Government of **Western Australia**
Department of **Water**

Guideline for the approval of non-drinking water systems in Western Australia

Urban developments

December 2013

Looking after all our water needs

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Department of Water
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Acknowledgements

The *Guideline for the approval of non-drinking water systems in Western Australia* supersedes the *Draft approval framework for the use of non-drinking water in Western Australia* document on the department's website.

The Department of Water released the *Draft approval framework for the use of non-drinking water in Western Australia* in October 2010. It was developed in partnership with: Department of Health; Department of Environment Regulation; Department of Planning; Department of Commerce (Building Commission, Plumbers Licensing Board); Urban Development Institute of Australia; Water Corporation and Western Australian Local Government Association.

The Department of Water would like to thank these organisations and others involved for their contribution to the development and revision of the document.

Review

This guideline will be reviewed as required on the basis of experience of its use, feedback and any technical or regulatory changes.

Disclaimer

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Summary

In recent years there has been increased interest in the use of alternative water sources for non-drinking purposes to supplement or partially replace scheme (potable) water supplies in urban areas. Motivation for the increased interest includes:

- reduced average rainfall, particularly in the south-west of the state
- climate change predictions
- population growth and increased demand for water
- the cost to the community and the environment of developing new sources
- increased public awareness of the need to conserve our drinking water resources.

The objective of the *Guideline for the approval of non-drinking water systems in Western Australia* is to provide for the delivery of non-drinking water systems that meet regulatory requirements by promoting:

- protection of public health and the environment
- optimal management of water resources
- timeliness – eliminating duplication of reporting
- regulatory certainty – conforming to known and uniform standards
- auditable standards – monitoring and reporting to ensure compliance
- public confidence – providing reliable service
- financially viable projects delivered at an acceptable cost to consumers.

A non-drinking water system provides water that can have lower quality standards than potable water but is still suitable for many uses such as irrigating parks, public and private gardens, and toilet flushing.

The implementation of such systems is encouraged provided they meet water quality standards for protecting public health and the environment; reduce drinking water demand; and maximise water use efficiency through prioritised use of available water sources.

This guideline provides information about the general considerations and specific approval requirements for establishing a non-drinking water system in an urban development. While it is intended for use by proponents of greenfield, infill and urban renewal projects, the principles and general requirements are likely to be relevant for other non-drinking water projects.

The guideline supports the *Better urban water management* framework (Western Australian Planning Commission 2008), which recognises that water efficiency, reuse and recycling are integral components of total water cycle management.

It establishes four stages for assessment of non-drinking water systems with the following primary aims:

1 Option evaluation and concept design – Identify source options.

2 Preliminary design – Secure source and identify supply system.

3 Detailed design and approvals – Provide for infrastructure requirements and apply for approvals to use (and supply) a non-drinking water source.

4 Implementation – Obtain approvals to construct (and operate).

The following regulatory agencies may be involved at various planning stages in the assessment of non-drinking water projects (see Appendix B for contact details):

- Department of Health
- Department of Environment Regulation
- Department of Water
- Economic Regulation Authority
- Local government: individual councils
- Office of the Environmental Protection Authority
- Western Australian Planning Commission and Department of Planning.

Proponents are encouraged to discuss the steps and requirements for their proposal with the approving agencies early in the planning process. The Department of Water can coordinate preliminary advice on proposals across regulatory agencies and provide consolidated advice to the proponent.

Where a non-drinking water proposal has the potential to affect existing water service infrastructure, the proponent should also consult the water service provider (for example, the Water Corporation, Aqwest, Busselton Water, and relevant local government).

For non-drinking water projects with potential to cause significant environmental impacts the proponent should obtain advice from the Office of the Environmental Protection Authority regarding the need to refer the proposal for an assessment. Any formal environmental impact assessment will occur independently of the approvals process described in this guideline.

The aim of this guideline is for proponents of non-drinking water projects to gain a greater understanding of the general considerations and regulatory requirements at various planning stages and have more confidence in assessing the viability of their proposal.

This guideline and any updates will be made available on the Department of Water's website at www.water.wa.gov.au.

The guideline supersedes the online *Draft approval framework for the use of non-drinking water in Western Australia* (Department of Water 2010).

1 Document purpose

The guideline is for proponents such as land developers and local governments who are interested in implementing a development-scale non-drinking water system.

The approval of the use of such systems is the responsibility of various state agencies and local government. This guideline aims to simplify and clearly define the approval process for the use of non-drinking water, with a focus on urban development. It involves a commitment by government agencies to work collaboratively in the approval process.

The guideline outlines a step-by-step process which may be taken to establish such a system, including concept planning and design, approvals and implementation. It provides information on the approval-specific requirements for non-drinking water sources to ensure that they are appropriately addressed at the right planning stage.

Although this document is intended to guide primarily proponents of greenfield, infill and urban renewal projects the principles and general requirements are likely to be relevant for projects outside the land planning process, including those in industry, mining and agriculture. Proponents may contact the Department of Water for advice on projects outside urban areas.

This document is only a guide. As the use of non-drinking water is an evolving field, the regulatory requirements for its use may change as more information becomes available.

1.1 How to use this guideline

We recommend that proponents discuss the steps and details of investigation required for the approval of their proposal with relevant approving agencies early in the planning process to ensure that the necessary requirements are met (see Appendix B for contact details).

For non-drinking water systems that will be developed alongside the land planning process, a summary of the proposal (Table 3) should be included in or as an appendix to a district or local water management strategy as required under the *Better urban water management* (Western Australian Planning Commission 2008) framework. This demonstrates consideration of the total water cycle outcomes. The *Better urban water management* process for submitting the relevant water management reports is detailed in the Department of Water's online *Better urban water management* guidance notes.

There may be instances where a non-drinking water system is being considered outside the land planning process or where a local government development application is the only land planning approval required. For example, a local government may wish to retrofit its public open space irrigation systems to replace groundwater with treated wastewater. In this instance this guideline may still be useful, but the staging of requirements may vary.

This guideline does not apply to:

- Individual groundwater licence applications sought under the *Rights in Water and Irrigation Act 1914*, for example a groundwater licence for a local government to irrigate public open space. The relevant regional office of the Department of Water is the point of contact for such licence applications.
- Single household use of non-drinking water options, such as on-site greywater reuse systems and rainwater tanks, domestic garden bores and aerobic wastewater systems. The Department of Health and local governments can provide information on relevant approval requirements for single household options. Information on domestic garden bores is provided on the Department of Water's website.

However, the guideline does apply where groundwater is part of an integrated non-drinking water proposal, such as managed aquifer recharge and abstraction, or a community bore system, providing groundwater to residential properties via a third pipe scheme. The guideline is also relevant where greywater reuse systems or rainwater tanks are proposed for a number of houses, multi-residential properties and commercial or community facilities as a requirement of the development.

1.2 Coordination of pre-approval advice by the Department of Water

Where requested by a proponent, the Water Recycling and Efficiency section of the Department of Water can coordinate preliminary advice on non-drinking water proposals across relevant agencies in the early planning stage as outlined in this guideline. The Department of Water will then provide consolidated advice to the proponent. This advice does not constrain regulatory agencies from an independent assessment as part of their regulatory role.

Where a proponent decides to contact relevant agencies individually, the assessment role of the Department of Water will be limited to the *Better urban water management* documentation.

Where a non-drinking water project is to be implemented alongside the land planning process, ideally preliminary advice should be obtained before any formal lodgement into relevant planning processes to allow for enough response time from other agencies.

Details of the coordination process and investigations required from a proponent at various planning stages are outlined in Section 3 of this guideline.

Contact the Water Recycling and Efficiency section at the Department of Water (see Appendix B) or email to recycling@water.wa.gov.au for information.

2 Overview of the non-drinking water approval process

2.1 What are non-drinking water systems?

A non-drinking water system substitutes a fit-for-purpose water source for scheme (potable) water where a lower quality is sufficient for its intended use, such as irrigating parks and gardens, and for in-house non-drinking uses, such as toilet flushing. This guideline addresses approval requirements for development-scale proposals of using stormwater, wastewater or groundwater for non-drinking purposes.

An overview of non-drinking water sources, supply and storage options is provided in Appendix A.

The effective use of non-drinking water sources is best achieved by applying the principle of effective risk management for protecting public health and the environment, and provided they reduce demand for drinking water and are used efficiently.

2.2 Stages for planning, design and approval process

This guideline establishes four stages for assessment of non-drinking water systems for greenfield, infill and urban renewal projects with the following primary aims:

1 Option evaluation and concept design – Identify source options.

2 Preliminary design – Secure source and identify supply system.

3 Detailed design and approvals – Provide for infrastructure requirements and apply for approvals to use (and supply) a non-drinking water source.

4 Implementation – Obtain approvals to construct (and operate).

Section 3 provides information on the level of detail and supporting investigations required at each stage and Figure 2 provides an overview of approval requirements and a recommended order for obtaining approvals. For projects developed outside the land planning process the timing and staging of requirements may vary.

