conditions of their approval.

Objective 6. Precautionary principle

When considering the above risks and the appropriate treatment and management of sewage, the precautionary principle reinforces the policy approach to requiring reticulated sewerage as the default position of government. The policy intent is for this principle to be applied in decision-making to protect public health and the receiving environments.

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4. Policy application

The policy applies across Western Australia to all local governments including those offshore, such as the Christmas and Cocos (Keeling) Islands.

The policy applies to all gazetted towns whether a local government has a local planning scheme or not.

The policy applies to proposals prepared and/ or assessed in accordance with the Planning and Development Act 2005 (Figure 1). It applies to all stages of the planning process from strategic planning through to development, with the exception of:

- *subdivision applications for lots greater than four hectares* – due to the relatively low risks associated sewage treatment and disposal and the viability of reticulated sewerage at this density
- *development applications for rural uses or a single house on single lots* – due to the fact planning applications are not generally required so there is no mechanism to consistenly apply the policy.

The policy does not apply to permits, approvals or licences issued under health, environmental or water legislation, in particular:

- works approvals or licences issued under the *Environmental Protect Act 1986* and *Environmental Protection Regulations 1987*
- applications to construct or install an apparatus for the treatment of sewage, which are required in accordance with the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*. Where relevant, the policy may be a useful reference tool to assist in decision-making for these types of applications.

Planning applications that are not subject to the *Planning and Development Act 2005*.

For example, Rottnest Island, Barrow Island, Metropolitan Redevelopment Authority redevelopment areas and other lands such as Reserved lands managed by the Crown or by traditional owners do not follow the planning process set out in the policy. Nevertheless, the intent, objectives and general principles of the policy should be considered when developing land in these areas.

Due to the specialised nature of strategic industrial areas, and to avoid duplication of other approval processes, the policy is to be applied to the strategic industrial zones of these areas on a case-by-case basis. An assessment of the best practicable servicing option for these areas is to be undertaken at the strategic planning/ rezoning stage. The local water management strategy undertaken at the rezoning stage will detail the site water balance and the proposed servicing strategy for water supply, sewage management and stormwater management. A proponent would most likely undertake a cost benefit analysis at this stage. Onsite systems may be an acceptable method of servicing where reticulated sewerage is not feasible.

The policy does not negate the need to comply with the requirements of any other legislation, regulation or policy related to the treatment and disposal of sewage.

5. Policy measures

5.1 Reticulated sewerage

The policy defines reticulated sewerage as:

> *'A network of sewers managed by a sewerage service provider that conveys sewage from any development or subdivision for disposal outside the boundary of a freehold title or survey strata.*
>
> *Infrastructure may form part of a large centralised scheme, small decentralised scheme or hybrid systems that combine on-site primary treatment and offsite disposal'.*

Reticulated sewerage is often referred to as 'deep sewerage'. It may include small package treatment plants or decentralised systems that operate through a combination of on-site secondary treatment systems linked to an offsite discharge/ reuse system such as irrigation of an area of public open space.

The defining feature of reticulated sewerage is that the sewage infrastructure **crosses** the boundary of a freehold lot or survey strata. Under the *Water Services Act 2012*, sewerage services are to be provided in accordance with a licence issued by the Economic Regulation Authority, unless otherwise exempted by the Minister for Water.

5.1.1 Requirement to connect to reticulated sewerage

The provision of reticulated sewerage is the default policy position and is a requirement for subdivision and development, including any of instances listed in Section 5.1.1 of the policy. As detailed in Section

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3 of these notes, reticulated sewerage provides the lowest risk to public health, environmental, social and economic, long term planning outcomes associated with sewage treatment and dispsoal.

The requirement for reticulated sewerage may be further justified in consideration of the potential for sewage reuse to augment water supply. As water supplies continue to be impacted by climate change, alternative water sources are increasingly being considered as a way to both employ total water cycle management and ensure continuity of supply for our growing population. While the policy's scope is not intended to address how alternative water sources may be obtained or used, the requirement for reticulated sewerage means the volumes that a wastewater treatment plant receives and treats could provide a valuable resource for potential reuse.

For example, just one wastewater treatment plant operated by the Water Corporation currently has capacity to treat up to 135 million litres of sewage per day (mld) and potential to treat up to 180 mld. The plant, at Beenyup, is also the site of Australia's first groundwater replenishment scheme whereby treated wastewater is further treated to drinking water standards, and then recharged into the aquifer for storage and future abstraction and treatment. It is estimated that by 2060 this scheme could make up to 20 per cent of Perth's yearly drinking water supply.

Rezoning of land

Policy measure 5.1.1.7 requires land where the highest groundwater level is less than 0.5 metres below the natural ground level to only be rezoned for the creation of lots less than one hectare where reticulated sewerage is provided.

This measure was developed in response to health and environmental issues that have arisen from on-site sewage disposal in urban areas with high groundwater levels throughout Western Australia. Urban development changes local hydrology and often leads to higher groundwater levels. High groundwater is a major risk factor in the operation of on-site sewage systems. The government's position is that land with high groundwater level (for example, less than 0.5 metres below natural ground level) is unsuitable for on-site sewage disposal at lot sizes less than one hectare.

5.1.2 Licensing requirements under the *Water Services Act 2012*

Reticulated sewerage services in Western Australia are primarily provided by government-owned utilities, in particular the Water Corporation. In the past, it was relatively easy to determine whether land would be connected to reticulated sewerage at all stages of the planning process. Demonstration of serviceability was mainly based on referral advice from a single licenced provider. Advice was supported by a pre-determined and scheduled capital works program associated with the expansion of large reticulated schemes.

With the State's commitment to competitive neutrality, the emergence of private sewerage service providers and potential establishment of new innovative reticulated sewerage schemes, planning decision-makers no longer rely solely on advice from the Water Corporation related to whether land can be serviced by reticulated sewerage. It is also acknowledged that some planning proposals cannot be supported by a licence issued by the Economic Regulation Authority under the *Water Service Act 2012*. In the early stages of the planning process, the level of detail required to obtain a licence is not often apparent until detailed design is undertaken.

The measures contained in Section 5.1 and Schedule 1 (2.2, 3.2 and 3.3) have been developed to provide guidance on how to demonstrate that reticulated sewerage services will be provided in support of rezoning, structure planning and subdivision proposals. This will:

- facilitate planning proposals involving the establishment of new reticulated schemes by private service providers – previously, planning decisions have been delayed due to uncertainty regarding approvals);
- encourage innovative reticulated systems and technology – this can result in more efficient disposal, water reuse and better environmental outcomes, as well as connection in areas where reticulated sewerage was previously considered unviable; and
- remove potential land use conflicts associated with sewage treatment and disposal buffers.

5.1.3 Survey strata

The policy provides clarity with regard to the provision of reticulated sewerage services to survey strata lots. Currently, licenced service providers only provide a service to the boundary of the parent lot, and do not provide any internal plumbing within the boundaries of a strata. Issues have arisen in recent years where early development within a strata has obstructed the provision of sewerage infrastructure

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to other strata lots. Consequently, arrangements, such as easements, should be in place to ensure that a separate sewer connection is available to each lot within the strata scheme that is intended for separate use or occupation. A new advice note has been developed for this purpose (refer to Schedule 4 of the policy).

5.2 Onsite sewage disposal

The measures contained in Section 5.2 of the policy were developed for use only when reticulated sewerage is not required (refer to Section 5.1.1 for a description of where reticulated sewerage will be required). In addition, a proposal should demonstrate, in accordance with the policy measures detailed in section 5.2 and Schedule 2, that the lots are capable of development without endangering public health and the environment, and that the minimum site requirements can be met.

5.2.1 Lot sizes

Lot size is a critical risk factor associated with on-site sewage disposal. This section of the policy sets out the minimum lot sizes relevant to specific situations. The justification for these lot sizes is detailed below.

Smaller lot sizes increase both the likelihood and consequences of impacts. Small lots reduce the area available for sewage disposal; increase the number of residents exposed to health and amenity issues in the event of system malfunction; and increase nutrient and non-nutrient contaminant loads per unit area.

Higher density urban development alters the water balance, which often causes groundwater levels to rise and result in system malfunction. The disposal of sewage on-site adds to the hydraulic loads applied to a local area. Impervious surfaces tend to increase with density, making it more difficult to establish or retain deep-rooted vegetation. This can result in reduced evapotranspiration and larger volumes of water infiltrating to groundwater.

One to four hectares in public drinking water source areas

Protection of public drinking water source areas (PDWSAs) is an important issue for a growing population as land use intensification increases risks to drinking water quality and public health. When developing land, on-site sewage treatment systems are not the only source of contamination; risks also come from vehicles and the use of chemicals, fertilisers and pesticides. All of these risks need to be considered when determining an appropriate minimum lot size.

In Western Australia, public drinking water source areas are managed through an approach advocated by the *Australian drinking water guidelines* that is based on preventing risks and using multiple barriers to protect consumers from the catchment to the tap. There are more than 130 public drinking water source areas across the state and they all have a drinking water source protection report that assesses risks and makes recommendations to address the risks. Public drinking water source areas locations and associated reports are available online at www.dwer.wa.gov.au.

The WAPC uses State Planning Policy to protect the state's public drinking water source areas and provide the measures for integrated land use and water planning in these areas.

Compatible land uses for public drinking water source areas are listed in the Department of Water and Environmental Regulation's *Water Quality Protection Note 25 Land-use compatibility in public drinking water source areas (2016)* (WQPN25) and *WQPN38 Priority 3* (P3) areas (2018).

The minimum lot sizes for unsewered subdivision in public drinking water source areas are outlined in Table 1. These were determined by the the Department of Water and Environmental Regulation and are based on the findings of a Parliamentary inquiry: *The Select Committee on Metropolitan Development and Groundwater Supply Report* (1994). The same approach used in 1994 is applicable today.

