

Asset management planning

Guideline for water service providers



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Summary

Proactive and well-considered planning to reduce water supply security risks is essential to the delivery of safe, reliable and cost-effective water supplies which underpin the livelihoods and lifestyles of all Queenslanders.

Water service provision is an asset-intensive business. **Appropriate asset management provides a clear understanding of what assets exist, the objectives for their management, and what actions are required to ensure the objectives are achieved.**

Integrated plans for water supply system assets and upgrades, and managing supplies during 'normal times' and drought, are fundamental to the prudent and efficient delivery of water supply services to any community. Such planning is a key consideration by the Department of Regional Development, Manufacturing and Water for regulatory activities conducted under Part 5A, Division 3 of the *Water Supply (Safety and Reliability) Act 2008* in relation to water security and continuity of supply. This document provides what the Department of Regional Development, Manufacturing and Water considers is a minimum standard for both strategic and tactical (operational) aspects of asset management planning, and examples of how to demonstrate that plans are being implemented. Key aspects of asset management include:

- having a register of assets
- documenting performance objectives and actions to maintain asset capability (which are then supported by appropriate asset maintenance and renewal programs)
- defining key roles and responsibilities
- establishing capital plans and operating budgets to support the implementation of actions
- monitoring and reviewing the asset management plan and the effectiveness of its implementation.

Best practice standards recommend that asset management planning occurs within the framework of an asset management system. Additional guidance is also provided on documenting the asset management system and developing an asset management policy, which the department considers are both desirable elements of asset planning.

This guideline is designed to apply to infrastructure assets relating to urban water supply provision, and is focussed on planning to maintain asset capability. Asset management planning, integrated with drought management planning and water supply planning, supports decision-making for the prudent and efficient delivery of water supply services to a community.

Developing asset management plans in accordance with these guidelines, and implementing those plans, will help water service providers to meet their responsibilities for supplying safe drinking water, and contribute to the effective management of risks to water security and continuity of supply.

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1.0 Introduction

Safe, reliable and cost-effective water supplies underpin the livelihoods and lifestyles of all Queenslanders. Informed and effective planning for water supplies is essential to support our communities, industry and agriculture in Queensland's variable and changing climate.

In Queensland, the provision of reticulated water supplies to urban communities is the responsibility of water service providers, which is often the local council. This responsibility includes planning for new water supply sources and infrastructure works, demand management and maintaining asset capability to meet demand over the short and long term, in normal times and in drought.

The state government aims to support water service providers to deliver safe and reliable water services by establishing appropriate policy and regulatory frameworks, developing guidance material, and working with providers to understand the ability of their systems to meet current and future demands.

2.0 Purpose

Integrated planning for water supply, asset management and drought management is fundamental to the prudent and efficient delivery of water supply services to any community. Asset management is a key consideration by the Department of Regional Development, Manufacturing and Water (the department) for regulatory activities conducted under Part 5A, Division 3 of the *Water Supply (Safety and Reliability) Act 2008* in relation to water security and continuity of supply. Of particular interest to the department is the condition and capacity of key water supply, treatment and distribution infrastructure, and system leakage.

If there is reduced water supply to a community there is potential for public health risks, economic stress, social hardship, and loss of amenity—regardless of the cause (for example a shortage of source water, a failure in the water treatment process, or a reduced ability to distribute water through the service network). One of the best ways to minimise risk to water security and continuity of supply, and the potential associated hardships, is through proactive and well-considered planning.

Water service provision is an asset-intensive business. To get the best value from assets, it is necessary to make informed decisions at each stage of the asset lifecycle in a transparent and well-considered manner. Asset management is the coordinated activity of an organisation to determine how best to acquire, operate, maintain, renew, replace, and decommission assets to deliver the agreed standard of service.

Appropriate asset management provides a clear understanding of what assets exist, the objectives for their management, and what actions are required to ensure the objectives are achieved. Well-executed asset planning provides a range of benefits to an organisation and its customers, including improved financial outcomes and reliable service delivery.

This guideline has been developed to assist water service providers to undertake asset planning, as part of their responsibility for managing risks to water security and continuity of supply, including the provision of safe drinking water. It applies to the sub-set of physical infrastructure assets relating to urban water supply provision, which includes equipment, structures, and property; this guideline is focussed on planning to maintain asset capability.

The guideline outlines what the department considers is a minimum standard for strategic asset management planning and tactical (operational) asset management planning. Additional guidance is also provided on documenting the asset management system and developing an asset management policy—both desirable elements of asset planning. This guideline provides various levels of detail to support water service providers at different stages of planning maturity. It does not provide guidance on any financial or accounting requirements related to asset management, such as the use of asset registers or protocols for asset valuation.

Adoption of these guidelines will support asset management planning, including the development of a strategic asset management plan and tactical asset management plans. Implementation of asset management plans will assist water service providers to meet their responsibilities for urban water supply provision, and contribute to the effective management of risks to water security and continuity of supply.