By following this guideline, proponents of non-drinking water projects will gain a greater understanding of the general considerations and regulatory requirements at various planning stages and will have more confidence in determining the viability of their project.

2.3 Linking approvals to the land planning process

The greatest opportunity for establishing a non-drinking water system exists where it is planned and constructed at the same time as other infrastructure in the land development process.

Better urban water management (Western Australian Planning Commission 2008) provides guidance on implementing *State planning policy 2.9 Water resources* (Government of Western Australia 2006). *Better urban water management* intends to ensure consideration of the total water cycle at each stage of the planning and development process, including regional, district, local and subdivision phases.

Aligning the approval requirements for non-drinking water projects with the *Better urban water management* framework demonstrates consideration of total water cycle outcomes.

For non-drinking water projects developed alongside the land planning process, a summary of information required to support their establishment should be included in or provided as an appendix to the relevant water management reports (e.g. district or local water management strategies or urban water management plan) as requested under the *Better urban water management* process. Table 3 provides an overview of the overarching requirements at each planning stage.

The Department of Water has developed supplementary guidelines and decision support tools to assist land developers in the implementation of *Better urban water management.* These include online guidance notes on the preparation and assessment of water management reports required under this framework.

Figure 1 illustrates the ideal relationship between the stages in developing a non-drinking water project and the land planning and *Better urban water management* stages.

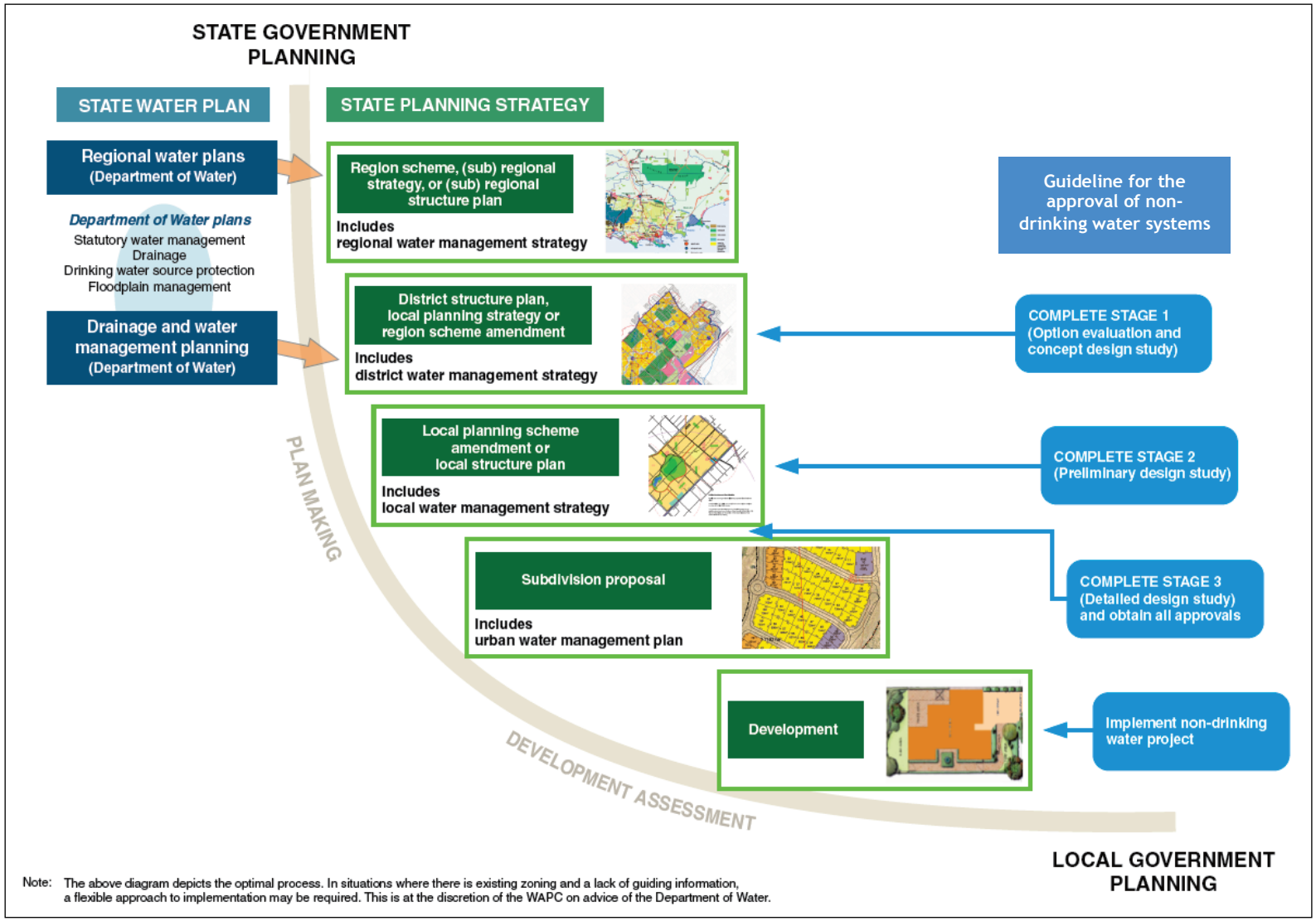


Figure 1 Non-drinking water project stages and relationship to the 'Better urban water management' process

2.4 Agencies involved in assessing non-drinking water proposals

The regulatory agencies listed below may be involved at various stages in the assessment of non-drinking water proposals. Agency contacts are provided in Appendix B.

Agency	Roles/responsibilities in the context of this guideline
Department of Health	Regulates the design, construction, connection, operation and maintenance of sewage schemes and the management of required health standards of potable (drinking) and non-drinking water supplied by service providers in accordance with the *Health Act 1911.*
Department of Environment Regulation	Regulates prescribed premises as determined under schedule 1 of the *Environmental Protection Regulations 1987*, including sewerage facilities and effluent discharged to land and waters from them.
Department of Water	Protects and manages the state's water resources; issues licences for the extraction of water and the construction of bores and wells under the *RiWI Act 1914*; assesses water management reports required by *Better urban water management* (Western Australian Planning Commission 2008); provides advice to the Minister for Water on requests for exemptions from water services licencing.
Economic Regulation Authority	Assesses technical and financial capability in the licensing of water service providers and issues water service licences under the *Water Services Act 2012*. Monitors compliance with licensing conditions.
Local Government	Prepares and administers local planning schemes under the *Planning and Development Act 2005*; grants approvals through the land planning process; may be a water service provider; administers community health provisions of the *Health Act 1911*; administers the *Building Act 2011* and the *Building Regulations 2012*; owns and maintains local drainage assets and public open space irrigation infrastructure.
Office of the Environmental Protection Authority	Assesses proposals of potentially significant environmental impact under section 38 of the *Environmental Protection Act 1986* referred by a proponent or by a decision making authority. Monitors compliance with Ministerial conditions related to approvals.
Western Australian Planning Commission and Department of Planning	Coordinate, assess and approve regional land use planning and development in Western Australia. Approve water management reports required by *Better urban water management* (Western Australian Planning Commission 2008) on advice from the Department of Water, local government and other relevant agencies; consider non-drinking water proposals through the land planning process.

2.5 What are the agencies' approval requirements?

Proponents should contact relevant regulatory agencies early in the planning process to obtain preliminary advice on approval requirements. Where a non-drinking water system is proposed to be developed alongside the land planning process, this may include a discussion of source options as a chapter of the amendment document. This is critical where the proposed non-drinking water source provides an essential water service.

Figure 2 outlines the relevant regulatory agencies' approval requirements for groundwater, stormwater and wastewater, and the recommended order for obtaining approvals for non-drinking water systems. This order applies to all such proposals whether they are progressed through, or are independent of, the state's land planning process. The investigation requirements for each planning stage are further detailed in Section 3.

Obtaining approvals in the recommended order, including provision of relevant information, will streamline the process for subsequent approvals.

Although proponents can plan to obtain all relevant approvals concurrently, it may result in delays of the proposal's overall development and implementation. The potential for delays will be higher where:

- one approval is subject to obtaining another approval
- in obtaining one approval there is potential for the proposal details (such as design, technology proposed) to change significantly enough to affect other approvals obtained (such as it's no longer valid) or being progressed (such as the assessment process required to start again).

If a non-drinking water system is likely to have a significant impact on the environment, the proponent should obtain advice from the Office of the Environmental Protection Authority (OEPA) regarding the need to refer the proposal to the OEPA for assessment under the *Environmental Protection Act 1986*. For further information about referrals and the environmental impact assessment process, including timeframes, refer to the EPA website www.epa.wa.gov.au. The EPA assessment will occur outside the non-drinking water approvals process described in this guideline.

Where irrigation of public open space is part of the non-drinking water proposal the relevant local council should be consulted as the future asset owner and/or manager of the irrigation system. The council may have a local water planning policy that mandates design standards for public open space including fit-for-purpose water supplies.

