

Office of the Technical Regulator

Preparing safety, reliability, maintenance and technical management plans

A guidance document for water industry entities



Government of South Australia

Preparing safety, reliability, maintenance and technical management plans – A guidance document for water industry entities

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Preface

Background

The *Water Industry Act 2012* (Act) establishes the regulatory framework for the water industry covering economic regulation, licensing, technical regulation and water planning. The Act identifies the Technical Regulator as being responsible for the development, monitoring and regulation of technical standards in connection with the water industry. The technical standards include requirements to ensure technically sound and safe practices are followed in operation and maintaining water and sewerage installations and associated equipment, products and materials.

Under Section 68(2)(a) of the Act, the Technical Regulator may require a water industry entity to prepare and periodically revise a safety, reliability, maintenance and technical management plan (plan).

Furthermore, Part 5(21) of the *Water Industry Regulations 2012* (Regulations) identifies that the following matters are to be dealt with by the plan:

- Safe design, installation, commissioning, operation, maintenance and decommissioning for water/sewerage infrastructure owned or operated by the water industry entity.
- Maintenance of water or sewerage services of the quality required to be maintained by or under the Act, Regulations, Licence or other conditions.
- Monitoring compliance with safety and technical requirements imposed by or under the Act, Regulations, Licence or other conditions.
- Monitoring water/sewerage infrastructure owned or operated by the water industry entity that is considered unsafe or at risk of failing or malfunction.
- Establishment of indicators and the collection and recording of information to measure the water industry entity's performance.

The intention of the plan is to demonstrate that the water industry entity's infrastructure is designed, installed, commissioned, operated, maintained, monitored and where required, decommissioned, in a safe and reliable manner by suitably qualified persons.

The plan is a working document that is unique and functional to each water industry entity. It will include information pertaining to organisational makeup, descriptions of their assets, operations, safety elements and assessment processes, supporting management systems, and compliance monitoring. Once prepared, the plan will be reviewed and if considered acceptable it will be approved by the Technical Regulator. Updates to the plan will only be required when changes are experienced. For significant changes, the water industry entity will be required to update the plan as soon as practicable. Whereas for minimal changes, only periodical updates will be expected. These are most likely to occur subsequent to audits of the water industry entity against the plan.

Purposes of this Guidance Document

The aim of this Guidance Document is to provide advice and assistance to water industry entities for the development of the plan that is acceptable to the Technical Regulator and deemed to comply with the Act and Regulations.

This Guidance Document is structured in a manner consistent with Australian Standards for similar documents in the gas industry in the absence of equivalent standards in the water industry. The focus is placed on safe and reliable operation for people and plant to ensure a safe and reliable service to customers.

In many cases it is expected that the water industry entity will have existing documentation which meets the minimum information requirement. Such documentation is discussed throughout this Guidance Document, and where documentation exists, the water industry entity should provide references and a description and/or summary to demonstrate appropriateness.

How to use this document

The Guidance Document is presented in sections which represent topics that the water industry entity will need to cover in their plan. Minimum information requirement (plain text) and supporting examples (shaded boxes) are provided to indicate the expected content and level of detail required.

To provide context, the supporting examples focus on wastewater and recycled water infrastructure and provide extensive and detailed information. Water industry entities should use these examples as a guide that can be applied to other assets as applicable.

This Guidance Document has been prepared to provide water industry entities a clear understanding of their requirements to the Office of the Technical Regulator (OTR) and does not absolve the entities' responsibilities to any other legislation and/or regulatory authority.

This Guidance Document should be read in conjunction with the *SRMTMP Checklist* available at www.sa.gov.au/otr.

SRMTMPs and Recycled Water Risk Management Plans (RMPs)

Topics to be covered by the plan may be consistent with the information included in Recycled Water Risk Management Plans (RMPs). RMPs document appropriate management of recycled water systems based on the risk management framework in the 2006 Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (AGWR). The AGWR were developed to provide guidance on best practices for water recycling. The AGWR adopt a risk management approach with the aim of providing measurable and on-going assurance that performance requirements are met, and that faults are detected prior to recycled water being supplied, discharged or applied. This approach enables risks to be appropriately addressed.

An example RMP has been prepared for water entities by the Department for Health and Ageing (DHA). The Wastewater Management Section of DHA can provide water industry entities with assistance and advice on the preparation of RMPs and may be contacted on 8226 7100 or by email at public.health@health.sa.gov.au.

A RMP is an example of existing documentation that can be referenced in the plan.

Terminology

Terminology used for describing the minimum information requirements has been taken from the Act and Regulations. However, the supporting examples also adopt typical terminology employed by the water industry.

The supporting examples make reference to "Water Industry Entity Pty Ltd". Water Industry Entity Pty Ltd is fictitious company which has been used for context purposes only.

Input from Interested Parties

The Office of the Technical Regulator welcomes comments, discussion, or suggestions for amendments to this Guidance Document from any interested party. Any contributions should be addressed to:

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Glossary of Terms, Acronyms and Abbreviations

Acronym/ Term	Definition
AGWR	Australian Guidelines for Water Recycling
ALARP	As Low as Reasonably Practicable
AS / NZS	Australian / New Zealand Standard
ASP	Activated Sludge Plant
BOD	Biochemical Oxygen Demand
CFU	Colony Forming Unit
CMS	Contractor Management System
CWMS	Community Wastewater Management System
DAC	Development Assessment Commission
DBYD	Dial Before You Dig
DHA	Department for Health and Ageing
DN	Nominal Diameter
DPTI	Department of Planning, Transport and Infrastructure
EP	Equivalent Population
EPA	Environment Protection Authority
ESCOSA	Essential Services Commission of South Australia
FAT	Factory Acceptance Test
GIS	Geographic Information System
HAZOP	Hazard and Operability Study
IMP	Irrigation Management Plan
ISO	International Organisation of Standardisation
JHA	Job Hazard Analysis
kPa	Kilopascal (gauge pressure)
kW	Kilowatt
KPI	Key Performance Indicator
L	Litres
LGA	Local Government Association
LIMS	Laboratory Information Management System

lpm	Litres per Minute
LTI / MTI	Lost Time Injury / Medical Treatment Injury
LTIFR	Lost Time Injury Frequency Ratio
mg/L	Milligrams per litre
mL	Millilitre
mmol/l	Milli mol per litre
ML	Megalitre
NATA	National Association of Testing Authorities Australia
NCC	National Construction Code
NRMCMC, EPHC	Natural Resource Management Ministerial Council, Environment Protection and Heritage Council, Australian Health Minister' Conference
OTR	Office of the Technical Regulator
PCBU	Person Conducting a Business Undertaking
PIRSA	Primary Industries and Resources SA
PCA	Plumbing Code of Australia
PPE	Personal Protective Equipment
PS	Pump Station
PVC	Polyvinyl Chloride
RMP	Risk Management Plan
SAT	Site Acceptance Test
SCADA	Supervisory Control and Data Acquisition
SDS	Safety Data Sheet
SN	Size Nominal (HDPE pipe)
SOP	Safe Operational Procedure
SRMTMP	Safety Reliability Maintenance and Technical Management Plan
SS	Suspended Solids
TR	Technical Regulator
WHS	Workplace Health and Safety
WQMP	Water Quality Management Plan
WSA	Water Services Association
WWTP	Wastewater Treatment Plant

1. Introduction

1.1 Statement of the Purposes

The plan should clearly state its purpose, and that it has been developed to meet the requirements of the Water Industry Act 2012 and Regulations 2012.

This document constitutes the safety, reliability, maintenance and technical management plan (SRMTMP) associated with the collection and distribution networks for wastewater, and the wastewater and recycled water treatment plants associated with Water Industry Entity Pty Ltd operations.

This SRMTMP has been developed to meet the requirements of the Water Industry Act 2012 and associated Water Industry Regulations 2012 as required by the Technical Regulator.

1.2 Scope and Objective

State a clear objective and scope for the plan. The plan should be the Water Industry Entity's own plan, owned and managed by the Water Industry Entity, and to which they are operating and managing all their facilities and assets that come under the Water Industry Act 2012.

The plan should reflect the procedures and processes followed by operations and maintenance employees in undertaking their activities to ensure safe and reliable operation of these facilities.

This SRMTMP has been prepared to describe how our operations and maintenance employees ensure the safe and reliable operation of our collection networks, wastewater treatment facilities and recycled water use for surface irrigation of adjacent land.

Water Industry Entity Pty Ltd is committed to the safe and efficient operation of our system in compliance and all statutory legislation which is demonstrated by the adherence to the elements described in this plan.

This SRMTMP reflects our ultimate goal of achieving operation which can be confidently claimed as best practice for similar sized facilities and technology based operations whilst achieving statutory requirements.

1.3 Organisational Background Information

State the background organisational context, the water industry entity's name, the ownership of and responsibility for the operations and maintenance of the facilities and assets described in the plan, and a high level description of the facilities

Provide a high level description of the size of the organisation in employee terms, how many are involved full time and part time with the operation of assets, and a brief description of the use of subcontractors.

Water Industry Entity Pty Ltd is the owner and organisation responsible for Scheme 1 and its associated operation including septic tank effluent collection and transportation through ABC district to XYZ treatment facility where the water is treated and made 'fit for purpose' for distributed for beneficial reuse or disposal.

Water Industry Entity Pty Ltd employs xx employees and similar number of subcontractors in any given year. Of the xx employees, yy are dedicated to the operation of Scheme 1 (ABC districts networks; XYZ treatment facilities), with a further zz working part time. Subcontractors are utilised for various maintenance and construction activities.

1.4 Relationship with Stakeholders

Provide a high level description of the stakeholders who have an interest in the facilities and assets, and the intent of the water industry entity to provide for the responsible use of recycled water, with a

clear focus on safety, and ensuring clear and regular communications are developed with all stakeholders.

The collection, transfer and treatment of septic tank effluent for disposal or beneficial reuse require a clear focus on safety towards the community and all recycle water customers.

Key stakeholders in the operation and maintenance of Water Industry Entity Pty Ltd ABC district collection, treatment and distribution system include:

- *Customers of the services provided.*
- *Neighbours of the XYZ facility, and property holders in locations where network infrastructure runs through public places or private landholdings,*
- *Relevant regulatory authorities including Essential Services Commission of South Australia (ESCOSA), the Technical Regulator (TR), Department for Health and Ageing (DHA), Development Assessment Commission (DAC), Local Government Association (LGA) and the Environment Protection Authority (EPA).*
- *Additional stakeholders for other asset types or plants will be added as applicable.*

Water Industry Entity Pty Ltd strives to maintain a line of communication with all stakeholders in relation to its operation and any events which may in any way affect one, some, or all stakeholders. The scheme, including the recycled water system, was subject to community involvement as part of its design and construction process.

Specific stakeholder communication outline is provided in Section 7.

1.5 Organisational Structure

Provide a diagram of the water industry entity organisational structure showing the major elements of the water industry entity's structure from the Chairperson and/or Chief Executive Officer (CEO) downwards, in particular the relevant departments with responsibilities noted in the plan.

Water Industry Entity Pty Ltd organisational structure is provided by the following diagram.

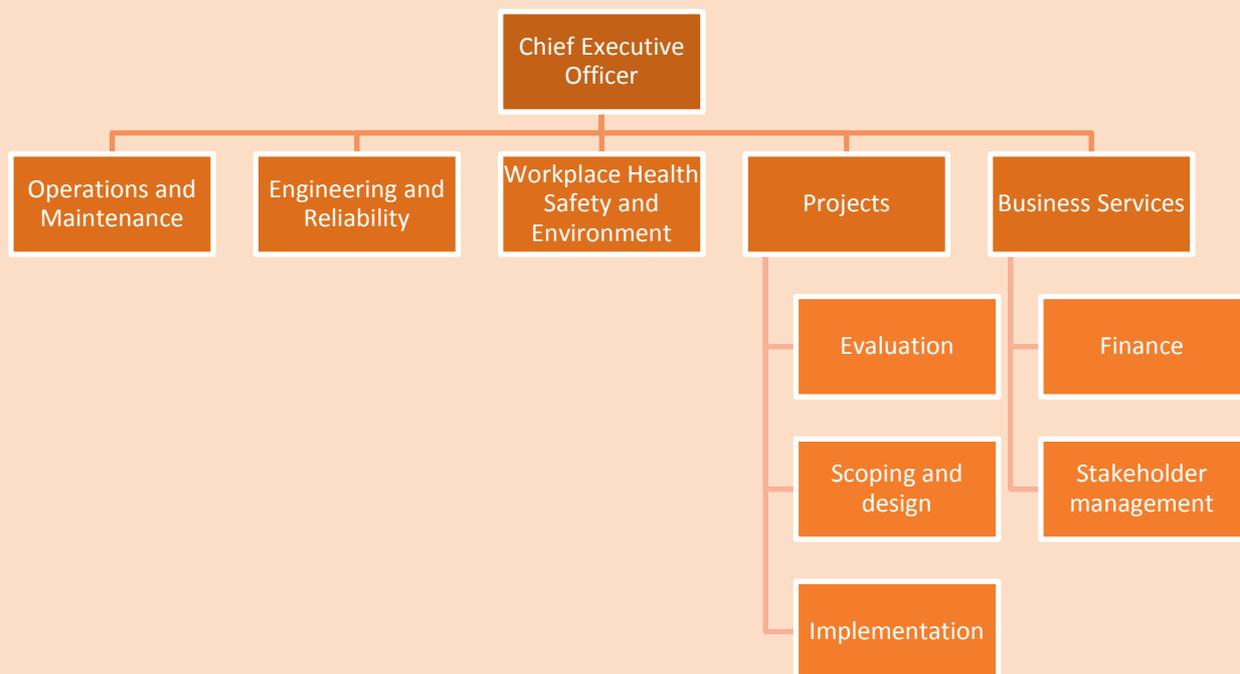


Figure 1.1 Organisational Structure

Operation, maintenance and management of Scheme 1 falls across all 5 major departments of the organisation.

1.6 SRMTMP and its Responsibilities

1.6.1 Responsible Person for the Plan and Revision Information

Provide a simple statement nominating the person (including their position within the organisation and contact details) that carries responsibility for the plan and all of its revisions.