3.0 Using this guideline

3.1 Background

In Queensland, the *Water Supply (Safety and Reliability) Act 2000* (the Act) establishes a regulatory framework to provide for the safety and reliability of water supplies. The framework allows the department to take certain actions if it reasonably believes that there is a risk to water security or continuity of supply of a water service (sections 445 and 448 of the Act).

In 2014, there were some significant changes to the regulatory framework for water service provision. Mandatory requirements for a range of management plans were replaced with a system of annual reporting against key performance indicators (KPIs). Since 2020, water service providers have been required to report annually on the status of water supply planning for each scheme they operate, including if asset management planning has occurred in the last 10 years.

The *Local Government Act 2009* (section 104), and its subordinate regulation (sections 167, 168 and 180), requires a local government to prepare an asset register, and prepare and adopt a long-term asset management plan that provides strategies to ensure the sustainable management of assets and infrastructure to deliver effective services, for at least the next 10 years. The asset management plan must state the estimated capital expenditure for renewing, upgrading, and extending assets. The plan also must be part of, and consistent with, long-term financial forecasts. The systematic approach to asset management planning described in this guide provides a solid basis for developing key elements of a long-term asset management plan for water service assets.

3.2 How this guideline applies

This guideline has been prepared to assist water service providers to undertake and implement effective asset management planning as a part of their responsibility for managing risks to urban water security and continuity of supply of their water supply services.

When assessing risk to water security and continuity of supply for a scheme, the Regulator will take into consideration if a water supply plan, asset management plan and drought management plan exist, if these documents meet the minimum standards recommended in the guidelines provided by the department, and if there is evidence that the plans are being implemented (or that the water service provider has capacity to implement the plans when required).

The intent of the minimum standards specified in this guideline (Table 1 and Table 2) is to position water service providers to understand what actions might be required to maintain asset capability. The guidance on implementation (Section 6) outlines what documentation is considered appropriate to support the delivery of the planned actions.

There is an expectation that water service providers operate within an existing institutional framework with established asset management systems. It is important that the asset management planning that occurs in relation to water supply assets is fully integrated with existing business systems. It is important that water supply assets are easily identifiable and able to be separated for water supply planning and management.

The use of the word 'should' in this guideline indicates a recommended course of action and establishes what the department considers is a minimum standard for asset management planning.

This guideline provides recommendations and suggestions; it does not contain any mandatory requirements and it does not override any legislation or regulatory requirements. While it is recommended that water service providers follow this guideline, a water service provider can choose their own methods or information as the basis for undertaking asset management planning.

3.3 Relationship to regulations and other guidelines

The legislative framework that provides for safe and reliable water supplies can be found in the *Water Supply (Safety and Reliability) Act 2008* available at www.legislation.qld.gov.au.

Water service providers owned by local governments in Queensland are required to operate within an established regulatory framework. Information on local government responsibilities for the sustainable development and management of assets and infrastructure can be found at www.dlgrma.qld.gov.au.

This guide has been developed to be consistent with related Australian Standards AS ISO 55000:2014: *Asset management - Overview, principles and terminology*, and AS ISO 55001:2014: *Asset Management - Management systems – Requirements*, available from Standards Australia at www.standards.org.au.

Guidance on planning to manage water supply risks in normal times is presented in the *Water supply planning: guideline for water service providers*; available in the 'Water supply security' section of the Business Queensland website www.business.qld.gov.au.

Guidance on planning to manage risk during drought is presented in the *Drought management plans: guideline for development* available in the 'Water supply security' section of the Business Queensland website www.business.qld.gov.au.

3.4 Key terminology

To assist in interpretation of the minimum standards and guidance provided in this guideline, the following descriptions of key terminology are provided.

The Australian Standard AS ISO 55000:2014 describes a **strategic asset management plan (SAMP)** as: '*documented information that specifies how organisation objectives are to be converted into asset management objectives, the approach for developing asset management plans and the role of the asset management system in supporting achievement of the asset management objectives*'.

The Australian Standard AS ISO 55000:2014 describes an **asset management plan** as: '*documented information that specifies the activities, resources and timescales required for an individual asset, or a grouping of assets, to achieve the organisation's asset management objectives. The grouping of assets can be done by asset type, asset class, asset system or asset portfolio. An asset management plan is derived from the strategic asset management plan and can be contained in or be a subsidiary plan of the strategic asset management plan*'. Asset management plans can be thought of as more operationally focused, compared to strategic asset management plans.

To assist in differentiating between asset management plans and strategic asset management plans, asset management plans are identified throughout this document as **tactical AMPs**.

The aim of undertaking integrated planning for water supply, drought management and asset management is to provide urban water security. **Water security** for urban supplies means having a high degree of confidence that the water needs of a community can be sustainably met now and in the future (with the community's water needs clearly described, and ideally agreed between the water service provider and the community¹). Water security is underpinned by the availability, accessibility and dependability/reliability of the sources of supply to meet the community's water needs. Water security (particularly short-term) is influenced by the continuity of supply, i.e. the condition, capacity, capability and resilience of the water supply infrastructure to maintain a consistent and adequate volume of water to meet the community's water needs.