There may be potential for alternative service providers to provide drinking water, non-drinking water and/or sewerage services within currently un-serviced development areas. Where this is proposed a sufficient level of information will be required to demonstrate financial, technical and environmental feasibility.

2.6 Infrastructure planning considerations

Proponents of a non-drinking water system should take into account any existing and planned water infrastructure and ensure that their project is compatible.

Where relevant, contact the water service provider (for example the Water Corporation, Aqwest, Busselton Water, or local government) for information about any existing and planned water infrastructure, including aspects such as timing, sizing and configuration of the capital investment program.

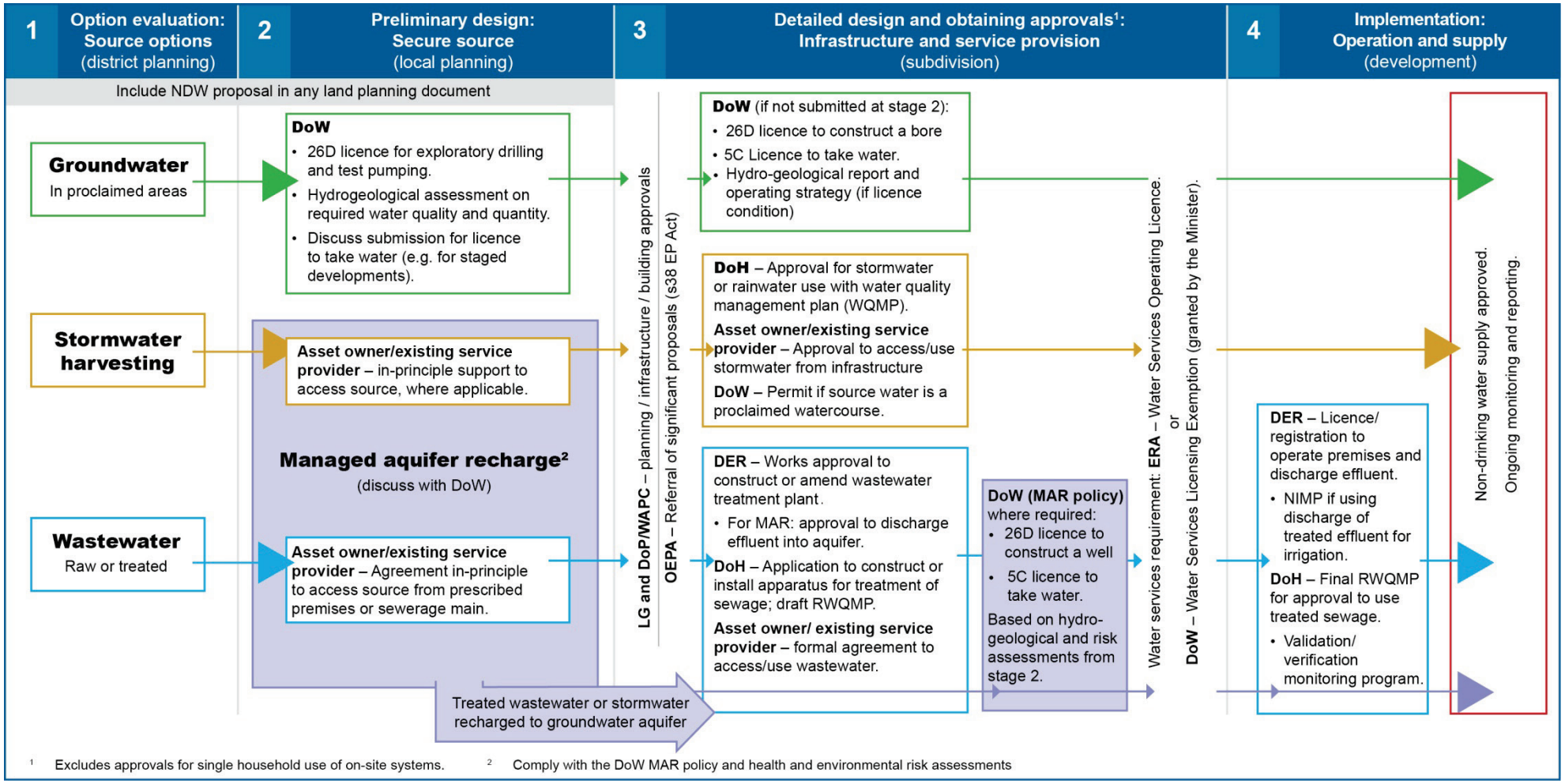


Figure 2 Overview and recommended order of applications for approvals of non-drinking water systems in Western Australia

3 Details of the approval process

3.1 Stage 1: Option evaluation and concept design

A concept is a general idea, or something conceived in the mind.

Concept design is a description of how the idea, object or system will work and meet its performance requirements.

Overarching requirements for Stage 1:

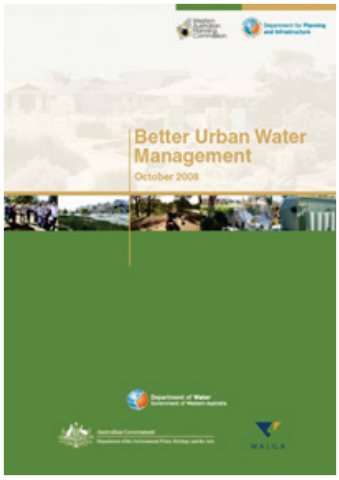
- Undertake broad-scale water balance to identify non-drinking water needs.
- Identify available options and develop preliminary non-drinking water concept(s).
- Consult with relevant approving agencies to seek advice on the proposed concept(s).
- Demonstrate an understanding of the requirements of relevant regulations.
- Include the preliminary concept(s) in any required district planning document.

The first stage in the development of a non-drinking water system is to consider options and suitability for the source, treatment (depending on intended uses and location), storage (if required) and distribution to supply the needs of the end users.

Proponents are encouraged to discuss their preliminary option(s) with the relevant approving agencies early in this stage.

Better urban water management – district scale

Proponents should undertake the option evaluation and concept design in the development of a non-drinking water system at the district scale of planning. As stated in *Better urban water management* (Western Australian Planning Commission 2008) a district water management strategy should:



Discuss potential water sources for drinking water and other uses, including irrigation of public open space, having consideration of impacts of use/ allocation and infrastructure and management requirements, highlighting the preferred options for supply of non-potable water for fit-for-purpose use and giving consideration to major infrastructure needs.

Identify pre- and post-development water balances at the district-level scale to inform the determination of hydrologic regimes of water dependent ecosystems to be protected and options for use of potable and non-potable water sources. Identify future infrastructure requirements, options and necessary approvals.

For a non-drinking water system implemented through the land planning process the proponent should incorporate a summary of the option evaluation and concept

design study into the district water management strategy, as required above. Compiled detailed information may be submitted as a report in an appendix to the strategy report.

The inclusion of the preliminary non-drinking water source and supply concept in the district water management strategy allows consideration by the Department of Water of the total water cycle solution for the proposed development. For detailed information refer to the Department of Water's online *Better urban water management* guidance notes series.

Coordination of early advice across regulatory agencies

Where requested by a proponent, the Department of Water can coordinate pre-approval advice on the proposal from relevant approving agencies at this planning stage.

The department's Water Recycling and Efficiency section is the contact point for coordinating across-agency advice on non-drinking water proposals.

The proponent should provide a digital copy of the option evaluation and concept design study (Table 1) to the department's Water Recycling and Efficiency section (see Appendix B for contact details). If the report is too complex for electronic distribution the proponent should provide hard copies or a CD.

If all required information has been provided, the department will coordinate comments from relevant approving agencies and prepare a consolidated response to the proponent within 45 working days for complex projects. Less time will be required for small and less complex projects. Where additional information or clarification is sought from proponents, the assessment process will stop until additional information has been received by the department.

Elements of the option evaluation and concept design study

The option evaluation and concept design study should address the following elements, noting that the level of detail of the investigations and discussion will depend on the scale and complexity of the project.

It is suggested that Stage 1 comprise two tasks:

1. Identify the options for non-drinking water source(s).
2. Develop the concept design of preliminary option(s).

Table 1 sets out the requirements for each task.