1.6.2 Communication of the Plan

The plan should be widely communicated throughout the organisation and to key external stakeholders. It is recommended that regular presentation of the plan to stakeholders occurs, to enable queries, comments and input from the stakeholder community, to facilitate continual refinement and improvement of the plan.

State the communication strategy for the plan.

The communication of the plan is through distribution of the document to key internal stakeholders. An annual forum is held for key internal stakeholders to present and discuss the plan. Attendance, queries and comments are recorded and published on the corporate internet.

Following the preparation of the plan [period as advised by OTR], it is provided to the Technical Regulator or their delegate for review and comment. Comments are discussed and incorporated as appropriate and the plan is issued and a copy provided to all internal stakeholders and the Technical Regulator (or their delegate).

1.7 Legislation, Codes and Standards

Provide a statement of the legislation, standards and other codes that the water industry entity complies with in carrying out your operation, maintenance and management.

In addition, it is requested that the water industry entity identifies any legislation, codes and standards which were current at the time of asset construction that are now superseded. This list will allow the water industry entity to identify opportunities for asset replacement and improvement of overall risk profile.

The recommended list for wastewater and recycled water is provided in the following sections. Water industry entity should also include lists of standards appropriate to other facilities and assets that they operate (i.e. drinking water, non-drinking water).

Water Industry Entity Pty Ltd complies with or exceeds the requirements of all applicable legislation, including:

- *Water Industry Act 2012 and Regulations 2012.*
- *Work Health and Safety Act 2012 and Regulations 2012.*
- *Workers Rehabilitation and Compensation Act 1986.*
- *South Australian Public Health Act 2011 and Regulations (Wastewater) 2013.*
- *Water Resources Act 1997.*
- *Natural Resources Management Act 2004 and associated Regulations.*
- *Local Government Act 1999.*
- *Environment Protection Act 1993.*
- *Environment Protection (Water Quality) Policy 2003.*
- *Dangerous Substances Act 1979 and associated Regulations 2008.*
- *Livestock Act 1997 (specifically Section 3.6).*

Water Industry Entity Pty Ltd operations in relation to ABC district and associated installations also comply with

the following codes, standards, criteria and guidelines:

- *Guidelines, Design Criteria and Standards for Community Wastewater Management Schemes (LGA).*
- *Community Wastewater Management System Codes 2013 (DHA).*
- *Sewerage Code of Australia (WSA 02) and any SA Water supplementary documentation*
- *Water Supply Code of Australia (WSA 03).*
- *Dual Water Supply Systems First Edition Version 1.2. A Supplement (WSA 03-2002).*
- *Sewage Pumping Station Code of Australia (WSA 04).*
- *Vacuum Sewerage Code of Australia (WSA 06).*
- *Pressure Sewerage Code of Australia (WSA 07).*
- *AS/NZS 3500: Plumbing and drainage.*
- *AS/NZS 4020: Testing of products for use in contact with drinking water.*
- *AS/NZS 5667: Water quality - Sampling - Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.*
- *AS/NZS 2031: Water quality - Sampling for microbiological analysis (ISO 19458:2006, MOD).*
- *AS/NZS ISO 3100: Risk management - Principles and Guidelines.*
- *The National Construction Code (NCC) Volume 3 Plumbing Code of Australia (PCA) including South Australian Variations and/or Additional Provisions as listed in Appendix A.*
- *Standard Form: Technical Specification-Construction of Septic Tank Effluent Drainage Schemes (DH, LGA).*
- *Septic Tank Effluent Drainage Scheme Design Criteria (DH, LGA).*
- *South Australian Biosolids Guidelines for the Safe Handling, Reuse or Disposal of Biosolids (EPA).*
- *South Australian Recycled Water Guidelines (DHA).*
- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase1) (NRMMC, EPHC).*

1.8 Approvals and Licences

Provide a summary of the approval and licences associated with the water and sewerage infrastructure. It is understood that there are a number of approvals provided for collection systems, the Office of the Technical Regulator is seeking all major approvals summary, reference information, validity information and documentation location (either in electronic or paper form).

Water Industry Entity Pty Ltd has valid approvals and licences from the relevant regulatory authority as listed in Table 1.1 below.

Table 1.1: Existing regulatory approvals

Organisation	Approval Number	Description
DHA		Approval for treatment plant, storage and irrigation of recycled water
EPA		Irrigation Management Plan (licensed premises only)
PIRSA		Approval to use recycled water for pasture irrigation

The wastewater scheme has approval to supply and use recycled water. All third party users have valid individual approvals issued from the DHA.

2. Description of the Operation

2.1 Introduction

The aim of this section is to give an overview of the facilities associated with:

- The distribution of drinking water.
- The distribution of non-drinking water.
- The collection, treatment and redistribution or disposal of the treated wastewater assets owned and operated by water industry entity.

The description of the facilities should be collated with the following in mind:

- Sufficient detail to gain an understanding of the installations.
- Gain an understanding of the consumers affected by each network of infrastructure.
- Brief description of its design and operating parameters.

The assets covered by this SRMTMP include:

Wastewater

- *Community Wastewater Management System (CWMS) in Town ABC, including suburbs ABC North and ABC East from Lot 123 to 789 inclusive for a total number of 1,000 properties. The CWMS is a septic tank effluent scheme and comprises:*
 - *XXX m of collection gravity main (YYYm of 100mm uPVC, ZZZm of 150mm uPVC).*
 - *2 pumping stations (PS1 is located on ABC Street, Town and receives 50% of the catchment area and PS2 is located on DEF Street, Town and receives 30% of the catchment area. The remainder of the catchment is gravity fed to XYZ wastewater treatment plant).*
 - *XXX m of pumping main (YYYm of 110mm PE between PS1 and XYZ wastewater treatment plant, and ZZZm of 80mm mPVC between PS2 and XYZ wastewater treatment plant).*
 - *XYZ wastewater treatment plant (activated sludge treatment plant with a peak wet weather flow capacity of 9000 equivalent population) located at GHI Road, Town, adjacent to YZML HDPE storage lagoon.*
 - *On site disposal of treated wastewater (UU Ha of tree lot planation on JKL Road, Town).*

Recycled water (Non-Drinking Water)

- *UVW recycled water treatment plant (membrane filtration and UV disinfection with a peak wet weather flow capacity of 4000 equivalent population; located at GHI Road, Town).*
- *1 delivery pump station (PS101 is located adjacent to UVW recycled water, which delivers recycled water to ABC North).*
- *2 booster pump stations (PS102 is located on MNO Street, ABC North and PS103 is located on PQR Avenue, ABC North).*
- *XXX m of distribution main (YYYm of 75mm PE pipe servicing 23 properties within the ABC North catchment with recycled water at a supply pressure of PPM head).*

2.2 Asset Description

Provide a high level description of **each** of system within the following categories for each scheme:

- **Sources of water** – Describe the source(s) of contaminated water and the measures undertaken for the treatment and monitoring of all contaminants, for each of the schemes.

- **Collection network** – Describe the network including the gravity mains, pump station, pressure mains etc.
- **Treatment system** – Describe the plant and methods employed to ensure the quality and quantity of supply.
- **Distribution network** – Describe the methods employed to store and distribute/dispose of the water.

The following tables and additional information describe Scheme 1's assets and their operation.

Wastewater Scheme

Table 2.1: Wastewater Scheme

Drainage Area	Date Commissioned	Population Served	Hydraulic Design Capacity ML/d	Average Daily Inflow ML/d
Scheme 1	2000	10,000	1.5	0.5

Wastewater Collection System

Table 2.2 :Wastewater Collection System Description

Gravity Pipelines	Gravity Main Dia / Length ; Material	From / To
Main 1	DN250 x 2200m SN12 PVC	From ABC North To Pump Stn 1
Main 2	DN150 x 1000m SN12 PVC	From ABC To Pump Stn 2

Table 2.3 :Pump Stations

Scheme 1	Pumping Units	Pump power/ Capacity	Pump Head	Average Daily Inflow ML/d	Average Daily Flow ML/d
Pump Stn 1	Pump 1 Grundfos SL1	4 kW 60 lpm	100 m water		
	Pump 2 Grundfos SL1	2 kW 50 lpm	80 m water		
Pump Stn 2	Pump 1 Grundfos SL1	4 kW 60 lpm	100 m water		
	Pump 2 Grundfos SL1	2 kW 50 lpm	80 m water		

Additional Information – Pump Stations

Pump stations included in the wastewater collection system are located in concrete walled wells with gravity network piping from the residential properties at the inlet, and a pressure main feeding the XYZ treatment facility at the outlet.

Each pump is provided with a level switch for automatic operation (start-stop), high level alarm (to notify the operator if the high level switch does not activate), and low level alarm (to shut down the pump when the liquid level becomes too low for pumping).

Table 2.4 :Pressure Mains

Scheme 1	Pressure Main Dia / Length; Material	From / To	Average Daily Inflow ML/d	Design Capacity ML/d	Features
Main 1	DN250 x 2200m SN12 PVC	From Pump Stn 1 To XYZ Facility			Crossing XXX St
Main 2	DN150 x 1000m SN12 PVC	From Pump Stn 2 To XYZ Facility			Intersecting with DN250 Pressure pipe at YYY

Additional Information – Pressure Mains

The DN 250 pressure pipe crosses the XXX gas line at XXX Street, Town and has multiple street crossings detailed in Water Industry Entity Pty Ltd network maps and geographic information systems (GIS).

The DN 150 pressure pipe crosses the Water Supply Company Pty Ltd water pipeline at xxx Road, Town and under the XXX rail line and XXX Street, Town.

Wastewater Treatment System (incl. Storage)

The treatment plant comprises a facultative lagoon, two polishing lagoons and storage lagoon. From the storage lagoon the treated water can either be disposed of on land parcel xxx in accordance with EPA Licence XXX and DHA approval, or further treated in the recycled water plant for provision to the recycled water network.

The facultative lagoon has a total volume of xx ML and provides a retention time of xx days. The lagoon is designed for a total organic loading of xxx tonnes BOD per day for a total equivalent population (EP) of xxxx. The hydraulic and organic loadings are based on 150 litres/person/day and 50 g BOD/person/day.

The polishing lagoons are of equal dimension and arranged in series. Each lagoon has a total volume of XX ML and provides retention of xx days. The storage lagoon has a total volume of each is XX ML and provides retention of xx days based on dry weather inflows.

Table 2.5 :Waste Water Treatment Plant

Drainage Area	Service and Date Commissioned	Population Served	Hydraulic Design Capacity ML/d	Average Daily Inflow ML/d	Pollutant Design Capacity kg /d	Average Daily BOD Load kg/d
ABC North	ASP Jun 2000	10,000	XX	20	XXXX	XXXX

Notes:

1. Some parameters and units may be changed to align with Licence Conditions.
2. Population served is based on figures from the most recent Australian Bureau of Statistics Census.

On-site Disposal of Treated Wastewater

The water quality from the storage lagoon is approved for disposal to land parcel xxx at a maximum rate of xx L/hectare/year under EPA Licences and DHA approvals. Monitoring of water quality from the outlet of the storage lagoon is monthly. The minimum water quality requirement for disposal is provided in Table 2.6:

Table 2.6 :On-site Disposal Processes

Scheme 1	System Description Capacity ML/d	BOD ₅ Mean Value	Suspended Solids (SS) Mean	Thermo-tolerant Coliform (e-coli) Count	Sodium Adsorption Ratio	Features
Storage Lagoon	Lined pond	< 20 mg/L	< 30 mg/L	< 100/100 mL	< 5 mmol/L	Submersible Pump
Spray Irrigation System	Distribution to local field	< 20 mg/L	< 30 mg/L	< 100/100 mL	< 5 mmol/L	DN100 and DN25 reticulation system

Additional Information – Treated Wastewater System

The submersible pump is connected to pipework which delivers the treated wastewater into a spray irrigation system. The delivery process is a manual operation with pump start-up initiated by an operator who sets a timer which shuts down the pump.

Recycled Water Treatment System

The recycled water treatment plant consists of a dissolved air flotation plant to reduce suspended solids and a microfiltration plant utilising membranes for final water polishing. In accordance with the Australian Guidelines for Water Recycling, the wastewater and recycled water treatment plants provide a collective xx log removal which is required for spray irrigation in public places under controlled conditions along with dripper irrigation of agricultural businesses.

Table 2.7 :Recycled water treatment plants

Scheme 1	System Description Capacity ML/d	BOD ₅ Mean Value	Suspended Solids Mean	Thermotolerant Coliform (e-coli) Count	Features
Flotation Agent	Dissolved Air Floatation Polyacrylamides 0.5 ML/d	< 10 mg/L	< 20 mg/L	<10/100mL	3 x Distribution Pump
Filtration	6 x Banks 10 x Membrane Canisters 0.2 ML/d total	< 10 mg/L	< 20 mg/L	<10/100mL	DN100 pipeline and DN25 reticulation system

Additional Information – Recycled Water System

The dissolved air flotation system is designed for a total water treatment rate of xx L/d. Polyacrylamides are used as the flotation agent.

Water quality performance is monitored weekly during irrigation season and performance is reported annually to DHA.

Recycled Water Pumping System

Recycled water is delivered for distribution via a set of three distribution pumps.

Table 2.8 :Recycled water delivery pump stations

Scheme 1	Pumping Units	Pump power/ Capacity	Pump Head	Average Daily Inflow ML/d
Pump Stn 1	Pump 1 Grundfos xxx/x	x kW at 50% rating yy lpm	xxx m water	
Pump Stn 1	Pump 2 Grundfos xxx/x	x kW at 50% rating yy lpm	xxx m water	
Pump Stn 1	Pump 3 Grundfos xxx/x	x kW at 50% rating yy lpm	xxx m water	

Additional Information – Recycled Water Pumps

The pumps are operated on a pressure system controlled to maintain a final pressure of 20 kPa minimum at a customer's boundary. The pumps automatically start on low pressure in the distribution system, and operate on a variable speed drive to maintain pressure in the network. A flow indicator in the discharge line will stop pumps one at a time as the flow decreases.

Recycled Water Distribution System

The recycled water distribution system delivers water from mixed sources derived from stormwater and recycled water.