¹ Modified from: Allan, JV, Kenway, SJ and Head, BW, (2019) *Urban water security – what does it mean?* Urban Water Journal, 15(9).

4.0 Minimum standards for asset management planning

The department expects water service providers to document the system they use to plan for and make decisions throughout the asset lifecycle, including during the acquisition, operation, maintenance, decommissioning, and disposal of assets.

Table 1 outlines the department's minimum standard expectations for strategic asset management planning and the various elements that should be documented as part of a strategic asset management plan (SAMP). Further details and guidance on strategic asset management planning are provided in Section 5.4.

Table 2 outlines the department's minimum standard expectations for the development of tactical asset management plans (tactical AMPs). Further details and guidance on tactical asset management planning are provided in Section 5.5.

If a water service provider does not meet the minimum standards in this guideline, they should carry out at least one of the following actions:

- Explain how and when the standards will be met in the near future in the KPI annual report, as comments against the relevant KPI (QG 2.11a).
- If the water service provider considers itself to be still meeting the overall objective for asset management planning (e.g. a particular aspect of asset management is not relevant for the water service, and therefore omitted or treated differently to the minimum standards), a comment in relation to this should be provided in the KPI annual report as comments against the relevant KPI (QG 2.11a).

Best practice standards recommend that asset planning occurs within the framework of an asset management system. Additional guidance is provided on documenting the asset management system (Section 5.2) and developing an asset management policy (Section 5.3), which the department considers are both desirable elements of asset planning.

Table 1: Minimum standards for strategic asset management planning

Element	Minimum standard	Additional desirable inclusions
Purpose and scope	The SAMP should clearly state its purpose and the water services to which it applies (and other services or assets if relevant).	Describe how the strategic asset management plan fits in the asset management system.
Context and drivers	The SAMP should summarise key regulatory and organisational requirements, including the service standards and the level of service objectives for water security.	Provide the business vision, purpose, and objectives. Provide the policy framework including the asset management policy. Describe key enabling and related business systems. Describe asset management principles that apply.
Assets and services	The SAMP should describe: <ul style="list-style-type: none"> the services being delivered by the assets the customers receiving the services the classes of assets to which it applies. The SAMP should make reference the location of the asset register.	Broadly describe the assets used to deliver the services, including major facilities or elements of the service delivery chain such as water source/s, treatment, storage, and distribution. Describe the priority of service delivery, for example supply of drinking water to residential customers has priority over provision of recreational services. Note related service provision, for example sewage treatment and collection services that impact on recycled water production. Describe the asset hierarchy ² , which is the way of organising or classifying assets.
Strategic objectives		Describe the strategic objectives for management of water supply assets. Ideally strategic objectives are broad and there are only a few of them; there will be a clear line of sight from legislative objectives and customer service standards, to organisational objectives and the strategic asset management objectives.
Governance	The SAMP should describe key roles and responsibilities for asset-related activities.	Summarise the frameworks, policies, strategies, processes, and criteria used to make decisions throughout the asset lifecycle. Describe risk assessment and management processes relating to asset planning, including for asset criticality. Describe the extent and nature of stakeholder engagement in decision-making.
Actions	The SAMP should outline the asset-related actions required to maintain asset capability, including timing and resource estimates.	Outline the actions to be undertaken to achieve the strategic asset management objectives.
Review	The SAMP should be reviewed at least once every ten years.	

SAMP = Strategic asset management plan

² Asset hierarchy is a systematic way to organise information about assets involving tiers of information (called parent-child relationships), for example facility, process unit, equipment item, component. It generally groups assets according to common factors that might drive the management treatments such as location, type of asset (mechanical, electrical, civil), purpose, or type of equipment (for example pump, motor, or switchboard) or a combination of these.

Table 2: Minimum standards for tactical asset management planning, for each asset class

Element	Minimum standard	Additional desirable inclusions
Scope	The tactical AMP should describe the asset or class of assets to which the plan applies.	
Description of assets	The tactical AMP should describe the physical characteristics, functions, and criticality of the asset in delivering water services.	Identify the key assets essential to service delivery. Describe location of assets, age distribution of assets across the estimated life, related assets, interactions, and relationships.
Performance objectives	The tactical AMP should describe how the asset is intended to perform.	Describe how the asset contributes to meeting service objectives.
Failure modes	The tactical AMP should identify circumstances that could result in asset failure, the likelihood and nature of failures, and the potential impact on performance objectives.	Estimate impact of failure on service delivery. Prioritise failure modes for management.
Maintenance strategy	The tactical AMP should describe the strategy (or mix of strategies) that will be adopted to ensure the asset meets its performance objectives.	Consider preventative, condition-based, corrective, responsive, or risk-based approaches to maintenance.
Condition management strategies	The tactical AMP should describe the triggers and actions to be taken to manage risk of failure. Example triggers include condition, run time, and failure. Example actions include inspection, renewals or replacement (of components or entire assets) and holding spares. The tactical AMP should define key roles and responsibilities.	Prepare schedules and resourcing estimates for skills, time and specialised equipment required to implement condition management strategies. Conduct job safety analyses for maintenance activities. Define terminology.
Monitoring and review	The tactical AMPs should be continually monitored, and a full review undertaken at least once every ten years.	