Table 1 Stage 1 study requirements (option evaluation and concept design)

Task 1: Identify the options for non-drinking water source(s)
Site characteristics and possible constraints:
• Is the site in a public drinking water source area? Any proposed change in land use within a public drinking water source area is required to have regard to the *Land Use Compatibility in Public Drinking Water Source Areas water quality protection note* (DoW 2004). • Are conservation wetland or odour buffers required? • Does the site have contaminated soil or is it registered with Department of Environment Regulation as contaminated? • Are there any other site-specific constraints or considerations that may affect the proposed system; e.g. subject to flooding?
Land planning considerations:
• Consider relevant state and local planning policy and include the preliminary concept in any required planning documents. • Take into account the form and function (i.e. level of irrigation) of proposed areas of public open space. • Identify land requirements including opportunities to integrate infrastructure into multiple-use corridors.
Intended end uses and estimated demand:
• Identify the proposed non-drinking uses of the water supply including proposed source of irrigation for public open space and consider supply for domestic garden irrigation, toilet flushing etc. • With the end uses identified, estimate demand, based on assumptions of consumption rates. The Water Corporation's online *H_2Options* provide additional information and a water balance calculation tool.
Assessment of possible non-drinking water sources:
• Assess source options for identified end uses and consider contingencies where necessary, having regard for the estimated demand. • Consider the quality of the water supply and whether it is fit for the purpose. If unknown, identify the water quality variables to be determined based on its intended use. • If the water is sourced from a wastewater treatment plant, sewer mining or a stormwater pipeline, contact the existing wastewater or drainage service provider, where applicable. Obtain advice on matters such as volumes available for abstraction/supply, quality, charges and performance of existing treatment systems. • For groundwater (or surface water) in a proclaimed area and where groundwater is a contingency source, obtain advice from the Department of Water regional office on water availability and licensing or permit requirements.
Assessment of possible options for treatment, storage and distribution:
• Define likely requirements for treatment of the identified source(s) for proposed end use(s) and location. • Decide if storage is required and likely options to provide it. • Assess possible options for distribution of non-drinking water to end users.
Evaluation of options and identification of preliminary preferred option(s):
• Make a preliminary evaluation of options for source(s) and supply to identify the preferred non-drinking water system(s).

Task 2: Develop concept design of preliminary option(s)

Identify infrastructure and land requirements:

- Identify infrastructure needs and how much land is required for the protection of the water source, treatment, storage and/or distribution needs.
- Identify any existing and planned water infrastructure for the site and how it may affect the proposed non-drinking water system – contact the existing water service provider.
- Address relevant standards, codes and guidelines (e.g. plumbing).

Preliminary review of health risks:

- Identify Department of Health requirements – discuss requirements for treatment and management of exposure risk based on source water and intended end-uses and the receiving environment as per the *Guidelines for the non-potable uses of recycled water in Western Australia* (DoH 2011) and/or the *draft alternate water supply guidelines – stormwater and rainwater* (DoH 2009).
- Understand the requirements of the *Australian guidelines for water recycling* (Phase 1 and relevant Phase 2 modules, NRMMC-EPHC-NHMRC 2006-09) and the above mentioned Department of Health guidelines to determine ability to manage public health risks.

Preliminary review of environmental risks:

- Identify Department of Environment Regulation requirements for an environmental works approval and licence if proposing source water from a prescribed activity listed in schedule 1 of the *Environmental Protection Regulations 1987*; e.g. from a sewerage waste water treatment plant.
- For treated wastewater proposed from prescribed premises, the Department of Environment Regulation will require details of anticipated water quality, how the system will be managed, and the intended uses of the water.
- For managed aquifer recharge proposals consider the Department of Water's requirements as per *Operational policy 1.01 – Managed aquifer recharge in Western Australia* (DoW 2011a), including hydrogeological assessment and environmental risk assessment requirements. Department of Water recommends a desktop site feasibility assessment and a preliminary meeting with the department at this stage.
- Obtain advice from the Office of the Environmental Protection Authority for proposals with a potential to cause significant environmental impacts (e.g. location in sensitive environments) regarding the need to refer the proposal for assessment. Any EPA assessment will occur outside the non-drinking water approval process.

Institutional arrangements:

- Consider who will own and manage the non-drinking water system in the immediate and long term.
- Consult with the current or future asset manager for POS irrigation (e.g. local government) on the preferred non-drinking water option.
- Identify the preferred water service provider where applicable:
  - Contact the Department of Water or visit its website for initial advice whether the proposed service would qualify for a water services licensing exemption and on the process for obtaining an exemption.
  - Where applicable, review requirements to become a licensed water service provider outlined in the Economic Regulation Authority's publication *Electricity, gas and water licences: application guideline and forms* (Economic Regulation Authority 2011).

Preliminary costs and financial viability:
• Develop a broad understanding of likely costs for the system (cost-benefit analysis) including the preferred source, required treatment, storage and distribution infrastructure as well as future operating and capital costs, revenue sources and financial viability.
Preliminary project risk assessment:
• Proponents are encouraged to meet with the approving agencies to undertake a preliminary evaluation of risks.
Community acceptance:
• Identify the benefit to customers and whether the community would be likely to accept and use the non-drinking water supply.
Overall environmental footprint:
• Identify impacts on ecological biodiversity, energy efficiency, water efficiency, and any other site-specific considerations.

3.2 Stage 2: Preliminary design

Preliminary design bridges the gap between the concept design and the detailed design. The overall system configuration is defined and schematics, diagrams and layouts will provide early project configuration. During detailed design and optimisation, the parameters and part specifications will change, but the preliminary design focuses on creating the general framework on which to build the project.

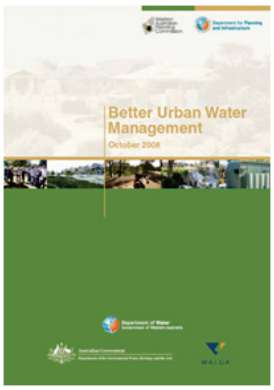
Overarching requirements for Stage 2:

- Consider site-specific factors to determine the preferred option for source and supply including service provision, preliminary costs and feasibility.
- Identify and if possible secure the source of non-drinking water and identify infrastructure requirements for treatment, storage and distribution, including land.
- Understand regulatory requirements of relevant approving agencies and existing water service provider requirements and conditions.
- Confirm support of future manager of non-drinking water system and/or POS irrigation.
- Complete the preliminary design.

The purpose of the preliminary design stage is to further develop the proposal and to obtain advice from agencies on the specific approval requirements.

Better urban water management – local scale

The preliminary design stage in the development of a non-drinking water system relates to the local scale of planning. As stated in *Better urban water management* (Western Australian Planning Commission 2008) a local water management strategy should provide:



Fit-for-purpose water use strategy – mechanisms (including those relating to development design and construction) to conserve potable water, minimise wastewater and reuse all forms of water, including stormwater.

Infrastructure and management requirements and proposed locations for proposed water, wastewater and stormwater systems, having consideration of infrastructure already existing and identifying any necessary approvals.

Therefore, when implementing a non-drinking water system through the land planning process, the proponent should summarise the findings of the preliminary design study and incorporate them into the local water management strategy.

Where detailed investigations or reporting have been completed, submit them as an appendix to the local water management strategy. For detailed information refer to the Department of Water's online Better urban water management guidance notes series.

Coordination of early advice across regulatory agencies

Where requested by a proponent, the Department of Water can coordinate pre-approval advice on the proposal from relevant approving agencies at this planning stage.

The department's Water Recycling and Efficiency section is the contact point for coordinating across-agency advice on the non-drinking water proposal.

The proponent should provide a digital copy of the preliminary design study (Table 2) to the department's Water Recycling and Efficiency section (see Appendix B for contact details). If the report is too complex for electronic distribution the proponent should provide hard copies or a CD.

If all required information has been provided, the department will coordinate comments from relevant approving agencies and prepare a consolidated response to the proponent within 60 working days for complex projects. Less time will be required for small and less complex projects. Where additional information or clarification is sought from proponents, the assessment process will stop until additional information has been received by the department. Advice will include agency-specific requirements for the next planning stage – obtaining approvals.

Elements of the preliminary design study

The preliminary design study should address the following elements, noting that the level of detail for investigations and reporting will depend on the scale and complexity of the project and whether the non-drinking water system is considered an essential water supply.

It is suggested that the preliminary design study comprises two main tasks:

1. Proposal definition.
2. Preliminary design of non-drinking water system.

Table 2 outlines the requirements of each task.

Table 2 Stage 2 study requirements (preliminary design)

Task 1: Proposal definition
Project description and intent:
• Outline the proposed source and supply system for the non-drinking water system. • Briefly discuss the aims and reasons for the system.
Non-drinking water source(s) and contingency sources:
• Describe proposed source(s) of non-drinking water and identify required approvals, responsibilities and timing. • If the water is sourced from a wastewater treatment plant, sewer mining or a stormwater drain, evaluate project feasibility against any requirements, conditions and charges set by the existing wastewater or drainage service provider. Obtain in-principle agreement from the existing service provider regarding access to the required volumes and quality of water. • Where stormwater is sourced from a Department of Water licensable watercourse under the *Rights in Water and Irrigation Act 1914* obtain advice on access and licencing requirements. • For groundwater (and surface water) in proclaimed areas, and where groundwater is a contingency source, seek the following information on licencing requirements from the Department of Water regional office to secure the water source and obtain advice for staged developments: - A s26D licence (to construct or alter wells) will be required for exploratory drilling and test pumping. - If sufficient water is available for allocation, apply for a s5C licence to take water. These applications should be submitted concurrently. Applications for groundwater licences (other than MAR) may be subject to the first-in first-served policy or other similar mechanisms used when granting new water entitlements. - Commission a hydrogeological report (where required by the Department of Water) in accordance with *Operational policy 5.12 – Hydrogeological reporting associated with a groundwater well licence* (DoW 2009) demonstrating the availability of water quality and quantity, including the impacts of taking the water. - An operating strategy may be required by Department of Water in accordance with *Operational Policy 5.08 – Use of operating strategies in the water licensing process* (DoW 2011b).
Intended end uses and supply of the non-drinking water:
• Specify the uses of the non-drinking water and required quality for each proposed use. • Describe method of distribution including locations for use, requirements for treatment and/or storage and proposed service provider (where required).
Detailed water balance:
• Develop a detailed water balance for the proposal, including demand and flow characteristics. The Water Corporation's online *H_2Options* water balance tool may be useful. • Confirm that the non-drinking water source can meet demand and consider contingency source(s) where required.
Identify land requirements:
• Identify appropriate zoning of land required for infrastructure. • Specify easement and buffer requirements and identify proposed locations within the development. • Describe site characteristics and possible constraints and any impacts on the proposed option; e.g. is the land subject to seasonal flooding, or located in a PDWSA?

