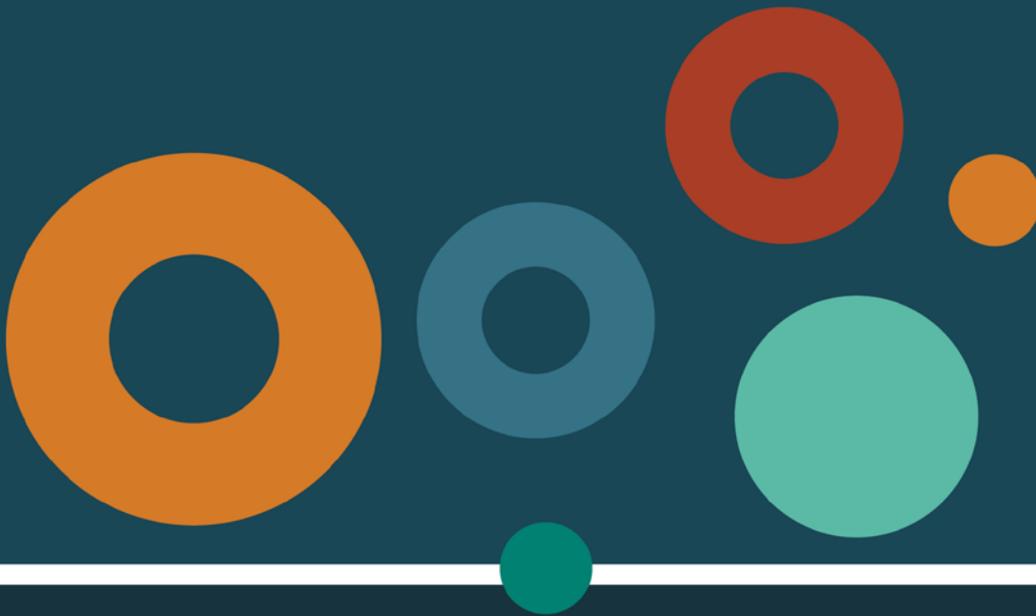


# Drinking Water Quality Management Plan Guideline

November 2018



This publication has been compiled by Water Supply Regulation of Operations Support, Department of Natural Resources, Mines and Energy.

© State of Queensland, 2018

The Queensland Government supports and encourages the dissemination and exchange of its information. The copyright in this publication is licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

Under this licence you are free, without having to seek our permission, to use this publication in accordance with the licence terms.



You must keep intact the copyright notice and attribute the State of Queensland as the source of the publication.

Note: Some content in this publication may have different licence terms as indicated.

For more information on this licence, visit <https://creativecommons.org/licenses/by/4.0/>.

The information contained herein is subject to change without notice. The Queensland Government shall not be liable for technical or other errors or omissions contained herein. The reader/user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from using this information.

## Table of contents

<b>1. Introduction</b>	<b>1</b>
1.1 Scope of the <i>Water Supply (Safety and Reliability) Act 2008</i>	1
1.1.1 Administration of the Act	1
1.1.2 Definition of drinking water	1
1.1.3 Definition of drinking water service provider	1
1.1.4 Definition of drinking water service provider	2
1.2 Aim of this guideline	2
1.3 Relationships to other guidelines	2
1.3.1 Other regulatory guidelines	2
1.4 Relationships to other legislation and regulations	3
1.4.1 Public health	3
1.4.2 Other legislation and regulations	3
1.5 Other resource material	4
<b>2. Drinking water quality management plan</b>	<b>4</b>
2.1 The drinking water quality management plan	4
2.2 Purpose of the plan	5
2.3 Requirement to prepare the plan	5
2.4 Timeframes for preparing the plan	5
2.5 Multiple providers involved in preparing the plans	6
2.5.1 Augmenting a drinking water supply with recycled water	7
<b>3. Preparing the drinking water quality management plan</b>	<b>8</b>
3.1 Overview on how to prepare the plan	8
3.2 Incorporating existing plans and procedures	9
3.3 Use of risk management methodologies	9
3.3.1 Applying risk management methodologies	10
3.4 Using guideline sections 3.5 to 3.11	12
3.4.1 Key considerations	14
3.4.2 Stakeholders	15
3.5 Registered service details	15
3.5.1 Service description	15
3.6 Details of infrastructure for providing the service	16
3.7 Identify hazards and hazardous events	19
3.7.1 Information gathering—water quality and catchment characteristics	20
3.7.2 Hazard identification	22
3.8 Assessment of risks	26
3.9 Managing risks	28
3.9.1 Risk management measures	29

3.9.2 Operation and maintenance procedures .....	30
3.9.3 Management of incidents and emergencies .....	31
3.9.4 Risk Management Improvement Program .....	32
3.9.5 Service wide support—information management.....	34
3.10 Operational and verification monitoring programs .....	35
3.10.1 Operational monitoring.....	36
3.10.2 Verification monitoring .....	38
3.11 Best practice recommendations.....	39
3.11.1 Commitment to drinking water quality management .....	39
3.11.2 Employee awareness and training.....	40
3.11.3 Research and development.....	40
3.11.4 Review and continual improvement.....	41
<b>4. Approval of the plan .....</b>	<b>41</b>
4.1 Applying for approval of the plan .....	41
<b>4.2 Assessment process for the plan .....</b>	<b>41</b>
4.2.1 Regulator’s considerations when making a decision about the plan.....	41
4.2.2 Request for additional information .....	41
4.2.3 Timeframes for decisions.....	42
4.2.4 Regulator’s decisions.....	42
4.3 Approval of the plan .....	42
4.4 Conditions that can be placed on the plan.....	43
4.5 Augmenting a drinking water supply with recycled water .....	43
4.6 Appealing the decision .....	43
4.7 Amending the approved plan .....	44
4.8 Duration of the approved plan.....	44
4.9 Operating under the approved plan .....	44
4.9.1 Compliance with the conditions of the plan .....	44
<b>5. Annual reporting, reviews and audits of the plan .....</b>	<b>45</b>
5.1 Annual reporting.....	45
5.2 Reviews and audits.....	45
5.2.1 Reviews.....	45
5.2.2 Audits .....	45
<b>6. Glossary .....</b>	<b>47</b>
<b>7. References .....</b>	<b>51</b>

# 1. Introduction

The *Water Supply (Safety and Reliability) Act 2008* (the Act) commenced on 1 July 2008. The purpose of the Act is to provide for the safety and reliability of water supply throughout Queensland.

The Act also introduces new provisions relating to the management of drinking water quality, aimed at protecting public health. This outcome is achieved primarily through the regulatory framework for drinking water quality, which requires drinking water service providers to:

- undertake monitoring and reporting on drinking water quality
- have an approved drinking water quality management plan (the plan) in place.

The Act can be accessed online at <[www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)>.

## 1.1 Scope of the *Water Supply (Safety and Reliability) Act 2008*

### 1.1.1 Administration of the Act

The Act is administered by the chief executive (Director-General); of the Department of Natural Resources, Mines and Energy (the department). The chief executive of the department is the regulator under the Act. The chief executive of the department, as the regulator, has delegated certain powers under the Act to officers of Water Supply Regulation.

### 1.1.2 Definition of drinking water

The Act defines drinking water to mean water for human consumption, intended primarily as water for drinking, whether or not the water is used for other purposes. Drinking water does not include:

- a) water that is food as defined under the *Food Act 2006*<sup>1</sup>,
- or
- b) water taken or supplied for domestic purposes under the *Water Act 2000*<sup>2</sup>.

### 1.1.3 Definition of drinking water service provider

The Act defines a drinking water service provider as a water service provider for a drinking water service. A water service provider means a person registered under Chapter 2, part 3 of the Act as a service provider for a water service.

A water service does not include a service supplied by infrastructure, if:

- the infrastructure is used solely for mining purposes or
- the service is used only by:
  - (i) the owner of the infrastructure or the owner's guests or employees including, for example, guests at a resort; or
  - (ii) if the owner of the infrastructure is a body corporate for a community titles scheme under the *Body Corporate and Community Management Act 1997*—the occupants of lots in the scheme.

---

<sup>1</sup> This is water sold for human consumption (for example, bottled water) or is used by a food business that involves the handling of food intended for sale or the sale of food. It also includes water carried in bulk in a vehicle and intended for human consumption, regardless of the source of water.

<sup>2</sup> In the *Water Act 2000*, the term 'domestic purposes' includes irrigating a garden not exceeding .25 ha, being a garden cultivated for domestic use and not for the sale, barter or exchange of goods produced in the garden. Domestic purposes are sometimes referred to as 'stock and domestic' water

### **1.1.4 Definition of drinking water service provider**

A drinking water service means a water service that is:

(a) the treatment, transmission or reticulation of water for supply as drinking water;

or

(b) water collection in a water storage, if the water in the storage:

(i) includes recycled water

and

(ii) is used to augment a drinking water supply.

## **1.2 Aim of this guideline**

This guideline has been developed to provide information to drinking water service providers (providers) about preparing the plan. Section 95(3) of the Act states that the plan must be prepared in accordance with this guideline.

Information contained in this guideline includes details on:

- requirements of the Act and related criteria
- matters considered by the regulator in assessing the plan and making a decision about the plan
- operating under the plan
- amending the plan
- adopting best practice recommendations.

It is the responsibility of the provider to meet the requirements of the Act and to provide the necessary information to fulfil these requirements. This will ensure that all relevant information needed by the regulator to make a decision about the plan is available.

This guideline also contains a series of best practice recommendations in recognition of current practices that promote the safe supply of drinking water within the industry. These recommendations are primarily based on the Australian Drinking Water Guidelines (ADWG). Providers are encouraged to consider, and where possible or practical adopt, these recommendations in the plan to demonstrate their continued commitment to achieving industry best practice.

It is anticipated that this guideline will be reviewed on a regular basis.

This guideline can be accessed online at <[www.dnrme.qld.gov.au](http://www.dnrme.qld.gov.au)>.

## **1.3 Relationships to other guidelines**

### **1.3.1 Other regulatory guidelines**

This guideline is part of a suite of guidelines prepared to assist water service providers in understanding the regulatory requirements that the Act places on them. In addition to this guideline, other water related regulatory guidelines in this suite include the:

- Drinking Water Quality Management Plan Auditing and Review Guideline<sup>3</sup>

---

<sup>3</sup> The Drinking Water Quality Management Plan Auditing and Review Guideline is being developed and will be made available when approved.

- Drinking Water Quality Management Plan Annual Reporting Guideline<sup>4</sup>
- Water Quality and Reporting Guideline for a Drinking Water Service
- Water Quality Guidelines for Recycled Water Schemes
- Recycled Water Management Plan and Validation Guidelines
- Recycled Water Management Plan Exemption Guidelines
- Guidelines for the Preparation of a System Leakage Management Plan
- Guidelines for Granting Exemptions for a System Leakage Management Plan
- Guidelines for Preparing Strategic Asset Management Plans
- Guidelines for Preparing Customer Service Standards
- Guidelines for Granting Exemptions for: Strategic Asset Management Plans, Customer Service Standards and Annual Reports
- Guidelines for the Review and Regular Audit of Strategic Asset Management Plans
- Annual Reporting of Strategic Asset Management Plan and Customer Service Standards Guidelines for Service Providers
- Guidelines for the Preparation of a Drought Management Plan.

## **1.4 Relationships to other legislation and regulations**

### **1.4.1 Public health**

At the same time the Act was established, amendments were made to the *Public Health Act 2005* (Public Health Act) and the Public Health Regulation 2005 to include provisions relating to drinking water quality.

As the administrator of the Public Health Act and the Public Health Regulation, Queensland Health has:

- set specific standards for drinking water quality in the Regulation
- the power to respond when drinking water supplied by a provider may present a risk to public health or be considered unsafe<sup>5</sup>.

Under section 57E of the Public Health Act, it is an offence for a provider to supply drinking water that the provider knows, or reasonably ought to know, is unsafe. The maximum penalty for the offence is 3000 penalty units or two years imprisonment.

Section 57C of the Public Health Act states that 'drinking water is unsafe at a particular time if it would be likely to cause physical harm to a person who might later consume it, assuming nothing happened to it after that particular time and before being consumed by the person that would prevent its being used for its intended use'.

### **1.4.2 Other legislation and regulations**

The operations of a water service or a drinking water service (the service); will also be covered under other state and Commonwealth legislation, such as:

---

<sup>4</sup> The Drinking Water Quality Management Plan Annual Reporting Guideline is being developed and will be made available when approved.