AMP = asset management plan

5.0 Asset management planning details

Additional detail and guidance is provided here related to asset management systems, asset management policy, strategic asset management plans and tactical asset management plans (tactical AMPs).

Asset management plans produced under previous regulatory frameworks or associated with related planning activities (such as total management plans, strategic asset management plans, system leakage management plans, and total water cycle management plans) might provide a useful basis for satisfying current department expectations for asset management planning and documentation.

5.1 Water supply planning

Asset management to maintain asset capability is an essential element of planning to maintain safe, secure, and reliable urban water supplies.

Water supply planning considers water supply source access and reliability, water demand forecasts, and infrastructure capacity, to ensure that a water service provider can meet the future water supply needs of its serviced community at an appropriate level of water supply security. Water supply planning should consider different circumstances such as normal times, drought and flood, bushfires, and other severe weather events.

Integrated water supply planning, asset management planning and drought management planning are fundamental to the prudent and efficient delivery of water supply services to any community.

Figure 1 below shows the relationship between key elements of planning to manage risk to water security and continuity of supply, including how asset management planning contributes.

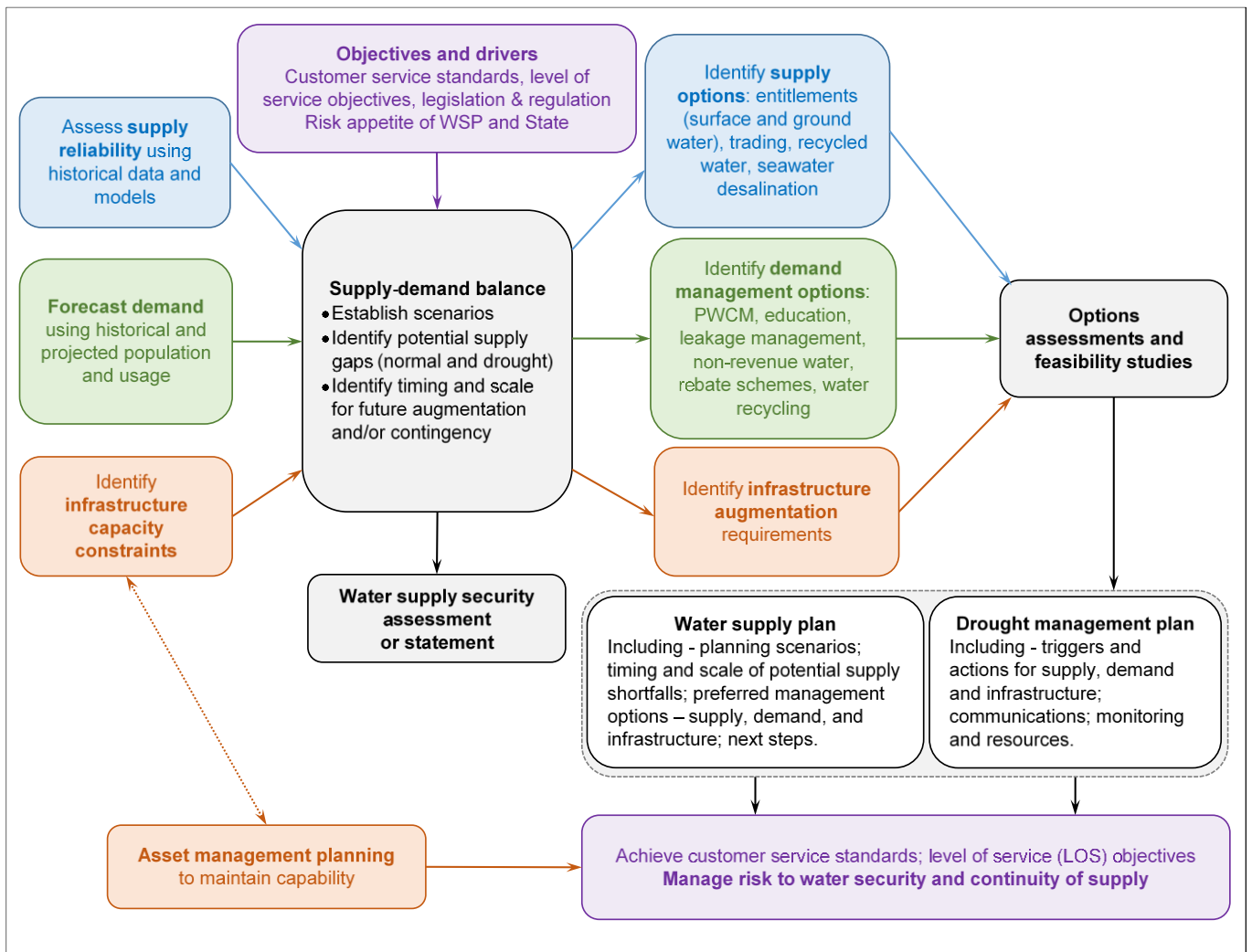


Figure 1: Key elements of planning to manage risk to water security and continuity of supply