Task 2: Preliminary design of non-drinking water system

Health risks:

- Undertake any studies required to complete the application for a non-drinking water system in accordance with the requirements of the Department of Health, e.g. the *Guidelines for the Non-potable Uses of Recycled Water in Western Australia* (DoH 2011) and/or the draft *Alternate Water Supply Guidelines – Stormwater and Rainwater* (DoH 2009). This may include a health risk assessment - the Recycled water quality management plan (RWQMP) and Alternate water quality management plan (WQMP) templates from the Department of Health include guidance on risk assessments.

Environmental risks:

- Demonstrate that the system will not adversely affect present water resource values such as water-dependent ecosystems and public and private water sources.
- Assess the project's environmental sustainability using the *Australian guidelines for water recycling: managing health and environmental risks* (Phase 1 and relevant Phase 2 modules; NRMMC-EPHC-NHMRC 2006-09) and relevant guidelines from the WA Department of Environment Regulation.
- Obtain advice from the Department of Environment Regulation on whether a works approval, new licence, or registration is required in accordance with the *Environmental Protection Regulations 1987*, and whether a scoping meeting with the regional office is recommended to discuss requirements. Scoping should be undertaken prior to lodgement of an application for a works approval, new licence or amendment to ensure the application is in an acceptable form and contains the information required to enable it to be accepted, assessed and appropriate decisions made in a timely manner.
- As part of the scoping process obtain advice from the Department of Environment Regulation on requirements for managed aquifer recharge proposals where the source water is treated wastewater from prescribed premises.
- For managed aquifer recharge proposals consider requirements from the Department of Water:
  - Comply with the Department of Water's managed aquifer recharge policy (DOW 2011a), including environmental risk assessment requirements in line with the *Australian guidelines for water recycling: managing health and environmental risks* (phase 2) Managed aquifer recharge (NRMMC-EPHC-NHMRC 2009).
  - Obtain further information on the Department of Water's management approach for the licensing of MAR projects and testing/piloting requirements prior to commencement of MAR activities. This applies to MAR projects that involve the construction of bores (s26D licence) or the abstraction of groundwater from bores (s5C licence) in proclaimed groundwater areas.
  - Supporting information (including a hydrogeological assessment) is required to allow the department to assess the potential impacts of the proposed infiltration or injection and subsequent abstraction on the environment, other groundwater users, and aquifers.

Consider risk management approach:

- Complete environmental, health and operational risk assessments identifying the risks and measures for minimising and managing the risk of hazards and hazardous events identified.

  The *Australian Guidelines for Water Recycling: managing health and environmental risks* (NRMMC-EPHC-NHMRC 2006) recommend performing a maximal risk assessment, then considering preventative measures, and then performing a residual risk assessment. This loop is repeated until the risk is reduced to an acceptable level.

Institutional arrangements:

- Outline ownership and governance arrangements including roles and responsibilities for

construction, operation and maintenance of the system initially and for the long term. • Identify the water service provider by considering the Economic Regulation Authority's *Electricity, gas and water licences: Application guideline and forms* (Economic Regulation Authority 2011). • Obtain advice from the Department of Water whether the provider of the proposed non-drinking water service may be eligible for an exemption from the need to hold a licence (s7 of the *Water Services Act 2012)*. • If the Water Corporation is the preferred non-drinking water service provider, identify their requirements in their online *H_2Options* guideline or contact them. • Obtain support from the relevant local council as the current or future asset owner and manager of the public open space infrastructure, where applicable. • Identify other local government requirements as applicable (e.g. local planning policy, environmental health requirements, planning and building approvals).
Preliminary project feasibility (business case):
• Complete preliminary costing of capital expenditure for required infrastructure including for access, treatment, storage and distribution of the non-drinking water. • Complete preliminary costing of operational expenditure including operation and maintenance of the system for the long term. • Complete preliminary assessment of revenue sources and financial viability over the life of the system. • Assess the effect of meeting the existing water service provider's requirements and conditions on the feasibility of the project. • Assess the project feasibility in terms of benefits to the proponent, the consumer, the community and the environment and any management implications where applicable.
Design criteria and standards:
• Describe standard of treatment (where required). • Identify relevant codes, standards and guidelines for design and/or operation of required infrastructure and comply with any existing infrastructure where applicable. • Identify existing local government policies for public open space where applicable.

3.3 Stage 3: Detailed design and approvals

Detailed design is the process of refining and expanding the preliminary design to the extent that the design is sufficiently complete to begin implementation.

Overarching requirements for Stage 3:

- Seek planning approval from local government for infrastructure requirements and from the Western Australian Planning Commission as required.
- Design the non-drinking water distribution infrastructure and develop a detailed business case where a service provision is involved.
- Secure a water service provider licence where required (confirmation of institutional arrangements).
- Submit applications to the Department of Health, Department of Environment Regulation, Department of Water, Economic Regulation Authority, local government and existing water service provider (as required).

The purpose of the detailed design and approvals stage is for proponents to secure all the necessary approvals in order to proceed with the project.

Proponents should submit the detailed design and required applications for approval directly to the relevant agencies. The time taken to assess applications differs from agency to agency and depends on the complexity of the project, proposed treatment and the level of information provided in the application.

Better urban water management — subdivision and/or development

Proponents seek approvals as part of the subdivision approval processes. Approvals may be required to support the subdivision application and obtain preliminary approval, or to clear conditions of subdivision and obtain final approval. The preparation of an urban water management plan is often required as a condition of subdivision approval.

Where an urban water management plan is to be prepared, the plan should include a summary of the proposed non-drinking water system (source, intended uses, volumes and contingency planning, required treatment, storage, distribution, service provider and governance arrangements) and outline the approvals being sought and the timing of establishment of the system.

Elements of the approvals stage

This stage involves obtaining approval from each of the necessary agencies in order to proceed with the non-drinking water project.

The detailed design process will continue throughout the approvals stage. It will progress towards final detailed designs that refine the objectives and principles

identified during the preliminary design stage and respond to the requirements of all approving agencies.

It is necessary at this stage to secure the required planning approvals to support the operation of the system. This may include appropriate zoning of land required for infrastructure and/or development approval for construction of infrastructure. Other approvals from the Western Australian Planning Commission or local government may also be required, as outlined below.

The timeframes provided are indicative only and proponents should allow sufficient time for possible delays.

Agency approvals

Western Australian Planning Commission

- Where a non-drinking water system is associated with a subdivision application, relevant information should be included when lodging this application to create lots and public reserves for infrastructure.

Local government

- Where required submit detailed engineering design.
- Obtain planning approval to construct infrastructure.

Department of Health

- Submit an application for the non-drinking water project (for example stormwater, treated wastewater) and, where required, apply for the permit to construct or install an apparatus for treatment of sewage, together with a draft *Recycled water quality management plan* for the proposed project – detailed requirements and templates are available from the Department of Health website. The timeframe for assessment is approximately 30 days if all information is submitted.
- Greywater systems for multi-tenanted buildings are approved through a *Recycled water quality management plan*. However, there is no service provider required. The owner of the building or strata property will be responsible for the operation, sampling and reporting as per conditions of approval.
- Following assessment of the application(s) to the satisfaction of the Department of Health, 'in-principle approval' is granted, and conditions provided for the final approval of the project.

Department of Environment Regulation

- Where the proposed supply source is from a prescribed activity under the *Environmental Protection Regulations 1987*, submit either a works approval application to construct the prescribed premises or a licence amendment for existing premises. Prescribed categories currently include wastewater treatment plants that discharge over 20 kL/day. Allow three months for Department of Environment Regulation to process the application.

- Where a MAR project is using effluent from a wastewater treatment plant or other prescribed premises, Department of Environment Regulation approval to discharge the effluent into the aquifer (such as emission to the environment) will be required, usually through a works approval or licence amendment, as advised by the Department of Environment Regulation in the scoping process.