<sup>5</sup> For example, Queensland Health can require action to be taken to protect public health by the issue of a public health order or an improvement notice to a provider.

- *Workplace Health and Safety Act 1995*
- *Plumbing and Drainage Act 2002*
- *Sustainable Planning Act 2009*
- *Water Fluoridation Act 2008*
- *Environmental Protection Act 1994*
- *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009*
- *Water Act 2000*
- *Trade Practices Act 1974.*

The requirements of the Act do not negate the requirements of other legislation unless where expressly stated. It is the responsibility of the provider to determine and ensure compliance with relevant legislative obligations. The provider is also responsible for obtaining any necessary approvals under the other Acts to ensure the continued operation of the service. The plan only relates to matters under the *Water Supply (Safety and Reliability) Act 2008*.

## **1.5 Other resource material**

It is recognised that a variety of existing resources are used by industry to ensure the safe supply of drinking water. While these resources hold valuable information on supplying safe drinking water, providers may also find them useful when preparing the plan. Refer to the *Preparing a Drinking Water Quality Management Plan: Supporting Information (supporting information)* document which accompanies this guideline for further information relating to these resources.

## **2. Drinking water quality management plan**

### **2.1 The drinking water quality management plan**

The drinking water quality management plan (the plan) is about the storage, treatment, transmission or reticulation of water for drinking by a provider. Under section 95 of the Act, the plan must be prepared by a provider and must:

- (i) state the registered services to which the plan applies
- (ii) include details of the infrastructure for providing the services
- (iii) identify the hazards and hazardous events the drinking water service provider considers may affect the quality of water to which the services relate
- (iv) include an assessment of the risks posed by the hazards and hazardous events
- (v) demonstrate how the drinking water service provider intends to manage the risks posed by the hazards and hazardous events
- (vi) include details of the operational and verification monitoring programs under the plan, including the parameters to be used for indicating compliance with the plan and the water quality criteria for drinking water.

No exemptions will be granted by the regulator from preparing the plan.

Refer to Chapter 3 of this guideline for detailed information on the matters to be considered and/or included in the plan.

## 2.2 Purpose of the plan

In accordance with section 94 of the Act, the purpose of the plan is to protect public health through the identification and minimisation of any public health related risks associated with drinking water.

The drinking water quality management provisions in Queensland follow a risk management approach and it is intended that the plan be a documented, risk-based system for managing the supply of drinking water. It is also intended that the plan be a living document that reflects the requirements of the provider and be actioned through the provider's day to day activities now and in the future. To ensure that this is achieved, senior management should be actively involved in the development and implementation of the plan and encourage an organisational philosophy and culture that supports drinking water quality. The plan should be viewed by the provider as a means of achieving drinking water quality outcomes (in the short and long-term) and demonstrating that drinking water quality management measures are in place.

## 2.3 Requirement to prepare the plan

Section 95(1) of the Act states that each provider must prepare the plan for the service and apply to the regulator for approval of the plan (this includes providers that supply bulk water, manufactured water and distributor-retailer services). While a service may comprise of one or more discrete drinking water schemes<sup>6</sup> (scheme(s)), all the schemes must be covered by the plan. Non-potable water supply schemes are not to be included in the plan.

The costs of preparing and maintaining the plan must be borne by the provider.

## 2.4 Timeframes for preparing the plan

An approved plan is not required while transitional periods are in place. Table 1 outlines the statutory deadlines for requiring an approved plan. Providers must submit the plan in advance of the dates to allow sufficient<sup>7</sup> time for the regulator to consider and make a decision about the plan.

**Table 1 Statutory deadlines for requiring an approved plan**

Service provider <sup>8</sup>	Timeframes
Large	Must have an approved plan in place by 1 July 2011
Medium	Must have an approved plan in place by 1 July 2012
Small	Must have an approved plan in place by 1 July 2013
Providers that store or treat source water containing recycled water <sup>9</sup> intended to augment a drinking water supply	Must have an approved plan before recycled water used to augment a drinking water supply can be added to the source water
New drinking water service provider	Must have an approved plan one year after the day of becoming a provider
Under section 629 of the Act, the regulator may require the plan to be prepared at an earlier time, if the regulator is satisfied or reasonably believes that the continued	

<sup>6</sup> For a definition of a drinking water scheme, see the glossary of this guideline, or the Water Quality and Reporting Guideline for a Drinking Water Service.

<sup>7</sup> Refer to section 4.2.3 of this guideline for timeframes for decisions.

<sup>8</sup> For the definition of large, medium and small service provider, see the glossary of this guideline, or schedule 3 of the Act.

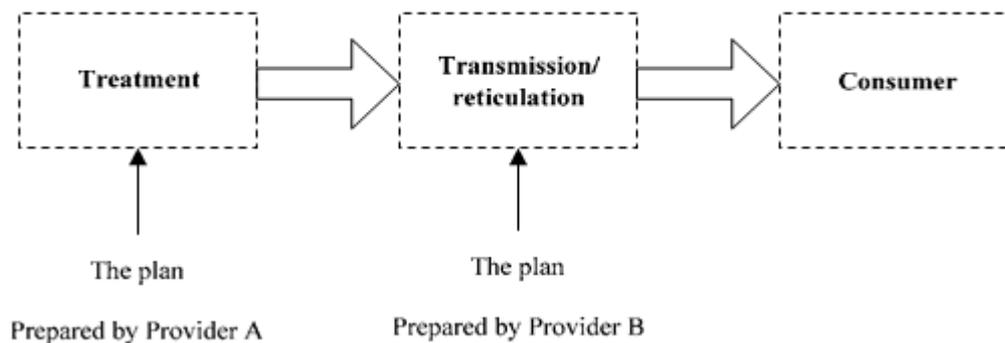
<sup>9</sup> In the context of this guideline, recycled water refers to recycled water that is used to augment a drinking water supply. This is commonly known as purified recycled water (PRW).

## 2.5 Multiple providers involved in preparing the plans

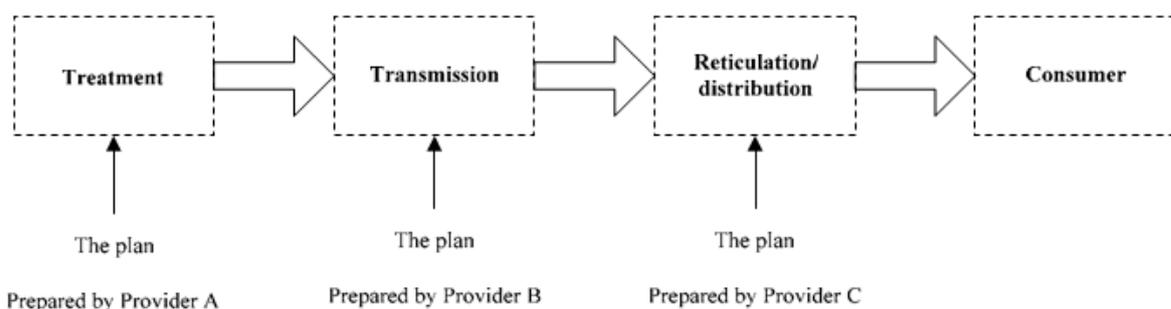
In the majority of cases, the service serving one or more communities would be owned and operated by a single provider. However, there are situations where the supply of drinking water to a community may involve multiple providers. For example, where:

- a provider supplies bulk treated water to another provider or providers, who are responsible for treatment, transmission and reticulation to the community served (refer to figure 1)
- a provider supplies bulk treated water to a second provider who is then responsible for the transmission of the water to a third provider (or group of providers). This third provider (or group of providers) is responsible for the reticulation to the community served (refer to figure 2)
- a recycled water provider supplies recycled water for the purposes of augmenting drinking water to another provider, who is then responsible for treatment, transmission and reticulation of water to the community served (refer to figure 3).

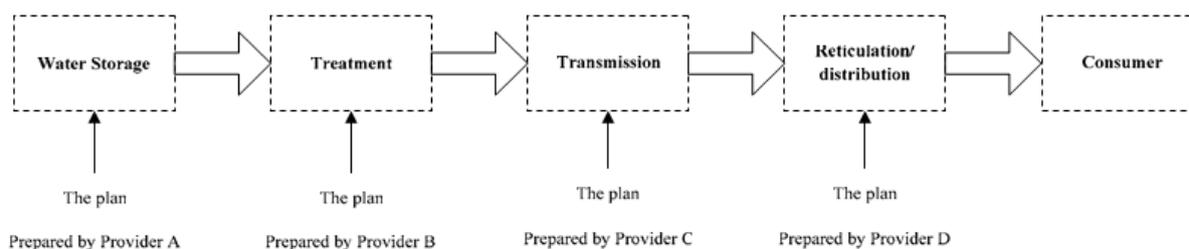
The Act requires each provider to prepare the plan relating to the service. Where there are multiple providers involved in the supply of drinking water to a community or communities, each provider must prepare the plan that relates to their respective service. As shown in the diagram below, while each plan is linked to the other as a result of the drinking water supply chain, a provider is only responsible for the preparation of the plan that relates to their service.



**Figure 1 Provider supplying bulk treated water to another provider for the treatment, transmission and reticulation**



**Figure 2 Provider supplying bulk treated water to other provider for treatment, transmission or reticulation**



**Figure 3 Bulk water provider receives recycled water into their water storage for the purposes of augmenting a drinking water supply**

The linkages between these plans are critical to the protection of public health as the supply of water from the catchment to the consumer is seen as a continuum. All multiple providers involved in the supply of drinking water play a key role in protecting public health. Therefore, it is vital that each multiple provider understands:

- their role and responsibilities in the supply of drinking water
- how the provider's actions impact another provider's infrastructure or quality of water received or supplied
- their role in managing the situation when the water quality is compromised.

The relationship between multiple providers is important particularly those immediately upstream or downstream to their service. Each provider should consider available and relevant information to ensure hazards and risks are effectively managed from catchment to consumer.

In preparing the plan, the provider should consider, where relevant:

- existing agreements and arrangements between providers for the supply of water
- communication protocols
- emergency response plans, protocols and procedures
- general reporting (including incident reporting), management protocols and procedures
- water quality monitoring programs
- other related documents, actions or matters.

Chapter 3 of this guideline outlines specific criteria that relate to multiple providers. It is recognised that due to commercial-in-confidence issues, some aspects of the information relating to the specific criteria (that is, catchment characterisation, hazard identification, risk assessment) may not be readily available between providers, however, providers should endeavour to use all their available knowledge and information to address the criteria in the plan.

The applicability of some of the criteria may vary across multiple providers based on the provider's service. For example, catchment characterisation is not required by a provider that only undertakes transmission or distribution services, however, the provider should be aware of the quality of water entering or leaving their service, and any hazards that may impact on their service from an upstream provider. Similarly, a provider that undertakes distribution is not required to provide information relating to treatment and disinfection processes in the plan unless it forms part of their service.

### **2.5.1 Augmenting a drinking water supply with recycled water**

When a drinking water service is augmented with recycled water, the Act requires both a drinking water quality management plan and a recycled water management plan to be approved before recycled water

is introduced into the drinking water supply. The drinking water quality management plan for the receiving water storage must be approved by the regulator before the recycled water management plan can be approved.

The provider must adequately consider the hazards and risks associated with the augmentation of drinking water with recycled water, and any other existing plans relevant to the supply, when preparing the drinking water quality management plan for the receiving water storage. The drinking water quality management plan(s) and the recycled water management plan must collectively demonstrate the management of risks from the catchment to the consumer to protect public health.

### **3. Preparing the drinking water quality management plan**

This chapter outlines information relevant to a provider when preparing the plan, including:

- an overview on how to prepare the plan
- incorporating existing plans and procedures
- the specific criteria that the provider must meet in accordance with the Act
- best practice recommendations.

#### **3.1 Overview on how to prepare the plan**

Section 95(3) of the Act states that the plan must be prepared in accordance with this guideline. It should be noted that:

- each provider must submit the plan for the service that addresses the legislative requirements. The plan may comprise of:
  - a number of sub-parts to address each scheme associated with the service
  - a collection of existing documents including
    - supporting documentation such as other existing plans (for example, Hazard Analysis and Critical Control Point (HACCP) and ADWG
    - referenced documents and procedures
    - any additional information.
- the detail and complexity of the plan or sub-parts of the plan may vary due to the differences in scheme complexity, size and risks. Overall the level of detail in the plan must be sufficient to support the requirements of the Act aimed to protect public health
- while the plan may be structured in various ways, the criteria outlined in this guideline must be addressed. The provider must demonstrate how they comply with each criteria, rather than simply stating that they do comply
- sufficient supporting information is required to demonstrate how the criteria have been met. However, routine operational and maintenance procedures may simply be referenced<sup>10</sup> in the plan (for example, calibration of testing equipment manual or mains breaks repairs procedures). In considering the plan, the regulator may request this documentation if required (refer to guideline section 4.2.2)

---

<sup>10</sup> This existing documentation should clearly indicate where the relevant information can be found, to which criteria it applies and to which scheme it relates.