5.2 Asset management system

An asset management system is a 'road map' showing the relationships between all the asset-related elements of a business. The Australian Standard AS ISO 55000:2014 describes an asset management system as: 'a management system for asset management whose function is to establish the asset management policy and asset management objectives'. It provides a structured approach to the development, coordination, and control of asset-related activities over all lifecycle stages, and describes how these activities are aligned with, and contribute to achieving, organisational objectives. An asset management system is sometimes called the asset management framework.

A well-designed asset management system will be integrated with, and supported by, relevant business systems such as risk management, safety systems, information management, workforce planning, finance, customer management and stakeholder communications. The asset management system is commonly represented schematically, showing its core elements and their relationship to key drivers and enablers. The asset management system documentation might be stand-alone or might be integrated into other corporate documents. Examples of asset management systems are provided in Appendix A.

Ideally, water service providers will develop and implement an asset management system and its core elements in line with the Australian Standard (AS) asset management series (AS ISO 55000:2014, 55001:2014, 55002:2019). These describe an asset management system as containing information on:

- organisation context (including regulatory requirements, customer needs, stakeholder expectations and the scope of the asset management system)
- leadership and commitment (including policy, roles, and responsibilities)
- planning (including asset management objectives, criteria and methods of decision-making and processes and actions to achieve the objectives (asset management plans))
- supports (including resource requirements, communications, and information requirements)
- operational planning and control (including outsourcing)
- performance monitoring and evaluation
- improvements (including preventative actions and corrective actions).

5.3 Asset management policy

An asset management policy provides a set of rules for rational and consistent decision making with respect to assets. It aligns with the organisational vision, purpose and plans and is ideally simple, clear and easy to understand. A policy statement can be supported by a policy document, procedures, or guidelines. The desirable elements of an asset management policy are provided in Table 3, together with example text.

5.4 Strategic asset management planning

The Australian Standard AS ISO 55000:2014 describes a strategic asset management plan (SAMP) as: 'documented information that specifies how organisation objectives are to be converted into asset management objectives, the approach for developing asset management plans and the role of the asset management system in supporting achievement of the asset management objectives'.

The SAMP is a common location for core elements of the asset management system, including a description of the asset management system itself (refer to Section 5.2), the asset management policy (refer to Section 5.3), strategic objectives, principles for asset-related decision making, governance arrangements and actions.

Table 3: Desirable elements of an asset management policy

Desirable element	Example text
Policy context	Council provides water and wastewater services to the communities of Alpha and Beta. We do this by managing more than \$100 million of infrastructure assets across an area of 10,000 hectares.
Policy statement	<ul style="list-style-type: none"> We are committed to safely managing our assets efficiently and effectively to meet our customer service standards and our level of service objectives for water security. We are committed to safely managing our assets efficiently and effectively to deliver water services that exceed our legislative obligations and satisfy the expectations of our community.
Principles and/or strategies	<p>We will achieve our aim by:</p> <ul style="list-style-type: none"> establishing clear asset management roles and responsibilities meeting or exceeding our regulatory obligations establishing appropriate asset management objectives aligned with our regulatory obligations and customer service standards developing and implementing strategies, systems, processes, and procedures to achieve our objective embracing industry best-practice approaches, where practical monitoring our performance against our objectives and adapting our strategies when required.
Application	This policy applies to all our employees and contractors, and anyone who represents us or acts on our behalf.
Drivers	This policy is consistent with [...include any critical legislation, Australian Standards, guidelines, performance standards or other driving references].
Authority	This policy is approved/endorsed by – name, position, signature, date. Approval is commonly at the most senior levels of an organisation, for example the CEO.

5.4.1 Strategic asset management objectives

Strategic asset management objectives inform the development of operational targets, and guide requirements for enabling business systems. Examples include:

- Assets will be managed using an approved asset management system aligned with the Australian Standard AS ISO 55001:2014 for asset management systems.
- Asset management objectives will be linked to and support delivery of services to the agreed customer standards.
- Asset management decisions will achieve service standards at minimum economic, environmental, and social cost.
- Asset management investment will be prudent and efficient, taking account of whole-of-lifecycle and non-asset solution options.