Department of Water

- Under section 5C of the *Rights in Water and Irrigation Act 1914,* the unauthorised taking of water from watercourses, wetlands and underground water sources in proclaimed areas is prohibited without a licence or permit from the Department of Water. Forms and guidelines are available on the Department of Water's website.
- For managed aquifer recharge/aquifer storage and recovery:
  - Obtain licences to construct a groundwater well (s26D licence) for the construction of injection and recovery bores, and to abstract water (s5C licence) as required. The Department of Water aims to issue licences in less than 90 days; however, for complex applications, the timeframes cannot be guaranteed. If further information or reports are required from the proponent, the process will take longer. Monitoring bores for non-artesian aquifers are exempt from licensing.
    - Provide hydrogeological reports, operating strategies and other managed aquifer recharge policy requirements (including final environmental risk assessment) to support s26D/s5C licences as required by the Department of Water.
- For the abstraction of groundwater (for example for a community bore system) or surface water (including stormwater drains that are also a proclaimed watercourse) in proclaimed areas where approvals have not already been granted:
  - Obtain licences to construct a groundwater well (s26D); or obtain a permit to dam a watercourse or install works to take surface water.
  - Obtain a licence to take water (s5C) for the required volume.
    - Submit a hydrogeological report (where required by the Department of Water) demonstrating the availability of water quality and quantity including impacts of taking water in accordance with *Operational policy no. 5.12 – Hydrogeological reporting associated with a groundwater well licence* (Department of Water 2009).
- Where applicable (as per advice from the Department of Water), submit an application for exemption from an Economic Regulation Authority water services licence (s7 of the *Water Services Act 2012*) to the Department of Water. Allow at least three months for processing. An exemption may be granted by the Minister for Water if it is not contrary to the public interest.

Agreement from existing service provider/asset owner

- For access to wastewater from a wastewater treatment plant or via sewer mining obtain formal agreement from the relevant service provider/asset owner to secure access to that source.
- Unless the applicant has the rights to the stormwater, the owner(s) of the stormwater drainage channel, stormwater storage and disposal system where the stormwater is channelled, must be contacted to provide permission to intercept, divert, retain, store or use water.
- The proponent should also ensure compliance with existing (potable) water service provider's requirements and conditions where applicable.

Economic Regulation Authority

- Where an Economic Regulation Authority operating licence is required under the *Water Services Act 2012* submit an application to become a licensed water service provider at least three months (as a minimum) before the water service is to be provided.
- The decision to grant a licence is at the discretion of the Economic Regulation Authority board. Proponents are required to undertake all necessary work to support the licence application in accordance with the authority's publication *Electricity, gas and water licences: application guideline and forms* (Economic Regulation Authority 2011).
- The issuing of a water service licence does not exempt the licence holder from complying with other approval requirements. Water service providers are subject to an operational audit and asset management system review conducted by an independent auditor approved by the authority. These processes occur at least every 24 months. In addition, licensees are required to provide annual performance and compliance reporting.
- A business case and detailed financial information are typically required to support an application to become a licensed water service provider.

3.4 Stage 4: Implementation

Implementation of a non-drinking water system consists of two distinct stages; Construction during which the infrastructure is built and/or assembled and Operation when the system becomes functional and collection/ treatment/ distribution of water commences and continues into the longer term.

Overarching requirements for Stage 4:

- Obtain building approvals from the relevant local government where applicable.
- Verify that the non-drinking water system can operate in accordance with the regulatory requirements of the Department of Health, the Department of Environment Regulation and the Department of Water.
- Submit monitoring regimes for approval where requested by approving agency.
- Ongoing reporting if requested as a condition of the licence/permit.

This stage requires validation and verification that the non-drinking water system complies with agency requirements.

Agency approvals

Department of Health

- After the commissioning of the recycling treatment plant, submit the results of the validation and verification sampling program and the completed *Recycled water quality management plan* (RWQMP).
- After the assessment of water quality results and completed RWQMP, to the satisfaction of the Department of Health, approval to use the recycled water is granted. Timeframe for assessment is approximately two weeks if all information is submitted.
- Ongoing requirements will include:
  - ongoing monitoring – frequency and parameters to be analysed based on contaminant exposure risk
  - annual report as per conditions of approval
  - notification of incidents and corrective actions implemented.

Department of Environment Regulation

- On completion of works the proponent should apply for an annual licence to operate. For existing facilities a licence amendment will be required.
- For irrigation schemes, the proponent should submit a *Nutrient and irrigation management plan* (Department of Water 2010) with their application for a licence to operate.

- The timeframe for processing an application for a licence to operate is approximately 60 working days.
- The *Environmental Protection Act 1986* Part V licence to operate may include conditions for monitoring and annual reporting to the Department of Environment Regulation.
- The licensee will need to pay a fee for the annual re-issuing of licences. If the project is an 'environmentally sound irrigation scheme' proponents can apply to the Chief Executive Officer of the appropriate department to waive the annual discharge fees. For further information on the waiver of fees contact the Department of Environment Regulation's regional office.

Department of Water

- For groundwater and managed aquifer recharge systems, ongoing monitoring and reporting will be required in accordance with the licence conditions under the *Rights in Water and Irrigation Act 1914* and the department's managed aquifer recharge policy (Department of Water 2011a).

Local government

- A building permit may be required for rainwater tanks and other infrastructure, in accordance with the *Building Act 2011* and *Building Regulations 2012.*
- For noting: Local governments are also the approving agency for single household use on-site wastewater treatment and reuse systems (including greywater) on behalf of the Department of Health.

Building Commission (Plumbers Licensing Board)

- As the installation of non-drinking water services currently falls outside the scope of plumbing work as defined by Western Australia's *Plumbers Licensing and Plumbing Standards Regulations 2000,* there are no licensing or standard requirements administered by the Building Commission (Plumbers Licensing Board). An independent review report on the Regulations has been undertaken in 2013 and more information and updates are provided on the Building Commission's website (Department of Commerce).
- To prevent any risk of cross connection between a non-drinking water service and a drinking water service, a plumber will be required to perform certain work, for example, installing appropriate backflow prevention devices.

Table 3 Summary of information required at each stage of the planning process of non-drinking water systems in WA

Planning / development stage	Non-drinking water proposal stage	Overarching investigation requirements
District	Stage 1: Option evaluation and concept design	• Undertake broad-scale water balance to identify non-drinking water needs. • Identify available options and develop preliminary non-drinking water concept(s). • Consult with approving agencies to seek advice on the proposed concept(s). • Demonstrate an understanding of the requirements of relevant regulations. • Include preliminary concept(s) in any required district planning document. Outcomes of Stage 1 summarised in **district water management strategy** where applicable.
Local	Stage 2: Preliminary design	• Consider site-specific factors to determine preferred option for source and supply including service provision, preliminary costs and feasibility. • Identify and if possible secure the source of non-drinking water and identify infrastructure requirements for treatment, storage and distribution, including land. • Understand regulatory requirements of relevant approving agencies and existing water service provider requirements and conditions. • Confirm support of future manager of non-drinking water system and/or POS irrigation. • Complete preliminary design. Outcomes of Stage 2 summarised in **local water management strategy** where applicable.
Subdivision	Stage 3: Detailed design and approvals	• Seek planning approval from Western Australian Planning Commission as required and from local government for infrastructure requirements. • Design non-drinking water distribution infrastructure and complete business case where a service provision is involved . • Secure water service provider where required (confirmation of institutional arrangements). • Submit applications to the Department of Health, Department of Environment Regulation, Department of Water, Economic Regulation Authority, local government and existing water service provider. Outcomes of Stage 3 summarised in **urban water management plan** where applicable.
Development	Stage 4: Implementation	• Obtain building approvals from the relevant local government where applicable. • Verify that the non-drinking water system can operate in accordance with regulatory requirements of relevant agencies. • Submit monitoring regimes for approval where requested by approving agency. • Ongoing reporting if requested as a condition of the licence/permit.

Appendices

Appendix A — Non-drinking water sources and supply options

Non-drinking water systems in an urban environment provide a fit-for-purpose water source for uses that do not require high quality potable water, e.g. irrigation of public open space and private lawns and gardens or in-house uses such as toilet flushing.

The Department of Water's online *Waterwise Community Toolkit* provides information on non-drinking water sources and supply options, and general considerations when developing a non-drinking water system. The toolkit also refers to water use efficiency programs and provides web links to relevant information from other government agencies or industries.

Non-drinking water source options

Water source options for a non-drinking water system include:

Groundwater

Groundwater is water located below the surface of the ground and resides in aquifers (superficial or confined). It includes surface expressions of groundwater such as lakes and wetlands. Groundwater is an important water source in Western Australia as it supplies much of the water we need for irrigation, drinking and other uses.

Groundwater may be an appropriate source for the irrigation of public open space or for residential irrigation supplied via a community bore system. However, a groundwater allocation may not always be available due to the allocation limit being reached or due to poor water quality.