- the criteria are presented in this guideline to align with the requirements of the Act. A provider may choose to address all related criteria collectively and present the information as a component in the plan. For example, all criteria relating to stakeholders or multiple providers may be addressed in a stakeholder or multiple provider section within the plan
- multiple providers involved in the supply of drinking water have an obligation to be aware of the impacts the service may have on an upstream or downstream service and vice versa. Where information on an upstream or downstream service is sought, the provider must, to the best of their ability and knowledge, provide this information to address the relevant criteria
- where further information is required to meet the legislative requirements which was not available at the time of submission of the plan, or additional risk management measures are required, this information should be identified and documented in a separate part of the plan (refer to guideline section 3.9.4).

## **3.2 Incorporating existing plans and procedures**

A provider may have existing plans or documents that meet all or part of the requirements of the Act, such as:

- risk assessments
- operation and maintenance manuals
- corporate procedures and forms
- other regulatory management plans (for example, strategic asset management plans).

Where a provider submits existing documentation to meet the requirements of the Act, the provider should clearly indicate where the relevant information can be found, to which criteria it applies and to which scheme it relates.

The provider must also ensure that existing plans or documents that are being used are current and relevant to the criteria.

## **3.3 Use of risk management methodologies**

Risk management focuses on reducing the likelihood of hazards and hazardous events occurring and proactively managing incidents and emergency responses. Risk management is gaining importance within the water industry. There are a range of existing risk identification and management methodologies that could be used to form the basis of the plan such as ADWG, HACCP, ISO 22000 or AS/NZS ISO 31000:2009.

Any risk management methodology can be used for the plan as long as it meets the legislative requirements of the Act. The methodology must be identified in the plan and consistently applied within each scheme. Table 2 provides an overview of where existing risk management methodologies may be used to address the legislative requirements of the Act. In the plan, a provider can, where applicable, use information from any existing risk management methodologies, they may have in place such as ADWG, HACCP or AS/NZ ISO 31000:2009 to satisfy the legislative requirements of the Act. However, it is important to recognise that these risk management methodologies do not address all the requirements. Therefore it is the provider's responsibility to submit any additional information to meet these requirements. For example, if a provider has a HACCP framework in place for managing their drinking water supply, they can submit this information as part of the plan. The provider must submit the additional information in the plan that may not be part of HACCP (for example, registered service details

and information gathering for water quality and catchment characteristics) to fully comply with the legislative requirements of the Act.

### 3.3.1 Applying risk management methodologies

It is important to recognise each risk management methodology uses different terminology. This guideline generally uses the terms from the ADWG. As such, the terminology used in this guideline is different to that used in HACCP or AS/NZ ISO 31000:2009, but may have the same meaning or intent as the Act requirements. Where this is the case, the HACCP or AS/NZ ISO 31000:2009 terminology can be used in the plan. For example, preventive measure in the ADWG has the same meaning as a control measure in HACCP and can be referenced as a control measure in the plan. It is preferable that terminology included as part of the plan, where different to that adopted or referenced in this guideline, is described.

**Table 2 Act requirements compared to ADWG, HCCP and AS/NZS ISO 31000:2009 components**

Requirements under the Act	Reference in this guideline	Related ADWG element	Related HACCP task	Related AS/NZS ISO 31000:2009 component
Registered service details				
Section 95(3)(b)(i): state the registered services to which the plan applies	3.5 Registered service details			Establish the context
Details of infrastructure for providing the				
Section 95(3)(b)(ii): include details of the infrastructure for providing the services	3.6 Details of infrastructure for providing the service	2.1 Water supply system analysis (construct a flow diagram, document key characteristics)	Task 4: Construct flow diagram	Establish the context
Identify hazards and hazardous				
Section 95(3)(b)(iii): identify the hazards and hazardous events the drinking water service provider considers may affect the quality of water to which the services relate	3.7.1 Information gathering—water quality and catchment characteristics	2.2 Assessment of water quality data (assess historical water quality data, exceedances and trend analysis)		Risk assessment (analysis and evaluation)
	3.7.2 Hazard identification	2.1 Water supply (catchment to consumer) 2.1 Water supply system analysis (assemble a team)	Task 1: Assemble HACCP team	Develop risk criteria

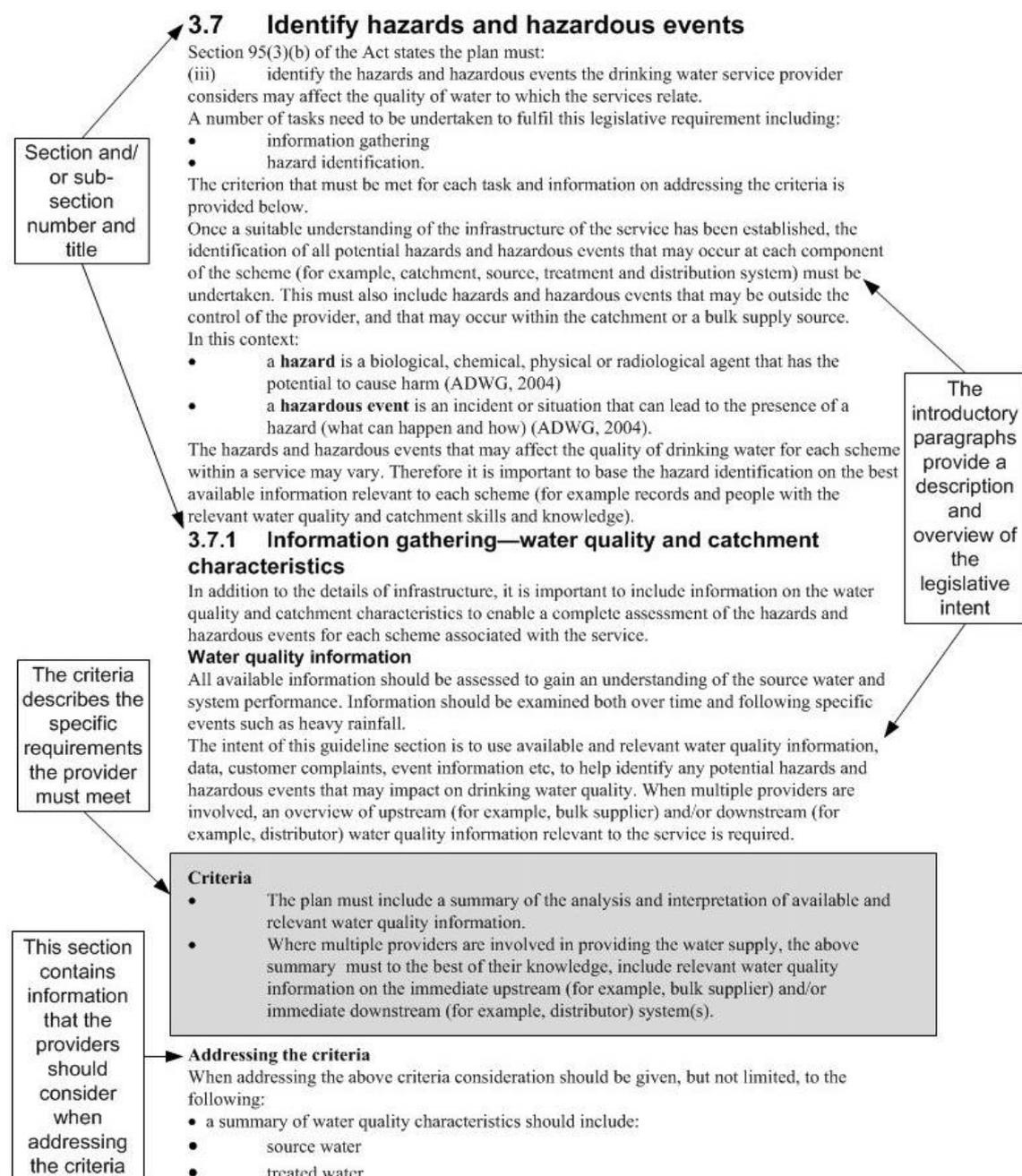
Requirements under the Act	Reference in this guideline	Related ADWG element	Related HACCP task	Related AS/NZS ISO 31000:2009 component
		2.3 Hazard identification and risk assessment (define methodology, identify and document hazards)	Task 6: List all potential hazards, conduct hazard analysis	Risk assessment: (identification)
Assessment of risks				
Section 95(3)(b)(iv): include an assessment of the risks posed by the hazards and hazardous events	3.8 Assessment of risks	2.3 Hazard identification and risk assessment (evaluate hazards and estimate the risk levels)	Task 6: consider methods to control identified hazards	Risk treatment
Managing risks				
Section 95(3)(b)(v): demonstrate how the drinking water service provider intends to manage the risks posed by the hazards and hazardous events	3.9.1 Risk management measures	3.1 Preventive measures and multiple barriers (identify measures and where improvements are necessary)  7.1 Employee awareness and training (communications mechanisms, qualifications)	Task 6: Identify control measures  Task 7: Determine critical control points  Task 8: Establish critical limits for each Critical Control Point (CCP) Training requirement	Preparing and identifying risk treatment plans
	3.9.2 Operation and maintenance procedures	4.1 Operational procedures (identify and document)  4.4 Equipment calibration and maintenance	Task 12: Work procedures should be developed for each CCP	
	3.9.3 Management of incidents and	4.3 Corrective actions (document actions for control excursions and communications systems) 5.4 Corrective actions (document actions for non-conformance)	Task 10: Establish corrective actions	Recording the risk management process

Requirements under the Act	Reference in this guideline	Related ADWG element	Related HACCP task	Related AS/NZS ISO 31000:2009 component
	3.9.4 Risk management improvement program	6.1 Communication  6.2 Incident and emergency response  10.2 Reporting protocols 12.2 Drinking water quality management improvement plan	Task 10 Establish corrective actions	Recording the risk management process
	3.9.5 Service wide support – information management	5.3 Short term evaluation of results  10.1 Management of documentation and records	Task 12 Establish documentation and record keeping	
Operational and verification monitoring				
Section 95(3)(b)(vi): include details of the operational and verification monitoring programs under the plan including the parameters to be used for indicating compliance with the plan and the water quality criteria for drinking water	3.10 Operational and verification monitoring programs	3.2 Critical control points  4.2 Operational monitoring (document protocols, set criteria)  5.1 Drinking water quality monitoring  11.1 Long-term evaluation of results	Task 9 Establish a monitoring system for each CCP  Task 11 Establish verification and auditing— establish procedures for verification, confirm efficacy	Monitoring (and review)

### 3.4 Using guideline sections 3.5 to 3.11

Guideline sections 3.5 to 3.10 are based on the legislative requirements under section 95(3) of the Act and follow a standard format, including:

- a section or sub-section number and title
- introductory paragraphs
- criteria—the criteria describe the specific requirements the provider must meet. These requirements are mandatory as they are legislative requirements under the Act and use the word ‘must’. Information required as a ‘must’ is considered the minimum amount of information needed to address the criteria
- addressing the criteria—contains information that the provider should consider when addressing the criteria. It is not intended to be a definitive list and it is the responsibility of the provider to ensure that sufficient, relevant information is provided to demonstrate that they have met the criteria to allow the regulator to make a decision about the plan.



Section 3.11 of this guideline also outlines a number of best practice recommendations. Based on the ADWG, these recommendations reflect current practices within the industry to promote the safe supply of drinking water. There is no requirement under the Act for these recommendations to be incorporated and they will not be assessed by the regulator in making a decision about the plan. Consequently, they do not have any criteria listed. However, the consideration and inclusion of these recommendations in the plan is encouraged, to demonstrate the provider's continued commitment to achieving industry best practice.