Table 2.9: Recycled water distribution system

Scheme 1	Pressure Main Dia / Length Material, Capacity	From / To	Average Daily Inflow ML/d	Design Capacity ML/d	Features
Main 1	DN250 x 2200m SN12 PVC 0.5 ML/d	From Pump Stn 1 To XYZ Facility			Crossing XXX St
Main 2	DN150 x 1000m SN12 PVC 0.5 ML/d	From Pump Stn 2 To XYZ Facility			Intersecting with DN250 Pressure pipe at YYY

Additional Information – Recycled Water Distribution System

The recycled water pumps deliver water through a DN 150 SN12 PVC pipe, approximately 12km. Key road crossings include: xxx Street, Town; xxx Road, Town; and xxx Road, Town.

Take-offs to consumers are designed to meet connection standards such that backflow prevention is assured. All connections are audited on a biennial basis to ensure the integrity of backflow prevention systems and compliance with standards.

Consumer take offs are either DN 25 or DN 50 pipework fitted with turbine meters which are on a routine calibration program. Calibration reports are available on the Water Industry Entity Pty Ltd intranet.

Meters are read annually. Customers are billed for their recycled water consumption in accordance with the customer charter and relevant consumer laws.

Refer to the Scheme 1 RMP for further information.

Operational Responsibilities

Scheme 1 described above is monitored on a daily basis by operations and maintenance employees.

During irrigation periods, a full time operator is assigned from the maintenance crew during the periods of irrigation which are carried out during the day only. No operators are present outside of working hours however maintenance employees are on a call out roster to attend to calls from equipment failures and process upsets.

During non-irrigation periods, no operators are present. Maintenance employees are on a 24 hour call out roster to attend to calls from equipment failures and process upsets.

3. Organisational Safety and Reliability

The aim of this section is to give an overview of the systems used to ensure that all the input elements to the operational functions of the water industry entity are managed to deliver safe and reliable development and operation of these assets. That is all safety related risks are properly assessed, managed and reported, to minimise harm or damage and ensure reliability of operation.

A safety management system is implemented to ensure:

- Appropriate design, construction and commissioning of plant and network distribution systems owned by the water industry entity.
- Safe and reliable operations, and reduced risk of damage to plant and property during the operating phase of the assets' life, in particular breakdowns.
- End-of-life activities, such as decommissioning, demolition, disposal and abandonment are conducted in a safe manner to minimise residual risks to the public over time.
- Employees and contractors working on assets owned or operated by the water industry entity are competent and properly trained to perform their work safely and effectively.
- Incidents and unsafe situations are properly dealt with, reported and investigated properly to reduce the risks of injury and death.

A safety management system model may comprise the following principles;

- **Leadership and Commitment** – a business-wide vision, understanding and ownership (Section 3.1).
- **Effective Planning** – what do we need and when (Section 3.2).
- **Controlled Implementation** – how we will do it safely and in a sustainable fashion (Section 3.3).
- **Monitoring and Evaluation** – what is actually happening, is it on track (Section 3.4).
- **Audit and Review** – is it done according to plan, can we improve the plan (Section 3.5).
- **Continuous Improvement** – are there better ways to do it (Section 3.5).

3.1 Leadership and Commitment

3.1.1 Policy, Procedures and Guidelines

Demonstrate the water industry entity's commitment to the safety and reliability of its assets, employees and the public by providing a statement that it has in place a Safety Policy which incorporates prioritisation of risks.

The relevant obligations of its operating Licences with respect to safety should also be mentioned.

Water Industry Entity Pty Ltd demonstrates its commitment to the health and safety of its employees, contractors, other stakeholders and the public through our Workplace Health and Safety Policy (WHS Policy), which is complemented by a range of supporting policies, procedures and systems to ensure implementation of the WHS Policy.

In addition to our WHS Policy, Water Industry Entity Pty Ltd has a Policy Statement for Recycled Water. An extract from this Policy is provided below:

Water Industry Entity Pty Ltd:

- *Commits to the responsible use of recycled water and the application of a risk management approach.*
- *Recognises and will comply with all regulatory requirements*

- Communicates with all relevant agencies and stakeholders in the production and use of recycled water
- Communicates and engages with all employees, contractors and suppliers of equipment to ensure compliance with all aspects of operation.
- Adopts “best practice” and the multiple barrier approach to produce the required recycled water quality.
- Commits to annual reviews and continuous improvement practices in the operation of our system.

The policy and associated supporting policies, procedures and systems observe the requirements of the relevant legislation and the other obligations of the Water Industry Entity Pty Ltd operating Licence(s). It extends beyond WHS to include safety of physical plant and assets, and the environment.

Within Water Industry Entity Pty Ltd organisational structure shown in Section 1.5, the Works Manager has the responsibility for safety within Water Industry Entity Pty Ltd, and this includes ensuring that the Safety Policy is implemented, supported, reviewed and revised as necessary, and for reporting relevant safety matters as required by the Chief Executive Officer (CEO) and legislation.

Section 3 describes Water Industry Entity Pty Ltd systems and procedures, from design through to decommissioning, demolition and abandonment, which ensure that risks to the safety of plant and employees are identified and mitigated to a level that is in accordance with the relevant legislation, codes and standards.

3.1.2 Organisational Procedures and Commitment to Competence

Provide details of how human resources are managed to ensure the maintenance of technical competency and professional standards, and provide employees with the appropriate training and development of skills to perform their work competently.

Employee Selection and Competency

Human resources within Water Industry Entity Pty Ltd are managed according to policies and practices which serve to ensure that employees, contractors and other persons satisfy personal, practical and professional requirements of the corresponding operations. Regular reviews of competency and skill levels are undertaken to identify where deficiencies may exist, including those introduced by new technology. Where deficiencies are identified, training is provided and assessment of subsequent competencies and skills undertaken.

Operator, Contractor and End-User Training

Operator

- Water Industry Entity Pty Ltd employees are trained in the procedures governing the operation and maintenance of the system through recognised training procedures.
- General awareness of risks associated with recycled water is provided to all operators as part of the induction process. Operator specific training covering all aspects of the operations manual for the system has been undertaken.
- WWTP Operators hold Certificate III in Water Operations qualifications.
- Water Industry Entity Pty Ltd has standard training available & incorporates other training requirements.
- Water Industry Entity Pty Ltd is committed to providing every opportunity for employee involvement in continuous improvement as part of our safety culture. Employees are actively encouraged to identify opportunities for improvements in work methodologies to increase the safety of operations, and to improve practices with respect to implementing improved hierarchy of hazard controls.

Contractors

Water Industry Entity Pty Ltd employs contractors who have completed appropriate training to undertake correct operation and maintenance of our assets. All contractors undergo a site specific induction to be made aware of risks associated with our assets and the location in which they will be working, including those specifically related to recycled water. Wherever possible, established and experienced contractors are engaged on recycled water systems to ensure that they have appropriate management practices and knowledge of the risks associated with sewage and recycled water.

3.2 Effective Planning

3.2.1 Design

A major component of having a safe and reliable facility during operations is the design component. The process by which new plant, and modifications to existing plant is designed should be described here, not in detail but at high level, referring to systems, processes and procedures used to achieve a design that complies with the legislation, standards and codes nominated in Section 1.

Design can be completed by competent in-house resources or outsourcing to qualified, competent and reputable consulting engineers and professionals.

Engineering and technical design of any wastewater system or recycled water system is outsourced to qualified, competent and reputable professional consultants. Water Industry Entity Pty Ltd has systems and processes to ensure that any design commissioned by others will be validated as conforming to current legislative requirements and appropriate standards. As such, plant and facilities are designed, constructed and commissioned, operated and maintained to meet the requirements of the list of legislation, standards and codes listed in Section 1.7.

The design of all infrastructure (new or upgrades) involving wastewater and recycled water is submitted to the DHA for approval in accordance with the current Public Health legislation.

Water Industry Entity Pty Ltd employees will continually oversee and facilitate the progress of designs, and assist in the identification of potential hazards, risks and other safety and operational concerns in relation to our design activities.

The establishment of scopes of work and the procurement of such services is managed by the Water Industry Entity Pty Ltd Engineering Manager.

Water Industry Entity Pty Ltd has in place a project development process which includes a phased approach to expansion or modification of existing assets, and development of new assets.

This process involves:

- **Concept Phase**, whereby different concept schemes are identified, reviewed and preferred alternative(s) are selected to be progressed in the next phase.
- **Feasibility Phase** includes early stage design of the selected concept(s), with the aim of developing capital and operating cost estimates which support an economic evaluation of the proposed work. If there is more than one concept alternative, this phase will identify the preferred alternative to progress to execution phase.
- **Execution Phase** includes detailed design, procurement, construction and commissioning of the preferred alternative.

Throughout the various phases, project development process identifies and involves relevant internal and external stakeholders to review, comment on and approve the various elements of the work. As a minimum, the person responsible for administration of the Water Industry Entity Pty Ltd Licence under the Water Industry Act will review of the proposed works to ensure that they comply with the terms of the Licence.

3.2.2 Design Life of Plant

The service life of plant should align with the nominated codes and standards used for design while recognising the operating parameters and processes which affect the integrity of the plant.

The service life of new infrastructure is approved with consideration for the deterioration of equipment during operation and mitigating effects of maintenance, replacement and redundancy.

Operating conditions such as pressure, fluid velocity, temperature, and service factor are considered in design and any excursions from the design envelope addressed to review the remaining life of equipment.

Deterioration caused by corrosion or other mechanisms is monitored according to the selected design codes, to confirm the effectiveness of mitigating measures or to respecify remaining life for given service conditions.

3.2.3 Safety in Design Requirements

The water industry entity, as the owner and/or operator, takes all available opportunities to ensure the safe design of the assets to achieve best practice. This applies to any design element, whether the design is carried out in-house or externally by design contractors. The water industry entity should have in place processes and procedures to ensure that it and its design contractors adequately identify hazards and risks, and provide mitigations for those hazards and risks in its design through application of the hierarchy of controls.

This section should outline the processes and procedures that the water industry entity has in place to fulfil this requirement.

Water Industry Entity Pty Ltd is committed to compliance with all relevant legislation affecting its business operations. This includes compliance with the safe design requirements as specified in the Work Health and Safety Act 2012. Water Industry Entity Pty Ltd adheres to safety standards and codes of practice and has implemented processes and procedures for the design of new assets, or modification of existing assets that include safety in design principles and practices.

The priorities in Water Industry Entity Pty Ltd Safe Design Procedures include:

- *Elimination of hazards during the early design stages.*
- *Reduction of high incidence and high severity risks.*
- *Improvement of business operations capacity.*
- *Provision of competent and trained employees for effective management of WHS.*

Table 3.1 provides an excerpt from our Safety in Design Checklist.

Table 3.1 :Excerpt Safety in Design Checklist

1. General	Yes	No	N/A	Comments
Has System Planning provided a report for development?				
Are there existing easements that can be utilized?				
Are external easements required?				
Are there natural features (e.g. creeks) to be negotiated?				
Are there any obstructions to be negotiated?				
Are exist/proposed levels or contours provided?				
Will constructors have easy access to site?				
Is this a high traffic area?				
Is this a DPTI road?				
Are main sizes appropriate for zoning classification?				
Are there existing/new internal drains to connect?				
Has every lot been serviced by the design?				
Have existing underground services been located / note				
Has "Dial Before You Dig" information been received?				

Refer to Safe Design Procedure for further information [Link].

3.2.4 Procurement

A water industry entity should have recognised procurement systems and processes, of which all relevant employees in the organisation are aware, and which are used in the design, construction, operations, maintenance and management of their assets. These systems and processes should:

- Ensure correct materials are specified and selected to reflect the design environment – e.g. low or high temperature resistance, corrosive chemical resistance etc.
- Contain procurement and purchasing procedures to ensure that the material design requirements and specifications are transferred to the tendering and tender review processes. For example, if a component is required to withstand high temperatures, that the purchasing documentation reflects this, and that supplier tenders are reviewed to ensure this technical requirement is included in the offered item.
- Contain procurement and purchasing procedures for all chemicals used in the construction or operations of the assets that include requirements for ensuring they meet the specified quality and for their safe handling, transport, storage and application. This includes the provision and use of Safety Data Sheets (SDS).

Systems and processes for inspection and testing of procured materials and components should be in place to ensure the procured materials and components comply with specifications and to assess their condition on arrival into water industry entity's control. Typical processes commonly used include Factory Acceptance Tests (FAT), Site Acceptance Tests (SAT) and despatch and receipt inspection procedures.

Procurement Systems and Processes

Water Industry Entity Pty Ltd maintains specific procurement processes which address the need to ensure correct specification and purchasing of materials and components. Any procurement of goods with significant business risk is undertaken with clear evaluation criteria and understanding of the implications associated with the supply contracts. Whereas, commonly used items will be catalogued as approved stock items, supplied by recognised vendors.

Apart from the commercial and contracting aspects of the overall procurement processes, it is important to ensure that all the relevant technical requirements are transmitted from the design process into the procurement process. Procurement employees ensure that procurement documentation is reviewed by technical employees to ensure correct and relevant technical requirements are included.

These processes also contain procedures and requirements for the specification and selection of spare parts, including commissioning spares, suppliers' recommended operating spares, complemented by assessment by Water Industry Entity Pty Ltd technical employees as to appropriate spares levels given the asset's maintenance history.

Responsibility for the procurement process within Water Industry Entity Pty Ltd rests with the Procurement Manager.

Water Industry Entity Pty Ltd Procurement Manual provides further information on the procurement process and responsibilities [Link].

Materials and Components Selection

Design processes used by Water Industry Entity Pty Ltd address the specification of appropriate materials and components to ensure that they are selected to comply with particular design and other requirements such as:

- *Compliance with specified codes and standards.*
- *Appropriate to the design life of the asset.*
- *Ability to withstand high or low pressure and high or low temperature.*
- *Where applicable, ability to resist corrosive environments.*
- *Ability to resist bacterial or microbiologic attack or degradation.*

Once specified, the procurement process contains procedures that transfer these requirements into the tendering and purchasing process.

Inspection and Testing of Procured Materials and Components

The overall procurement system includes systems and processes for inspection and testing of procured materials and components to ensure they comply with specifications and to assess their condition on arrival

into Water Industry Entity Pty Ltd control. Processes include Factory Acceptance Tests (FAT), Site Acceptance Tests (SAT) and despatch and receipt inspection procedures.

These inspections are carried out by competent and experienced professionals and/or employees using documentation developed for the process, such as Inspection and Test Plans and appropriate checklists.