Rainwater

Rainwater availability is often seasonal in Western Australia. In urban areas rainwater can provide an additional water supply to irrigate lawns and gardens. To gain the full potential of rainwater as a water source and reduce the volume of scheme (potable) water used, the rainwater tank should be plumbed into the building for non-drinking uses such as toilet flushing. In rural areas with no access to mains scheme water rainwater is often considered an essential water supply.

Factors that influence how much water a rainwater tank can yield include roof size to capture the rain, tank size and proposed uses (in-house, ex-house) and volumes. On average, a roof area of 100 m^2 can collect about 50 000 litres of water a year when plumbed for internal and external use. With an appropriately-sized rainwater tank this could supply up to 20 per cent of a household's water needs.

Stormwater

The use of stormwater can be incorporated in new urban developments using water sensitive urban design principles. The Department of Water encourages management of urban stormwater at or near its source in accordance with the department's *Stormwater management manual* (Department of Water 2004–2007). This assists to keep the water balance as close as possible to the pre-development hydrology situation.

Large volumes of stormwater for harvesting and use as a non-drinking water source (for example irrigation of public open space) are most likely to be available from:

- high-density development or commercial areas
- areas with limited infiltration potential (due to high groundwater levels or less permeable soils).

In developed areas it may be possible to harvest and use stormwater from existing large-scale discharge systems, such as traditional drains or large sumps. This is commonly known as 'retrofitting' and requires agreement from the asset owner.

Stormwater drainage systems are often former natural waterways and the harvesting of stormwater can impact on ecosystems and water bodies that are dependent on that water. Proponents need to consider these ecological water requirements of the catchment in determining the volume of water that can be collected for large-scale harvesting systems and the impacts on the local water balance.

Wastewater

Reuse of treated wastewater can provide a secure and sustainable source of water for many purposes and is independent of rainfall. The volume of wastewater currently available for recycling will increase with population growth. Consequently, wastewater recycling is an important and significant fit-for-purpose water supply solution.

Treated wastewater from wastewater treatment plants

Wastewater reuse is likely to be most economical in the vicinity of an existing wastewater treatment facility, after it has had its nutrient, biochemical and pathogen loads reduced. Further treatment may be required depending on the intended end use.

Raw wastewater from 'sewer mining'

Sewer mining involves the abstraction of raw wastewater from the sewer main upstream before it reaches a treatment plant. Sewer mining is a complex option requiring the construction of a decentralised wastewater treatment facility to treat the raw wastewater to 'fit-for-purpose' quality, delivering the recycled water to the end-user and managing residuals.

For more information, availability and conditions of using wastewater from existing treatment plants or via sewer mining visit the Water Corporation's *H_2Options* website, which includes a water balance calculation tool and useful factsheets.

Greywater

Greywater can provide a climate-independent source for reuse. Available volumes will depend on the number of household members and continued occupancy. Greywater reuse is likely to be most viable for single household use with the most basic method being manually bucketing greywater from showers and laundry and using it for watering gardens or for toilet flushing.

Other methods, which have to be approved by the local council, include greywater diversion devices which coarsely filter greywater for sub-surface irrigation or the more complex greywater treatment systems that collect and treat greywater to a higher quality for additional uses. The choice of bathroom and laundry products for use in greywater irrigation systems is important to prevent chemical and structural deterioration of receiving soils.

The Department of Health *Code of Practice for the reuse of greywater in Western Australia* (Department of Health 2010) provides information on greywater reuse at household level on its website as well as a list of all approved greywater systems.

Non-drinking water supply storage and distribution options

The choice of supply option(s), including both storage and distribution elements of a non-drinking water system, needs to be appropriate for the source and volume of water being provided.

Storage and distribution options for the non-drinking water supply include:

On-site options

Single household options include rainwater collected from roofs in storage tanks, greywater reuse (bucketing, diverting or treating) from showers, bathrooms and laundries, or groundwater from a domestic garden bore in suitable areas.

It is the responsibility of the homeowner to maintain these systems and to obtain the required approvals from their local council. All greywater reuse systems require approval from the Department of Health.

This guideline does not address requirements for single household use non-drinking water options unless they are proposed across a number of houses as a requirement of the development.

‘Third-pipe’ schemes

A third-pipe or dual reticulation system provides fit-for-purpose water, e.g. treated wastewater or groundwater from a community bore, for in-house and/or ex-house use to residential homes or multi-tenanted office or apartment complexes, industry, horticulture and public open space. It is an additional water supply network to the mains (potable) scheme supply and to the sewerage scheme. It comprises a series of purple pipes and fixtures to differentiate it from the other systems. Distinct labelling is used to reduce the risk of inappropriate use.

A water service provider is generally required to operate a third-pipe scheme.

Although it is possible to retrofit third-pipe schemes into developed areas, they are considered more viable in new residential developments where all underground infrastructures can be constructed concurrently.

A fundamental principle in the design of a third-pipe distribution system is maintaining separation and providing identification of drinking water schemes and non-drinking water systems in accordance with Australian standards to prevent any risk of cross contamination. The WSAA Water Supply Code of Australia provides guidance on installation and management of distribution systems but is an industry code, rather than a national standard. Water utilities may have their own standard designs.

Aquifer storage (and recovery)

Aquifer storage and recovery or managed aquifer recharge (MAR) is the intentional recharge of an aquifer under controlled conditions, either by injection or infiltration of a suitable water source. The aim is to store water for subsequent abstraction and use (indirect reuse), or for environmental benefits.

MAR can provide effective storage for water from different sources, including stormwater or treated wastewater or excess surface water. Depending on the outcome of environmental and health risk assessments, pre-treatment of the source water may be required prior to recharging the aquifer. Natural treatment processes in the aquifer can improve the quality of water.

MAR may not be feasible on all sites, due to hydrogeological, environmental or cost limitations. There are also limitations to managed aquifer recharge within proclaimed public drinking water source areas.

Under current legislation, water infiltrated or injected into the natural groundwater system is vested in the Crown. The department's managed aquifer recharge policy (Department of Water 2011a) facilitates approval of socially and environmentally acceptable MAR projects. Under this policy stormwater runoff infiltrated into the aquifer through soak wells, infiltration trenches, constructed basins, garden beds or other vegetated areas as a consequence of urbanisation, is not considered as purposeful recharge.

Surface storage

Surface storage is often required where the non-drinking water source is seasonal or the rate of collection is different from the rate and timing of supply needs. Surface storage may include lakes, dams, wetlands or tanks. The choice of storage infrastructure should consider the requirements for land, as well as the cost and complexity of managing the infrastructure into the long term. The use of sub-surface tanks or cells may be more practical to allow for other above-ground land use opportunities.

Approval for storage options is likely to be required from the local government and advice should be obtained from the Department of Water for surface storage using constructed lakes to ensure effective management of issues associated with eutrophication (excessive nutrients), including algae, midges and odour.

The department provides information about constructed lakes in the department's *Interim position statement: constructed lakes* (Department of Water 2007).

Appendix B – Agency contacts

Department of Water

Water Recycling and Efficiency section
The Atrium, 168 St Georges Terrace, Perth WA 6000
Postal address:
PO Box K822, Perth WA 6842
Tel (08) 6364 7600 Fax (08) 6364 7601
Email: recycling@water.wa.gov.au
Contact details for regional offices are available on the website <www.water.wa.gov.au>

Department of Health

Water Unit, Environmental Health Directorate
Grace Vaughan House, 227 Stubbs Terrace, Shenton Park WA 6008
Postal address:
PO Box 8172 Perth Business Centre WA 6849
Tel (08) 9388 4999 Fax (08) 9388 4910
<www.public.health.wa.gov.au>

Department of Environment Regulation

Industry Regulation Licensing Branch
The Atrium, 168 St Georges Terrace, Perth WA 6000
Postal address:
Locked Bag 33 Cloisters Square WA 6850
Tel (08) 6467 5000 Fax (08) 6467 5562
Contact details for regional offices are provided on the website <www.der.wa.gov.au>

Department of Planning
Western Australian Planning Commission

Infrastructure Planning & Coordination Division
140 William Street, Perth WA 6000
Postal address:
Locked Bag 2506, Perth WA 6001
Tel (08) 6551 9000 Fax (08) 6551 9001
<www.planning.wa.gov.au>

Economic Regulation Authority

Assistant Director – Licensing
Level 4, Albert Facey House, 469 Wellington Street, Perth, WA 6000
Postal address:
PO Box 8469, Perth BC WA 6849
Tel (08) 6557 7900 Fax (08) 6557 7999
<www.erawa.com.au>

Office of the Environmental Protection Authority

The Atrium, 168 St Georges Terrace, Perth WA 6000
Postal address:
Locked Bag 10, East Perth WA 6892
Tel (08) 6145 0800 Fax (08) 6145 0895
<www.epa.wa.gov.au>

Other relevant contacts

Aqwest

5 MacKinnon Way, Bunbury WA 6230
Postal address:
PO Box 400, Bunbury WA 6231
Tel +618 9780 9500
<www.aqwest.wa.gov.au>

Busselton Water

1 Fairbairn Road, Busselton WA 6280
Postal address:
PO Box 57, Busselton WA 6280
Tel +618 9781 0500
<www.busseltonwater.wa.gov.au>