### 3.4.1 Key considerations

Guideline sections 3.5 to 3.10 are based on the legislative requirements under section 95(3) of the Act. The relationship between these guideline sections is illustrated in the supporting information which accompanies this guideline. In preparing the plan, it is important to note:

- the provider must submit all relevant and available information for the service, an each scheme associated with it, to meet the legislative requirements of the Act. Where there is insufficient information about the plan to make a decision, the regulator may request additional information (refer to guideline section 4.2.2)
- the plan must contain the necessary information to fulfil each criteria, outlined in the shaded boxes under guideline sections 3.5 to 3.10, for the service and each scheme associated with it, to enable the regulator to make a decision about the plan
- the criteria are further explained in the addressing the criteria section. This section provides an indication of the type of information the regulator believes will assist in fulfilling the requirements of the criteria
  - the provider may submit information on all or some of the items listed in the addressing the criteria section. The level of information provided in the plan is dependent on the service, its size and complexity and the availability of information for all or some of the schemes associated with it.
- the structure of the plan will vary from provider to provider. It is up to the provider to determine the best way to present the information. It may be worth considering the plan as a narrative on how the provider manages its service from catchment to the consumer to protect public health
  - in some cases, further information may be required to address particular criteria for a scheme associated with the service, where the relevant information was not available at the time the plan was submitted:
  - the Risk Management Improvement Program<sup>11</sup> is an acceptable approach for addressing additional information requirements for one or more criteria for a scheme, where the information was unavailable at the time of the plan submission, and additional risk management measures that are required in the short, medium or long-term to address unacceptable risks to protect public health
  - the Risk Management Improvement Program must detail the outcomes to be achieved (for example, the type of information required or risk management measure to be put in place), the actions to be undertaken to achieve the outcomes (for example, the process for obtaining information or steps to be followed to put additional measures in place) and the timeframes in which the actions are to be completed

---

<sup>11</sup> Refer to guideline section 3.9.4

- the Risk Management Improvement Program is part of the plan and forms part of the regulator's decision with respect to the appropriateness of the plan to protect public health.

### 3.4.2 Stakeholders

An integrated management approach with the collaboration from all relevant stakeholders is essential for effective drinking water quality management. Throughout guideline sections 3.5 to 3.10, reference is made to stakeholders in the relevant criteria. Key stakeholders who are actively involved and therefore could affect the quality of the drinking water, or be affected by the decisions or activities of the service or each scheme associated with the service are required to be identified in the plan. Appropriate mechanisms and levels of stakeholder engagement (for example, meetings, workshops, newsletters etc) should also be developed. Whilst community is an important stakeholder in the quality of drinking water supply, a general community consultation process is not considered necessary in the preparation of the plan, in most circumstances.

The following are examples of the types of stakeholders that should be included:

- upstream suppliers
- catchment users and/or managers
- downstream customers
- vulnerable customers
- material suppliers
- the community served
- internal organisation units
- regulatory agencies or statutory authorities (for example, regulator, catchment boards).

### 3.5 Registered service details

Section 95(3)(b) of the Act states the plan must:

- state the registered service provider to which the plan applies.

This guideline section requires the registered service details to be provided with the intent being to clearly identify the service, the scheme(s) and the communities to which the plan applies.

#### 3.5.1 Service description

##### Criteria

- The plan must contain information on the registered service, including the:
  - service provider identification number (SPID)
  - service provider name and contact details. If the service provider is not the operator, then the operator's name and contact details must also be provided
  - name of each scheme to which the plan applies
  - name of the communities that are supplied including the current and future (next 10 years) populations, connections and demands.

##### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details of the service (for example, SPID, name and contact details, name of scheme(s)) could be provided using the Drinking Water Quality Management Plan Approval Application form
- current and future projections should include
  - name of the community served by the scheme
  - current population of the community served (i.e. number of persons), number of connections and the water demand (i.e. volume)
  - projected future population of that community (i.e. number of persons), likely increase in the number of connections and the likely increase in water demand for the next 10 years (i.e. volume).

### **3.6 Details of infrastructure for providing the service**

Section 95(3)(b) of the Act states the plan must:

- (ii) include details of the infrastructure for providing the services.

Understanding the infrastructure of the service is a critical first step for identifying the hazards and hazardous events that can compromise drinking water quality, and ensuring that risks are addressed.

For the purposes of this guideline, infrastructure details include all the key components that form part of the service, from catchment to consumer, including:

- source
- treatment process
- disinfection process
- distribution and reticulation system including reservoirs and pump stations
- stakeholders (who are relevant to drinking water quality management)

This guideline section outlines the infrastructure details of the service that are required to be provided. The plan must contain sufficient information on infrastructure details for, and the communities served by, each scheme associated with the service. The plan must contain sufficient information to demonstrate that the provider has an understanding of each scheme and its operation.

## Criteria

- The plan must describe the details of the infrastructure including the following:
- A schematic layout for each scheme must be included in the plan and must:
  - be representative of the scheme as at the date of the submission of the plan
  - include all components of the scheme from catchment to consumer (even when a bulk supplier exists upstream of the distributor)
  - show the linkages between the major infrastructure elements including sources, treatment plants, reservoirs, pump stations and re-chlorination facilities
  - include the locations of changes in infrastructure ownership and operational responsibility
- Source details for each scheme must be provided in the plan. These details must contain information on the:
  - water source(s) including
    - name
    - characteristics
    - performance
  - Source infrastructure
- Treatment process details for each drinking water source must be provided in the plan. These details must contain information on:
  - the process steps
  - the relationship between each step design capacity
  - operation
  - current loading
  - availability of stand-by equipment
  - proportion of flow from each source
  - proportion of scheme supply distribution area
  - a list of chemicals (if added).
- A description of any variations to process operation (for example, bypassing a process step) must be included in the plan.
- A schematic(s) representing the treatment process(es) must be included in the plan.
- Any sources that do not undergo a treatment process must be identified and an explanation as to why no treatment process exists must be included in the plan.
- Disinfection process(es) for each drinking water source must be provided in the plan. These details must include:
  - location
  - type
  - operation.

Any sources that do not undergo a disinfection process must be identified and an explanation as to why no disinfection process exists must be included in the plan.

- Details of the distribution and reticulation system must be included in the plan. These must include the:
  - extent
  - characteristics
  - operation.
- Key stakeholders, who have been actively involved in the management of drinking water quality, and their relevance, must be identified for each scheme and detailed in the plan

### **Addressing the criteria**

When addressing the above criteria consideration should be given, but not limited, to:

- Schematics should generally be at the level illustrated in the supporting information which accompanies this guideline.
- The details of each water source should include:
  - name
  - proportion of scheme supply
  - historical performance (for example, does it run dry or to very low levels)
  - water quality issues (for example, blue-green algae, pesticides, fluoride, radiological agent, nitrates etc.).
- The details of the source infrastructure should include (where appropriate):
  - for surface water:
    - intake location
    - type of intake structure (for example, flexible, fixed)
    - multiple off take level capability
    - protection from debris and flood damage
  - for groundwater: pre-treatment (for example, aeration for groundwater):
    - bore location, depth
    - aquifer description:
      - depth and thickness
      - confined/unconfined
      - fast or slow response to events on surface
  - bore construction details, for example:
    - casing (for example, depth, diameter, material, age)
    - borehead details to prevent contamination.

- Details of the treatment processes(es) should include:
  - flocculants used
  - type of sedimentation
  - chemical correction
  - filtration and type of filter media
  - fluoridation.
- The schematic of the treatment process(es) should show the linkages between each treatment step.
- Details of the disinfection process(es) should include:
  - location (including re-disinfection facilities)
  - type of disinfection and make and age of infrastructure
  - chemical dosing (where applicable)
  - dose rate and dosing arrangements (for example, fixed, flow-,;aced, residual analyser)
  - target residual levels (where applicable)
  - duty/stand-by available and description:
    - alarms (for example, failure, low/high residual)
    - auto shut-off arrangements.
- Details of the distribution and reticulation system should include:
  - pipe material and age range
  - approximate proportion of total length of each material
  - areas where potential long detention periods could be expected
  - areas where low pressure could be expected
  - details of reservoirs (for example, name, type, capacity, roofed Y/N)
  - details of pump stations (for example, number and location).
- Details of key stakeholders<sup>12</sup> who have been actively

### **3.7 Identify hazards and hazardous events**

Section 95(3)(b) of the Act states the plan must:

- (iii) identify the hazards and hazardous events the drinking water service provider considers may affect the quality of water to which the services relate.

A number of tasks need to be undertaken to fulfil this legislative requirement including:

- information gathering
- hazard identification.

The criterion that must be met for each task and information on addressing the criteria is provided below.

---

<sup>12</sup> Refer to guideline section 3.4.2 for further details on stakeholders. Stakeholders would generally include the community, however a general community consultation process is not considered necessary in all circumstances.

Once a suitable understanding of the infrastructure of the service has been established, the identification of all potential hazards and hazardous events that may occur at each component of the scheme (for example, catchment, source, treatment and distribution system) must be undertaken. This must also include hazards and hazardous events that may be outside the control of the provider, and that may occur within the catchment or a bulk supply source.

In this context:

- a **hazard** is a biological, chemical, physical or radiological agent that has the potential to cause harm (ADWG, 2004)
- a **hazardous** event is an incident or situation that can lead to the presence of a hazard (what can happen and how) (ADWG, 2004).

The hazards and hazardous events that may affect the quality of drinking water for each scheme within a service may vary. Therefore it is important to base the hazard identification on the best available information relevant to each scheme (for example, records and people with the relevant water quality and catchment skills and knowledge).

### **3.7.1 Information gathering—water quality and catchment characteristics**

In addition to the details of infrastructure, it is important to include information on the water quality and catchment characteristics to enable a complete assessment of the hazards and hazardous events for each scheme associated with the service.

#### **Water quality information**

All available information should be assessed to gain an understanding of the source water<sup>13</sup> and system performance. Information should be examined both over time and following specific events such as heavy rainfall.

The intent of this guideline section is to use available and relevant water quality information, data, customer complaints, event information etc, to help identify any potential hazards and hazardous events that may impact on drinking water quality. When multiple providers are involved, an overview of upstream (for example, bulk supplier) and/or downstream (for example, distributor) water quality information relevant to the service is required.

#### **Criteria**

- The plan must include a summary of the analysis and interpretation of available and relevant water quality information.
- Where multiple providers are involved in providing the water supply, the above summary must to the best of their knowledge, include relevant water quality information on the immediate upstream (for example, bulk supplier) and/or immediate downstream (for example, distributor) system(s).Criteria

---

<sup>13</sup> For a drinking water service that has multiple providers, source water may include the raw water entering the treatment process or treated water entering a transmission or distribution and reticulation system.

## Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- a summary of water quality characteristics should include:
  - source water
  - treated water
  - supplied water:
    - number of samples, maximum/minimum/median/standard deviation, annual values for the above (where appropriate)
- a commentary on figures or information given, should include reasons for:
  - trends
  - exceedences
  - major variations
  - abnormal results
  - low number of results or no results for some relevant characteristics
  - potential problems
- a commentary on the validity of the data should include:
  - position of person that takes the samples, transport arrangements for off-site analysis, the testing laboratory
  - whether there have been any significant changes such as catchment characteristics, treatment process(es) during or since the period the tests were undertaken
- summary information and commentary on any water quality complaints that may have impacted on public health, should include:
  - the nature of the complaints by category (for example, dirty water, suspected illness)
  - proportion of customers affected
  - frequency of occurrence
  - likely cause of complaints
- It would also be desirable to provide the history of water quality complaints (relevant to the safety of the supply). For example: Suburb A experiences 30 dirty water complaints each week over the wet season. The provider believes that the dirty water could impair disinfection residual and therefore result in excessive *E.coli*.

### Catchment characteristics

The aim of this guideline section is to provide a broad qualitative description of the catchment characteristics. It is not anticipated that providers that are responsible for transmission or distribution will need to undertake a catchment characterisation exercise. However, the information necessary to underpin this hazard identification process should be available through the upstream entity (for example, a bulk supplier).

#### Criteria

- The catchment characteristics for each scheme's water source must be documented in the plan. This includes a description of:
  - catchment area or groundwater recharge area
  - topography
  - main geological features
  - climatic features
  - land use.

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details on the catchment characteristics should include:
  - soil type
  - annual and monthly rainfall (for example, average, maximum, minimum)
  - incidence of flooding and bushfire
  - predominant vegetation types
  - urban settlements, population and location
  - agricultural, industrial, mining and recreational activities
  - planned future activities which may impact on water quality.