The 1994 inquiry examined potential risks from intensifying land uses in public drinking water source areas in the Perth metropolitan area. Sewage from septic tanks and wastewater lagoons was documented as a potential source of contamination for Perth's drinking water supplies.

The Select Committee reviewed extensive scientific information from Australia and overseas about groundwater pollution from septic tanks (for example, nitrates, pathogens and household chemicals) and their potential long-term impacts on the environment and public health. Based on this evidence, the

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Committee supported the following policy positions of the then Water Authority (responsibility now with Department of Water and Environmental Regulation):

- Priority 1 (P1) areas – subdivision is not permitted.
- Priority 2 (P2) areas – a minimum lot size of two hectares within special rural/ rural residential zones, based on one system per two hectare lot in the Jandakot Underground Water Pollution Control Area, P2 area, special rural zone (refer to Section 13.1.6, page 137).
- Priority 3 (P3 and P3*) areas – to have reticulated sewerage for urban zones, noting that urban development in public drinking water source areas will inevitably cause contamination of the drinking water, despite being sewered.
- Commercial land uses – should be limited in public drinking water source areas due to the well-documented evidence these can cause pollution of land and water. If they are allowed, they need to be connected to reticulated sewerage.
- Industrial land uses – are not permitted in public drinking water source areas due to the well-documented evidence that these can cause gross pollution of land and water.

As even treated wastewater discharge delivers a major contaminant load to the environment, this policy requires secondary treatment systems with nutrient removal in public drinking water source areas. Secondary treatment greatly reduces non-nutrient contaminant concentrations, including endocrine disrupting compounds[4]. It is paramount to maintain these systems to ensure they perform to the manufacturer's specification in the long term. This was also recommended by the Select Committee (Section 13.1.5, page 136).

Locations of public drinking water source areas can be viewed online at www.dwer.wa.gov.au.

More detailed information is available in WQPNs 25 & 38.

Table 1: Minimum unsewered lot size for subdivisions and developments in public drinking water source areas

Priority (P) area	Minimum lot size [1] (based on existing zoning)	Comments
P1	Subdivision of land is incompatible with P1 source protection objectives due to increased contamination risk. Most land in P1 areas is Crown land	
P2 (only one on-site sewage treatment system permitted per lot)	4ha	Within rural zones (outside the scope of the Government Sewerage policy
	2ha	Within special rural / rural residential zones
P3 and P3* (only one on-site sewage treatment system permitted per lot)	1ha	Within special rural / rural residential zones
	Urban or urban deferred	Connection to a reticulated sewerage scheme is required
	Industrial and commercial	Connection to a reticulated sewerage scheme is required

1. Unless otherwise specified or approved in applicable environmental protection policies, state planning framework, an approved local planning scheme, or relevant statutory document endorsed by the WAPC.

[4] Reitsma T, Nice HE, Leusch FDL, Quayle P, Chapman HF, Khan SJ, Trinh T, Coleman H, Rawson C, Gagnon MM & Blair P 2010, *Development of an 'ecotoxicity toolbox' to characterise water quality for recycling*, Water Science Technical Series, Report no. 36, Department of Water, Western Australia

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One hectare in sewage sensitive areas

The policy sets a one hectare minimum lot size in sewage sensitive areas primarily to manage cumulative impacts on the environment and water resources. This is supported by *AS/NZS 1547:2012*, which recommends a conservative approach be adopted where cumulative environmental risks are deemed to be high. As outlined below, the approach is further justified in consideration of the hydrogeology and vulnerability of receiving water bodies in Western Australia.

Gerritse (2002) indicated that nitrogen leaching from septic tanks is a rapid process. Soluble nitrogen is transported efficiently with surface water or groundwater flow until it reaches a receving water body such as a waterway, wetland or estuary. Therefore, nitrogen leachate from septic tanks is difficult to manage. The most effective method of management is source control: to reduce the overall amount of nitrogen export by reducing the density of septic tanks.

The minimum lot size requirements in sewage sensitive areas are consistent with the previous draft *Country Sewerage Policy (2003)* requirements in Environmentally Sensitive Areas and *State Planning Policy 2.1 Peel-Harvey Coastal Catchment (1992)* (SPP2.1) of a maximum of one sewage disposal unit per hectare for rural residential development unless specific investigation of the capacity of the local environment to absorb the effluent is undertaken. This is further substantiated by catchment modelling undertaken as part of the development of a number of water quality improvement plans, as mentioned in Section 5.1.1.

All sources of nutrient input have to be addressed in nutrient-sensitive areas (Gerritse 2002). In unsewered sensitive areas the desired nutrient targets will only be achieved if the recommended lot sizes are used. If smaller unsewered lot sizes are permitted, the additional nutrient inputs from sewage would mean the targets of any water quality improvement plan will never be achievable regardless of other measures put in place.

For non-residential, commercial or industrial planning proposals in sewage sensitive areas, lot sizes will be assessed on a case-by-case basis. This is because the nutrient loads produced will vary according to the proposed land uses. The same requirements otherwise apply.

Land already zoned for urban land use

The policy acknowledges that there is land within sewage sensitive areas that is already zoned for urban subdivision and development (including residential land assigned with R2 to R10 density coding) based on the provisions of the previous government sewerage policies. Where it can be demonstrated that a density coding was assigned with the understanding that reticulated sewerage **would not be provided**, subdivision may proceed in accordance with the scheme provisions, provided that lots are capable of accommodating on-site sewage disposal in accordance with relevant policy provisions.

In some instances, land has been rezoned for urban purposes with the assumption that reticulated sewerage would not be provided, however a density code was not specifically assigned. In these instances, a conservative approach should be taken to the determination of lot sizes, which takes into consideration:

- planning context – such as the provisions of local planning strategies, townsite expansion plans and the level of land capability assessment undertaken at rezoning stage
- consideration of the environmental impacts associated with on-site sewage disposal – where the proposal is likely to set a precedent for similar subdivision in sewage sensitive areas in the local catchment, cumulative impacts should be taken into account
- site-and-soil evaluation – demonstrating the land is capable of accommodating on-site sewage treatment and disposal in accordance with Section 5.2 of the policy.

Where it cannot be demonstrated the density coding was assigned with the understanding that land would be serviced by on-site systems, subdivision at lot sizes less than one hectare should only proceed where reticulated sewerage is provided.

2,000m² for urban / industrial subdivision outside public drinking water source areas and sewage sensitive areas

This scenario applies to greenfield subdivision outside of sewage sensitive areas and public drinking water source areas. This lot size is consistent with established practice informed by the previous sewerage policies.

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2000m² is generally a sufficient size to provide for a range of development including buildings, other infrastructure, paved surfaces and on-site sewage systems (including land application areas that are not paved or subject to regular foot or vehicular traffic) and setbacks.

- In residential areas this includes dwellings, outbuildings/sheds, driveways, verandahs and alfresco areas, paved areas, on-site stormwater infrastructure such as rainwater tanks and soakwells. Setbacks for these aspects of the development must be provided in accordance with the R-Codes (and as such, may be amended from time to time); and the National Construction Codes.
- Industrial and commercial development often comprises larger buildings and hardstand/ paved areas than residential development. More than one on-site system may be required. For example, standard primary/ secondary treatment may be needed for staff/ customer amenities, in addition to grease and/ or oil separator systems for trade waste. The experience of regulatory authorities demonstrates that in many instances, lots less than 2,000m² cannot accommodate infrastructure and setbacks in accordance with required standards. The Department of Health and local governments have advised that applications are frequently received for the installation of sewage apparatus servicing industrial/ commercial land where there is insufficient land available for sewage disposal.
- The size of land application area is dependent on the infiltrative capacity of the soils and the type of system used. Land application areas for single residential lots have been calculated for ease of application (refer to Schedule 2, Table 3 of the policy).

Where development is located on well-drained soils, or where secondary treatment is proposed, it is possible to accommodate most land uses and land application areas within 1,000m² lots. However, at a catchment scale, the cumulative environmental impact of expansive unsewered development at this density is considered unacceptable even when development is located outside sewage sensitive areas. The outcomes of the Inquiry into Deep Sewerage in the Cockburn Area substantiate this position. Furthermore, reticulated sewerage is considered both appropriate and viable as a servicing option for the development of greenfield 1,000m² lots.

1,000m² infill residential or commercial subdivision in existing urban areas (outside sewage sensitive areas and public drinking water source areas)

This scenario applies to small-scale infill subdivision in areas that are already developed in accordance with an Urban zoning. It replaces the provisions for 'small infill' subdivision that were contained in previous sewerage policies. It is not to be applied to large scale infill (commonly referred to as 'brownfield') subdivision proposals in urban areas, which should be serviced by reticulated sewerage. It is also not to be applied to industrial subdivision.

The 1,000m² lot size was determined in accordance with the following factors:

- it provides for a more efficient use of urban land and infrastructure by facilitating subdivision and development in urban areas that are already connected to other essential services – in many instances, it is not financially or technically feasible to provide reticulated sewerage to this form of subdivision. The policy acknowledges it is significantly more expensive to retrofit reticulated sewerage to developed areas than provide services during greenfield subdivision, which has informed the default requirement for new subdivision and development to be connected to reticulated sewerage;
- financial and technical challenges are further exacerbated by fragmented land ownership and low lot yield;
- depending on site and soil conditions and the type of on-site system used, it is generally possible to accommodate most land uses and land application areas within 1,000m² lots.
- risks associated with challenging site and soil conditions are addressed through the exclusion of poorly drained soils (medium to heavy clay) and requirements for site-and-soil evaluations;
- risk to water resources reduced through the exclusion of sewage sensitive areas and public drinking water source areas; and
- lower cumulative environmental impacts, as there will be lower lot yield than greenfield subdivision of an equivalent land area.