The procurement process is documented and reviewed on a biannual basis.

3.3 Controlled Implementation

3.3.1 Construction and Commissioning

Any organisation carrying out construction activities should have documented safety systems and processes.

One particular aspect that needs to be acknowledged and managed is the transfer of any particular project from the design and procurement phases into the construction phase. There should be a formalised transfer of hazard and risk information from the design / procurement team to the construction management team. This should also include commissioning risks and hazards. It is common for the Feasibility Phase to provide an execution plan, including construction, and then for the construction management to monitor this from a schedule point of view to avoid scope and time creep, and thus cost increase and delay.

Further, just as in the design and procurement phases, defined project management and control processes need to be in place and used to ensure safe, timely and efficient construction and commissioning of new assets, and modifications to existing assets.

Construction Safety

Construction and installation activities are performed in accordance with processes and practices defined within Water Industry Entity Pty Ltd Safety Procedures. These measures aim to provide a safe environment for construction activities. The procedures include the use of various tools, such as:

- Daily pre-start tool box meetings.
- Job Hazard Analysis.
- Safe Work Method Statements.

The efficiency and effectiveness of safety management during construction activities is monitored, evaluated, reviewed and where appropriate updated to promote continuous improvement.

Construction Project Management

Water Industry Entity Pty Ltd employs construction project management and this is captured in the project management systems (as previously mentioned) and provides processes during the construction phase to monitor construction contractors and work against the time, quality and cost parameters nominated in execution plans and construction contracts.

Regular project progress updating is required as part of these procedures particularly for construction, and the project control elements included in this updating are:

- Project deliverability – issues that arise or are foreseeable that may affect the project or may add pressure to the performance or outcome.
- Project safety and incident reports – a summary of indicators such as Lost and Medical Time Incidents (LTI / MTI), along with number of hours worked and a summary of site incidents for each reporting period is provided.
- Project schedule – a detailed schedule of all construction activities is maintained and updated on a regular basis for each project, and reviewed against the baseline schedule established at construction commencement. Schedule reports are issued to various levels of project and senior management, including summary level for management and 2 week construction look ahead for on-site construction management.

- *Project cost reports – reports are issued following the update process which include progress to date, updated cost forecasts of work in the future, and summarised into a forecast cost at completion.*

Execution plans developed in Feasibility stage (contracting strategy, procurement etc.) are monitored during construction to ensure that delays are not introduced into the construction schedule by poor implementation of these plans, or scope creep, thus resulting in additional costs or unacceptable delays.

The interface between Water Industry Entity Pty Ltd project management employees and contractor is recognised and managed to ensure Water Industry Entity Pty Ltd is discharging its project responsibilities in an effective manner. The full Project Management Procedures document is available at [Link].

Commissioning

In all Water Industry Entity Pty Ltd commissioning activities, the emphasis is firstly on providing a safe commissioning process, then on the effective plant commissioning to ensure outputs from the plant comply with legislation and Licence requirements.

Commissioning plans take full account of the required health and safety standards for the new or modified plant such as pathogen and E.coli levels, disinfection levels, pH and various biochemical parameters etc.

Inspection and test plans form an integral part of the commissioning process and include the use of pre commissioning and commissioning checklists, review of construction data and supplier manuals and other data relevant to development of a safe commissioning process.

Commissioning is not commenced until all documentation fully reviewed by all designated employees involved in the commissioning process.

Resources for commissioning are selected and reviewed for appropriate experience with the particular plant and processes involved.

3.3.2 Operations and Maintenance

A water industry entity should have established and documented Standard Operating Procedures (SOP) which covers the operations of its assets. These procedures should ensure that the assets are operated in accordance with the water industry entity's Licence and other legislative requirements. This is generally done by following relevant Australian and international codes and standards, industry codes and the water industry entity's own policies and procedures.

The intent of this section is to provide an overview of these procedures, with sub-sections describing the key practices, such as Permit to Work, Job Hazard Analysis or similar, major asset operations, confined space procedures, hazardous chemical management, working from heights, use of appropriate personal protective equipment.

Operations – Safe Operational Procedures

The WWTP and recycled water assets operated by Water Industry Entity Pty Ltd use a range of procedures, site-specific operational procedures, generic operational procedures, administrative procedures which are summarised in Scheme 1 RMP.

The SOP's are developed by risk analysis of each task in the procedure and prescribe the safe methods for routine work. Other procedures in place to ensure work safety during non-standard or non-routine activities, and when multiple activities occur include the following:

Permit to work – Water Industry Entity Pty Ltd has a Permit to Work System in operation. The Permit to Work System is used by all operators and maintenance employees and is explained to all contractors who work on Water Industry Entity Pty Ltd infrastructure. The Permit to Work System is administered by Water Industry Entity Pty Ltd Work Health and Safety Officer.

Job Hazard Analysis – Job Hazard Analysis (JHA) processes are used to identify, assess and mitigate risks and hazards at a workgroup level, on a daily operational task basis. It is a simple, effective tool for planning and communicating job hazards and risks to individual work groups, and involves all employees in applying their skills and knowledge to plan how the job should be undertaken safely and effectively. It is completed jointly by all of the people involved in the task, documented and then approved and signed off by all participants before the task is undertaken, with the objective of enabling all tasks to be completed with

minimal risk.

Employees are trained in the JHA process: what it is, when it is required, and the process for carrying out the JHA. This training is provided to all new employees who work at the operational or maintenance level as a part of their normal duties, and regular refresher training is provided for existing employees at frequencies defined in the training register [state where training records are kept and the required training refreshers for each procedure].

Confined space procedures – Water Industry Entity Pty Ltd has in place procedures to define confined spaces, assess the hazards associated with working in confined spaces, and rigorous procedures for employees working in confined spaces.

Confined spaces are commonly found in tanks, pits, pipes, ducts, flues, containers, pressure vessels, underground sewers, wells, shafts, trenches, tunnels or other similar enclosed or partially enclosed structures.

Procedures for working in confined spaces include:

- Specific confined space training and certification for employees designated to work in confined spaces.
- Procedures which require that only trained employees work in confined spaces.
- Identification of risks and hazards for confined spaces in general, and specifically for each site.
- Inclusion of confined space identification into the permit to work system and Job Hazard Analysis process.

Hazardous Chemical Management – Specific procedures exist for the use of hazardous chemicals in operations. These include development of hazardous chemical registers, which are clearly displayed at each workplace, and available on Water Industry Entity Pty Ltd internal electronic information systems. Specific employees are allocated responsibility for maintaining these registers, updating them as chemicals are purchased or changed.

The registers contain items such as: where the chemical is used; specific precautions required for use; Safety Data Sheet (SDS); treatment of injuries resulting from exposure; and expiry dates.

Employees are given specific training in the use of each hazardous chemical, and training records are kept to aid in ensuring regular refresher training is provided.

Water Quality Process Management - Operational Monitoring and Protocols

Across the Water Industry Entity Pty Ltd assets, various systems are used to record operational monitoring data including cross-checks of instruments. These systems range from hard copy registers to electronic databases attached to electronic monitoring systems such as SCADA. Operational monitoring involves observational and on-line monitoring of control parameters and is undertaken to confirm that processes are under control and optimised. The control parameters also provide an advanced warning that systems may be deviating to a point where corrective action is required.

Maintenance, Inspection, Testing and Modification

All assets used either directly or indirectly for maintaining water quality, plant performance and integrity are maintained in accordance with the manufacturer's recommended maintenance schedule. The relevant asset operations manual describes the routine inspection, testing and maintenance required for all equipment including instrumentation.

Procedures and checklists specific to the operation of the WWTP recycled water and other assets have been developed and are included in the operations manual (see Scheme 1 RMP).

3.3.3 Decommissioning, Demolition, Abandonment and/or Disposal

State any systems and processes for decommissioning, abandonment, demolition and disposal that ensure plant and equipment in this category handled in a safe manner that will not leave residual risks for future operators, the environment or the public.

Examples of situations requiring mitigation are:

- Corrosion of steelwork and major equipment items that might result in collapse hazards years into the future.

- Build-up of toxic gases in abandoned plant that will present a hazard to employees in the future (e.g. H₂S).
- Leakage into the environment or existing infrastructure of damaging liquids and gases
- Microbial organisms which can proliferate to toxic levels presenting a hazard to employees in the future.
- Containment of asbestos materials to avoid dusts being created due to exposure.
- Making safe the equipment to be disposed of to ensure third parties are not exposed to hazards.
- Keeping records on any or all of the activities.

Decommissioning of assets being replaced or renewed is included in Water Industry Entity Pty Ltd annual capital and maintenance programs, and processes are in place to ensure that the assets are decommissioned in a safe and appropriate manner. Water Industry Entity Pty Ltd Asset and Maintenance Management Systems are regularly updated with decommissioned and abandoned assets. Decommissioning and abandonment planning ensures that in cases where assets are no longer required and not being replaced, the assets are tagged accordingly in the asset register and prioritised for action using a risk-based approach.

Water Industry Entity Pty Ltd maintains a technical guideline for the decommissioning of various types of assets which covers procedures for the safe design, materials management, demolition and testing of these assets. Where relevant, as-decommissioned or as-abandoned drawings are specified and maintained, in hard copy and GIS.

Records of de-commissioned assets such as network mains are shown on relevant current drawings.

Disposal procedures for demolished equipment and materials include checks to ensure that they are free of toxic or corrosive chemicals that may be a hazard for future operators, third parties, the environment or the public. All authorities are notified as appropriate to our Licences.

3.3.4 Emergency Response Management

Provide an overview and summary of the water industry entity's emergency response organisation, procedures and documentation, with particular emphasis on emergencies that could result in a threat to public safety and security of supply. Thus the response to emergency incidents at waste water treatment plants, and water treatment plant water quality incidents should be described (including who has responsibility within the organisation for managing emergency preparedness) and a cross reference to the relevant emergency response plans and procedures.

Responsibility for emergency preparedness and response within Water Industry Entity Pty Ltd rests with the Works Manager and the Emergency Response Plan provides details of the organisational responsibilities adopted during emergency situations. The plan is communicated to all relevant employees within the organisation, from executive management through to operators and maintenance employees. It undergoes regular review to maintain relevance.

Emergency Response Procedures have been developed to provide specific response actions for a range of the Scheme 1 emergency scenarios, across the Water Industry Entity Pty Ltd assets. These are documented in Scheme 1 RMP.

The Emergency Response Procedures are tested XX times per year, by conducting a program of emergency exercises. Results and recommended actions are communicated to management, considered and where appropriate, approved then implemented.

The Emergency Response Procedure outlines actions to be taken by plant operators and managers in response to a range of potential emergencies and incidents that may occur at the WWTP plant, including but not limited to:

- System error.
- Communications failure.

- Operator error.
- Terrorist interference.
- Electrical power failure.
- Treatment process failure.
- Equipment failure (e.g. aerators, reuse pumps, disinfection, return activated sludge pump, centrifuge).
- Pipeline failure.
- Lagoon overflow and chemical spills.
- Odours.
- On-site fire.
- Bushfire.

The plan will also include links to contact lists for corporate emergency employees and relevant landholders. Emergency Response Procedures and Emergency Management Plans are reviewed regularly to capture infrastructure changes and include additions and lessons from any incidents or emergencies are incorporated, as appropriate. In some instances, the detailed actions may vary based on the nature of the event and discussions on appropriate corrective actions will involve key stakeholders, such as DHA, EPA, OTR and other relevant parties.

3.4 Monitoring and Evaluation

3.4.1 Incident Classification, Management, Reporting and Investigation

Water industry entities have clear guidelines from the EPA/DHA and OTR with regards to incident classification and their obligations associated with notification and reporting to authorities.

In some cases, the water industry entity may also adopt internal incident classification, management, reporting and investigation processes and procedures. This section proposes to capture the water industry entity's approach to incident identification and overall management.

Water Industry Entity Pty Ltd conforms to the EPA/DHA Water/Wastewater Incident Notification and Communication Protocol, and the OTR Water and Sewerage Infrastructure Incident Notification and Communication Protocol.

In addition, Water Industry Entity Pty Ltd has established internal protocols for various activities which focus on regulatory requirement, including:

- Reporting of environmental incidents.
- Reporting of breach of Licence events.
- Reporting of recycled water quality incidents.
- Public emergency incident notifications.

These protocols cover communication with the following regulatory bodies:

- The Technical Regulator.
- Department for Health and Ageing.
- Environment Protection Authority.
- Department of Environment, Water and Natural Resources.
- District Council (Local Government).
- SafeWork SA.

Protocols are reviewed with all stakeholders annually, agreed and updated as required. All protocols form part of the overall notifications procedures and reside within the operating procedures.

3.4.2 Documentation and Reporting

State how all documentation related to the safe and reliable operation of the assets is managed.

Documentation provides a basis for effective communication within an organisation, as well as with the community and various stakeholders. A system of regular reporting, both internal and external, is important for ensuring that the relevant people receive the information needed to make informed decisions about the management or regulation of all water systems (from source to end user).

Documentation should include descriptions of, as applicable:

- Preventive measures and their purpose.
- Operational procedures for relevant activities (all activities are to be sufficiently detailed to allow operation of plant and training of operators).
- Operational monitoring protocols, including parameters and criteria.
- Schedules and timelines.
- Data and records management requirements.
- Corrective actions to be implemented when required.
- Maintenance procedures.
- Responsibilities and authorities.
- Internal and external communication and reporting requirement.
- Incident reporting requirements.

Effective documentation may be aided by utilising a document management system which ensures that all documents have a revision status and history, change of documents is managed appropriately with approvals provided where required, document review periods are established and reviews undertaken when scheduled. Only current revisions of documents are available to employees for the activities they undertake. An effective document management system does not need to be an electronic or elaborate software system. The aim is to ensure documents are managed appropriately which can be done manually for simple systems.

Documentation

Water Industry Entity Pty Ltd operates a combined electronic and hardcopy system for managing documents. All document masters are kept electronically in a folder on the shared network drive accessible to the responsible Quality Officer, Chief Financial Officer and Operations Manager. Backup copies are made each week and kept in a secure third party site using XXX Document Management Services.