### 3.7.2 Hazard identification

The plan must contain sufficient detail to indicate that the provider has identified all the hazards and hazardous events that might affect each scheme component (for example, catchment, sources, treatment and distribution system). This includes:

- all appropriate point and diffuse sources of pollution, continuous, intermittent and seasonal pollution patterns, including infrequent and extreme events
- treatment plant failure, operational error or incorrect chemical dosing
- hazards that are not under the direct control of the provider but which may impact on drinking water quality.

Where multiple providers are involved, the identification of hazards and hazardous events for each provider's plan should include those identified by the other entities (to the extent they are relevant). To ensure consistency between plans and minimise duplication of effort this information should be obtained from the other provider (where possible).

Each provider must take into account the hazards which are likely to occur, based on the infrastructure details, catchment characteristics and relevant water quality information for each scheme within the service.

The identification of potential hazards, hazardous events and the subsequent risk assessment should be undertaken by those that have the relevant skills and experience to fully assess the hazards that may affect drinking water quality. The hazard identification process should involve other members of the organisation that have the knowledge of each scheme within the service. Members may include management, operations and maintenance staff, laboratory staff, external consultants, multiple providers, stakeholders and consumer groups (where applicable). Staff responsible for undertaking the hazard identification process and risk assessment should also be involved with developing, verifying and implementing the plan.

Refer to the supporting information which accompanies this guideline for a list of examples of potential sources of hazards and hazardous events.

#### **Criteria**

- The hazards and hazardous events and the sources of the hazards and hazardous events that could adversely affect water quality must be documented in the plan, including those affecting the:
  - catchment
  - sourcing infrastructure
  - treatment plants
  - disinfection process(es)
  - distribution system.
- When multiple providers are involved, the plan must to the best of their knowledge, include the hazards and hazardous events and the sources of the hazards and hazardous events associated with the operations and water quality management processes of the other entities' systems which the provider considers could impact on the service.
- Whole of service hazards and hazardous events (*including cyber security threats and breaches with regard to water quality*) and the sources of the hazards and hazardous events must be documented in the plan.
- The plan must detail the personnel (i.e. position) responsible for the hazard identification and risk assessment process, their roles and responsibilities and how knowledge of the actual day to day operations of the scheme(s) has been included in this process.
- Key stakeholders who have been actively involved in the hazard identification process, their role and rationale for inclusion must be documented in the plan.

## Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details of the hazards and hazardous events<sup>14</sup> should include those arising from:
  - catchment activities, for example:
    - alternative water sources
    - polluted discharges
    - contaminated runoff
    - mining
    - agriculture (for example, grazing animals, pesticide spraying, fertiliser application etc)
    - intense feedlots/dairy
    - environmental events (for example, bush fire, storm events, drought etc)
    - high levels of naturally occurring fluoride or radionuclides
    - human access to catchments and recreational use of storages
    - any potential sewage or recycled water discharges within the catchment
    - land uses (for example, landfill, forestry, industry, roads, urban development)
    - PRW used for augmenting a drinking water supply
    - algal blooms within raw or source water storages
    - spillage and/or accidents in catchment
    - residence time, short circuiting and stratification of dams
  - sourcing infrastructure, for example:
    - for surface water:
      - intake details (for example, operation, ability to change levels etc)
      - raw water or source water pipeline (for example, breakages)
    - for groundwater:
      - bore details (for example, age, construction, susceptibility to ingress of poor quality water etc)
- treatment plant, for example:
  - equipment failure and/or availability of stand-by
  - treatment plant component capacity exceedences
  - operational excursions
  - inadequate treatment processes
  - use of chemicals (for example, storage, dosage etc)

---

<sup>14</sup> Refer to the supporting information which accompanies this guideline for a list of potential sources of hazards and hazardous events.

- natural disasters
- disinfection or lack of disinfection process(es), for example:
  - equipment failure and/or availability of stand-by
  - operational excursions
  - disinfection by-products
  - no, or inadequate, disinfection process(es)
- distribution system, for example:
  - equipment failure and/or availability of stand-by
  - operational excursions
  - pressure fluctuations
  - no, or inadequate, disinfectant residual
  - maintenance practices
  - aging infrastructure
  - backflow
- upstream and/or downstream infrastructure, for example:
  - re-chlorination facilities
  - balance storages
  - long delivery mains
  - potential low pressure areas
  - alternative and/or varying sources
  - catchment characteristics
  - treatment facilities
- whole of service context, for example:
  - organisation wide issues (for example, amalgamation or formation of distributor and/or retailer)
  - *all relevant cyber security hazardous events ( e.g. vulnerabilities, threats and breaches).*
  - workforce structure, skills retention, etc
- personnel involved in the hazard identification and risk assessment process, for example:
  - role in the process
  - expertise
  - knowledge of the service.
- Details of key stakeholders who have been actively involved in the hazard identification process, their role and rationale for inclusion.

### 3.8 Assessment of risks

Section 95(3)(b) of the Act states the plan must:

- (iv) include an assessment of the risks posed by the hazards and hazardous events.

Following the identification of the hazards and hazardous events relevant to each scheme, an assessment of the risk posed by each hazard is necessary in order to correctly apply risk management measures.

Risk is defined as the likelihood of identified hazards causing harm in exposed populations in a specified timeframe, including the severity of the consequences (i.e. risk = likelihood x consequence) (ADWG, 2004).

For drinking water supplies, risk assessments need to be undertaken in two stages:

- Maximum risk—assumes no preventive measures are in place<sup>15</sup>
- Residual risk—includes the mitigating effects of existing preventive measures.

Preventive measures are those actions, activities and processes that are used to prevent hazardous events from occurring or reduce the risks to acceptable levels. Refer to the supporting information, which accompanies this guideline for a list of preventive measures. The supporting information also provides an example of a risk methodology table.

For multiple providers, the risk assessment of each provider should consider the maximum and residual risk assessment results from the other provider(s) to the extent they are relevant.

Uncertainty relates to the level of confidence that is placed in the risk assessment and arises from issues such as:

- lack of complete knowledge (ADWG, 2004)
- or
- variability of information (ADWG, 2004).

The plan should recognise any uncertainties surrounding the risk assessment and factor these into the preventive measures adopted.

The plan must contain sufficient information to indicate that the provider's risk assessment outcomes have addressed the hazards and hazardous events identified.

---

<sup>15</sup> At the very least, the maximum risk should be evaluated on the basis that no treatment is provided, i.e. raw water being supplied to the community. Assessing maximum risk level prioritises risks and assists with the development of emergency incident plans in the event that major treatment components or barriers fail. It is also helps to establish the critical preventative measures across the service to guide appropriate operational procedures and monitoring to ensure these critical measures continuously effective.

## Criteria

- The plan must detail the risk assessment methodology used for each scheme including:
  - reference to a published version such as ADWG, HACCP, AS/NZS ISO 31000-2009
  - if a published version has not been used, a description of the methodology which has been used must be provided
  - the definition of likelihood, consequence and risk level used
  - an explanation of the acceptable risk level and the rationale for this selection.
- Details of the risk assessment results for each scheme's identified hazards and hazardous events must be documented in the plan, including:
  - hazard
  - source of hazard and hazardous event
  - maximum risk level or equivalent process<sup>16</sup> (i.e. without existing barriers in place for example, treatment and/or disinfection)
  - existing preventive measures including multiple barriers (i.e. treatment process steps)
  - residual risk level (i.e. with existing barriers in place for example, treatment and/or disinfection)
  - any uncertainties.
- Key stakeholders who have been actively involved in the risk assessment process, their role and rationale for inclusion must be documented in the plan.
- Where multiple providers are involved, the plan must, to the best of their knowledge, explain how the relevant maximum and residual risk assessment results from other provider's service(s) have been considered.

When addressing the above criteria consideration should be given, but not limited, to:

- Details of the risk assessment should include:
  - if different risk assessment methodologies are used for different schemes across the service, an explanation as to why
  - if significant future changes have been noted (for example, population growth), a scenario in the risk assessment
  - how the risk assessment process was conducted (for example, workshop, interviews, data analysis etc)
  - the treatment performance assumed for each multiple barrier and the rationale
  - key stakeholders.

---

<sup>16</sup> A process that assesses unmitigated risks or the situation where there are no barriers or existing control measures in place

- Where risks arise from other providers' systems or activities, the risk assessment should (where relevant):
  - consider the risk assessment results from the other provider<sup>17</sup>
  - be evaluated in the context of the risk and the measures in place by both providers
  - include maximum and residual risks from the other provider that impact on the service
  - include an assessment of the methodology adopted for the service.

### 3.9 Managing risks

Section 95(3)(b) of the Act states the plan must:

- (v) demonstrate how the drinking water service provider intends to manage the risks posed by the hazards and hazardous events.

In completing the risk assessment, the effectiveness of any existing preventive measures would have been evaluated to determine the level of residual risk (for example, low, medium, high or 1, 2, 3) for each identified hazard and any uncertainties in the results. The level of each residual risk will then need to be assessed as acceptable or unacceptable. The unacceptable residual risks will require the identification of (further) measures or actions to reduce them to an acceptable level.

It is the responsibility of the provider to determine, within the circumstances of its service and each scheme associated with the service, the appropriate measures or actions for managing risks to drinking water. These measures or actions include internal organisational measures, such as infrastructure improvements, operational procedures, workforce skills and knowledge, information management, incident and emergency management protocols or procedures, and actions by external organisations or stakeholders.

The plan must demonstrate the provider has appropriate measures or actions in place to adequately manage the identified risks and protect public health. To achieve this, the plan will need to document how:

- the existing preventive measures will be managed to ensure their ongoing effectiveness
- unacceptable residual risks will be addressed in both the short and long-term
- uncertainties in the risk assessment will be reduced
- incidents and emergencies will be managed
- information will be handled to support the management of risks.

---

<sup>17</sup> Where the other provider's risk assessment results are not available, an estimate of the risks likely to be transferred from the other providers system may need to be undertaken.

### 3.9.1 Risk management measures

#### Criteria

- The plan must contain an overall list of all the existing and proposed preventive actions or measures managed by the provider to achieve acceptable residual risks in the short and longer-term.
- Where the provider relies on an external organisation to manage a risk to their service, the plan must document what the preventive actions or measures are, and what arrangements are in place with the external organisation to ensure the measures remain effective.

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- a description of short-term measures should include:
  - replacement of equipment
  - operational procedures
  - improving workforce awareness or use of external expertise
  - information sharing processes
  - management of existing measures
- a description of longer-term measures should include:
  - alternate sourcing arrangements
  - infrastructure upgrades
  - workforce composition
  - skills gaps and training needs
  - training and skills development
  - water quality management skills in the organisation through recruitment, succession planning, mentoring etc
  - ensuring that staff are made fully aware of their responsibilities to drinking water quality (for example, through position descriptions)
  - ensuring that contractors and/or new staff have appropriate skills and knowledge
- when multiple providers are involved in the supply of recycled water to augment a drinking water supply, a summary of arrangements should include:
  - contracts, and agreements
  - service level agreements relating to volume and water quality
  - other relevant strategies and/or plans, for example:
    - communication or stakeholder strategies between providers
    - recycled water management plans and/or other provider's drinking water quality management plans

- when external organisations are relied on to manage a risk to the service, details may include:
  - preventive actions or measures including:
    - controlling stock access to source water
    - catchment land use controls and/or practices
  - arrangements with the external organisation to ensure the measures remain effective:
    - contracts, agreements
    - agreed plans and/or protocols.

### 3.9.2 Operation and maintenance procedures

Operation and maintenance procedures formalise the day-to-day activities and help to ensure that all preventive measures are effective in managing the identified risks. While operation and maintenance procedures are usually developed to manage infrastructure related aspects of the service, these procedures may also address program areas such as stakeholder or catchment management.

The plan must demonstrate the preventive measures identified in the risk assessment process, and used to achieve a documented residual risk, are supported and managed by appropriate operation and maintenance procedures. These procedures must be identified, documented and implemented.

In preparing the plan, providers should review the current practices to identify any procedures that need to be improved or upgraded and detail how this will be achieved in the Risk Management Improvement Program (refer guideline section 3.9.4 for further information).

Refer to the supporting information which accompanies this guideline for a list of potential documented operation and maintenance procedures.

#### Criteria

The plan must contain, for each existing preventive measure identified in the risk assessment as a measure for achieving the documented residual risk, a list of the documented operation and maintenance (or other) procedures that are required to ensure the integrity of the measures, including:

- title
- date last revised
- the process used for maintaining the documented procedures
- the process for implementing the procedures.