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In order to effectively manage risks associated with this lot size, it is important that site-and-soil evaluations be undertaken prior to subdivision approval to demonstrate that each lot is capable of accommodating on-site sewage disposal in accordance with policy provisions. Note that heavy soils will require lots larger than 1,000m² as per Section 5.2.1 and Schedule 2, Table 1 of the policy.

Where there is existing infrastructure such as dwellings and driveways on the subject land, an indicative lot layout should be provided showing the location of infrastructure, land application areas and required setbacks.

In many instances, residential land will need to be rezoned from R5 to R10 to facilitate subdivision to 1,000m². As outlined in Schedule 1 (2.3), this will trigger requirement to consider best practicable servicing option for the area, and a site-and-soil evaluation. Land with a high groundwater table (<0.5 metres below natural ground surface) should not be rezoned from R5 to R10 to facilitate unsewered infill subdivision (Policy measure 5.1.1.7)

1,000m² in towns outside Perth Metropolitan and Peel region scheme areas (outside sewage sensitive areas and public drinking water source areas)

The policy recognises that there are many areas in Western Australia that do not have, and are not likely to have access to reticulated sewerage networks. Although advances in technology have increased the availability of decentralised reticulated sewerage systems, some impediments remain regarding their installation, such as cost and/ or service provision. The policy therefore provides flexibility where appropriate to support regional development.

The minimum lot size outside the Perth Metropolitan and Peel region scheme areas have been determined in consideration of following factors:

- efficient use of urban land and infrastructure - the remote location, lower land values and lower growth potential of many country towns can compromise the viability of providing reticulated sewerage. The policy enables country towns to expand at R10 density without impost of prohibitively expensive infrastructure costs;
- depending on site and soil conditions and the type of on-site system used, it is generally possible to accommodate most land uses and land application areas within 1,000m² lots;
- sparse settlement patterns in regional Western Australia mean there is potential for a lower number of unsewered lots at catchment scale compared with the Perth Metropolitan and Peel region scheme areas, resulting in relatively lower cumulative environmental impacts;
- risk to water resources reduced through the exclusion of sewage sensitive areas and public drinking water source areas;
- reticulated sewerage will be required where deemed reasonable or where unsewered subdivision is likely to pose an unacceptable risks to public health, the environmental or water resources (refer to Policy measure 5.1.1); and
- subdivision at R10 density will only be provided where it can be demonstrated that the land use planning, public health and environmental impacts of unsewered subdivision at this density are acceptable (refer to Schedule 1, Section 2.3 of the policy)

Towns without reticulated sewerage schemes (outside sewage sensitive areas and public drinking water source areas)

There are many small towns outside of the Perth Metropolitan and Peel region scheme areas that do not have reticulated sewerage schemes. In most instances, there is limited potential for townsite expansion and it is unlikely to be feasible to establish a new scheme for a small number of lots.

1,000m² is consistent with the established approach to subdivision established by the previous *draft Country Sewerage Policy (2002)*. It is noted however, that in some instances the establishment of a new reticulated scheme may be considered reasonable and will be required.

Towns with established reticulated sewerage schemes

A large number of towns have established reticulated sewerage schemes (refer to Schedule 3 of the policy). The sewerage infrastructure in some of these towns is at, or nearing capacity and it may not be viable to expand. In these instances it may be appropriate to provide for 1,000m² (R10) unsewered lots in areas that are not in sewage sensitive areas or public drinking water source areas.

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The policy requires unsewered subdivision at this density to be specifically provided for through the provisions of the local planning scheme or structure plan endorsed by the WAPC. This is because R10 density coding in towns with established schemes was generally assigned with the assumption that reticulated sewerage would be provided. This requirement will generally trigger the requirement for a local planning scheme amendment or new structure plan to be prepared, which will enable the strategic and cumulative impacts of unsewered development to be properly considered.

Schedule 1 (Section 2.3) of the policy outlines how sewerage servicing is to be addressed through local planning scheme amendments and local structure plans. These provisions have been developed to ensure that:

- all relevant sewage servicing options have been considered – this is a key element of the revised government sewerage policy. In many country towns, the expansion of existing reticulated sewerage infrastructure will remain the most appropriate option into the future and in these instances, R10 subdivision should only proceed where reticulated sewerage is provided;
- land use planning, health and environmental impacts of unsewered subdivision at this density are acceptable; and
- future development is capable of accommodating site requirements for on-site sewage treatment and disposal.

Survey strata lots and strata lots for approved grouped dwelling, commercial or industrial development outside public drinking water source areas – case-by-case assessment

The policy does not prescribe a minimum lot size for unsewered survey strata and strata lots for grouped dwellings, commercial or industrial development where the built form for each developable lot has been determined and received development approval. It is anticipated this will provide for a diversity of housing and development in unsewered areas, facilitating a more efficient use of urban land and infrastructure.

This represents a departure from previous sewerage policies, which required the density of development to be consistent with single residential land uses. The revised position is based on the policy requirement for applicants to demonstrate that the site requirements for on-site sewage disposal can be met prior to development approval being granted.

The risks associated with on-site sewage disposal systems for this form of strata/ survey strata development can be effectively managed without prescribing a minimum lot size based on the following:

- the land use and built form has already been determined at the time of subdivision – this enables maximum hydraulic loads to be calculated and land application areas to be identified; and
- through the development assessment process applicants are able to demonstrate the site is capable of accommodating on-site sewage disposal in accordance with the requirements contained in the policy.

The risks can be further reduced through ensuring on-site systems are owned and operated by a single person/ entity to provide the service, or by the strata company. The involvement of the strata company provides an additional layer of protection to ensure systems are operated and maintained appropriately. Maintenance programs acceptable to the local government should be in place, particularly where secondary treatment is proposed. The Strata Titles Act 1985 contains powers for the WAPC, or other relevant body to require content of the management statement for a strata scheme (refer to s42 [2d] of the *Strata Titles Act*). This power is being reinforced in the review of this legislation.

In sewage sensitive areas special consideration should be given to the impact on the environment and water resources.

Where the development of the buildings has not been approved for each strata/ survey strata lot (for example, the creation of vacant strata lots), the minimum lot size for urban/ industrial subdivision should apply. As the built form has not been established, it is not possible to accurately calculate maximum hydraulic loads or identify land application areas.

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5.2.2 Separation from water resources

In order to protect receiving waterbodies, bores and public drinking water source areas, the policy prescribes separation distances for an on-site sewage disposal system and a water resource. The source for these distances and additional details are in Table 2.

There may be rare instances where smaller setbacks may be considered (for example, where the lot would be rendered undevelopable) and it can be demonstrated that the reduced setback would not have a detrimental impact on public health or the environment. Should a smaller setback be approved, a system with nutrient removal capability will be required. Smaller setbacks from reservoirs or bores used for public drinking water will not be supported.

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Table 2: Separation from water resources

Location	Separation distance (metres)	Comments
Wellhead protection zone or reservoir protection zone	Onsite systems are not to be located within these protection zones	Based on *WQPN 25 Land Use Compatibility Tables for PDWSAs* (Department of Water, 2016)
Reservoir or any bore used for public drinking water supply where: - a wellhead protection zone or reservoir protection zone has not been assigned; or - where existing lots would be rendered undevelopable by the wellhead protection zone	100	Based on *WQPN 25 Land Use Compatibility Tables for PDWSAs* (Department of Water, 2016)
Private bore used for household/drinking water purposes	30	The *Health Act (underground Water Supply) Regulations 1959* prescribe 30 metres, which is for human health impacts. *WQPN 41 Private Drinking Water Supplies* (p8) recommends 100 metres as best practice and is based on environmental protection
Waterway or significant wetland and not within a waterway foreshore area or wetland buffer	100	The separation distance should be measured outwards from the outer edge of riparian or wetland vegetation. Department of Biodiversity, Conservation and Attractions *Corporate Policy Statement No. 51: Planning for Wastewater Management Affecting the Swan Canning Development Control Area* (p6) recommends 100 metres from the river system.
Drainage system that discharges directly into a waterway or significant wetland without treatment	100	Includes irrigation channels, surface and subsurface drains that discharge directly into a waterway. Department of Biodiversity, Conservation and Attractions *Corporate Policy Statement No. 51: Planning for Wastewater Management Affecting the Swan Canning Development Control Area* (p6) recommends 100 metres from a surface or subsurface drainage system that discharges to the Swan and Canning rivers or their tributaries. Examples of treatment include the use of amended soils; or bioretention systems prior to discharge into the drainage system. Guidance on treatments and best practice management practices that should be employed may be sought from the Department of Water and Environmental Regulation.
Land subject to inundation and/ or flooding in up to a 10% Annual Exceedance Probability (AEP) rainfall event	Onsite systems are not to be located in areas that are low-lying and prone to flooding.	Flooding may damage systems and cause sewage to flow up through toilets and sinks. Systems that rely on mechanical and electrical equipment to operate may be damaged by flood or loss of power. Department of Biodiversity, Conservation and Attractions *Corporate Policy Statement No. 51: Planning for Wastewater Management Affecting the Swan Canning Development Control Area* (p6) recommends locating onsite sewage systems outside of any area subject to inundation and/ or flooding in a 10% AEP rainfall event.

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5.2.3 Separation from groundwater

Vertical separation from groundwater is a critical consideration when determining if the site is capable of the on-site sewage disposal. Where soils are highly permeable, micro-organisms such as faecal bacteria are easily transported and other contaminant concentrations are not readily attenuated. Depending on site characteristics and on-site sewage disposal system type, a separation to groundwater of 0.6 metres – 1.5 metres is generally required as per AS/NZS 1547.

Separation distances – subdivision and development

Table 3 outlines the vertical separation distances required between an on-site sewage system's discharge point and the highest groundwater level.