All policies, procedures, work instructions reporting templates and other documents are provided to employees electronically via Water Industry Entity Pty Ltd intranet. Each document has a revision letter and date printed on each page, and revision history (limited to last 3) is located at the back of each document. When documents are printed from the intranet they are all watermarked with "uncontrolled copy" across each page to ensure as the printed document ages, employees are reminded to seek the most current version from the intranet.

Operating procedures for all assets (equipment, plant, networks and instrumentation) are printed and provided as version controlled copies and each is stored at the relevant operating plant. When new revisions are published they are printed and taken to the operating plant and swapped out with the old ones. Old revisions are destroyed.

Documents considered sensitive and not for general viewing are password protected with only relevant employees provided the password for each document. These include all statutory reports provided to various government agencies.

Official registers such as risk registers, competency registers, subcontractor registers (including induction currency), workplace health and safety incident reports and quality action reports are also stored and maintained on the intranet by the relevant officer responsible for each.

Reporting

A reporting register is maintained tracking all Water Industry Entity Pty Ltd reporting requirements both internal and external. The register includes the following information for each report:

- Report name and purpose.
- Internal / external.
- Government agencies to receive the report (if relevant).
- Responsible officer.
- Relevant audience.
- Report stakeholders.
- Approvals required prior to issue.
- Review period.
- Current report revision number and date.
- Review date required.

Water Industry Entity Pty Ltd currently completes the following internal and external reporting. The report register content and details are managed by the Quality Manager.

Table 3.2 :Internal & External Reporting

Item	Description
DHA approval / EPA Licence	Details reporting requirements between Council & DHA/EPA.
Annual DHA/EPA reports	Consolidated by plant operator and works manager
Daily , weekly, monthly compliance / operations checklist & records	Consolidated by plant operator and works manager.

Table 3.3 :Internal & External Incident Reporting

Item	Description
Incident Management System	Standard report generated for health and environmental incidents (including actions taken).
Incident /Event Notices	Communication of operational incidents and events to relevant agencies
LIMS	Email-based automatic exceedance notification system generated by NATA accredited laboratories data management software.
Water & Wastewater Incident Notification (See Scheme 1 RMP)	Contingency / emergency plan to follow in the case of type 1 or type 2 incidents.

3.5 Audit and Review

All systems and processes in place for the purpose of operating and maintaining assets safely, require regular review to ensure they are still relevant, current and reflect the most recent information available with respect to any item. Improvement initiatives, audits and general observations can drive change which needs to be reflected in systems and processes used by water industry entity for management of their operations.

Auditing is the systematic use of activities and processes to confirm that objectives within these processes are being met, including assessment of the implementation and capability of management systems. It provides valuable information on those aspects of the systems that are effective, and identifies opportunities for improving poor operational practices. Periodic auditing of all aspects of the management system is needed to confirm that activities are being carried out according to defined requirements and are producing the required outcomes. This should include auditing of the actions of all stakeholders.

The frequency and schedule of audits, as well as the responsibilities, requirements, procedures and reporting mechanisms, should be defined. The extent of auditing will generally be proportional to the potential for risks relating to the different risk areas discussed in Section 4. Those risks specific to health and environmental impacts will take into account the source and volume of water and the types of uses. Auditing requirements will be greater for a dual reticulation system supplying recycled water for domestic use than for a system involving drip irrigation of, for example, wine grapes.

Internal audits will involve trained employees, and should include review of the management system and associated operational procedures and monitoring programs. Audits should also cover the records generated to ensure that the system is being implemented correctly and is effective. A water industry entity should consider external auditing, which can be useful in establishing credibility and maintaining confidence among customers and/or regulators. External auditing could be achieved by peer review or undertaken by an independent third party. Affiliation and qualifications of external auditors should be recorded. External audits should focus on confirming implementation and results of internal audits.

A water industry entity is encouraged to establish an audit plan which will highlight which systems and processes are under consideration each year for both internal and external audits. This should not preclude the organisation from initiating unplanned or ad-hoc audits following incidents or other events which may trigger the need to determine the extent of various behaviours and activities with respect to specific functions or operations.

With particular reference to water quality results for any water type, long term evaluation audits are required to determine whether preventive strategies are effective and whether they are being implemented appropriately. This long-term evaluation allows performance to be measured against objectives and helps to identify opportunities for improvement.

Review Responsibilities

All Water Industry Entity Pty Ltd procedures and documents have an owner associated with the document and the review requirements of the document or procedure are described in Section 3. In addition to being responsible for the document or procedure, the document owner is also responsible for the process and undertakes a review of each process no less frequently than every [3 years]. A review of a process or procedure may be called for in less than a 3 year period following an incident, event or audit which identifies an opportunity for improvement or risk reduction.

Review activities are captured as part of auditing processes and procedures and the company's management of change and continuous improvement discussed in other parts of this plan.

Audit Plan and Results

Water Industry Entity Pty Ltd Quality Officer prepares an annual audit plan which is reviewed and approved by the management team every December for commencement in March of the following year.

The plan comprises internal and external audits and covers all processes and procedures addressed in this safety reliability and technical management plan. Audit reports are prepared within 2 weeks of the audit and findings are then recorded in the audit action register for tracking.

Audit actions have a due date assigned by the Quality Officer. Upon completion of an audit action the activities undertaken to correct or improve a given procedure or process are provided to the Quality Officer and the relevant manager will approve the action or request further actions to be undertaken. When actions are completed they are closed out in the audit action register. Follow up actions are also recorded in the audit action register against the original audit action. Where the due date for an action is not met, the Quality Officer will report the inactivity to the relevant line manager to ensure the action is reviewed and completed and to initiate a risk assessment regarding the failure to implement the action and the consequences relating to the continuation of activities which may pose a risk.

Audit actions which result in changes to operational, maintenance or other procedures are communicated to the relevant owner of the procedure for its subsequent updating and re-training of employees/contractors, if required. Audit results are reviewed at management meetings routinely as the results become available.

Auditing of water system management and compliance with regulatory requirements is discussed in Section 8.

4. Formal Safety and Reliability Assessment

4.1 General

Safety and reliability assessments are adopted for avoiding and minimising risks which may occur from the design, manufacture, procurement, importation, construction, operation and management of assets.

The assessment involves understanding and identifying hazards that are presented by the assets, and the risk or potential that these hazards have to cause damage or harm to property or people. Understanding the risk will assist, part way, to the selection of appropriate controls to mitigate the risk or the severity of consequence of the hazardous event. The application of these controls will reduce the risk to a residual level which should be considered “as low as reasonably practicable” (ALARP).

The assessment is undertaken to respond to the legal duty or obligation of the water industry entity and in turn satisfy the requirements of due diligence. This must be demonstrable as a permanent record and the responsible party should be comfortable that it could be defended in a court of law.

Safety and reliability assessments should be undertaken for each asset type owned by water industry entity.

4.2 Due Diligence

Describe the processes by which the water industry entity ensures it keeps up to date with all safety matters, understands the risks associated with carrying on out the operations of the various asset types, ensuring appropriate resources and processes are available to manage risk, and for receiving information to respond to incidents and risks, ensure that relevant management has, and implements, processes for complying with legislation, and verifying that these requirements are satisfied.

Typically this is achieved through hazard identification and rating, and determination of levels of responsibilities associated with controlling and monitoring hazard control measures.

Hazard Identification and Rating

The hazard identification processes, both for new infrastructure and ongoing operations, are aimed at identifying all reasonably foreseeable hazards. The identification process utilises persons with appropriate knowledge and experience. These processes include:

- *Consideration for off-design operating conditions and deterioration of existing equipment.*
- *Consultation with the employees/operators “at the coal face” or those with experience in similar operations. This is a requirement of legislation.*

The identified hazards are assessed and rated according to likelihood of occurrence and the consequence of the event, which may affect the circumstances at the time.

Hazard Registers are maintained and regularly reviewed and updated for incorporation of new assets and as existing operating assets are modified. As well as for safety, the rating system considers implications such as environmental, societal/reputational or financial. Methodologies and mitigations for addressing the hazards take into account these environmental, societal/reputational or financial considerations.

Refer to Scheme 1 RMP for Hazard Identification and Rating.

Levels of Responsibility

The level of responsibility for controlling and reporting of hazards, and monitoring the effectiveness of hazard controls are aligned with the organisational structure, where each member of the workforce carries a responsibility commensurate with their level of influence, as described below:

Level 1– Water Industry Entity

It is the duty of Water Industry Entity Pty Ltd under legislation to eliminate or minimise risks so far as is reasonably practicable (ALARP).

Level 2 – Portfolio Manager / Steering committee – Director / Officer

Management and officers ensure the health and safety of employees, contractors and the public by exercising due diligence to be aware of the risks that the business undertake.

Level 3 – Site / Plant Manager or Supervisor

Site/plant managers and supervisors ensure that they do not present undue risks to the health and safety of any person whilst maintaining safe and reliable operations.

Level 4a – Installation, construction, commissioning employees

Systems and processes are implemented for the selection and control of contracting and procurement functions which ensures that all equipment, installation and commissioning of equipment, operation and appropriate maintenance services to keep all equipment fit for safe use. The systems ensure that employees have sufficient understanding and skill to implement the works with reasonable care.

Level 4b – Designers, manufacturers, importers and suppliers

Design development for all new plant/equipment and modification to existing assets is undertaken with reasonable care, and includes the appropriate level of hazard identification and assessment.

4.3 Risk Response, Mitigation and Control

Risk response and mitigation strategies / activities should be applied to identify and assess risks using the hierarchy of control, which states preference to eliminating the risk rather than controlling it.

The hierarchy of controls is as follows:

- 1) **Elimination** – removes the cause of danger completely.
- 2) **Substitution** – controls the hazard by replacing it with a less risky way to achieve the same outcome.
- 3) **Isolation** – separates the hazard from the people at risk by isolating it.
- 4) **Engineering** – using engineering controls, i.e. making physical changes, to lessen any remaining risk
- 5) **Administration** – use administrative controls to lessen the risk
- 6) **Personal Protective Equipment (PPE)** – application of PPE in carrying out defined tasks.

Provide an overview of the organisations risk response and application of controls to mitigate identified risks as well as the methodology for assessing risks and ranking them in some priority order.

The selected hazard controls and mitigations that are applied are assessed for effectiveness. Applying controls that are not effective negates the control measure.

In responding to and mitigating identified risks, Water Industry Entity Pty Ltd applies a rigorous set of controls which take account of, for each risk or hazard, how well the hazard or risk is known, what can be done, and is reasonable to do, the degree of harm associated with failure of the controls, and the availability and sustainability of controls.

The methods employed to reduce risk are selected recognising the hierarchy of controls as follows:

Elimination – removes the cause of danger completely e.g. using non-hazardous acids and alkalis for controlling pH instead of Class 8 chemicals.

Substitution – controls the hazard by replacing it with a less risky way to achieve the same outcome.

Isolation – separates the hazard from the people at risk by isolating it e.g. moving the chlorine dosing away from the plant and encasing it in an enclosure with increased security measures such as locks and alarm systems.

Engineering – using engineering controls, i.e. making physical changes, to lessen any remaining risk, e.g. redesign a machine by adding safeguards.

Administration – using administrative controls to lessen the risk, e.g. install signs, job rotation.

Personal Protective Equipment (PPE) – requiring employees to wear PPE, e.g. provide gloves, earplugs, goggles.

Within this hierarchy, both physical and procedural controls are applied. However where applicable, the implementation of physical controls such as traffic barriers or fencing will be preferred over procedural controls.

Physical Controls

Physical controls consist of a physical item which provides a barrier to prevent contact between the item being protected and an unwanted external event (Separation), or by providing adequate physical strength of the item itself against identified external interference events (Strength).

Examples of physical controls are:

- Separation-traffic barriers, fencing, burial of pipes, concrete slabs.
- Strength-pipe wall thickness, pipe supports, pressure vessel nozzle connections.

Procedural Controls

Procedural controls are those which minimise the likelihood of the hazardous activity or risk occurring without the knowledge of the operator (Detection), and maximize the likelihood of people undertaking such an activity being aware both of the presence of the particular asset and the possible consequences of damaging it (Awareness).

Examples of procedural controls are:

- Detection-Planning zone notifications, remote intrusion monitoring at plants, inspections and patrols.
- Awareness-One-call systems (DBYD), community awareness programs, agreements with other utilities, signage and marking, specific third party liaison programs.

Engineering Controls

Engineering controls are those which, during the design or procurement phases introduce changes that lessen the hazard or risk. Examples are:

- Hazard and Operability (HAZOP) studies.
- Increased height of vent pipes on sewer mains or tanks.
- Revise plant layouts to remove threatened equipment from a risk area.
- Increased strength of foundations, or introduce seismic proof designs.
- Additional height on bunds and ponds to prevent overflow.

Risks and Controls – Human Health Management

Hazard identification and risk assessment (together with critical control point analysis) for hazards specific to human health has been undertaken based on Element 2.2.4 of the AGWR–2006. The hazard identification and risk assessment was conducted at a high level, looking only at the main process steps. The hazards that were identified include bacteria, protozoa and viruses, and further detail including the results of the risk assessment, is provided in Scheme 1 RMP.

4.4 Risk Assessment

Once risks and hazards are identified and mitigations / controls applied, any that have not been eliminated are assessed, usually according to a range of criteria and subsequently ranked. It is important that water industry entity understands its extreme or high hazards as opposed to those that are low or negligible.

AS/NZS ISO 31000 Risk management – Principles and Guidelines (previously AS 4360) describes the principles and processes of risk assessment, and these should be applied within water industry entity's organisation to assess the identified risks and hazards.

General

Identified risks and hazards are assessed using criteria, which are standardised throughout Water Industry Entity Pty Ltd, for the likelihood of the event occurring and the consequence if it does occur.

In particular, consequences are not just assessed as the physical or employees impact (e.g. number of injuries or fatalities) but also against other criteria such as financial impact, environmental impacts and reputational impacts.

Financial Impact

Assessment of financial impact considers cost of the hazardous event to Water Industry Entity Pty Ltd including physical repairs, lost production, damages from third parties, legal claims and the like. Various levels of cost are determined and ranked as Minor, Moderate, Major and Extreme, for use in the risk ranking process described in Appendix A.

Environmental Impact

Environmental impacts considered range from those ranked as trivial, which have minor or no effects and are rectified rapidly, through to those with increasing severity.