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details of the operation procedures should include:
  - a summary of routine operational practices, including changes to routine activities during abnormal conditions (for example, flooding)
- a summary of maintenance practices:
  - asset group

- maintenance activity
- frequency
- reference to a documented procedure (if applicable)
- details of the operation and maintenance procedures:
  - date that each procedure was reviewed and when any proposed new procedures will be completed
  - processes to ensure that documented procedures are accepted and implemented by staff
  - processes for documentation review, update and distribution to relevant staff
- details of procedures or practices for ensuring any other measures relied on to achieve acceptable levels of risks (for example, external organisation actions, land use planning and management) are maintained.

### 3.9.3 Management of incidents and emergencies

In addition to having preventive measures for managing risk, effective incident and emergency communication and response protocols are also essential to protect public health and important to maintain community confidence. Protocols for both internal and external communications should be established in advance.

The plan must define potential incidents and emergencies and responses to these events, including communication protocols for internal and external notification.

Staff training and follow-up investigations are also important aspects of incident and emergency management and, therefore, the process for training employees for emergency situations and the protocols for investigating incidents and emergencies, should also be established and included in the plan.

#### Criteria

- The process for managing drinking water incidents and emergencies must be described in the plan, including:
  - incidents and emergencies (*including cyber security incidents/emergencies associated with drinking water quality*)
  - the level of emergency (for example, green, amber, red or level 1, 2)
  - summary of action(s) taken for each level including emergency contacts
  - internal and external communication processes and protocols , including those with other key stakeholders that are actively involved
  - responsible positions.
- When multiple providers are involved in providing drinking water, the plan must explain how incidents and emergencies are managed between the entities.

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details on managing drinking water incidents and emergencies should include:

- defining the emergency and its incident level (for example, green, amber, red or level 1, 2)
- links to local or regional emergency or disaster management plans
- documented procedures (for example, for providing safe drinking water to customers when a high *E. coli* test result is received, or loss of supply)
- a list of people to be contacted during emergencies, including:
  - incident or emergency type
  - organisation (including the department):
    - contact position(s)
    - contact details
    - communication protocols
    - level of engagement
- the processes for:
  - training employees for emergency situations
  - testing emergency response procedures and frequencies
  - incident investigation and how corrective and/or preventive measures are implemented
  - revising emergency protocols as necessary
- when multiple providers are involved in responding to incidents and emergencies, details on how each providers' incident management protocols integrate to demonstrate collaborative communication arrangements in managing risks, for example:
  - communication protocols
  - emergency response plan protocols and procedures
  - incident reporting and management protocols and procedures
  - relationship between monitoring programs
  - response measures to incidents.

### **3.9.4 Risk Management Improvement Program**

The plan must:

- identify the hazards and hazardous events
- assess the risks (maximum risk and residual risk) posed to the quality of drinking water (risk assessment process)
- demonstrate how they intend to manage the risks identified through the risk assessment process.

The results of the risk assessment process should give the provider an indication of the types of risks that need to be managed across the service and each scheme associated with the service. Information on the measures that the provider has in place to manage these risks should be documented in response to the legislative requirement— managing risks (that is, guideline sections 3.9.1 (risk management measures) through to 3.9.3 (management of incidents and emergencies)).

It is recognised that for some risks identified in the plan for the service and each scheme associated with the service, management measures may not be in place at the time the plan is submitted for

various reasons or external factors beyond the control of the provider. The provider is responsible for managing these risks, including unacceptable risks, to protect public health. In this situation, the provider is required to identify interim, short-term to long-term management measures as part of the plan. The risk assessment process should also assist the provider in prioritising these additional or improved measures or actions.

The Risk Management Improvement Program (the program) is a mechanism for the provider to demonstrate to the regulator how it will address these risks identified in the plan. The program must accompany the provider's plan and outline the interim, short-term to long-term management measures and actions and the implementation timeframe.

The program may include a wide range of measures or actions for improving the management of risks, such as:

- unknowns in the system description
- high uncertainties from the risk assessment
- risks that remain high at the current residual risk level
- operational monitoring and process controls
- water quality performance
- customer complaint performance
- required upgrades following any emergencies or incidents
- skills and staff levels
- areas that performed poorly during audit and review
- stakeholder engagement.

It is the provider's responsibility to ensure that funding or commitments to funding for any measures or actions identified in the program are secured through their organisation's budget processes. This will be an important issue for providers, as the program will be assessed by the regulator as part of the plan and the timing for implementing measures or actions will be a consideration. The regulator may choose to place conditions (for example, progress reports) relating to the measures, strategies or actions of the program. The consideration of the program by the regulator will not commit the state to funding in any measures or actions within the program.

Similarly, it is the responsibility of the provider to submit relevant and available information to meet the legislative requirements for the service and each scheme associated with the service. However, it is recognised in certain circumstances, the provider's ability to submit all relevant information relating to the service and each scheme associated with the service may be impeded due to external factors which are beyond the control of the provider. These factors may influence the availability of information on a scheme, or service, in terms of:

- common risk assessment methodology
- water quality information
- hazard identification
- risk assessment
- management of risks

- common protocols, procedures for managing risks, communication, training and awareness
- adequacy of the monitoring program.

A provider should attempt to provide all available information to meet the legislative requirements. Where further information is required for a service or scheme, the provider must articulate how the information will be provided to the regulator, including timeframes for completion and this can be done through the program.

Insufficient time to prepare the plan is not considered an external factor.

#### Criteria

- The plan, through the program, must describe the management measures proposed for each unacceptable residual risk. The process for providing the relevant information to the regulator must also be described. The description must include:
  - measures, actions, strategies or processes
  - priority for implementation
  - timeframe
  - other factors, for example, responsibilities between the provider and third parties and/or other stakeholders.

#### Addressing the criteria

When addressing the above criteria, the provider may combine the above requirements in the program. In developing the program, consideration should be given, but not limited, to:

- the prioritised measures, actions, strategies or process(es) including:
  - interim or short-term management measures proposed for each unacceptable residual risk
  - permanent or long-term management measures proposed for each unacceptable residual risk
  - strategies or process(es) for providing the relevant information to the regulator
- timeframe for delivery of measures, actions, strategies and process(es)
- a rationale for the implementation schedule
- funding available (yes/no), if no funding is available, then consider other alternatives to achieving the outcome
- position responsible for delivering the measures, actions, strategies or process(es).

### 3.9.5 Service wide support—information management

Information relating to drinking water quality must be appropriately managed so that it is readily accessible, accurate, reliable, timely and up to date. Providers should:

- maintain adequate records of operational activities and decisions that could impact on the management of drinking water quality

- have an information management system for document control, data management, record keeping and internal and external reporting. Document retention times should be based on any relevant regulatory requirements and to satisfy auditing needs.

Although records may not need to be included as part of the plan, they should be available to submit to the regulator on request.

#### Criteria

- The plan must describe the information management, record keeping and reporting processes relevant to drinking water quality management, including how they address:
  - accessibility
  - currency
  - record retention requirements.

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- a description on the information management, record keeping and reporting processes should include:
  - information type (for example, manuals and procedures) and format (for example, hardcopy/electronic)
  - the document control process
  - responsible position(s)
  - processes for internal and external (including regulatory) reporting.

### 3.10 Operational and verification monitoring programs

Section 95(3)(b) of the Act states the plan must:

- (vi) include details of the operational and verification monitoring programs under the plan including the parameters to be used for indicating compliance with the plan and the water quality criteria for drinking water.

Operational and verification monitoring programs are required to support the management measures for the identified risks. The plan must contain sufficient information to demonstrate that the provider has appropriate operational and verification monitoring in place.

Monitoring should have a whole of scheme focus and include each of the components (for example, treatment, transmission and reticulation).

It is the provider's responsibility to determine the operational and verification monitoring program relevant for each scheme associated with the service.

Until the approved plan for the service is in place, the provider is responsible for undertaking water quality monitoring and reporting in accordance with the Drinking Water Service Provider Monitoring and Reporting Requirement Notice (the notice) issued by the regulator in December 2008 pursuant to section 630 of the Act. It is anticipated that the information collated as part of this process by the provider, together with the results of the hazard identification and risk assessment process should identify:

- whether the current operational and verification monitoring programs are appropriate and adequate to protect public health
- any deficiencies in the existing operational and verification monitoring programs of each scheme associated with the service
- improvements or upgrades to the existing operational and verification monitoring programs necessary to address these deficiencies.

The operational and verification monitoring programs contained in the plan should address all hazards and risks that may impact on each scheme associated with the service to protect public health.

The provider is responsible for complying with the operational and verification monitoring program under the plan and the water quality criteria generally.

The Water Quality and Reporting Guideline for a Drinking Water Service<sup>18</sup> articulates the water quality criteria for drinking water. It identifies the parameters that must be included in the verification monitoring program of a service, in accordance with the Public Health Regulation. It also sets out the criteria made by the regulator that must be complied with for other parameters where they are included in the verification monitoring program. The water quality criteria are defined under schedule 3 of the Act as:

for drinking water, means all of the following:

- (i) the standards for the quality of drinking water prescribed in a regulation under the Public Health Act
- (ii) the criteria stated in a guideline, if any, made by the regulator about the quality of drinking water
- (iii) the criteria for the quality of drinking water stated in a condition applying to a drinking water quality management plan.

The ADWG also provides information on the types of parameters, monitoring methodology, sampling locations and sampling frequency that should be considered, along with desired water quality criteria or standards that should be achieved.

### **3.10.1 Operational monitoring**

Operational monitoring is a planned sequence of observations or measurements that ensure that the system, including critical control points, is operating within performance limits in 'real time'. It is an important component of an overall monitoring program and is used to:

- confirm the system is performing within the operational tolerance limits
- control process elements
- provide for corrective actions in the short-term.

An effective monitoring program should meet the following requirements:

- provide an immediate indication of performance
- include appropriate surrogates and indicators to enable continuous monitoring
- be used to trigger immediate short-term corrective actions to maintain drinking water quality

---

<sup>18</sup> The Water Quality and Reporting Guideline for a Drinking Water Service can be accessed online at <https://www.business.qld.gov.au/industries/mining-energy-water/water/industry-infrastructure/industry-regulation/drinking-water/forms-guidelines>

- monitor with sufficient frequency to reveal any failures in a timely manner (with sufficient time to act)
- monitor any significant hazards identified in the risk assessment (for surrogates or indicators of those hazards).

#### **Criteria**

- The plan must contain details of the operational monitoring program, including:
  - a link to the process step or operational function
  - the parameter being tested
  - location of monitoring
  - frequency
  - summary of how excursions are managed and/or corrective action is taken.
- The plan must describe why the operational monitoring program is appropriate to confirm and maintain the effective operation of the existing preventive measures.

#### **Addressing the criteria**

When addressing the above criteria consideration should be given, but not limited, to:

- details of the operational monitoring program should include:
  - operational monitoring details, for example:
    - the parameter being tested
    - sample method (for example, grab, online)
    - the process for sampling, routine analysis and transportation
    - analysis method
    - interpretation and communication of results (including quality control)
  - process for long-term evaluations of trends in monitoring results including use of results to influence and improve management of the drinking water service
  - referenced documented procedures, for example:
    - sampling procedures
    - data handling procedures
    - response to excursions
    - communication procedures
    - contractual obligations
    - list of plant operating procedures
  - details of the operational monitoring program in relation to the identified preventive measures including:
    - the parameter

- the test location
- identified target and critical levels
- the rationale for the monitoring program (including parameter selection).

### 3.10.2 Verification monitoring

Verification monitoring is used to confirm product quality at the point of supply, compliance with water quality criteria and to identify deficiencies in existing preventive or control measures. It is an assessment of the performance of the scheme and unlike operational monitoring, it does not occur in real time. It is used to confirm product quality, compliance with water quality criteria and to identify deficiencies in existing control measures.

The water quality criteria for the service must include the water quality criteria set by Queensland Health and any set by the regulator. Other parameters identified for monitoring the safety of the drinking water for individual schemes must also be included.

#### Criteria

- The plan must contain details of the verification monitoring program, including:
  - the parameter being tested
  - location of monitoring
  - frequency
  - summary of how excursions are managed and/or corrective action is taken.
- The plan must also describe why the verification monitoring program is appropriate to confirm that the drinking water complies with the water quality criteria for drinking water (including the rationale for the choice of the parameters).