Table 3: Separation distances from groundwater

Location	Soil type	Separation distance (metres)	Policy justification and source
Public drinking water source areas	All soil types	2	*WQPN 70: Wastewater treatment and disposal – domestic systems* (Department of Water, 2016, and as may be amended from time to time)
Sewage sensitive areas	All soil types	1.5	Department of Biodiversity, Conservation and Attractions *Corporate Policy Statement No. 51: Planning for Wastewater Management Affecting the Swan Canning Development Control Area* (p5) recommends at least 1.2 to 1.5 metres separation, dependent on the permeability and nutrient-retentive properties of the soil. These areas often have poor sandy soil profiles and are sensitive to nutrients.
Outside public drinking water source areas and sewage sensitive areas	Loams and heavy soils	0.6	Values developed in consideration of *AS/NZS 1547 Onsite domestic wastewater management* (Tables R1, R2 and K2). Values for sand identified in consideration of soil conditions in Western Australia. Where soils are highly permeable, nutrients and micro-organisms such as faecal bacteria are easily transported.
	Gravels	1	
	Sands • primary treatment • secondary treatment with nutrient removal	1.5 0.6	

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Determination of highest groundwater level

Applicants are to provide sufficient information with a proposal to demonstrate that relevant separation distances to groundwater will be achieved. Highest groundwater level should take into account the range of seasonal groundwater conditions in the context of long term variability and possible groundwater rise following development. The scale of investigation and analysis will depend on the presence of local water resources, the availability of existing data, the proposed urban form and any associated risks.

In low risk cases such as small scale developments in areas where it is known that the highest groundwater level is more than two metres from the surface, it may be sufficient to reference advice from the local government and / or Department of Water and Environmental Regulation related to data from similar adjacent locations.

In medium/ high risk situations such as medium or large scale proposals, where groundwater levels may be an issue or locations in close proximity to high value assets, a comprehensive monitoring program may be required. The monitoring requirement to determine the groundwater regime would depend on the size, character and location of the development.

Supporting resources available from the Department of Water and Environmental Regulation

- *Water resource considerations when controlling groundwater levels in urban development* (2013) – provides details of the considerations when assessing the groundwater regime and groundwater levels. For example, for new structure plan areas or subdivision areas it recommends:
  - to understand local groundwater conditions a minimum of 12 months of monthly monitoring data is to be collected on-site (more data may be required in high risk sites or where there is no regional bore data)
  - at a minimum, observation bores are to be located at the extremities of the site to ensure variation and direction of flow across the site is captured
  - local monitoring data is to be correlated to the most appropriate departmental regional bore with historical data to enable the local data to be extrapolated to determine the maximum seasonal groundwater level
  - to assess which departmental regional bore is most appropriate, consideration should be given to the spatial proximity, ground level, screen depth and lithology as well as the similarities or differences in the proximity of regional bore and the site to water bodies.
- *Water monitoring guidelines for better urban water management strategies and plans* (DoW 2012) – defines the hydrological information, including groundwater levels, to be collected and reported before and after urbanisation.
- Regional bore information – http://water.wa.gov.au/maps-and-data/monitoring
- Groundwater Map – provides information for the Perth area that indicates areas suitable/ unsuitable for the development of a bore within the superficial aquifer. It provides estimates of the depth to groundwater and to the base of the superficial aquifer. It only provides information that can be used as a data source to support other investigations and is not intended to define the groundwater regime for urban development, which must also consider post-development groundwater rise.
- Where a water management strategy or plan is required and prepared in accordance with *Better Urban Water Management*, WAPC 2008, and as amended from time to time) information about groundwater levels including monitoring requirements should be discussed and agreed during the preparation of the water management strategy/plan.

Demonstration of separation where use of fill or drains is proposed

These provisions were prepared in response to experiences throughout Western Australia that have shown that reliance on the use of fill and drains to achieve separation distances can result in unintended consequences. For example:

- sewage has been observed seeping from the base of sand pads, contaminating perched water tables and resulting in potential human exposure to pathogens;

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- access to clean fill is becoming increasingly expensive and technically challenging, particularly in the Perth Metropolitan and Peel regions. Requirements to provide large volumes of fill to meet land application area requirements may make future development cost prohibitive; and
- some drainage systems constructed on the Swan Coastal Plain have not performed as well as proposed, primarily due to insufficient topography and groundwater gradients resulting in water not draining away, stagnating and becoming breeding grounds for insects such as mosquitoes and midges.

Section 5.1.1.7 of the policy requires connection to reticulated sewerage if lots are less than one hectare and the highest groundwater level is less than 0.5 metres. Land should not be rezoned for urban use if unsewered development is proposed that requires the use of engineered solutions (for example, fill or sub-soil drains) to achieve separation distances.

5.2.4 Land application area

Size of land application areas

Schedule 2 of the policy provides guidance on the size and gradient of land application areas. The area required is calculated by multiplying the estimated hydraulic load of sewage by a conversion factor that is based upon the soil type and the type of on-site system used.

Hydraulic loads for a wide range of land uses are provided in the fact sheet: *Supplement to Regulation 29 – Wastewater system loading rates* (Department of Health, 2014), which is available online at: http://ww2.health.wa.gov.au/Articles/S_T/Supplement-to-Regulation-29-and-Schedule-9-Wastewater-system-loading-rates.

The conversion factors are specified in Schedule 2 (Table 2) of the policy. The values are extrapolated from Table L1 of AS/NZS 1547.

Schedule 2 (Table 3) of the policy provides specific guidance on the land application area required for a single house on a range of soil categories. It assumes a hydraulic load of 900 litres. This is based upon occupancy of six persons, each generating 150 litres of sewage per day. This assumption is slightly larger than what is provided in the current *Supplement to Regulation 29 Wastewater system loading rates* (Department of Health, 2014), however the government's policy position is that a more conservative approach is considered appropriate at subdivision stage as the maximum number of occupants, or activities being undertaken at any one time cannot be certain (for example, visitors, and guests). This is supported by AS/NZS 1547 (section 5.4.2), which states that systems should be of sufficient capacity to treat the peak wastewater flow generated by the facility being served. For example, there may be two toilets, a shower, dishwasher, washing machine all in use at any one time.
A sample calculation that demonstrates how the land application areas for single houses are calculated is provided below.

It is important to note that if treated wastewater, which is regulated under the *Environmental Protection Act 1986* is also proposed to be distributed on-site to a land application area, the Department of Water and Environmental Regulation may liaise with the Department of Health for advice on the health aspects and quality of effluent being discharged. Works approval or licence conditions or a registration have precedence over the requirements of this policy.

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Figure 2: Sample Calculation for determining the land application area for a single house with primary treatment system in soil categories 1 and 2

Calculation

	Hydraulic loading	900 L/day
×	Design loading rate (As per AS1547)	20 mm/day
×	Width of standard concrete leach drain (400 mm)	0.4 m
=	Area required for drainage	112.5 m
÷	Recommended length of drains	≅ 20m
=	Number of drains required (Note: must be an even number of drains)	(a) 4 @ 28 m (b) 6 @ 18.75 m

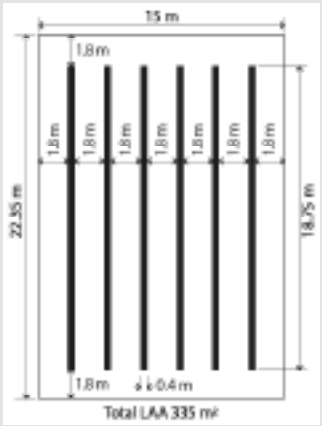
Length of land application area

	Length of drain	(b) 18.75 m
+	2 x setbacks	1.8 m x 2
=	Under Health Regulations 1974 length of LAA	22.35 m

Width of land application area

	Width of each drain	(b) 0.4 x 6
×	Number of drains	= 2.4
+	Separation between each drain (min 1.8 m)	+ 1.8 x 5 = 9.0
+	Setback under Health Regulations 1974 x 2	+ 3.6 = 15 m
	Length x Width = Land Application Area	= 335 m^2

Note: *AS/NZS 1547* recommends maximum drain lengths of 20 metres. Longer lengths may be possible if even distribution can be demonstrated.



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Land uses within land application areas

Activities within land application areas need to be carefully managed in order to ensure that on-site sewage disposal systems function properly and to avoid potential human contact with sewage residues. Schedule 2 (Table 4) states that unless specifically provided for in the design of the on-site systems, land application areas must:

- not be built on or paved in a manner that precludes reasonable access
- not be subject to vehicular traffic (other than a pedestrian controlled lawnmower)
- not be subject to regular foot traffic such as pathways and clothes line areas
- be kept in a manner which enables servicing and maintenance of the on-site sewage disposal system and land application area.

These requirements are based upon the provisions of the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974* and are also contained in *AS/NZS 1547*.

As these requirements affect the use and enjoyment of the land, the policy requires all newly created unsewered lots that are proposed to utilise a secondary treatment system to have a notification on the title advising that the developable area of the lot is reduced. Model conditions have been developed for this purpose. See Schedule 4 (2) Condition 2 or 3 as appropriate.

5.2.5 Types of on-site treatment systems required

Onsite sewage treatment is classified as either primary or secondary. The policy definitions are based on *AS/NZS 1547*, and have been refined in accordance with Western Australian practice and environmental conditions. The type of system required should be determined in accordance with the site and soil conditions, vulnerability of the receiving environment and nature of the proposal. Information should be sought from the local government environmental health officers related to the performance of particular systems in the local area. All systems for use in Western Australia require the approval of the Department of Health.