6.0 Asset management principles

Asset management principles can assist decision-making at various points in the asset lifecycle. Some examples of strategic asset management principles are:

- **General:** We will make asset management decisions legally, ethically, transparently and in the public interest; manage our assets to maximise benefits to the community that are sustainable, equitable and socially inclusive; understand our service delivery risks in the short, medium, and long term; ensure our asset planners, operators, maintainers, and project managers are appropriately skilled and competent; and embrace a culture of continuous improvement.
- **Planning:** We will undertake asset planning and decision-making based on whole-of-life, benefit to cost assessment considering technical, social, environmental, and economic factors; and utilise accurate, up-to-date asset condition and capability data, and realistic asset performance requirements as the basis for asset decisions.
- **Acquisition:** We will base investment decision-making on rigorous, defensible analysis with transparent assumptions and criteria.
- **Operation and maintenance:** We will only operate our assets in a safe manner, consistent with their capabilities; and maintain and refurbish our assets to maximise their useful life, to the extent that it is cost-effective.
- **Divestment/decommissioning:** We will ensure that assets that are decommissioned from service are safe and maintained to reduce environmental risk; we will apply the same rigour to divestment decision-making as for investments; and we will dispose of surplus assets to realise maximum residual value.

6.1.1 Governance

Governance incorporates the systems by which an organisation is controlled and operates, and the mechanisms by which it, and its people, are held to account³. Asset management planning operates within the business framework of the provider's organisation. For local government-owned providers there are well-established regulatory frameworks for governance and financial management.

A SAMP should list key asset management roles and responsibilities, and summarise the decision processes that apply to investment (acquisition) and divestment (disposal) of assets (for example, the use of planning studies, options assessments, feasibility studies, business cases and approval gates for investment and significant or high-risk decisions). The Queensland Government has a range of guidance material available to support effective and efficient decision making (refer to Section 8).

Where the water service provider has a framework for establishing policies or strategies specific to particular services or assets, this should be summarised in a SAMP. Such policies can provide clarity to customers, stakeholders and the workforce on the objectives and priorities for service delivery and management of assets, while the accompanying strategies can describe the desired pathway to achieve the objectives.

6.1.2 Actions

A SAMP should list the actions or tasks required to maintain service delivery. These tasks might be related to processes and their improvement, access to data, investigations or studies, the development and implementation of tactical AMPs, access to resources (financial or human), or other matters as determined by the provider. The action plan should include details of responsibilities for implementation and targets for delivery timeframes.

Examples of actions that might be identified in a SAMP are acquisition of asset information systems, setting targets for responsive maintenance works, or developing a method to assess asset criticality.

³ www.governanceinstitute.com.au/resources/what-is-governance

6.2 Tactical asset management plans

The Australian Standard AS ISO 55000:2014 describes an asset management plan as: '*documented information that specifies the activities, resources and timescales required for an individual asset, or a grouping of assets, to achieve the organisation's asset management objectives. The grouping of assets can be done by asset type, asset class, asset system or asset portfolio. An asset management plan is derived from the strategic asset management plan and can be contained in or be a subsidiary plan of the strategic asset management plan*'. To differentiate asset management plans from strategic asset management plans (SAMPs), they are identified here as tactical AMPs.

Tactical AMPs are focussed on maintaining the capability of existing assets. This includes documentation of performance objectives, failure modes, maintenance philosophies and condition management strategies. The scope of tactical AMPs is not expected to include the acquisition of new assets, upgrades (or down-rating) in capacity or capability, decommissioning, or disposal of assets⁴.

The final content of tactical AMPs will be guided by each provider's situation, including the type of services they deliver, their water sources and particularly their existing business systems and processes. Below is additional guidance on some of the key elements of tactical AMPs.

6.2.1 Asset performance targets

Asset performance targets are operational objectives that, ideally, link back to strategic objectives, customer service standards and level of service objectives for water security. They provide the basis for determining what actions and activities need to be undertaken throughout the asset lifecycle. They generally provide a quantitative (numeric) target to guide shorter term decision-making by planners, maintenance, and operational staff. They can be set at any level in the asset hierarchy², such as a group or class of assets, component, item, or facility level.

Performance targets for assets generally reside in tactical AMPs. The processes used to develop performance targets might be described in the strategic asset management plan (SAMP).

Some examples of asset performance targets are:

- Capacity or capability: the pump will be able to deliver at a maximum rate of 10 L/s for up to 1 hour and sustainably deliver at 8 L/s.
- Reliability (target failure rate): the pump will be able to operate continuously for 200 hours before a preventative maintenance intervention is required.
- Resilience (target time to return to service after failure): the pump will be out of service for a maximum of 6 hours during planned preventative maintenance.
- Availability: the pump will be available 95% of the time.
- Efficiency or cost: leakage will be less than 8% across the distribution system.

6.2.2 Failure modes

Failure modes describe the general circumstances that might lead to failure. It can include reference to:

- what exactly might fail, and the consequences
- failure mechanism, for example mechanical mechanisms might include ductile fracture, brittle fracture, impact, thermal shock, wear, corrosion, stress corrosion, cracking, and fatigue
- system state and cause, i.e. what is the event that might lead to the failure, including expected failures (e.g. due to run hours), and unexpected failures (e.g. ground shrinkage from prolonged drought causing a break in a pipe).

⁴ These decisions would be expected to be taken following assessment of timing for potential future augmentation of water supply schemes, with accompanying options assessments and feasibility studies. Refer to the *Water supply planning: guideline for water service providers* for more information.