Minor risks are those where the effect is localised and of short term duration with manageable consequences whilst extreme risks represent those where the effects are widespread with possible major off-site and long term severe environmental effects.

Reputational Impact

Social and reputation impacts are those which have an impact on the social standing and reputation of Water Industry Entity Pty Ltd. They include coverage of the incident in local or national media, effect on communities surrounding the incident site, involvement of regulators and/or shareholders.

Risk Matrix

All risks are assessed using the standard Water Industry Entity Pty Ltd Risk Matrix, which ranks each item against levels of consequence (as described above) and likelihood (See Appendix A.1).

'As Low as Reasonably Practicable' (ALARP)

The final step in the formal safety assessment process is, for risks and hazards that are assessed as medium or higher, consideration of reducing the risk to ALARP. Water Industry Entity Pty Ltd processes for this consider:

- What can be done? –what is possible in the circumstances for ensuring safety and reliability.
- Whether it is reasonable in the circumstances to do all that is possible?

Factors that may determine whether something is 'reasonably practicable' include:

- Likelihood of the hazard and associated risks occurring.
- Degree of damage or harm that might result from the hazard/risks.
- What the person concerned knows, or ought reasonably to know about the hazard/risks, and ways of eliminating the hazard/risks through design.
- The availability and suitability of design approaches to eliminate or minimise the risks.
- The design costs associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Importantly, the issue of influence and control is also considered in what is 'reasonably practicable':

ALARP is considered to be reached when that which is, or was at a particular time, reasonably able to be done to ensure health, safety and reliability has been done, taking into account and weighing up all relevant matters.

Residual Risks

Information on residual risks for a system, process, plant or site is provided to operators and users of that facility through the documented Risk of Hazard Register for that facility. Furthermore, where there are downstream processes that could be affected by the residual risks, the Risk or Hazard Register is provided to operators and users of those facilities, to take account of their own risk and hazard assessments.

5. Asset Management

5.1 Asset Management Systems

A water industry entity is expected to have implemented an asset management system which, at high level, controls and guides activities to develop the optimum value from their assets. This will include but not be limited to assessing ongoing costs, opportunities and risks of owning, operating and maintaining the physical assets, and decisions regarding expanding, continuing to maintain, or replacement of the asset portfolio of the organisation.

Give an overview of the asset management system used to ensure the safe and sustainable operation of all water related assets.

The description of the asset management system and processes should be collated with the following points in mind:

- Sufficient detail to describe how the asset management strategy aligns with the business plan and policy.
- Gain an understanding of the decision making processes which consider the life cycle of the asset.
- Utilises the knowledge gained through historic operation of the asset.
- Considers the risk regarding criticality, contingency and external pressures.
- Demonstrate that forums exist for the feedback of operational improvements to asset managers, i.e. there is a line of sight from operators to those in position to implementing improvements.
- Response to changing risks and continual deterioration of existing assets.

Water Industry Entity Pty Ltd uses a computerised Asset Management System Version 1.0 that integrates the company's maintenance strategy with our business plan.

Asset Management involves coordinated activity to realise value from assets and requires the balancing of costs, opportunities and risks against the required performance of assets, to achieve the organisational objectives. This balancing is considered over different timeframes.

Asset management enables the examination of the need for, and performance of, assets and asset systems at different levels. Additionally, it enables the application of analytical approaches towards managing an asset over the different stages of its life cycle (which can start with the conception of the need for the asset, through to its disposal, and includes the managing of any potential post disposal liabilities).

Asset Management System

The asset management system connects the strategic plan and the daily operations of Water Industry Entity Pty Ltd departments responsible for planning, engineering, procurement, operations, maintenance and performance management.

Asset Management is established to enable the right decisions and ensure optimisation of the delivery of value. Water Industry Entity Pty Ltd objective is to minimise the whole of life cost of its assets whilst ensuring other critical factors such as changing risk regarding external pressures and demand, and business continuity are considered objectively in the decision making process.

Features of Water Industry Entity Pty Ltd Asset Management System include mechanisms to allow risk based decisions toward optimal and sustainable improvements and growth.

Management of Change

Water Industry Entity Pty Ltd maintains a Management of Change (MOC) process to ensure that all changes to the operations of its various assets are identified, assessed, implemented in a safe manner and finally recorded. The process starts when a change is identified, and all management and operations employees have the responsibility to notify a change as soon as practical.

The safety and technical aspects of the proposed change are then assessed to ensure compliance with legislation, internal safety and technical criteria, and against the original design. The aim is to ensure the wastewater and recycled water output parameters are still maintained within the required limits.

Designated management and technical employees are required to approve the change. Once approved the change is passed into Water Industry Entity Pty Ltd Project Management System for implementation.

5.2 Operations and Maintenance Decision Making

Provide an overview of the water industry entity's processes for decision making regarding the operation and maintenance of all types of assets. It is desirable that the water industry entity adopts a whole-of-life approach to the operations, maintenance and replacement of assets.

It is anticipated that a water industry entity will mostly have processes in place to manage this, but they may not be currently documented, and if they are documented elsewhere, a high level description with reference to other documents will suffice.

Water Industry Entity Pty Ltd manages the capital and operational expenditure of plant and facilities to maintain the balance between business growth and sustainability with minimum life cycle cost.

The timing of routine and major maintenance activities has considerable impact upon the deliverability and reliability of operating assets.

Investment decisions are based upon continued demand and expected growth and the operation and maintenance strategies align with demand including cyclic conditions and the opportunity to interrupt the service.

The coordination of internal and outsourced services is founded on the asset management strategy with consideration of current and future demand and forecast requirement of internal capability to deliver the future requirements.

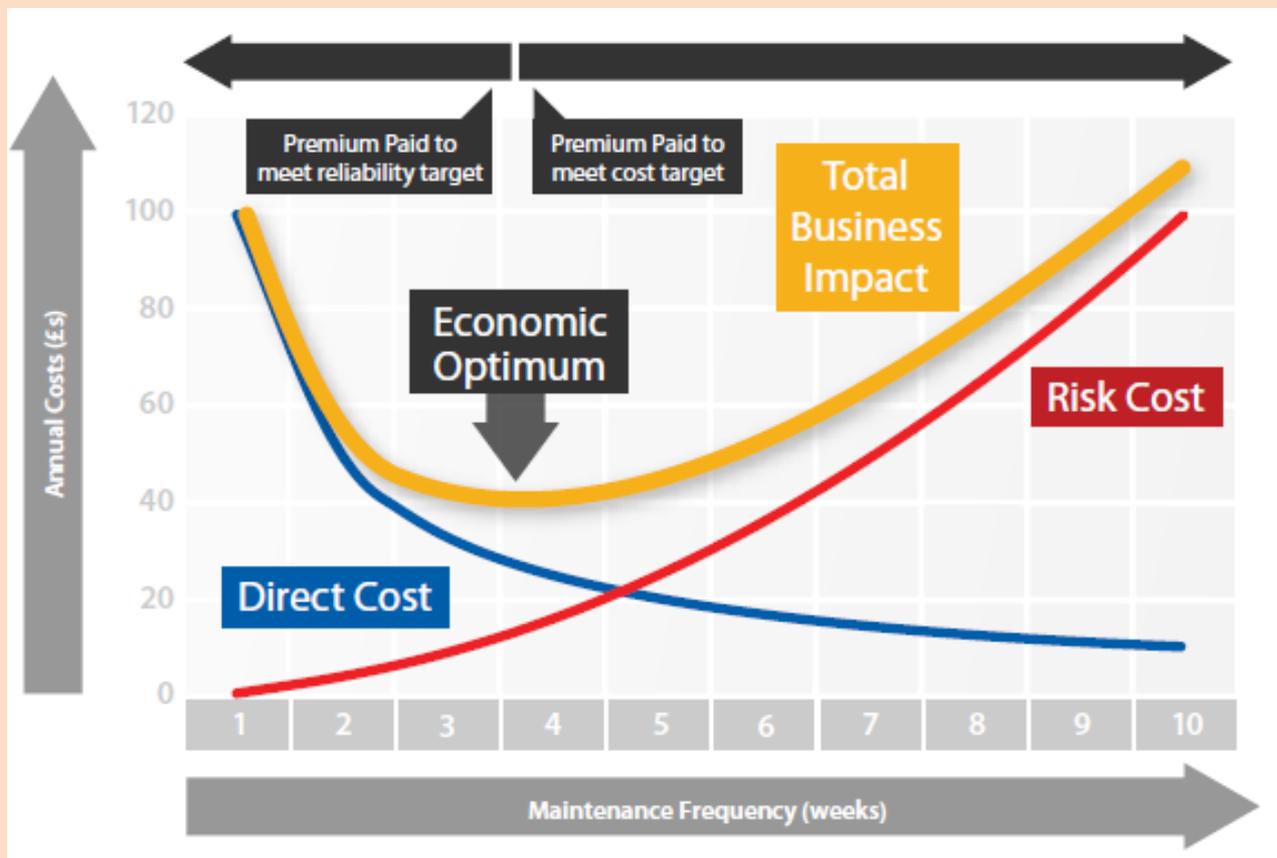


Figure 5.1 Asset Management Approach

Community Wastewater Management Assets

The CWMS described includes an integrated system of customer septic tank effluent collection into pipework delivering wastewater to a series of pump stations, which transport the wastewater through a pressure main to a treatment plant for storage and disposal/reuse.

The CWMS was designed and constructed to service the community as described in Section 2 and considered population growth up to XXX households. Future expansion of the residential area and associated wastewater load has been proposed and liaison with the land development authority continues.

The collection pipework system has been in service for XX years and has a design life of YY years.

Intervention with this system has been required due to damage by 3rd parties and for minor modifications only. Routine monitoring of the system for water tightness is done annually and repairs undertaken as needed. There has been no indication of the need for major maintenance on this system. A re-living study is planned to align with the end of design life and may be integrated with proposed developments when timing suits.

The Pump Stations design offers some redundancy for downtime, with a maximum survival time of X hours, during times of minimum load. This generally occurs at night and the risks associated with undertaking maintenance work out of hours are addressed using standard safe work procedures and onsite assessment methods such as the Hazard Analysis.

The pumps are serviced by the equipment owner as a part of a lease contract, including the pump control system and switchgear. On-board diagnostics allow in service condition monitoring which is reported to the Maintenance and Operations Managers.

Peripheral pump station facilities, gross pollutant traps, header tanks, interconnecting pipework and manifolds are operated, inspected and maintained by internal field service employees, and work is undertaken by service providers in coordination with planned shut down as required.

The pressure main pipelines that transport wastewater are designed, constructed and operated according to the Pressure Sewerage Code of Australia WSA 07-2007.

The pipeline system was designed in 19XX to the prevailing code of the time and has been in service for XX years, with a design life of YY years.

The pipeline alignment spatial data is registered with a one call service (Dial Before You Dig) and alignments patrolled XX weekly by company field maintenance officers.

Odour and septicity monitoring and control are managed by an internal biological group, while the associated equipment is serviced and maintained by the engineering group, engaging external resources where necessary.

The XYZ Waste Water Treatment Plant lagoons require minimal intervention for continuous operation but rigorous monitoring of the surrounding earth and ground water is require to ensure containment integrity of the liner. This monitoring is undertaken by the internal biological group.

During periods of low demand for recycled water for irrigation, monitoring of the polishing lagoons outflows is undertaken in accordance with DHA Approval and EPA Licence. Weekly monitoring of algae in the lagoon is undertaken to ensure solids are not built up in the distribution system, and water quality requirements are maintained.

Periodic removal of sediment in the ponds is required to ensure the active treatment value in the facultative and polishing lagoons is maintained.

This is implemented by a pond survey every 5 years to manage the sludge depth. Once a sludge depth of one metre is measured on average, contract sludge removal services are engaged to vacuum the sludge from the bottom of the lagoon.

5.3 Asset Life Cycle and Maintenance vs Replacement

Good asset management practices include adopting a whole-of-life approach, appreciation of the asset life cycle, and systems and tools to determine the optimum point of replacing an asset versus continuing to maintain it. As assets age, increasing maintenance is required and at some point it is more economical to replace the asset than to continue to maintain it. Asset management adopts a

forward looking view, aiming to forecast the optimum time to replace assets with enough lead time to undertake a considered and planned program.

Describe how decisions regarding continuing maintenance vs refurbishment or replacement of the asset are made, incorporating systems and tools available, data used and analysis undertaken.

Normally systems and process for determining the maintain vs replace equation will exist across the whole organisation, however may only be applied to certain asset types and not others (e.g. applied to plant and equipment in a WWTP, but not to distribution networks).

The existing equipment utilised by Water Industry Entity Pty Ltd in the CWMS is operated within a maintenance structure that schedules the work to common procedures.