Primary treatment

A number of primary on-site sewage treatment systems are approved for use in Western Australia. Primary treatment systems usually consist of a single, or multiple chambered tanks through which sewage is allowed to flow slowly to permit suspended matter to settle and be retained, so that organic matter contained therein can be decomposed (digested) by anaerobic bacterial action in the liquid. Effluent is usually discharged to either a secondary treatment process, or to a land application system such as leach drains or soak wells for subsurface disposal only (reuse is not permitted). A list of approved primary treatment systems is available online at https://ww2.health.wa.gov.au

Primary treatment with nutrient retention

Some primary treatment systems use amended soils to remove phosphorous and micro-organism from sewage. These systems are often referred to as nutrient retentive leach drains. As sewage is only subject to primary treatment, sewage constituents can clog soil pores over time. Furthermore, the amended soils can become saturated with nutrients and require replacement in order to continue to effectively reduce nutrient run-off. There are no mechanisms available to ensure soils will be replaced although it is recommended that an alternative area be available in the event of this occurring. As such, the policy does not provide for smaller land application areas or lot sizes based on usage. A list of approved septic tanks and leach drains is available online at https://ww2.health.wa.gov.au

Secondary treatment

During secondary treatment, microorganisms consume the organic matter, converting it to carbon dioxide, water, and energy. While secondary treatment technologies vary from activated sludge processes, to trickling filters and/or constructed wetland systems, the final phase of each involves an additional settling process to remove more suspended solids.

Secondary treatment systems are required to produce effluent of secondary standard, that is, 20mg/L of BOD, 20mg/L of TSS and 10cfu/100mL of E coli. The Department of Health has approved a number of secondary treatment systems, (commonly known as Aerobic Treatment Units [ATUs]) for use in Western Australia. A list of approved units is available online at https://ww2.health.wa.gov.au.

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Secondary treatment systems with nutrient removal

The nutrient removing capabilities of secondary treatment systems vary considerably. The AS 1546.3 standard for nutrient-removing systems is for phosphorus concentrations of 2 mg/L and nitrogen concentrations of 15 mg/L. In order for secondary treatment systems to meet the policy's nutrient removal requirement, they must be able to discharge treated sewage with phosphorus and nitrogen concentrations of less than 1mg/L and 10mg/L respectively. These thresholds are based on recommendations of the Department of Water and Environmental Regulation in response to Western Australian conditions.

Western Australian soils are on average much less nutrient-retaining than eastern states soils, therefore more stringent nutrient removal criteria are required for systems used in Western Australia. While this represents large decreases in effluent nutrient concentrations compared with non-nutrient removing systems, these concentrations are still orders of magnitude greater than nutrient concentrations that should flow to waterways. Note that ANZECC guidelines[5] for Western Australian lowland rivers are 1.2 mg/L TN and 0.065 mg/L TP; the guidelines for upland rivers are 0.45 mg/L TN and 0.02 mg/L for TP.

[5] ANZECC & ARMCANZ 2000, Australian and New Zealand guidelines for fresh and marine water quality, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand.

Nutrient concentrations of treated sewage produced by specific systems are published on the Department of Health website. Currently there are only three approved systems that meet these outputs so purchasers are advised to ensure that the one chosen meets the policy criteria.

Instances where secondary treatment systems may be required

Secondary treatment systems are more expensive to install and maintain than a primary treatment system. The operation and effective regulation of these systems is also generally more complex. The systems may not be appropriate for all types of land uses, such as instances where daily flow is subject to large variations and shock loads. Secondary treatment systems should only be required in the instances identified in Section 5.2.5 of the policy.

Secondary treatment systems should not represent a default requirement for all unsewered development.

5.3 Information to support planning proposals

The policy requires sewage servicing to be addressed at the earliest opportunity of the planning process. This enables good decision making and prevents land being rezoned inappropriately.

The level of detail to be provided is to be commensurate with the proposal and should be incorporated into the appropriate water management strategy or plan in accordance with *Better Urban Water Management* (WAPC, 2008).

Schedule 1 of the policy details the minimum information to be provided at each stage of the planning system.

5.3.1 Site-and-soil evaluations

Where on-site sewage disposal is proposed, the policy requires the applicant to demonstrate that the site is suitable for long-term on-site sewage disposal (refer to Section 5.2).

Preparation of a site-and-soil evaluation allows on-site sewage disposal systems to be optimally designed. It allows for the most efficient use of land by facilitating the design of a system that is tailored to the specific characteristics of the site and the development, instead of being designed on the basis of conservative or generic criteria.

AS/NZS 1547 contains guidance on how to undertake a site-and-soil evaluation, including calculation of the required land application area. It assists in the assessment of the appropriateness of the proposed sewage disposal system for the frequency of use,

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available power, slope, soils, wastewater load and other site constraints, having consideration of the soil texture and structure with depth using standard soil descriptions.

Section 3.3 of *AS/NZS 1547* requires site-and-soil evaluations to be undertaken by appropriately qualified and experienced site evaluators/ soil assessors. This includes: soil scientists, professional engineers, drainage contractors or plumbers with appropriate training, competence and experience in design and installation practice. They evaluate the capacity of a site and its soil for accepting treated wastewater; certifying that the evaluation procedures have been undertaken in accordance with *AS/NZS 1547* and identifying any cultural concerns or constraints. In Western Australia there is currently no accreditation requirement for site evaluators/soil assessors. Further information on undertaking a site-and-soil evaluation is available in the fact sheet via the Department of Health website.

AS/NZS 1547 (section 5.2) states that the intensity of a site evaluation shall be matched against the size of the development and the likely nature and extent of potential health and environmental impacts, with consideration being given to:

- the volume, usage pattern or scale of the sewage application
- the cumulative risk to health and environment
- previous land uses and variability and complexity of site and soil parameters
- availability and nature of data from previous investigations
- the performance record of local on-site sewage disposal systems.

Section 5.3 of the policy recognises and acknowledges the above. If a site-and-soil evaluation is prepared in accordance with the policy provisions of Schedule 1 at the appropriate planning stage, it will be sufficient to submit with the planning application. It is not the intent of the policy to require geotechnical investigations as per *AS 1726:2017 Geotechnical site investigations*.

5.4 Industrial subdivision and trade waste management

Prior to the introduction of the *Government Sewerage Policy* (2019), reticulated sewerage was not required for most industrial land development and planning decisions did not consider the disposal of trade waste. This was facilitated by the provisions of:

- *Development Control Policy 4.1 – Industrial Subdivision (1988)*, which provided for 'dry industry' to be serviced by on-site sewage disposal. It is noted this policy is currently under review.
- *Government Sewerage Policy – Perth Metropolitan region (1995)* and the *draft Country Sewerage Policy (2002)*, which specifically excluded 'trade' waste from the definition of sewage.

This has resulted in:

1. The contamination of land and water. Water quality monitoring from groundwater and drains servicing industrial areas frequently shows high levels of nutrient and other contaminants that are found in sewage, and more specifically trade waste.
2. Long term planning issues associated with the lack of essential services, which prevents future change or intensification of land uses. For example, the lack of reticulated sewerage has impeded the intensification of strategically important areas such as Osborne Park. Retrofitting of these areas is difficult and costly.
3. Development issues. The location and size of sewage disposal areas is often not considered until after development approval has been issued. This results in insufficient land available for disposal, an issue which only becomes evident once applications to construct or install an apparatus for the treatment of sewage are received.

Connection to reticulated sewerage

In response to these issues, the *Government Sewerage Policy* generally requires industrial land to be connected to reticulated sewerage. Reticulated sewer will be required in instances where *5.1.1 Requirement to connect to reticulated sewerage* applies. It is acknowledged that there may be technical issues associated with the servicing the industrial land, such as low hydraulic flows and large lots.

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Strategic industrial areas are areas designed for investment in downstream processing and other heavy or strategic industrial activities. They are areas that LandCorp deliver on behalf of the Department of Jobs, Tourism, Science and Innovation. The servicing needs of these areas will be addressed on a case-by-case basis.

Where is it possible that reticulated sewerage will not be available, an assessment of the best practicable servicing option may be required. Refer to Schedule 1 (2.3) for further guidance on the assessment. It is especially important to consider the long term servicing needs of these areas and possible future intensification of development. Where the land is remote from the existing development front, consideration should be given to delaying the development until such time as sewerage infrastructure is available. The minimum lot size for unsewered industrial subdivision outside of public drinking water source areas and sewage sensitive areas is 2,000m^2.

Consideration of trade waste

The definition of sewage in the policy is taken from the *Health Act 1911* and now incorporates trade waste. As such, information on the land and infrastructure required for trade waste treatment and disposal should be incorporated into planning decisions. This applies whether reticulated sewerage or on-site disposal is proposed. Trade waste refers to wastewater discharged from a business or industry, aside from that which is produced from staff amenities or office facilities. It includes contaminated stormwater, cooling water, process waters and wash-down waters.

Wastes that may cause environmental harm should not be discharged into the environment, including down stormwater systems or on-site soakage. Offenders may be prosecuted under the *Environmental Protection Act 1986* or *Contaminated Sites Act 2003*. A list of materials that must not be discharged into the environment is provided in the Environmental (Unauthorised discharges) Regulations 2004.

Trade waste generated from a prescribed premises (listed in Schedule 1 of the *Environmental Protection Regulaltions 1987*) must be managed in accordance with a licence, works approval or registration under the *Environmental Protection Act 1986*. The registration, or conditions of the licence or works approval have precedence over the requirements of this policy.

In order to address trade waste, proposals for rezoning and structure plans are to identify the risks associated with disposal of sewage and trade waste, including the type of land uses permitted and contaminants likely to be present; vulnerability of receiving environment, proposed method of disposal; measures to address risk; and details of staging where relevant. Guidance on wastewater discharge quality criteria to waterways to minimise impact is provided in *WQPN 51: Industrial wastewater management and disposal* (Department of Water, 2009).

Measures to address the risk to the environment include the containment of contaminants; adequate buffers to nearby sensitive land uses and water resources; access to or provision of services that ensure potential wastes are reduced, recycled or adequately treated before safe disposal; site drainage controls to isolate potentially contaminated areas from discharge to the environment; environmental management and monitoring systems; environmental training and awareness programs for site employees and contractors; and effective emergency response systems and land rehabilitation plans (Department of Water, WQPN 51, 2009).