6.2.3 Maintenance strategy

The maintenance strategy (or mix of strategies) guides how an asset or group of assets is to be maintained to meet its performance targets. Common maintenance strategies include:

- Preventative: maintenance activities planned according to how much service has been delivered (e.g. how many pumping hours); this approach can be appropriate for high-risk assets where the consequence of failure is unacceptable.
- Condition based: inspection and monitoring to determine when maintenance intervention is required; this approach can be a very cost-effective approach to maintenance planning, and can be extended to a full risk-based approach.
- Corrective: maintenance is carried out following detection of an anomaly in performance; this approach can be cost effective.
- Responsive (or reactive): unplanned reaction to an asset failure; this approach can be appropriate when dealing with equipment that has low impact on operations (e.g. pumps that operate in duty/standby).

6.2.4 Condition management strategies

Condition management strategies are the actions planned to be implemented that are consistent with the maintenance strategy, or in response to asset failure. Condition management strategies will ideally list the activities to be undertaken, triggers for action, resources (such as skills or critical spares), maps and drawings, safety considerations and other relevant matters.

7.0 Documentation supporting implementation

When assessing risk to water security and continuity of supply for a scheme, the Regulator will take into consideration if an asset management plan exists, if they meet the minimum standards recommended in this guide, and if there is evidence that the plans are being implemented, or there is evidence that the water service provider has the capacity to implement the plans when required.

Examples of evidence of asset management implementation and capacity to implement include:

- Asset register:
 - a description of the asset hierarchy²
 - an electronic copy of the asset register.
- Tactical asset management plans (AMPs):
 - a list of the tactical AMPs that have been prepared and when
 - a schedule of what new tactical AMPs will be developed and when
 - selected examples of tactical AMPs
 - examples of inspection and monitoring programs.
- Capital works program for asset maintenance:
 - a program of major capital works (refurbishments and replacements) exists that:
 - covers each year for the next five years
 - is linked to the tactical AMPs and, where appropriate, an asset portfolio master plan
 - includes a summary of the project name, description, estimated capital cost, commencement, and completion dates
 - a copy of any approved and forecast budgets for capital expenditure

- a summary of capital expenditure for each year in the previous five years.
- Operating costs for asset maintenance:
 - an estimate of the planned operating costs for the next financial year linked to the tactical AMPs
 - a copy of any approved and forecast budgets for operating expenditure
 - a summary of operating expenditure for each year in the previous five years.
- A summary of capital and operating expenditure for asset management for each year in the past five years according to key indicators, such as:
 - proactive (planned) versus reactive (responsive) activities
 - type of asset (such as civil, mechanical, electrical, process control, information, and communications technology) compared to the value of the asset types.
- Regular monitoring and review (see also Section 8.0 following):
 - a history of document review and revision evolved over time
 - performance indicators are established against objectives and regularly reported on (for example, customer service standards).

8.0 Monitoring and review

To understand and improve the effectiveness of asset management planning, there should be monitoring and review of the asset management planning activities described in this guideline.

Consideration should be given to understanding if:

- actions are being implemented as planned
- implemented actions are delivering the intended results
- there are opportunities for clarifying or improving the planning process.

The strategic asset management plan should be reviewed at least once every ten years, or more frequently if triggered by a significant change to any key assumptions, scope, context, assets, services or objectives.

Tactical AMPs should be continuously monitored and updated to keep pace with advances in technology and asset management practices, and contribute to the achievement of asset management objectives. A full review of tactical AMPs should be undertaken at least once every ten years. Consideration should be given to developing a rolling program of plan reviews.

9.0 References and supplementary resources

This guideline was developed using the following key references.

- Standards Australia, (2014), AS ISO 55000:2014: *Asset management - Overview, principles and terminology*. www.standards.org.au
- Standards Australia, (2014), AS ISO 55001:2014: *Asset Management - Management systems – Requirements*. www.standards.org.au

Supplementary information resources to support asset management planning can be found at:

- Department of Local Government (2011), *Asset Management, Framework and Guidelines*, Government of Western Australia, accessed 20/01/21 from www.dlgsc.wa.gov.au
- Department of State Development, Manufacturing, Infrastructure and Planning (2020), *Strategic Asset Management Plan Framework – Overview*, Queensland Government, accessed 20/01/21 from www.statedevelopment.qld.gov.au
- Department of Local Government, Infrastructure and Planning (2015), *Investment policy guidelines for local government*, Queensland Government, accessed 20/01/21 from www.dlgrma.qld.gov.au
- Queensland Treasury (2017), *Gateway Review Process Guidelines*, Queensland Government, accessed 20/01/21 from www.treasury.qld.gov.au
- Local Government Victoria 2015, *Local Government Asset Management Better Practice Guide*, accessed 20/01/21 from www.localgovernment.vic.gov.au
- Seqwater 2020, *Asset Management Policy*, accessed 20/01/21 from www.seqwater.com.au.