#### Addressing the criteria

When addressing the above criteria consideration should be given, but not limited, to:

- details of the verification monitoring program should include:
  - a tabulation of verification monitoring including:
    - ADWG value
    - analysing authority (for example, National Association of Testing Authority accredited laboratory, inhouse)
    - other system monitoring measures (for example, customer complaints)
- description on the:
  - monitoring locations and the rationale for their selections
  - process for sampling, routine analysis and transportation of samples
  - interpretation and communication of results (including quality control)
  - process for long-term evaluation of trends in monitoring results
- referencing documented procedures, for example:

- sampling procedures
- data handling procedures
- response to excursions
- communication procedures, contractual obligations
- list of plant operating procedures.

### **3.11 Best practice recommendations**

This guideline has been developed to provide information to providers about preparing the plan. The plan must reflect the requirements of the Act as stated in guideline sections 3.5 to 3.10. Providers, however, can choose to expand the plan criteria by incorporating some or all of the following best practice recommendations. These recommendations are based on the ADWG elements and sub-elements and reflect the current practices used within the industry to promote a safe supply of drinking water. However, as these recommendations are not requirements under the Act they will not be considered in the assessment of the plan. These recommendations include:

- commitment to drinking water quality management
- employee awareness and training
- research and development
- review and continual improvement.

#### **3.11.1 Commitment to drinking water quality management**

##### **Drinking water quality policy**

The purpose of a drinking water quality policy is for the organisation to demonstrate a commitment to protecting public health. Any policy statement for drinking water should provide a basis for the development of detailed guiding principles, procedures and implementation strategies.

To meet this recommendation, the plan should include a drinking water policy statement. This statement should address broad issues and requirements as outlined in ADWG, such as:

- commitment to the application of a risk management approach
- communication and engagement with employees and the public
- intention to adopt or work towards best practice and multiple barriers
- continuous improvement in managing drinking water.

##### **Regulatory and formal requirements**

There are a number of requirements placed on providers ranging from legislative and regulatory requirements to industry standards and codes of practice. Providers may also enter into formal agreements with their customers, stakeholders, other water service providers and recycled water providers.

The provider should demonstrate their understanding of the regulatory requirements, and any formal agreements associated with the service.

To meet this recommendation, the plan should include a list of regulatory requirements and/or formal agreements for the service.

### **3.11.2 Employee awareness and training**

#### **Employee awareness and involvement**

It is vital to ensure that all staff and contractors fully understand the operations of the service and how their actions influence the protection of public health. The provider should have appropriate mechanisms and procedures in place to ensure staff across the organisation are aware of the key issues that influence the management of the service.

As mentioned in the ADWG, all staff should be aware of issues such as:

- drinking water quality policy of the organisation, regulatory and legislative requirements
- roles and responsibilities
- how their actions impact on water quality and public health.

Measures to enhance employee awareness may include:

- involving staff in the development of procedures and decision making
- induction training for employees and contractors, which may include a briefing on the ADWG, drinking water quality policy and the plan
- use of regular staff meetings (tool box meetings).

All staff awareness mechanisms should be recorded. This may include training material, date of training and attendance records.

To meet this recommendation, the plan should document what mechanisms are used to maintain employee awareness and involvement.

### **3.11.3 Research and development**

Research and development is required to increase understanding of the service (identify potential hazards), validate that existing and proposed processes will successfully control hazards and to design new equipment.

Many providers undertake various research and development activities as part of their normal business, such as investigative studies and attending conferences to maintain awareness of emerging technologies and industry best practice.

The level of research and development undertaken will differ significantly between providers, and should be appropriate to the size and complexity of the service. Providers should maintain records of all research and development activities.

Investigative research and development activities may include:

- catchment surveys—used to identify activities that may affect drinking water quality such as pesticide use
- baseline source water monitoring—used to identify potential issues such as high naturally occurring fluoride and exploring seasonal or event driven variations in water quality
- attending conferences and reading journal articles—used to maintain awareness of emerging technologies and industry best practice
- planning studies—used to investigate ways to optimise or improve the system performance. Planning studies may also be used to validate the selection of potential new infrastructure by documenting expert judgement and referencing published technical literature.

To meet this recommendation, the plan should document what research and development activities are currently undertaken and ensure that the plan allows for any ongoing research and development activities that are required to support continual improvement.

### **3.11.4 Review and continual improvement**

#### **Review by senior executive**

Providers should regularly review the activities relating to the service to improve operational processes and drinking water quality management. The review should ensure any changes to the internal (that is, activities of the organisation or outcomes of incidents) and external (that is, advances in science and technology or changes to legislation) environment are reflected in the operations of the service.

To meet this recommendation the plan should document the procedure for undertaking reviews of the effectiveness of the drinking water quality management system by a senior executive and evaluate the needs for change (that is, update policy, the plan, operational procedures).

## **4. Approval of the plan**

### **4.1 Applying for approval of the plan**

Each provider must apply to the regulator for approval of the plan. A copy of the plan must be submitted with an application for approval in accordance with section 95(2) of the Act<sup>19</sup>.

An application form for the plan is available on the department's website at <[www.derm.qld.gov.au](http://www.derm.qld.gov.au)>.

### **4.2 Assessment process for the plan**

#### **4.2.1 Regulator's considerations when making a decision about the plan**

In accordance with section 98 of the Act, when considering the plan the regulator must have regard to the following:

- (a) the plan and any additional information about the plan given to the regulator under section 96 of the Act
- (b) this guideline prepared by the regulator
- (c) any advice obtained by the regulator under section 97 of the Act
- (d) the water quality criteria for drinking water.

#### **4.2.2 Request for additional information**

The regulator must be satisfied that the plan is adequate to protect public health. In accordance with section 96 of the Act, the regulator may, by notice given to the provider, require the provider to give additional information about the plan, including, for example, information about arrangements relating to the supply of water to or from the provider's service. A requirement to give additional information under section 96 of the Act is an 'information requirement'.

If the provider fails, without reasonable excuse, to comply with the requirement within the reasonable period stated in the notice, the application is taken to be withdrawn.

---

<sup>19</sup> Section (95)(2)(b) of the Act states that the application must be accompanied by the fee prescribed under a regulation. However, currently there is no prescribed fee for an application for the plan.

In addition to requesting the provider to give additional information, the regulator may also obtain advice from an advisory council or any other entity the regulator considers appropriate, before making a decision on the application in accordance with section 97 of the Act.

### 4.2.3 Timeframes for decisions

In accordance with section 98 of the Act, the regulator must consider each application and decide to approve, with or without conditions, or refuse to approve, the plan:

- if an information requirement is not made in relation to the plan—within three months of receiving the plan
- if an information requirement is made in relation to the plan—within three months of the requirement being complied with.

### 4.2.4 Regulator’s decisions

After considering the plan, the regulator may approve the plan, with or without conditions, or refuse to approve the plan. The information the regulator must include in the notice of the decision or an information notice for the decision is given in accordance with section 99 of the Act and is shown below in Table 3.

**Table 3: Regulator’s decisions**

Decision	Factors included in the decision
Approve the plan without conditions	<p>The regulator must give the provider a notice of the decision. The notice of the decision must state:</p> <ul style="list-style-type: none"> <li>• the intervals at which: <ul style="list-style-type: none"> <li>▪ regular reviews of the approved plan must be conducted (not less than one year)</li> </ul> </li> </ul>
Approve the plan with conditions	<p>The regulator must give the provider an information notice for the decision.</p> <p>the information notice for the decision must state:</p> <ul style="list-style-type: none"> <li>• the conditions of the approval</li> <li>• the intervals at which: <ul style="list-style-type: none"> <li>▪ regular reviews of the approved plan must be conducted (not less than one year)</li> <li>▪ regular audits of the approved plan must be conducted (not less than two years).</li> </ul> </li> </ul>
Refuse to approve the plan	<p>The regulator must give the provider an information notice for the decision.</p>

Section 99(1) of the Act states that, within 10 business days of deciding the application, the regulator must give the provider either the notice of the decision or the information notice for the decision.

### 4.3 Approval of the plan

Approval is based on submission of the plan, completeness of the plan in addressing the criteria and the adequacy of the plan in appropriately managing the risks that have been identified. It involves a detailed review of the content and practicality of the plan in protecting public health.

An approval of the plan does not imply approval of supporting documentation accompanying the plan. That is, for example, the provider may reference a document (for example, mains breaks repairs procedures) in the plan to demonstrate how the criteria has been met. Similarly, the regulator in considering the provider's plan may request a copy of the mains breaks repairs procedures to cite the specific reference as it relates to the criteria. The referencing of the mains breaks repairs procedures in the plan or the review of the specific section in mains breaks repairs procedures does not imply that the mains breaks repairs procedures (and its contents in its entirety) has been approved by the regulator as part of the plan approval. The provider remains responsible for ensuring appropriate procedures are in place for the service to protect public health.

#### **4.4 Conditions that can be placed on the plan**

In accordance with section 99(2)(a) of the Act, the regulator can approve the plan with conditions. The types of conditions that can be placed on the plan include, for example:

- reporting drinking water quality incidents
- progress on a risk management improvement program (i.e. status report on their measures and actions)
- timing of particular actions, measures etc (i.e. bring forward a measure identified in the risk management improvement program)
- specific requirements (i.e. provide required information by a certain timeframe)
- conditions as deemed necessary by the regulator to protect public health.

#### **4.5 Augmenting a drinking water supply with recycled water**

The Act also deals with matters relating to recycled water aimed at protecting public health. For providers generally, an approved drinking water quality management plan must be in place by 1 July 2011, 2012 and 2013 for large, medium and small providers respectively. However, where a drinking water supply is augmented by recycled water, these arrangements do not apply.

Section 207 of the Act requires that before a recycled water management plan for a scheme that proposes to supply recycled water to augment a supply of drinking water is approved, there must be an approved drinking water quality management plan covering the water storage that will receive the recycled water. This means that the regulator will not approve a recycled water management plan for a recycled water scheme that proposes to supply recycled water to augment a supply of drinking water unless there is an approved drinking water quality management plan.

Where recycled water is proposed to be supplied under the recycled water scheme to augment a supply of drinking water, the complete water system (that is, from the source of recycled water to its addition to the drinking water supply), and ultimately the quality of water supplied to the customer (that is, from the drinking water supply to reticulation) should be covered by the combination of the drinking water quality management plan and the recycled water management plan.

The drinking water quality management plan that is developed for the receiving water storage and the water treatment plant(s) must meet all the requirements of the Act.

#### **4.6 Appealing the decision**

If the plan is refused by the regulator, or the provider disagrees with the conditions stated on the information notice for the decision, the applicant may appeal the decision.

Refer to Chapter 7, parts 1, 2 and 3 of the Act for further details about internal reviews and appeals of the regulator's decision.

## **4.7 Amending the approved plan**

To retain the currency of the plan by ensuring continued compliance with the Act, the approved plan may require amendment. Amendments to the plan may be initiated:

- by a provider under section 100 of the Act

If the provider proposes to amend the plan they must apply<sup>20</sup> to the regulator for approval of the proposed amended plan.

- by the regulator under section 101 of the Act

The regulator may require a provider to amend the plan if the regulator is satisfied that the amendment is required to protect public health.

Before requiring the provider to amend the plan, the regulator must give the provider a show cause notice about the proposed amendment. After considering all properly made submissions about the proposed amendment, the regulator can decide whether the proposed amendment should or should not be made. If, after considering all properly made submissions, the regulator decides that the proposed amendment should be made, the regulator must give the provider a notice and an information notice for the decision in accordance with section 101(3) of the Act.

If the regulator is satisfied with the way the plan has been amended, the plan will then be taken to be the approved plan and the regulator must give the provider a notice stating that the plan as amended is taken to be the approved plan. The amended plan will take effect from the day the notice is given to the provider.

If, after considering all properly made submissions, the regulator decides that the proposed amendment should not be made, the regulator must give the provider a notice that the plan need not be amended.

## **4.8 Duration of the approved plan**

The plan does not have an expiry date however it should be a living document and updated in line with any changes to the external and internal operating environment.

A provider will be required to undertake a regular review (under section 106 of the Act) and regular audit (under section 108 of the Act) of the plan<sup>21</sup> at intervals stated by the regulator. The outcomes of the regular review of the plan may require an amendment to the plan (see guideline section 4.6). These outcomes will also need to be stated in the annual report<sup>22</sup> prepared by the provider for the service.