It should also be noted that recycled water can also be reused with appropriate treatment to the required standards and some management controls for a wide range of beneficial uses including industrial uses such as cooling and dust suppression, irrigation of public open spaces and toilet flushing. Use of recycled water can substantially reduce disposal volumes and as a consequence may result in a reduced land application area requirement. All recycled water schemes must be approved by the Department of Health prior to implementation.

- **Where premises are connected to a reticulated sewerage scheme**

  Reticulated sewerage service providers have strict criteria as to what may be discharged from business or industry into the network and a trade waste agreement is required from the provider before disposing of trade waste into the system. As discharges may contain hazardous materials, this can seriously impact the operation of the entire network. If approval is not granted by the service provider, alternative arrangements for disposal are required. This may include arranging for the waste to be transported off site for disposal or treated and disposed of on-site, which may require additional approvals under the *Environmental Protection Act 1986*.

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- **Where on-site disposal is proposed**

  Similar to reticulated sewerage schemes, on-site systems can also be adversely affected by trade waste. Operators must ensure that hazardous materials are not disposed of into an sewage system on-site.

  Proposals for industrial subdivision and development should demonstrate that the proposed lots are capable of the treatment and disposal of all sewage, considering the land use permissibility of the applicable zone. The overall volumes of sewage to be disposed of on-site (for example, trade waste and that produced from staff amenities) are to be taken into consideration when calculating the hydraulic loading and land application area. Information should be provided on the type of on-site systems required.

6. Implementation

The successful implementation of the policy relies on it being utilised by the relevant decision-makers, referral agencies, providers, industry and landowners/ developers.

The policy outlines the responsibilities for each stakeholder who has a role in planning for the treatment and disposal of sewage. The responsibilities for both on-site and reticulated systems is provided in Section 6.1.

As the policy is not applied retrospectively, any current planning approvals that may conflict with the provisions of the policy remain valid for as long as the approval remains in effect. If an approval lapses and re-approval is sought, then the policy provisions apply.

6.1 Roles and responsibilities

The policy outlines the agreed responsibilities for local government, State government agencies, the WAPC and sewerage service providers. For the most part, these responsibilities already form part of their statutory role. More detail on these roles is provided below.

In addition, these guidelines outline responsibilities for other decision-making bodies as well as the role for landowners/ developers in the planning process.

6.1(a) Local government

Local governments are responsible for determining development applications and provision of advice to the WAPC on other planning proposals, such as subdivision concerning land capability when on-site sewage disposal is proposed. They are also required to make amendments to local planning schemes when rezonings occur and to include provisions to ensure sewage disposal is implemented in accordance with the water management plan that accompanies the rezoning proposal. Further responsibilities apply when local governments manage reticulated sewerage systems; allow for on-site sewage treatment and disposal; and/ or allow a hybrid arrangement (such as a Septic Tank Effluent Disposal [STED] system).

Responsibilities that apply where the local government has areas with on-site sewage systems

- Ensuring an appropriate on-site treatment and disposal regime is adequately addressed prior to issuing development and/ or building approval.
- Approving on-site sewage disposal systems (for single dwellings or other building not producing more than 540 litres of sewage per day) in accordance with *Health (treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*.
- Ensuring systems are functioning effectively so as not to cause a public health risk. This may involve:
  - inspecting the apparatus and issuing a permit to use

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- ensuring ongoing landowner compliance with maintenance schedules
- maintaining a register of on-site sewage disposal systems within their jurisdictions with a monitoring and auditing schedule. Local governments should ensure a monitoring and audit system is in place for secondary treatment systems within their jurisdictions. Electronic submission of reports is recommended.

As responsibilities for on-site sewage systems are resource intensive, local governments may charge a fee for making an inspection of a secondary treatment system under section 6.16 of the *Local Government Act (1996)*. These fees may be included in the property rates via general, special area or differential rating methods.

Responsibilities that apply where the local government allows for a hybrid approach

- Connecting existing septic tanks to the wastewater treatment plant.
- Decommissioning leach drains once connected.

6.1(b) Department of Health

The Department of Health is Western Australia's agency for the protection of public health.

Responsibilities in relation to implementation of the policy

- Provision of technical advice to responsible authorities to help guide decision-making on planning proposals and development applications concerning public health matters, which may include hydraulic loading and adequacy of soil-and-site evaluations.
- Processing and approval of on-site sewage systems installation applications (note: over 540L/day; local government assesses, prepares a report and then forwards to the Department of Health for approval).
- Product approval of domestic on-site sewage systems.
- Assessment and approval of recycled water schemes.
- Memorandums of understanding with wastewater service providers that enable the Department of Health to sample and monitor a wastewater service provider's data and reporting systems.
- Expert technical advice to the responsible authority in cases where refusal of the planning application is recommended.
- Expert technical evidence is required for the State Administrative Tribunal on the risk to public health and its consequences to planning decisions.
- On other occasions where a public health safety point of view is required to support planning decision-making.

6.1(c) Department of Water and Environmental Regulation

The Department of Water and Environmental Regulation manages water resources throughout the State through the administration of various Acts, including the *Water Agencies (Powers) Act 1984, Metropolitan Water Supply, Sewerage and Drainage Act 1909, Country Areas Water Supply Act 1947*, the *Water Services Act 2012, Waterways Conservation Act 1976, Rights in Water and Irrigation Act 1914, Metropolitan Arterial Drainage Act 1982, Contaminated Sites Act 2003* and *Environmental Protection Act 1986 (WA)*, and their respective regulations and by-laws.

Responsibilities in relation to implementation of the policy

- Provision of expert technical advice on water and environment matters (including industrial liquid waste, wastewater and odour) to the responsible authority to help guide decision-making on planning proposals and development applications.
- Granting works approvals, licences and registrations for prescribed premises, including wastewater treatment plants, and other prescribed premises that treat liquid waste.
- Monitoring and auditing of compliance with works approvals and licence conditions and other environmental protection regulations.
- Monitoring of compliance with any conditions imposed on exemptions from water services licencing.
- Provision of advice to the Minister for Water on water services charges and the development of regulations to legislate charges.

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- Undertaking public interest assessments on licensing exemption applications and making; recommendations to the Minister for Water based on these assessments.

Environmental Protection Authority services of the Department of Water and Environmental Regulation

The Department of Water and Environmental Regulation's Environmental Protection Authority (EPA) services division delivers quality advice and services to the EPA and Government to support the protection of the environment.

Responsibilities in relation to implementation of the policy

- The EPA determines whether to or not to assess schemes, scheme amendments and development proposals in order to protect the environment.
- Guidance Statement 33 – *Environmental Guidance for Planning and Development (Environmental Protection Authority, 2008)* to guide planners and developer to achieve environmentally sound outcomes.
- Environmental Assessment Guideline 15 – *Protecting the Quality of Western Australia's Marine Environment* relating to wastewater treatment plants.

6.1(d) Department of Biodiversity, Conservation and Attractions

The Department of Biodiversity, Conservation and Attractions is responsible for protecting and conserving the state's natural environment and administers Acts including the *Conservation and Land Management Act 1984*, the *Biodiveristy Conservation Act 2016* and the *Swan and Canning Rivers Management Act 2006*. Through the land use planning system, the department provides advice to referral agencies on the environmental values of lands proposed for development including biodiversity, fauna, flora, threatened ecological communities and wetlands. It also works to ensure that planning for land use and development maintains and enhances the ecological health, community benefits, amenity and heritage value of the Swan Canning river system.

Responsibilities in relation to implementation of the policy

- provision of referral advice on planning proposals abutting reserves and land under its management
- provision of referral advice relating to the identification and vulnerability of assets relevant to the department's jurisdictional responsibilities, which may include advice on the environment quality standards required to maintain the department's assets (for example, environment quality objectives and targets outlined in gazetted marine park and reserve management plans)
- provision of expert technical advice to the responsible authority on the environmental values of sensitive receiving environments, including sewage sensitive areas, as defined in Section 7 of the policy, marine parks and reserves, coastal embayments and wetlands
- assessing proposed developments within, adjacent to or affecting the Swan Canning Development Control Area in accordance with the policy measures
- provision of expert technical advice to decision makers to help guide decision-making on planning proposals and development applications where on-site sewage disposal systems are proposed and may affect waters in the Swan Canning river system, including setbacks to the river system, associated tributaries and fringing wetlands
- expert technical evidence for the State Administrative Tribunal on the environmental values of sewage sensitive areas.
- in the Swan Canning Catchment, advice may also be provided on the risk to the environment and its consequences to planning decisions.

6.1(e) Western Australian Planning Commission

The Western Australian Planning Commission is the determining body for most strategic planning proposals and subdivision within Western Australia. It also determines some development applications.

Responsibilities in relation to the implementation of the policy

- Provision of advice to the Minister for Planning on local planning schemes and scheme amendments where required.

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- Assessing and determining strategic planning proposals, subdivision and development applications in accordance with the policy measures.
- Ensuring appropriate zoning for wastewater treatment plants and their buffers.
- Ensuring sub-regional structure plans and local planning strategies identify special control areas for odour buffers, public drinking water source protection or other requirements related to the provision of water services.
- Ensuring sub-regional structure plans and local planning strategies identify sewage sensitive areas and establish controls that can be implemented through the local planning scheme; referring planning proposals to the relevant agencies for advice and comment.
- Setting and clearing conditions of subdivision approval under advice from the relevant agencies, utilities and service providers.
- Responding to State Administrative Tribunal reviews.

Department of Planning, Lands and Heritage

The Department of Planning, Lands and Heritage is the principal authority for land use planning in Western Australia.

Responsibilities in relation to the implementation of the policy

- Providing advice to the WAPC on planning proposals.
- Ensuring regional planning instruments determined or developed under delegated authority, including strategies, schemes and scheme amendments and structure plans consider and address the policy measures.
- Assessing and determining strategic planning proposals, subdivision and development applications under delegated authority in accordance with the policy measures.
- Monitoring the implementation and effectiveness of the policy measures.