Plumbers Licensing Board

Level 1, 31 Troode Street, West Perth WA 6005
Postal address:
Locked Bag 12, West Perth WA 6872
Technical Advice Line 1300 360 897 (for plumbers only)

Water Corporation

629 Newcastle Street, Leederville WA 6007
13 13 85 between 8am and 5pm weekdays
customer@watercorporation.com.au
<www.watercorporation.com.au> (refer to 'H_2Options' website)

Appendix C – Relevant guidelines and information

Australian Government (NRMMC-EPHC-NHMRC)

Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (2006 – 2009 phase 1 and phase 2 modules)

Department of Water

Community bores

Licensing information (including operating policies and licensing forms)

Land use compatibility in public drinking water source areas

Managed aquifer recharge policy

Nutrient and irrigation management plans

Stormwater management manual for Western Australia

Water Services (including water service licensing and exemptions)

Waterwise Community Toolkit

Better urban water management guidance note series

Department of Environment Regulation

Licensing and works approvals

Department of Health

Recycled water guidelines and publications (including RWQMP template)

Draft alternate water supply guidelines – rainwater and stormwater

Economic Regulation Authority

Water Licensing – Regulatory Guidelines

Water Corporation

H_2Options – a guide to non-drinking water options (including water balance tool)

Water Services Association of Australia (National codes and Standards)

Dual Water Supply Systems First Edition V1.2 – A supplement to the WSAA Water Supply Code of Australia WSA03-2002 (free PDF download)

For noting: Design standards and supplementary requirements specific to a selected water service provider will apply, and may in some cases overwrite recommendations provided in the WSAA Code. The updated WSAA Water Supply Code Version 3.1 is available for a fee.

Western Australian Planning Commission/Department of Planning

Better urban water management

Glossary

Blackwater	Water from toilets. Also commonly known as sewage.
Community bore	A bore or multiple bores supplying groundwater via a reticulated network (third pipe) to a number of properties in an urban development for non-drinking uses including garden or lawn watering and/or for irrigation of local public open space.
District water management strategy	A water management document prepared to support a district level planning decision. It should demonstrate that the area is capable of supporting the change in land use and identify areas required for water management and future investigations.
Environmental risk assessment	Risk management approach specified in the *Australian guidelines for water recycling: managing health and environmental risks (NRMMC-EPHC-NHMRC 2006–09* (various documents)) for assessing and managing environmental risk associated with non-drinking water projects.
Fit-for-purpose or non-drinking water	Water that has suitable quality for the intended end use and location as described in the *Australian guidelines for water recycling: managing health and environmental risks (NRMMC-EPHC-NHMRC 2006–09* (various documents)).
Greenfield site development	A previously undeveloped area of land which has been zoned for urban development and is located on the fringes of an urban area. (See *Liveable neighbourhoods*, WAPC 2007).
Greywater	Used household water from baths, showers, hand basins, washing machines, laundry and kitchen sinks. Generally, greywater from the kitchen is not recommended for reuse without further treatment due to the high levels of organic materials such as oils and fats. For more information visit the Department of Health website.
Groundwater	Water that occurs in pore spaces and fractures in soil and rock beneath the ground surface. It can be abstracted through bores and wells. Groundwater supports wetland and stream ecosystems, fauna and flora and is part of our water supply.
Health risk assessment	Risk management approach specified in the *Australian guidelines for water recycling: managing health and environmental risks (NRMMC-EPHC-NHMRC 2006–09* (various documents)) for assessing and managing health risks associated with non-drinking water projects. The Department of Health has adopted some of these guidelines in their relevant guidelines for WA.

Infill site development	The development of vacant, underdeveloped or underutilised sites within an urban area, rather than undeveloped land outside the city (greenfield sites).
Local water management strategy	A water management document prepared to support a local level planning decision. It should demonstrate how the proposed urban structure addresses water use and management and identify future investigations.
Managed aquifer recharge (MAR) or aquifer storage (and recovery)	The intentional recharge of water to an aquifer under controlled conditions in order to store the water for subsequent abstraction, or to gain environmental benefits. Methods include infiltration via ponds, trenches or galleries, or injection via bores. The process may involve passive treatment of water through natural processes within the aquifer.
Non-drinking water system	Substitutes a non-drinking water or fit-for-purpose source (e.g. treated wastewater, greywater, rainwater, stormwater, or groundwater) for potable (scheme) water where a lower quality is sufficient for the intended uses.
Non-drinking water supply service	A service constituted by the collection, storage, production, treatment, conveyance, reticulation or supply of a non-drinking water source by a service provider.
Nutrient and irrigation management plan (NIMP)	A plan for the establishment and growing of crops, gardens, trees or turf that recognises that inputs such as water and nutrients should be well matched to the plant growth cycle. A NIMP may be required by the Department of Environment Regulation as a licence condition where treated wastewater from prescribed premises is used for irrigation.
Potable or drinking water	Water of a quality suitable for drinking and other uses requiring high quality water, e.g. bathing and food preparation. The Standards that define potable water are described in the Australian Drinking Water Guidelines.
Prescribed premises	In this context this refers to facilities prescribed in Schedule 1 of the *Environmental Protection Regulations 1987*. Prescribed categories currently include wastewater treatment plants that discharge >20kL/day.
Proponent	In the context of this guideline, the proponent is the initiator of a non-drinking water proposal. The proponent is responsible for investigating and preparing information to support the non-drinking water proposal and to obtain necessary approvals.

Public drinking water source area (PDWSA)	Any area proclaimed under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* for the management and protection of water sources used for public drinking water supply. PDWSAs include proclaimed underground water pollution control areas, water reserves and catchment areas.
Public open space (POS)	Land used or intended for use for recreational purposes by the public and includes parks, public gardens, playgrounds and sports fields. POS may include irrigated and non-irrigated areas.
Rainwater	Water from rain events collected directly from roof run-off of buildings and stored in tanks. It has minimal surface contact and is generally relatively free of impurities.
Recycled water quality management plan (RWQMP)	A Department of Health document that outlines the proponent's commitments to managing the risks associated with a non-drinking water project. A template is available on the Department of Health website.
Retrofitting	In this context retrofitting refers to the installation of new, additional or alternative infrastructure in a developed area. Retrofitting can occur at different scales.
Risk management	In this context the systematic evaluation of the water source, the identification of hazards and hazardous events, the assessment of risks, and the development and implementation of preventive strategies to manage the risks. Source: *Australian guidelines for water recycling: managing health and environmental risks (NRMMC-EPHC-NHMRC 2006-09* (various documents)).
Scheme (potable) water	Water that is supplied through the mains water pipes at drinking water quality. In Western Australia the Water Corporation's Integrated Water Supply Scheme is the largest drinking water scheme, currently supplied from highly treated multiple groundwater and surface (dam) water sources and the Perth Seawater Desalination Plant.
Sewage or wastewater	Used water from households and businesses that include both greywater and blackwater disposed of through the sewerage network, or into septic tanks in unsewered areas.
Sewer mining	A process of extracting raw wastewater from the sewerage network and treating it on-site for use as recycled water.
Sewerage system	Collects wastewater from domestic, commercial and some industrial premises for offsite treatment and disposal.

Stormwater	Urban surface water runoff from rain events. In areas such as the sandy soils of the Swan Coastal Plain, rainfall and resultant stormwater naturally recharges the Superficial aquifer. Stormwater often intercepts with groundwater and varies in quality and volumes.
Third pipe or dual reticulation	A network (purple pipe) that provides non-drinking water to multiple users as a separate water supply to scheme (potable) water supply and the sewerage pipeline.
Treated wastewater or effluent	Discharge from a wastewater treatment facility. Treatment reduces its nutrient, suspended solids, bio-chemical and pathogen loads. Treated wastewater may require further treatment to provide a fit-for-purpose water quality for the intended reuse.
Urban renewal	Change of land use to enable residential, commercial and light industrial expansion, or changes in zoning that allows increased density or height (resulting in new single houses, apartments and medium developments).
Urban water management plan	A water management document prepared to support subdivision. It should demonstrate how the proposal complies with the local water management strategy and how the urban form/ infrastructure will use and manage water.
Wastewater treatment plant	Licensed premises where wastewater is treated to a certain standard prior to disposal to the ocean or to land, or being further treated for reuse.
Water licence	Refers to licences granted by the Department of Water under the provisions of the *Rights in Water and Irrigation Act 1914*. A water licence is required in proclaimed areas and for the use of artesian groundwater, while a permit is required for surface water in proclaimed areas.
Water services licence	An operating licence issued by the Economic Regulation Authority to an applicant to provide a water service under the provisions of the *Water Services Act 2012.* An operating licence is required for participants in the water industry who intend to, or currently, provide water services in a controlled area or part of a controlled area unless otherwise exempt. Persons seeking to apply for an exemption should contact the Department of Water for advice.

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