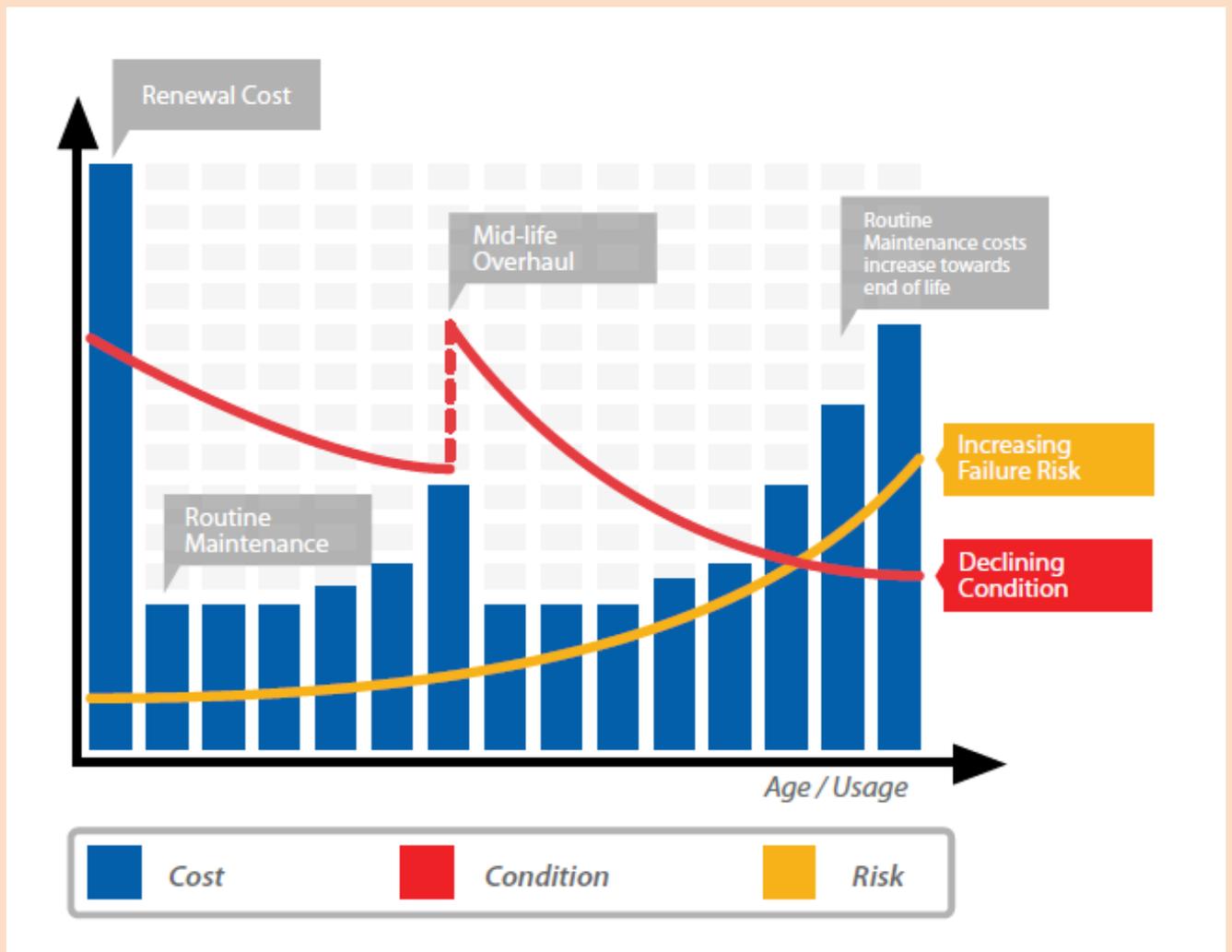


Figure 5.2 Asset Life Cycle Approach

Due to the age of Scheme 1, Water Industry Entity Pty Ltd adopts a preventive maintenance program over a breakdown maintenance approach. This program includes scheduled mid-life overhauls of major mechanical and electrical equipment to extend asset life and defer increased maintenance costs. Whereas replacement of minor – low capital mechanical and electrical equipment is adopted to avoid increased routine maintenance costs. This preventative maintenance program is reviewed by the Works Committee every 5 years.

The percentage utilisation of each element of the CWMS is assessed and indicates limiting elements to be included in the preventative maintenance program.

5.4 Resourcing Strategy and Optimisation

Describe the resources required to operate and maintain the assets, including human, physical (tools, spares vehicles etc.), and the processes by which these are optimised. This could include how levels of stock spares are determined and maintained, service programs for vehicles, reference to HR policies for employee replacement, competency etc., and resource optimisation.

Equipment selection and flexibility may consider standardisation, and be reflected in operation and maintenance practices, while also offering wide opportunity for staged growth in plant capacity or redeployment between sites to improve opportunities for responsiveness to changing market demands.

5.5 Maintenance Program

Provide an overview of the maintenance programs implemented by the water industry entity, including systems and processes for maintenance scheduling, acquisition of spares etc. If specialised software maintenance programs are utilised, state the program and provide a high level description and its capacity.

Water Industry Entity Pty Ltd performs regular maintenance and inspections to ensure the safe, effective and efficient operation of Scheme 1, which is detailed in the Scheme 1 Maintenance Program [Link].

Scheme 1 Maintenance Program covers the following areas:

- **Equipment requirements** including specialist equipment schedule.
- **Replacement parts/materials** including Parts Inventory.
- **Specific system operation and maintenance manuals.**
- **Connection Maintenance Procedure** including septic tank desludging program.
- **Trade waste Auditing Procedures** including identification of prohibited discharges.
- **Collection System Maintenance Procedures** including flushing, blockages, breakages, daily checks, monthly services, annual services for drains, pump stations, and pumping mains.
- **Treatment System Maintenance Procedures** including visual inspections, electrical and mechanical testing.
- **Disposal System Maintenance Procedures** including flushing, blockages, breakages, daily checks, monthly services, annual services for drains, pump stations, and pumping mains.
- **Recycled System Maintenance Procedures** including flushing, blockages, breakages, daily checks, monthly services, annual services for drains, pump stations, and pumping mains.
- **Maintenance Scheduling** including planned and unplanned maintenance scheduling.
- **Maintenance record keeping procedures** including proformas.

6. Contract Management

6.1 General

Contract management extends beyond engaging the procurement of materials and equipment as detailed in Section 3, it involves the management of contracts made with customers, suppliers, partners, or employees.

Provide an overview of the system or process employed by the water industry entity for determining the appropriate structure of the various contracts.

Water Industry Entity Pty Ltd process for implementing a structured contract comprises four key steps:

1. *Supplier Registration – Allows only pre-qualified organisations, or those undertaking prequalification to be eligible to secure service or supply contracts. Pre-qualification is achieved through an assessment completed by the Quality Manager.*
2. *Sourcing Activity – Define scope of works and scope of services for the proposed contract, and identify items which represent significant business risks. Assessment of identified risks associated and development of a strategy to control or mitigate.*

Some examples of control methods used are:

- *Select a contract sourcing team to manage the purchase of major capital equipment ensuring the asset management requirements are factored into selection criteria of any purchase.*
 - *Develop a receipt inspection and testing method for critical or sensitive equipment and consumables to ensure mitigation of risks associated with the operation and maintenance of the purchased products.*
 - *Conduct special training events to familiarise operators with new technology and equipment.*
 - *Request technical design of systems with appreciable risk is verified by a qualified third party for the specific discipline associated with the design. Record and maintain records of third party verification.*
3. *Contract Award – Develop contract document pack including contract schedule, record any pre-award clarifications. Define post-award monitoring and KPIs and other environmental or similar measures. Confirm compliance and qualification status of all relevant parties and designs prior to mobilisation.*
 4. *Contract Management – Use of management tools to facilitate ongoing performance monitoring including compliance of construction against design, compliance of construction activities to standard procedures, progress monitoring and management of technical issues, contract variations and scope changes with particular attention to the management of change post safety studies and audits as these have the potential to be high risk activities if the changes are not reviewed in detail against all system aspects. Changes should not be made in isolation of overall system design considerations.*

6.2 Contracting Risks, Mitigation, Review and Audit

Audit and review of contracting risks is critical to ensuring that they continue to be managed as part of delivery of any project, supply of equipment or consumable goods. Audits need to address the effectiveness of mitigation strategies and report on residual risks.

Detail how contracting risks are identified, quantified and managed; the establishment of a risk register, and processes to put mitigation strategies in place.

Water Industry Entity Pty Ltd extends its risk management activities to those associated with its contracting activities. Contract management risks are included in a risk assessment undertaken at the commencement of the procurement phase, whether it is for a period operating contract or a specific project contract. Risks associated with the contracting process are identified and mitigations developed. They are reviewed and updated as necessary once the contract is signed. Risks to successful contract management can arise from a number of sources. These include:

- *Contract management capability – both in our organisation and the contractor.*
- *Contractor performance – capability, competency, on time delivery, over or under budget.*
- *Change in circumstances – no change management implemented, variation management, changes not identified and addressed in a timely manner.*
- *Stakeholder relationships – stakeholders not consulted.*
- *Risks to safety – use of contractors vs in-house employees, contractor safety performance.*

The risks identified are documented in a risk matrix, and included in the appropriate risk register, either in the Procurement Department for on-going or period service contracts, or within project documentation for project contracts.

The Procurement Manager has responsibility for ensuring these practices are implemented within the organisation.

Water Industry Entity Pty Ltd has instituted robust audit and review processes to address the critical aspect of ensuring that contract risks continue to be managed as part of delivery of any project, or ongoing contracted service. An audit programme of Water Industry Entity Pty Ltd use of contractors forms part of the operational audits referred to in the Scheme 1 RMP, and is focussed at addressing the effectiveness of mitigation strategies developed to manage contracting risks. Audits are conducted both at project or individual contract level as well as a higher organisational level to identify commonalities and trends, and by both internal and external audit teams. Audit reports, including residual risks and trends, are circulated to project managers through to operational and senior management as appropriate. The Quality Manager, in conjunction with the Procurement Manager, is responsible for the contracting audit programme.

6.3 Contractor Management

An implemented contractor management system (CMS) provides a structured approach to the identification and acquisition of qualified and competent contractors, suppliers and service providers, and a robust process for awarding of contracts to those companies and managing the contracts once awarded.

A CMS can provide assurance that:

- Formal pre-qualification assessment is undertaken prior to mobilisation.
- Ongoing training requirements and qualification validity are maintained.
- Project/contract performance from both safety and commercial aspects are continually monitored.

Describe at a high level the water industry entity's approach to contractor management, which may or may not be documented elsewhere.

Water Industry Entity Pty Ltd Contractor Management System (CMS) requires contractors to demonstrate that they have the knowledge and experience to work safely and effectively within our operating environment.

The CMS also provides training and guidance to contractors and subcontractors to ensure awareness of all requirements of the Water Industry Entity Pty Ltd.

7. Customer/Public Protocols and Agreements

7.1 General

The installed infrastructure and operation of that infrastructure by the water industry entity has the potential to affect not only the customers of water industry entity but also the general community (public). Communicating with customers and the public with regard to matters affecting them directly or indirectly is an important part of ensuring adequate information is supplied to everyone to ensure they manage their own safety or service provision.

Communicating restrictions or interruptions to services for any period and ensuring customers are aware of the details of the restrictions are also important communications to consider so that they may make alternate arrangements for services where possible (e.g. purchase of drinking water during water outages, changing sprinkler programming during drought periods, moving at risk individuals to alternate locations if water quality is to be affected).

One of the most important areas for communication relates to recycled water. A water industry entity should have educational procedures in place to notify households provided with recycled water the specific use parameters as a means of reducing exposure to risk. Signage as a communication tool where recycled water is being used is a critical control measure used to reduce the risk of exposure to the public.

The public may need to be notified if there are traffic restrictions resulting from maintenance or emergency repair processes. Start up or shutdown of various plants during scheduled maintenance may result in noise or odours of which the local public should be notified. In some cases the installation of hazardous chemicals may require nearby residence to participate in evacuation drills to ensure risks to the public are appropriately managed.

The process by which these communications are prepared, distributed and checked for understanding should be in place for a water industry entity and should demonstrate a sound knowledge of the customer base and areas of the public affected by operation.

General

Protocols are reviewed with stakeholders annually and agreed and updated as required. Full protocols form part of Water Industry Entity Pty Ltd overall notifications procedures and are located with the operating procedures residing with the Operations Manager.

Stakeholder and Public Communication

Notification to Customers of Service Outages

It is our obligation to our customers that we are prepared for a planned or unplanned service outage.

Water Industry Entity Pty Ltd undertakes to notify all customers of a planned service outage specifying the date and expected duration of the outage using the following mechanisms:

- A letter will be posted to all customers at least 2 weeks before the date.*
- Water Industry Entity Pty Ltd website contains a listing of planned outages with a status update via a hotlink on its front page (customers are notified of the hotlink location in the mailed letter).*
- Work crews will post signs in the local area at the commencement of the outage and will remove signs only once full services are restored.*
- Where outages are to exceed a period of xx hours, customers will be provided with a daily delivery of xx litres of bottled safe drinking water (where appropriate).*
- Where outages are to exceed a period of xx hours, customers will be provided with portable toilets and showers (where appropriate).*

Unplanned service outages are managed using the following mechanism:

- *Water Industry Entity Pty Ltd will provide its team manning the emergency response telephone number with a status of affected area and expected duration for customers who contact Water Industry Entity Pty Ltd directly.*
- *Water Industry Entity Pty Ltd website contains a listing of unplanned outages with a status update via a hotlink on its front page (customers are notified of the hotlink location by the emergency response phone operators).*
- *Work crews will post signs in the local area at the commencement of the outage and will remove signs only once full services are restored.*
- *Where outages are expected to exceed a period of xx hours, customers will be provided with a daily delivery of xx litres of bottled safe drinking water (where appropriate).*
- *Where outages are expected to exceed a period of xx hours, customers will be provided with portable toilets and showers (where appropriate).*

Public Notification of Traffic Restrictions

Water Industry Entity Pty Ltd may need to undertake planned or unplanned works on infrastructure which will result in traffic restrictions. Traffic restrictions are governed via local and state government regulatory requirements and Water Industry Entity Pty Ltd ensures all traffic restrictions comply with the Road Traffic Act and subsequent regulations.

Procedures outlining requirements are documented with the operating procedures residing with the Operations Manager.

Public Notification of Noise or Odour Disturbances

In accordance with EPA requirements, Water Industry Entity Pty Ltd provides appropriate notification to affected parties with the documented lead times and using the documented procedures.

Boiled Water Notifications

In the event a drinking water health related parameter analysed by NATA accredited laboratories is determined as exceeding safe levels, Water Industry Entity Pty Ltd will notify the Technical Regulator and DHA in accordance with established protocols and then once agreed will execute the notification procedures as outline in the governing protocols with those agencies.

Public Emergency Announcements and Evacuation Procedures / Drills

Water Industry Entity Pty Ltd stores hazardous chemicals at its facility.

An emergency may arise following a loss of containment with any of these chemicals. Emergency Procedure will be followed to manage the event. Specific protocols for the notification of potentially affected parties are provided in the Emergency Procedures prepared for each site. These procedures contain specific instructions relating to radio and other media announcements to local residents including internet bulletin updates and SMS messaging to residents who have nominated to be notified via the Water Industry Entity Pty Ltd "NEED TO KNOW" programme for stakeholder notification.

Further to the Emergency Procedures in place, Water Industry Entity Pty Ltd will engage the relevant emergency authorities once each year and organise a drill for the evacuation of local residents and affected parties in the event of a loss of containment scenario. These will be spot drills. All affected parties will be notified in writing annually that these drills will occur at random without notification with a list of procedures of steps to follow during the drill and/or evacuation.