6.1(f) Sewerage service providers

Wastewater service providers are entities that provide wastewater treatment and sewage disposal services. The Water Corporation is the State's largest service provider but local governments and private businesses also provide such services. A licence issued by the Economic Regulation Authority (ERA) is generally required under the *Water Services Act 2012* (note: some providers may be exempt).

Responsibilities in relation to the implementation of the policy

- Compliance with the terms of the licence issued by the ERA (unless the water service provider has been given a licence exemption by the Minister for Water).
- Assess trade waste disposal applications and where trade waste is accepted.
- Ensure adherence to any specified acceptance criteria.
- Provision of expert technical advice to inform decision making regarding the feasibility of connection to reticulated sewerage.

Other bodies

In addition to the above agencies, other bodies also have responsibilities for the successful implementation of the policy. These inlcude:

Development Assessment Panels

Development Assessment Panels (DAPs) determine development applications only. They report directly to the Minister for Planning. Their responsibility under this policy is to assess development applications in accordance with the policy provisions.

Metropolitan Redevelopment Authority

The Metropolitan Redevelopment Authority (MRA) operates under its own legislation and reports to the Minister for Planning. Their responsibilities under this policy are the same as for the Western Australian Planning Commission when determining development applications.

Economic Regulation Authority

The Economic Regulation Authority (ERA) is responsible for administering the water services licensing regime prescribed under the *Water Services Act 2012*.

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Responsibilities in relation to the implementation of the policy

- Issuing water service licences to entities supplying potable water, non-potable water, sewerage, irrigation and drainage services that are not exempt from the requirement to hold a licence.
- Approving financial hardship policies and the review and amendment of the Water Services Code of Conduct (Customer Service Standards) 2013.
- Monitoring and reporting to the Minister for Water on the operation of the licensing scheme, and compliance by licensees with their licence by arranging for regular operational audits and asset management system reviews.
- Overseeing customer protection requirements encompassing billing, payment and debt collection, financial hardship, complaints and information obligations.
- Monitoring the performance of water licensees through the annual collection of performance data, which is also used to prepare reports on the performance of water, sewerage and irrigation services.

Landowners/ and proponents

Landowners / proponents are to provide information in support of their planning application as outlined in the policy. They may be landowners / proponents or consultants acting on behalf of a landowner / proponent, such as a planning consultant or property developer. Landowners / proponents and their agents should consult closely with the responsible authority and relevant agencies at all stages of the planning process.

Responsibilities in relation to the implementation of the policy

- All subdivision and development proposals should be connected to reticulated sewerage with on-site sewage disposal systems only being considered in specific circumstances as outlined in the policy measures.
- Where reticulated sewage disposal is proposed, the information outlined under Schedule 1 should be provided with the application.
- Where on-site sewage disposal is proposed, the information outlined under Schedule 2 should be provided with the application to demonstrate that the site is suitable for long-term on-site sewage disposal and will not result in unacceptable public health, environmental, administrative or land use planning impacts.
- Making arrangements for notifications to be placed on the title as a condition of approval.
- Consulting with the Department of Health on health and hydraulic loading matters, including where required the adequacy of soil-and-site evaluations.
- Consulting with the Department of Water and Environmental Regulation in relation to potential impacts on water resources, including waterways, foreshores, public drinking water sources and any other sewage sensitive water resources.
- Consulting with the Department of Water and Environment Regulation in relation to industrial liquid waste and the disposal of treated wastewater from wastewater treatment plants producing more than 20 kilolitres per day of sewage.
- Consulting with the Department of Biodiversity, Conservation and Attractions in relation to the values of wetlands, and any sewage sensitive areas, that is, environmentally sensitive areas or areas with significant environmental conservation values.
- Consulting with local government in relation to local issues relating to public health, water resources or any other sewage sensitive areas.
- Consulting with the sewerage service provider in relation to technical aspects of connection to the reticulated sewerage.
- Complying with the maintenance requirements for on-site sewage disposal systems.

6.2 Secondary treatment systems – maintenance requirements

Secondary treatment systems have rigorous installation, operation and maintenance requirements and are prone to failure when the requirements are not adhered to. For example, most systems require a continuous power supply to function and must be serviced and inspected by qualified personnel at three-monthly intervals. Furthermore, as sewage is disposed of at or near the ground surface the potential for human or environmental exposure is high when systems malfunction.

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The policy contains measures to manage the risks associated with secondary treatment systems. However, some factors cannot be effectively managed through regulation (for example, high flows, disposal of unsuitable matter into the system), and residual risk will remain.

All secondary treatment systems approved for use in Western Australia have been proven to work under controlled conditions. However, although technology is improving over time and some on-site waste water treatment systems are capable of producing better effluent quality, failure of systems continue. This is primarily due to ground and surface water ingress; systems not installed properly; unsuitable soil type; and undersized systems. Other factors include unplanned increase in wastewater volumes and root invasion. As such, there is a need to assess site and soil conditions rather than relying solely on technology. This supports the policy's adoption of a cautious approach to the use of secondary treatment systems and they are not considered an appropriate alternative to reticulated sewerage for most subdivision and development.

Institutional arrangements to manage risks associated with on-site sewage disposal

Robust institutional arrangements need to be in place to ensure the sustainable management of on-site sewage systems *(AS/NZS 1547:2012 s.2.1)*. Previous studies in Western Australia (including Gunady et al *A Review of On-Site Wastewater Treatment Systems in Western Australia from 1997 to 2011, Journal of Environmental and Public Health*, 2015) found there has been an absence of appropriate administrative systems to record the approvals, installation and management of on-site treatment systems. This is consistent with feedback from local governments at policy development workshops and submissions received from local governments in response to the draft policy, which demonstrated:

- different interpretations of the role of local government in regulating on-site systems
- planning decisions resulting in widespread requirements to install secondary treatment systems were made without consideration of ongoing administrative implications
- most local governments did not have any administration systems to monitor compliance with installation and maintenance requirements
- major resourcing limitations with regard to auditing of on-site systems and the follow-up of non-compliance.

The policy provisions in this section were developed to clarify the role of land owners and local government and to provide information on options available to local government to secure resources to set up systems to effectively regulate management and maintenance requirements, including the ability to charge fees for inspections and auditing.

7 Definitions

The definitions are policy specific unless there is a reference to legislation, regulation, policy or standard within the definition itself.

The definitions were developed and agreed by the Steering Committee comprised of the Department of Planning, Lands and Heritage; Department of Water and Environmental Regulation; Department of Biodiversity, Conservation and Attractions; Department of Health; and the Water Corporation. They were endorsed by the Western Australian Planning Commission and approved by the Ministers for Planning, Water and Health. Background information to policy-specific definitions is provided below.

- Highest groundwater level

  Reference to Watts and Hurt (1991) is provided as the technical basis.

- Infill

  This definition is policy specific. It means areas where density codings are increased through a scheme amendment to enable more dwellings per hectare to be achieved. This will be in already built-up areas for example where R-codings may be changed from R5 to R10. Infill in the policy does not apply to land on the edge of settlements that will incrementally expand settlement size.

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- Onsite sewage disposal

  This definition applies to all sewage generated from a dwelling, business and includes trade waste that is to be disposed of on-site. The critical element of on-site disposal is that the treated sewage is contained within the lot. This means the land application area must be on the same lot as where the sewage was produced. For example, a land application area cannot be located on another lot from where a dwelling is located. This requirement does not apply where the liquid waste is generated from a prescribed premises and discharged or disposed of in accordance with a works approval, licence or registration issued under the *Environmental Protection Act 1986*.

- Onsite sewage system

  An on-site system must be contained wholly within the lot from where the sewage was produced. This means an on-site system cannot be located on another lot (i.e. an adjoining lot).

- Residential subdivision

  This definition includes all areas that have been zoned Urban with the intention of future residential development and at the date of publication of this policy, do not have an assigned R-Coding.

- Reticulated sewerage

  The critical element of reticulated sewerage is that disposal of sewage is outside of the boundaries of the lot from where the sewage was produced. It can take very different forms from being a large centralised system (as exists in most of Perth), small scale system (as many mine sites have) or as a hybrid system (consisting of septic tanks and offsite ponds such as in Hyden town)

- Sewage

  The definition is the same as in the *Health Act 1911* – *'…any kind of sewage, nightsoil, faecal matter or urine, and any waste composed wholly or in part of liquid'*. This definition includes trade waste, some of which may be generated from a prescribed premises. Where trade waste is discharged or disposed of in accordance with a works approval licence or registration issued under the *Environmental Protection Act 1986*, the conditions of the licence, works approval or registration have precedence over the requirements of this policy.

- Sewage sensitive areas

  The potential impacts of on-site sewage disposal upon the environment and water resources are largely dependent upon the transport pathways and vulnerability of the receiving environments. Sewage contains nutrients and other pathogens. Nutrient pollution generally leads to excessive algal growth, algal death and low dissolved oxygen concentrations in water bodies, but can also impact sensitive terrestrial ecosystems. The estuaries in the south west of Western Australia suffer from chronic and sometime catastrophic nutrient pollution. For example, nutrient pollution caused the ecological collapse of the Peel-Harvey pre-Dawesville Cut. Today, the ecosystems of the lower Peel-Harvey rivers are in a similar condition. In the erly 2000's prawns disappeared from the Swan Estuary most likely due to low benthic dissolved oxygen (DO). The Swan and Canning Estuaries are now continuously artificially oxygenated (at large expense to government) to support their ecosystems.

  The Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions have spatially identified areas sensitive to sewage and these have been refined in response to public submissions.