Additional material on asset management might be available from industry and professional organisations such as:

- Water Services Association of Australia at www.wsaa.asn.au
- Queensland Water Directorate at www.qldwater.com.au
- Institute of Public Works Engineering Australasia at www.ipwea.org
- The Asset Management Council at www.engineersaustralia.org.au

10.0 Guideline review

The Department of Regional Development, Manufacturing and Water invites water service providers to email any feedback on this document to UrbanWaterSupply@rdmw.qld.gov.au. It is planned that this guideline will be reviewed within 18 months of its release, and then every five years (or earlier if required).

Appendix A. Examples of asset management systems



Figure A1: Redland City Council asset management system (for example purposes)

Source: Redland City Council, Strategic Asset Management Plan 2019-2029, accessed 07/04/2020, <https://www.redland.qld.gov.au>

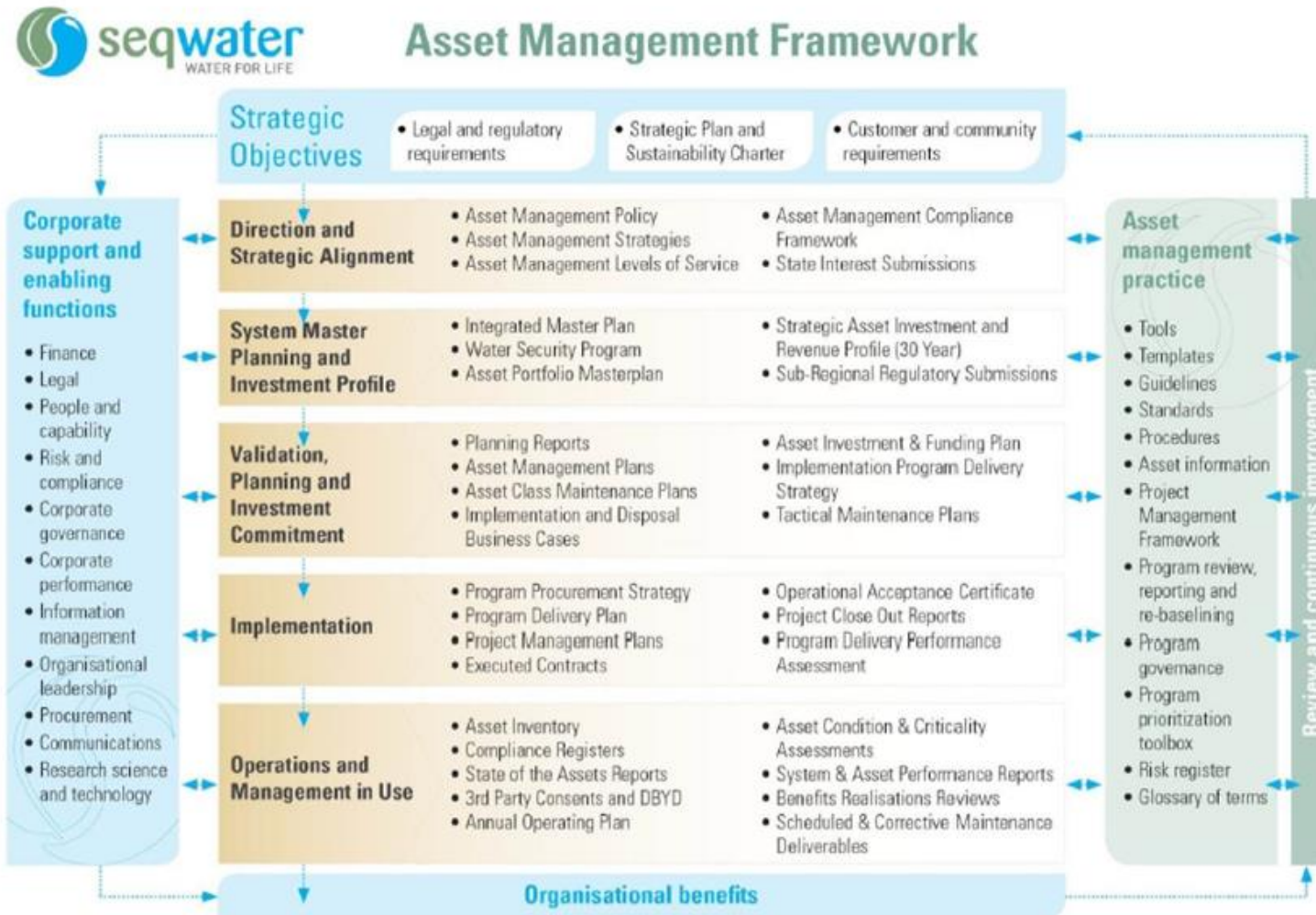


Figure A2: Seqwater asset management framework, 2014
(for example purposes)

Source: Seqwater 2014, Seqwater Bulk Water Prices 2015 to 2018, accessed 8/09/20, <https://www.qca.org.au/project/urban-bulk-water/seqwater-bulk-water-investigations>.