## **4.9 Operating under the approved plan**

### **4.9.1 Compliance with the conditions of the plan**

The provider must have an approved plan in place for the service. The provider is responsible for ensuring compliance with the approved plan and any conditions set by the regulator. Failure to comply with the plan or the conditions of the plan is an offence under section 93 of the Act.

### **4.9.2 Noncompliance with water quality criteria**

---

<sup>20</sup> Sections 95(2) and (3) and 96 to 100 of the Act apply to the application. That is, the same procedure that applies to the application for approval of the Plan applies to the application for amendment of the plan.

<sup>21</sup> A service provider must arrange for regular audit and compliance with the plan.

<sup>22</sup> The Drinking Water Quality management Plan Annual Reporting Guideline is being developed and will be made available when approved.

Under the approved plan, the provider must inform the regulator if the provider becomes aware that the quality of water supplied from the provider's service does not comply with the water quality criteria relating to the service.

In accordance with section 102 of the Act, unless the provider has a reasonable excuse, the provider must:

- immediately inform the regulator of the noncompliance with the water quality criteria and the circumstances that gave rise to the noncompliance
- give the regulator notice, in an approved form, of:
  - the noncompliance and the circumstances that gave rise to the noncompliance
  - any action taken or to be taken, by the provider to correct the noncompliance
  - the measures the provider will take to prevent the noncompliance in the future.

## **5. Annual reporting, reviews and audits of the plan**

Annual reporting, reviews and audits of the plan are requirements under the Act. The frequency of reviews and audits will be specified at the time of plan approval.

### **5.1 Annual reporting**

In accordance with section 141 of the Act, a provider is required to prepare an annual report for each financial year after a financial year in which the plan is approved. The annual report may be prepared by the provider in combination with other reports required under section 141 of the Act. The provider must give a copy of the annual report to the regulator within 120 business days after the end of the financial year to which it relates.

Section 142 of the Act outlines the contents that must be included in the annual report for the plan.

Under section 142(2) of the Act, an annual report for the plan must, for example, contain a summary of the provider's compliance with the plan in relation to the water quality criteria for drinking water. This summary may contain the corrective and preventive actions taken by the provider in complying with the water quality criteria for the plan.

In accordance with section 575 of the Act, a provider must keep a copy of the annual report for inspection and purchase by the public.

### **5.2 Reviews and audits**

Section 106(4) of the Act requires a provider to regularly review the provider's plan in accordance with the timeframes stated in a notice of the decision or an information notice for the decision given by the regulator under section 99 of the Act.

#### **5.2.1 Reviews**

In accordance with section 106(5) of the Act, the purpose of the review of the plan is to ensure that the plan remains relevant to the operation of the service provided by the provider. The annual report for the plan must contain the outcome of any review of the plan and how the provider has addressed matters raised in the review.

#### **5.2.2 Audits**

##### **Audit reports**

Section 108 of the Act states a provider is required to arrange for regular audit reports on the plan and compliance with the plan. The purpose of the regular audit report is:

- (a) to verify the accuracy of the monitoring and performance data provided to the regulator under the plan
- (b) to assess the provider's compliance with the plan
- (c) to assess the relevance of the plan in relation to the provider's service.

The annual report for the plan must contain a summary of the findings of, and any recommendations stated in, a regular audit report.

The regular audit report must be prepared by a person who is certified under the Drinking Water-Quality Management System Auditor Certification Scheme, or has a qualification the regulator is satisfied is at least equivalent to the Drinking Water-Quality Management System Auditor Certification Scheme. The report must be given to the regulator within 30 business days after its completion and made available for inspection and purchase. The regular audit report must be accompanied by a statutory declaration by the provider and the auditor.

### **Spot audits**

Section 110 of the Act allows the regulator to arrange for a spot audit report to be prepared about the provider's plan in the following circumstances:

- (a) if the regulator is satisfied, or reasonably believes:
  - (i) a provider is not complying with the plan
  - or
  - (ii) a provider's plan is no longer adequate for the provider's registered services
  - or
- (b) a provider does not:
  - (i) have an audit report prepared under section 108 of the Act
  - or
  - (ii) give the regulator a copy of an audit report under section 108 of the Act.

The regulator may only arrange for a spot audit if the regulator has given the provider a show cause notice in accordance with section 463 of the Act.

The spot audit for the plan must be prepared by a person who is certified under the Drinking Water-Quality Management System Auditor Certification Scheme, or has a qualification the regulator is satisfied is at least equivalent to the Drinking Water-Quality Management System Auditor Certification Scheme.

The spot audit report submitted to the regulator must be accompanied by a statutory declaration by the auditor. The regulator must give the provider a copy of the report within 30 business days after its completion.

If the report states the plan is inadequate in a material particular or the provider has not properly carried out the plan, the regulator must give the provider an information notice requiring the provider, within the reasonable period stated in the notice to either rectify the inadequacy or to properly carry out the plan.

The regulator may recover from the provider an amount equal to the cost of completing the report.

## 6. Glossary

**Note: This guideline glossary contains terms taken from the Act and terms taken from various water industry sources. The provider should refer to the Act for the meaning of the terms. However, terms referred to in this guideline are provided below for your convenience.**

Term	Meaning
ADWG	The Australian Drinking Water Guidelines incorporate the Framework for the Management of Drinking Water Quality based on the 12 elements and provides guidance on what constitutes good quality drinking water.
Conditions	Set by the regulator*
Consequence	Consequence of a hazardous event occurring (for example, catastrophic, major, moderate, minor or insignificant).
Control measure (preventive measure)	Any action or activity that can be used to prevent, eliminate or reduce a hazard to an acceptable level.
Corrective actions	Corrective actions are those taken immediately to prevent hazards from reaching end users for example, actions taken following noncompliance with water quality criteria.
Critical Control Point (CCP)	A point, step or procedure at which control can be applied and which is essential to prevent or eliminate a hazard or reduce it to an acceptable level.
Department	Department of Natural Resources, Mines and Energy.
Distribution system	Means the infrastructure for: <ul style="list-style-type: none"> <li>(a) the transmission of water</li> <li>or</li> <li>(b) the reticulation of water</li> <li>or</li> <li>(c) water treatment or recycling*</li> </ul>
Drinking water	Means water, for human consumption, intended primarily as water or drinking, whether or not the water is used for other purposes. Drinking water does not include: <ul style="list-style-type: none"> <li>(a) water that is food as defined under the <i>Food Act 2006</i></li> <li>or</li> <li>(b) water taken or supplied for domestic purposes under the Water Act*.</li> </ul>
Drinking Water Quality Management Plan (the plan)	Means a plan about the storage, treatment, transmission or reticulation of water for drinking by a drinking water service provider*.
Drinking Water Quality Management Plan Auditing and Review Guideline	Guideline issued by the regulator under section 571(o) of the Act are yet to be developed.

\* See Schedule 3 of the Act.

\* See Schedule 3 of the Act.

Term	Meaning
Drinking Water Quality Management Plan Annual Reporting Guidelines	Guidelines issued by the regulator under section 571(1) of the Act are yet to be developed.
Drinking water scheme	Infrastructure owned by a provider for single or multiple combinations of the individual components of treatment, transmission, or reticulation of drinking water supply, or the storage of recycled water to augment a drinking water supply. Refer to the Water Quality and Reporting Guideline for a Drinking Water Service for further information.
Drinking water service	<p>Means a water service that is:</p> <ul style="list-style-type: none"> <li>(a) the treatment, transmission or reticulation of water for supply as drinking water</li> <li>or</li> <li>(b) Water collection in a water storage, if the water in the storage: <ul style="list-style-type: none"> <li>(i) includes recycled water</li> <li>and</li> <li>(ii) is used to augment a drinking water supply*</li> </ul> </li> </ul>
Drinking water service provider	Means a water service provider for a drinking water service*.
Excursion including operational excursion	When a parameter goes outside identified limits. These limits may include alert levels, critical limits or water quality criteria.
HACCP	Hazard Analysis and Critical Control Point is an internationally recognised risk management system used extensively in the food industry.
Hazard	A biological, chemical, physical or radiological agent that has the potential to cause harm (contaminant).
Hazardous event	An incident or situation that can lead to the presence of a hazard (what can happen and how).
Large service provider	<ul style="list-style-type: none"> <li>(a) a service provider primarily providing bulk water services</li> <li>or</li> <li>(b) for a retail water service or sewerage service—a service provider with more than 25 000 connections to a registered service</li> <li>or</li> <li>(c) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with more than 25 000 connections to a registered service</li> <li>or</li> <li>(d) for an irrigation service—a service provider with: <ul style="list-style-type: none"> <li>(i) more than 500 users</li> <li>and</li> </ul> </li> </ul>

Term	Meaning
	(ii) a volume throughput, in any of the last five financial years, of more than 10 000ML*
Likelihood	Likelihood of hazard (for example, almost certain, likely, possible, unlikely, rare).
Maximum risk	Assumes that no preventive measures are in place.
Medium service provider	<p>(a) for a retail water service or sewerage service—provider with more than 1000 but not more than 25000 connections to a registered service; or</p> <p>(b) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with more than 1000 but not more than 25 000 connections to a registered service</p> <p>or</p> <p>(c) for an irrigation service—as service provider with:</p> <p>(i) more than 100 but not more than 500 users</p> <p>and</p> <p>(ii) a volume throughput, in any of the last financial years, of more than 10 000ML*</p>
Operational monitoring	The act of conducting a planned sequence of observations or measurements that ensure that the system, including critical control points, is operating within performance limits in real time.
PAC	Powdered activated carbon.
Preventive measures/actions	Any action or activity that can be used to prevent, eliminate or hazard to an acceptable level.
Providers that store or treat source water containing recycled water intended to augment a drinking water supply	<p>If a drinking water service carried out by the provider is:</p> <p>(a) water collection in a water storage, if the water in the storage:</p> <p>i. includes recycled water;</p> <p>and</p> <p>ii. is used to augment a drinking water supply</p> <p>or</p> <p>(b) the treatment of water intended for drinking that is sourced from a water storage, or water released from a water storage, mentioned in paragraph (a).</p>
Recycled water	In the context of this guideline, recycled water refers to recycled water that is used to augment a drinking water supply.

\* See Schedule 3 of the Act.

\* See Schedule 3 of the Act.

Term	Meaning
Regulator	The chief executive of the department is the regulator under the Act. The chief executive of the department, as the regulator, has delegated certain powers under the Act to the officers of the Department of Natural Resources, Mines and Energy*.
Residual risk	Includes the mitigating effects of existing preventive measures.
Risk	Risk is defined as the likelihood of identified hazards causing harm in exposed populations in a specified timeframe, including the severity of the consequences (i.e. risk=likelihood x consequence).
Service provider  Small service provider	Means a water service provider or a sewerage service provider* (a) for a retail water service or sewerage service—a service provider with 1000 or less connections to a registered service or (b) for a drinking water service that is the reticulation of water and is not a retail water service—a service provider with 1000 or less connections to a registered service or (c) for an irrigation service—a service provider with: (i) 100 or less users or (ii) a volume throughput, in any of the last five financial years, of 10 000ML or less or (d) for a water service other than a water service mentioned in paragraph (a), (b) or (c), a service provider: (i) with not more than 500 customers and (ii) that mainly provides drainage services or water for domestic purposes or for watering stock*.
Spot audit	Means an audit conducted under section 110 of the Act*
Uncertainty	Relates to the level of confidence that is placed in the risk assessment and arises from issues such as: (a) lack of complete knowledge; or (b) variability of information.
Verification monitoring	Used to confirm product quality at the point of supply, compliance with water quality criteria and to identify deficiencies in existing preventative/control measures. It is an assessment of the performance of the scheme, and unlike operational monitoring, it does not occur in real time.

\* See Schedule 3 of the Act.

Term	Meaning
Water quality criteria	for drinking water, means all of the following: <ul style="list-style-type: none"> <li>(a) the standards for the quality of drinking water prescribed in the regulation under the Public Health Act</li> <li>(b) the criteria stated in a guideline, if any, made by the regulator about the quality of drinking water</li> <li>(c) the criteria for the quality of drinking water stated in a condition applying to a drinking water quality management plan.</li> </ul>
Water service provider	Means a person registered under Chapter 2, part 3 as a service provider for a water service*

## 7. References

Drewes, J., Sedlak, D., Snyder, S. & Dickenson, E. (2008). Development of indicators and surrogates for chemical contaminant removal during wastewater treatment and reclamation - Final project report. WateReuse Foundation. Alexandria, Virginia.

National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2004. Endorsed by National Health and Medical Research Council.