  The policy acknowledges there are other areas that may be environmentally sensitive to the impacts of on-site sewage disposal. However, due to insufficient information regarding their location, conservation values and/ or sensitivity to on-site sewage disposal, they have not been included at this time within the definition of sewage sensitive areas. These areas should be identified during planning processes and any potential impacts considered and managed on a case-by-case basis. These areas include, but are not limited to wetlands that are classified as resource enhancement, marine parks and reserves, and karst systems.

  Indicative mapping has been prepared to accompany this policy and is available on the State Land Information Platform (SLIP) and the Department of Planning, Lands and Heritage's PlanWA.

  Note that the sewage sensitive area boundaries may be refined through higher resolution mapping that may be undertaken as part of the site and soil evaluation. Updates will be made from time to time so referral to the map should be undertaken for each proposal.

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- Sewerage service provider

  In line with the State Government's competitive neutrality position, the policy does not differentiate between providers. Prior to 2012, there was primarily only one provider servicing the greater Perth area – Water Corporation. There are several providers in Western Australia that now provide sewerage services. A list of service providers can be found on the Economic Regulation Authority's website.

- Site-and-soil evaluation

  It is expected that a site-and-soil evaluation (SSE) will address relevant considerations only. The minimum requirements at each stage of the planning process are listed in Schedule 1. A SSE need not be overly complex, particularly if soil conditions in the area are well known and understood by local government. More guidance is available from the Department of Health fact sheet – Guidance on Site-and-soil-evaluation for Onsite Sewage Management.

  It is not intended that proponents undertake geotechnical investigations as outlined in *AS 1726: Geotechnical site investigations*.

- Urban

  The definition conveys the meaning that lots less than 1 hectare will be created if zoned urban.

  Most of these areas will be serviced by reticulated sewerage however, some areas may have been zoned urban and at the date of publication of this policy, do not have an assigned R-coding.

  Some of these areas may have been rezoned on the understanding that on-site disposal would be utilised and with the publication of this policy are now located in sewage sensitive areas. As they do not have formal approval for a density coding at the time of publication of the policy, proposals will need to ensure compliance with the policy provisions which may mean that lot yield will be reduced. A site-and-soil evaluation should be undertaken to demonstrate how nutrients will be attenuated satisfactorily to ensure environmental degradation does not occur through unsewered development. See also definition of sewage sensitive areas.

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Schedule 1. Supporting information and requirements at various stages of the planning system

Schedule 1 outlines what information is required at each stage of the planning system from sub-regional plans and local planning strategies to development applications. Ideally, this information is to be incorporated into the relevant water strategy or plan in accordance with *Better Urban Water Management* (WAPC, 2008).

1. Sub-regional/district plans and local planning strategies

A high level assessment of options for sewage management that is incorporated into the regional/ district water strategy/ plan should be undertaken. This enables opportunities for alternative water supplies, fit-for-purpose use and management to be considered early in the planning process. This is increasingly becoming more important as our climate changes.

2. Rezoning and local structure plan

The most critical stage is the Region Scheme amendment (or lifting of Urban/ Industrial deferred zones) and the subsequent local planning scheme amendment where information relating to sewage disposal is to be included in addition to drainage lines, stormwater management and water supply.

If reticulated sewerage is proposed in a Region Scheme amendment, this should be detailed in the accompanying water management strategy or plan. It is the expectation of the WAPC that future development is connected to a reticulated sewerage scheme.

Provisions may be included into local planning schemes regarding the method and/ or treatment of sewage disposal.

The local structure plan should address the method, treatment and disposal of sewage in accordance with an approved local water management strategy.

This section of the policy outlines what is required to demonstrate the best practical servicing option for sewage disposal where it is possible that reticulated sewerage may not be available. The level of information should be commensurate with the scale and nature of the proposal.

If secondary treatment systems are proposed, appropriate provisions should be included in the local planning scheme. Similarly, if any restrictions on land uses are required to adequately manage impacts of sewage disposal, these should also be included in the local planning scheme.

3. Subdivision

By the subdivision stage, the district and local water management strategy should have set in place the proposed servicing strategy for water supply, sewage management and stormwater management so that preparation of the Urban Water Management Plan (UWMP) is simply an extension of these. It provides the detail to the design proposed in the structure plan. In accordance with BUWM, a UWMP is required in support of a subdivision application.

3.1 Survey strata subdivision applications where connection to reticulated sewerage is proposed

The plan of subdivision is to demonstrate how each strata lot is to be connected to sewerage infrastructure. This is important as current service provider practice is to provide only one connection to the boundary of the parent lot and without the appropriate easements in place; early development within the strata may obstruct/ block/ prevent future connection of infrastructure to some strata lots. A new advice note has been developed for this purpose.

3.2 Where connection to a reticulated sewerage scheme that is yet to be constructed is proposed

The subdivision application should show the areas of land required for sewerage infrastructure, disposal and buffers. If located outside the proposed subdivision, the application should demonstrate how access will be secured.

The policy acknowledges that a water services license may not be feasible to obtain prior to subdivision however sufficient detail, including identification of a service provider, regulatory applications/approvals in progress, proposed technologies to be used and any construction and staging considerations are to be provided in support of the subdivision application.

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3.3 Where on-site sewage disposal is proposed

A site and soil evaluation is required to be lodged in support of a subdivision application that proposed on-site sewage disposal. Again, the level of information is to be commensurate with the scale and nature of the proposal. This section details the minimum requirements.

4. Development

By the development stage, the sewerage servicing arrangements are generally known. This section addresses the requirements where on-site sewage disposal is proposed.

Advice from relevant agencies and local government during the preparation of the policy indicated that inadequate considerarion of on-site sewage requirements at development stage has lead to significant issues at construction/ building stage, when it becomes evident that lots are not capable of accommodating development, on-site systems and associated setbacks. The relevant policy provisions were developed to prevent these issues.

1.4 Non-residential/industrial development proposals

This section outlines the arrangements that are required to be in place should trade waste be generated. The Department of Water and Environmental Regulation may provide advice.

Schedule 2. Site requirements for on-site sewage systems

Where the provisions of section 5.1.1 of the policy do not apply, on-site sewage disposal may be considered. Schedule 2 is a 'ready reference' guide for proponents to determine the site requirements for on-site sewage systems. It provides the minimum lot sizes for heavy soils (categories 4-6) located outside the Perth and Peel Region Scheme areas and not in public drinking water source areas or sewage sensitive areas; the conversion factors for calculating the minimum land application area; a worked example for a single house; and the general site features that need to be met.

The public consultation raised queries regarding calculations for the land application area. These calculations are based on a five bedroom dwelling occupancy of six persons with a sewage design flow of 150l/person/day. Although it is acknowledged that many dwellings will not be occupied by six people most of the time, there will be times where visitors, guests and events will occur where this rate will be met, or exceeded. The Department of Health has advised that in the interest of public health, this approach is considered warranted to ensure there is a suitably sized land application area for the wastewater to be distributed.

It should be noted that for some types of dwellings – for example built stratas and over 55s – that propose on-site disposal, the policy recognises that lower loadings are more appropriate in these instances. Lower loadings may be applied on a case-by-case basis.

Schedule 3. Localities outside the Perth Metropolitan Region Scheme and Peel Region Scheme areas with established reticulated schemes

This table assists proponents to determine if a regional town has an established reticulated scheme. This assists in determining whether on-site sewage disposal may be considered.

The information is current at 1 December 2017.

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Schedule 4. Model subdivision conditions, notifications and advice notes

To assist in policy implementation new and amended subdivision conditions, advice notes and notifications on title have been developed. The Model Subdivision Conditions (WAPC, 2017) have been amended to reflect these and are summarised below:

- W2, W3 and W7 – amended so that there is no differentiation between service providers. Previously, these conditions referred only to the Water Corporation.
- WA4 (new) – advice that condition W2 will only be cleared once confirmation of connection has been received. Generally applies to non-Water Corporation schemes.
- WA5 (new) – advice that development in public drinking water source areas needs extra care in order not to contaminate bores.
- WA6 (new) – advice that AS/NZS 1547 provides best practice for on-site sewage disposal.
- W8 (new) – notification on title – to be used in conjunction with W5 if a reticulated service is not available and a secondary treatment system is required.
- W9 (new) – notification on title – to be used in conjunction with W5 if a reticulated service is not available and a secondary treatment system with nutrient removal capacity is required.
- W10 (new) – requirement for a site and soil evaluation where the WAPC is satisfied lots are capable of on-site sewage disposal but further information is required to inform future development. It is important to note that in all other instances the site and soil evaluation will be required upfront with the subdivision application.
- W11 (new) – notification on title – to be used where unsewered development is proposed in already zoned urban areas with high groundwater and fill is required to achieve separation to groundwater distances. This relates to legacy urban zoned land where unsewered development is proposed. No new rezonings should occur where unsewered development is proposed and the separation distance to groundwater is less than the minimum of 0.5 metres.
- W12 (new) – to ensure that a single person or entity or strata company provides the sewerage service for the strata scheme where on-site disposal is proposed for grouped dwellings or multiple unit commercial or industrial development. In addition, the Strata Titles Act 1985 (s 42 [2d]) also contains powers for the WAPC or other relevant body to require the management statement for a strata scheme.

Notifications on title

Consultation has identified that many landowners are unaware of their responsibilities regarding on-site systems. Notices on title are an effective way to raise awareness of these responsibilities, particularly when there is a change of ownership of established properties. They are supported by *AS/NZS 1547*.

The policy requires notifications to be placed on land titles to ensure:

- landowners are aware of the operation and maintenance requirements of on-site systems, which is critical to the effective performance of the systems, particularly where secondary treatment is required; and
- prospective purchasers are aware of significant factors that will affect their use and enjoyment of the land. For example, the land application area requirements of on-site systems can significantly reduce the developable area of lots; secondary treatment systems are often expensive to purchase and install, particularly where nutrient removal is required; and on-site disposal on properties with high groundwater, particularly in public drinking water source areas will require substantial amounts of fill, potentially impacting upon amenity, building design and development costs.