Signage Relating to the Use of Recycled Water in Public Places

As per DHA approval, site xxx provides recycled water which can come into contact with the general public. To mitigate exposure signage is supplied in accordance with DHA requirements and is documented in the DHA Risk Management Plan for that system which is kept by the Operations Manager.

Education and Notices to Customers

As per DHA approval, Water Industry Entity Pty Ltd provides recycled water to customers and communicates directly with customers as outlined in this Section regarding the collection scheme, plant operations and recycled water use.

In accordance with DHA requirements procedures outlining education of customers are detailed in the Operating Procedures and kept by the Operations Manager. Where required, input has been and will be sought from DHA in developing communication and education material where necessary.

7.2 Supply Agreements

It is intended that a water industry entity should establish appropriate agreements with those customers who will purchase and use or sell the recycled water from a recycled water system. This is in addition to standard customer contracts as established by ESCOSA and relates to the technical and health aspects of the water use.

An overview of the number of agreements and summary of their contents should be provided here. The agreements themselves should be appropriately referenced and their location cited.

Water Industry Entity Pty Ltd has only one recycled water system and a single user who is supplied with this recycled water.

The agreement includes the relevant onsite control and withholding period requirements as per the DHA approval and Irrigation Management Plan (IMP). It also includes contingency measures and communication protocols for process failures or situations where water supply or water quality may be compromised.

This agreement is stored with all agreements at the Head Office and is the responsibility of the Contracts Manager.

This agreement will be reviewed and audited.

8. Compliance Monitoring

8.1 General

It is a well-established principle of an ISO 9001 compliant quality system that there are processes and procedures in place for monitoring performance of an organisation's systems and procedures to ensure that compliance to internal procedures and policies, and external legislative and code requirements along with meeting customer needs is maintained. These processes should include an audit program, development of key performance indicators (KPIs), and measurement of operations against those KPIs, as well as appropriate reporting mechanisms both internal and external.

Evaluation, Audit, Review and Continual Improvement are also covered by Elements 11 and 12 of the Australian Drinking Water Guidelines and the South Australian Recycled Water Guideline and are fundamental in the practices of operating water services.

Audit programmes and the output of various audits will be required by regulators at different times and for different purposes as a means of demonstrating compliance with the water industry entity's own plan and those approvals and licences obtained from regulators and government agencies.

There is an expectation that the water industry entity will have in place some form of audit program and performance monitoring of its operations to ensure safe and manageable processes for employees and safe delivery of services and products to its customers.

8.2 Monitoring Compliance with Safety and Technical Requirements

Provide a performance monitoring and compliance structure which observes the obligations of the relevant legislation.

The structure should include a plan for review and continuous improvement, and recognise Key Performance Indicators (KPIs) which are specific to the industry.

Water Industry Entity Pty Ltd operates Scheme 1 under various government agency approvals and licences. Details of the infrastructure associated with the scheme are provided in the RMP. The scheme operates under its own unique set of key performance indicators (KPI), some of which are derived from approval and Licence conditions and others which are set by Water Industry Entity Pty Ltd to ensure safe, efficient and economic operation of each system.

The implemented performance monitoring and compliance structure includes a plan for review and continuous improvement against KPIs specific to the water industry and the environment within which Water Industry Entity Pty Ltd operates. These KPIs are regularly reported to internal and external stakeholders and published annually in a report for each system. The reports are published on the Water Industry Entity Pty Ltd website and customers are notified when it is available.

KPI Measurement and Reporting

Key Operational Performance Indicators are provided in Table 8.1 provide an on-going measurement of the organisations performance in providing a consistent, compliant service to customers in delivering wastewater processing, and recycled water delivery services to its stakeholder base, including households from which it collects wastewater and customers to who it sells recycled water.

These KPIs have been developed with input from relevant internal and external stakeholders, and represent an agreed basis for the measuring the performance of the organisation. They are reviewed annually for relevance, and modified as necessary.

Table 8.1 :Key Operational Performance Indicators

KPI	Description	Measure	Target
Microbial concentrations	Recycled Water Quality Measures	E.coli count per 100 mL	<100 cfu / 100 mL
Total Dissolved Solids			
pH			
Measured detention time in chlorine contact tank			
Recycled water reticulation pressure			
Wastewater collection system reported blockages			
Time to respond to customer reports of system blockages			

Water Industry Entity Pty Ltd has processes in place to collect this data on a continuous / monthly / weekly basis and the reports of performance against the targets are regularly provided to senior management and the Board.

The performance results also provide opportunity to identify aspects of our operations that should be improved, in order to maintain quality or other performance standards.

These opportunities are documented and fed into the Water Industry Entity Pty Ltd processes for asset management, including maintenance, replacement, upgrade or expansion, and also other processes as applicable such as health and safety, human resource management, training, and systems improvement.

8.3 Periodic Audit of Operations

Provide specific details of audits relating to each wastewater and recycled water system and those aspects which are required as part of regulatory requirements in the operation of these plants.

The audit plan relating to each system/scheme and the aspects audited should be stated here to ensure visibility of what is planned. If an audit plan is in place, either the audit plan can be provided or referenced here following consultation with the OTR.

Water Industry Entity Pty Ltd is committed to monitor and audit its operations commensurate with Licence conditions.

This includes monitoring of the following:

Wastewater Treatment - With regard to WWTP output water quality - mean BOD₅, mean suspended solids (SS), median E coli, mean total Chlorine – monitored by quarterly testing, audited annually. This follows the initial start-up monitoring regime, and is compliant with conditions of the Licence.

Recycled Water - Similarly for monitoring the quality of recycled water, after residence in holding pond and prior to irrigation or distribution. The effectiveness of associated backflow prevention systems is subject to initial audit, biennial testing and annual auditing.

Drinking Water - With regard to drinking water quality – those parameters associated with wastewater output and range Iron, average Arsenic, average total dissolved solids, and aesthetic values – monitored by quarterly testing, audited annually, following initial start-up monitoring regime.

Non-drinking water quality - With regard to non-drinking water quality – those parameters associated with wastewater output and range Iron, average Arsenic, average total dissolved solids, and aesthetic values – monitored by quarterly testing, audited annually, following initial start-up monitoring regime.

8.4 Corrective Action and Continual Improvement

Senior management support, commitment and ongoing involvement are essential to the continuous improvement of the organisation's activities. Senior managers should regularly review their approach to water quality management (drinking, recycled and non-drinking), develop action plans and commit the resources necessary to improve operational processes and overall water quality.

In order to ensure continuous improvement, the highest levels of the organisation(s) should review the effectiveness of the water quality management system and evaluate the need for change, by:

- reviewing reports from audits, recycled water quality performance, environmental performance and previous management reviews
- considering concerns of users of water (drinking and recycled), regulators and other stakeholders
- evaluating the suitability of the water quality policy (recycled and / or drinking), objectives and preventive strategies in relation to changing internal and external conditions such as:
 - changes to legislation, expectations and requirements.
 - changes in the activities of the organisation.
 - advances in science and technology.
 - outcomes of water (recycled and drinking) quality incidents and emergencies.
 - reporting and communication.

The review by senior managers should be documented.

Corrective actions resulting from audits or reviews should be considered as opportunities to make changes not only to rectify problems but also make improvements.

Management of corrective actions in a holistic sense is provided in Section 3.

Specific to water systems, a water industry entity should consider the value of preparing a water quality management improvement plan. Provide a description of how it manages improvements with regard to the water quality delivered to their customers.

Specific Audits – WWTP and Water Quality

Internal audits of the WWTP procedures (including Emergency Management) are conducted every two years. In addition, annual reviews of all procedures are undertaken.

The compliance of the wastewater treatment plant and recycled water scheme is reviewed against the approval conditions.

The WWTP has an Environment Protection Authority Licence (EPA No 123) that requires reporting on water quality and the WWTP monitoring program. Condition #5 of the Licence requires the licensee (on or before 30 September) each year to provide the EPA with independent verification of the monitoring data reports for the 12 months leading up to 30 June of that year. The verification is to cover the Licensee's compliance with the monitoring program and Irrigation Management Plan (IMP); and to assess whether the objectives of the monitoring program and IMP have been met.

Long Term Evaluation of WWTP and Recycled Water Quality Results and Operating Data

A systematic review of monitoring results over the preceding 12 month period is conducted every quarter through the collation of daily operation records and monthly reports prepared for internal assessment, to:

- *Assess overall performance against numerical guideline values, regulatory requirements or agreed levels of service.*
- *Identify emerging problems and trends.*
- *Assist in determining priorities for improving recycled water quality management.*

Where the data shows performance is below that required or could be improved, each instance is assessed and appropriate responses determined based on factors identified in Section 4. Where a corrective action is

recommended, it is recorded and an investigation initiated to assess the root cause with the aim of putting measures in place to stop recurrence of the excursions. Actions are not only corrective but also preventative.

Evaluation is reported internally to senior managers and externally to users of recycled water, stakeholders and regulatory authorities, in accordance with the requirements as detailed throughout this plan.

In addition, the water quality results and performance of the WWTP is reviewed annually. An annual report encompassing all recycled water data including basic statistics of plant performance, monitoring program and non-conforming product over the financial year is submitted to DHA and EPA as noted in Table 3.3.

Recycled Water Quality Management Improvement Plan

Water Industry Entity Pty Ltd has a recycled water quality management plan. The plan is endorsed by the Chief Executive Officer and incorporates the actions required over the next three years to effect an improvement in recycled water quality:

- Capital works.
- Training.
- Enhanced operational procedures.
- Consultation programs.
- Research and development.
- Incident protocols.
- Communication and reporting.

The plan takes into account an annual review of the WWTP operations which includes:

- Events and incidents (Priority Type 1/ Type 1/ Type 2).
- Operational procedures/ corrective actions.
- Process schematics & any changes.
- Plumbing audit findings where necessary.
- Cross-connections.
- Customer complaints or business development issues.
- Water quality data.
- Preventative measures.
- Water quality monitoring programs.
- Irrigation management plan changes.
- Changes/ variations to DHA Approval / EPA Licence conditions.
- Trade waste events.

The improvement plan includes on-site audit programs for Scheme 1, additional water quality training for operations employees, extending community awareness programs to the local primary and area schools. Long-term capital works projects include increasing storage capacity of lagoon, extending the recycled water distribution system to Town recreational oval and installation of a filter prior to delivery to the New development to allow a third pipe system by developers.

The improvement plan outlines the objectives, actions to be taken, how the action will be measured as effective, accountability, timelines and reporting. The plan is available on Water Industry Entity Pty Ltd internal website. A public version is also available on Water Industry Entity Pty Ltd website.

Action status is reported quarterly against the plan and reported as an addendum to the plan as posted on the websites.

8.5 Water Quality

Describe the systems and processes in place to monitor water quality supplied to customers and compliance with the relevant legislation, codes and standards, and what monitoring, audits and controls are included.

Non-drinking Water Quality

The following areas are supplied with non-drinking water:

- XXXX.
- YYYY.

Customers supplied with non-drinking water supplies are informed that their water is not suitable for drinking by [Insert mechanisms by which customers are informed their supply is non-drinking quality]].

Recycled Water Quality

As part of each EPA Licence and DHA approval (depending on what is done with which water sources) Water Industry Entity Pty Ltd is required to maintain a monitoring program which verifies the quality of the treated wastewater or recycled water. The aim of this program is to:

- *provide confidence to all stakeholders of recycled water that the quality of recycled water supplied by Water Industry Entity Pty Ltd is being maintained within the DHA requirements.*
- *ensure that environmental protection targets are being achieved, and the requirements of the EPA Licences are being met.*
- *provide an indication of problems and a trigger for any corrective actions, or incident and emergency responses.*

Recycled water supplies are managed with processes, systems and expertise that ensures recycled water complies with the Australian Guidelines for Water Recycling (AGWR).

Water Industry Entity Pty Ltd has implemented a Water Quality Management Plan (WQMP) which covers the 12 Elements of the AGWR. This includes external auditing as well as internal auditing as described in Section 8, and a commitment to continual improvement of the provision of recycled water, both in efficiency of operations and quality of water supplied. The WQMP ensures that the quality of recycled water supplied by Water Industry Entity Pty Ltd is compliant and continuously improves, and assists in minimising provision of out-of-specification recycled water.

The monitoring program requires regular site specific sampling and testing to assess whether recycled water quality and receiving environments are meeting guideline values, regulatory requirements, and agreed levels of service. Routine sampling at the WWTP is described in the operations manual which complies with the requirements of all approvals/ licences. These sampling procedures are consistent with AS/NZS 5667:1998 for sampling water and wastewater. In all cases, samples will be obtained by a competent person trained in sampling (e.g. Plant Operator, Technical Support Officer etc.) with all samples obtained and preserved in accordance with AS 2031:2000.

Initial review of performance data is undertaken immediately by the plant Operator, who responds to unplanned changes at the WWTP according to the contingency plan (see Scheme 1 RMP).

Equipment for on-site testing is regularly calibrated where necessary with results recorded on the appropriate documentation. All routine samples collected from the WWTP are analysed at a NATA accredited laboratory.

Appendix A. Risk Matrix Example

A.1 Water Industry Entity Pty Ltd Risk Matrix

	Health & Safety	Environmental	Community / Reputation / Statutory	Our People / Morale	Rating	Likelihood				
						Rare - 1% chance	Unlikely - 5% chance	Possible - 10% chance	Likely - 50% chance	Certain - 100% chance
Consequence	Fatality	High local impact	Serious public and national media outcry	Industrial action	Extreme	Medium	High	Extreme	Extreme	Extreme
	Lost Time Injury (LTI)	Moderate local impact	Significant adverse State media or public attention. Federal government scrutiny, involvement by local regulator	Loss of confidence in management	Major	Medium	High	High	Extreme	Extreme
	Medically Treated Injury (MTI)	Minor local impact	Media attention and heightened concern by local community. State government scrutiny, involvement by regulator	Reduced productivity	Moderate	Low	Medium	High	High	Extreme
	First Aid Injury (FAI)	Minimal site impact	Minor adverse local public or media attention or complaints	Lowering of morale	Minor	Low	Medium	High	High	High
	No illness / Near Miss	No impact	None	Insignificant Impact	Insignificant	Low	Low	Low	Medium	Medium