



*Protecting our
Natural Environment*

ASSET MANAGEMENT PLAN

WATER SUPPLY SYSTEMS

23 MAY 2016

MID-WESTERN REGIONAL COUNCIL
OPERATIONS: SERVICES

■ ■ ■ ■ ■ TOWARDS 2030



DOCUMENT CONTROL

Document ID: 59 299 140531 nams plus3 amp template v3.1

REV NO	DATE	REVISION DETAILS	AUTHOR	REVIEWER	APPROVER
1	Feb 2015	Draft for internal review	CC		
2	9/06/2015	Draft: Alignment with Draft Operational Plan	CC		
3	16/12/2015	Draft: Update Organisational structure	CC		
4	24/03/2016	Draft: Update financial data	NB		
5	4/04/2016	DRAFT FOR EXHIBITION (22/4/16 – 20/5/16)	CC	DC	Council Minute No.90/16
6	23/05/2016	PLAN ADOPTION: Minor editing to remove draft references	CC	DC	BC

THIS DOCUMENT HAS BEEN PREPARED BY CLAIRE CAM, MANAGER WATER AND SEWER, FOR MID-WESTERN REGIONAL COUNCIL.

ANY QUESTIONS IN RELATION TO THE CONTENT OF THIS DOCUMENT SHOULD BE DIRECTED TO:

council@midwestern.nsw.gov.au OR (02) 6378 2850

DATE OF PUBLICATION: 23 MAY 2016

Table of Contents

1

1.	Executive Summary	6
1.1	Context	6
1.2	What does it cost?	7
1.3	What we will do	8
1.4	What we cannot do	8
1.5	Managing the risks	9
1.6	Confidence Levels	9
1.7	The Next Steps	9
1.8	Questions you may have	9
2.	Introduction	12
2.1	Background.....	12
2.2	Goals and Objectives of Asset Management	14
2.3	Plan Framework.....	15
2.4	Core and Advanced Asset Management	17
2.5	Community Consultation.....	17
3.	Levels of Service.....	18
3.1	Customer Research and Expectations.....	18
3.2	Strategic and Corporate Goals	18
3.3	Legislative Requirements.....	18
3.4	Levels of Service	19
4.	Future Demand	24
4.1	Demand Drivers.....	24
4.2	Demand Forecast	24
4.3	Demand Impact on Assets.....	24
4.4	Changes in Technology	25
4.5	Demand Management Plan	25
4.6	Asset Programs to meet Demand.....	26

5.	Lifecycle Management Plan	28
5.1	Background Data	28
5.1.1	Physical parameters	28
5.1.2	Asset capacity and performance	28
5.1.3	Asset condition	29
5.1.4	Asset valuations	30
5.1.5	Historical Data	31
5.2	Infrastructure Risk Management Plan	31
5.3	Routine Operations and Maintenance Plan	33
5.3.1	Operations and Maintenance Plan	33
5.3.2	Operations and Maintenance Strategies	34
5.3.3	Summary of future operations and maintenance expenditures	35
5.4	Renewal/Replacement Plan	36
5.4.1	Renewal plan	36
5.4.2	Renewal and Replacement Strategies	37
5.4.3	Summary of future renewal and replacement expenditure	39
5.5	Creation/Acquisition/Upgrade Plan	40
5.5.1	Selection criteria	40
5.5.2	Capital Investment Strategies	41
5.5.3	Summary of future upgrade/new assets expenditure	41
5.6	Disposal Plan	42
5.7	Service Consequences and Risks	43
5.7.1	What we cannot do	43
5.7.2	Service consequences	43
5.7.3	Risk consequences	44
6.	Financial Summary	45
6.1	Financial Statements and Projections	45
6.1.1	Projected expenditures for long term financial plan	50
6.2	Funding Strategy	51
6.3	Valuation Forecasts	51
6.4	Key Assumptions made in Financial Forecasts	54
6.5	Forecast Reliability and Confidence	55
7.	Plan Improvement and Monitoring	57
7.1	Status of Asset Management Practices	57
7.1.1	Accounting and financial systems	57

7.1.2 Asset management system58

7.2 Improvement Plan.....59

7.3 Monitoring and Review Procedures59

7.4 Performance Measures.....60

8. References.....61

9. Appendices62

Appendix A Maintenance Response Levels of Service.....63

Appendix B Projected 10 year Capital Renewal and Replacement Works Program.....64

Appendix C Projected Upgrade/Exp/New 10 year Capital Works Program70

Appendix D Budgeted Expenditures Accommodated in LTFP73

Appendix E MWRC Water Supply and Sewerage Asset Criticality Assessment Report 201474

Appendix F Abbreviations107

Appendix F Glossary108

1. Executive Summary

1.1 Context

Mid-Western Regional Council services the urban areas of Mudgee, Gulgong, Rylstone, Kandos, Charbon and Clandulla with reticulated potable water supply. Municipal parks and gardens and community sporting facilities in Mudgee and Gulgong are serviced with reticulated chlorinated bore water.

Council operates and maintains three distinct potable water supply systems and two distinct chlorinated bore water supply systems as follows:

- **Mudgee potable water supply system.** Raw water is sourced from the Cudgong River and Burrundulla bore field, processed at Mudgee Water Treatment Plant in accordance with Australian Drinking Water Guidelines (ADWG) and distributed to the Mudgee community via a distribution system incorporating trunk mains, reservoirs, pumping stations, reticulation pipework and metered customer connections.
- **Mudgee chlorinated bore water supply system.** Raw water is sourced from Glen Willow bore field, chlorinated at Court Street pump station, pumped to Church Street reservoir and reticulated to municipal parks and gardens and community sporting facilities via trunk and reticulation pipelines. Customer connections are metered.
- **Gulgong potable water supply system.** Raw water is sourced from the Cudgong River, stored in an off-river storage, processed at Gulgong Water Treatment Plant in accordance with ADWG and distributed to the Gulgong community via a distribution system incorporating trunk mains, reservoirs, pumping stations, reticulation pipework and metered customer connections.
- **Gulgong chlorinated bore water supply system.** Raw water is sourced from bores, chlorinated at Elcom pump station, pumped to Flirtation Hill reservoir and reticulated to municipal parks and gardens and community sporting facilities via trunk and reticulation pipelines. Customer connections are metered.
- **Rylstone, Kandos, Charbon and Clandulla potable water supply system.** Raw water is sourced from the Council owned Rylstone Dam, processed at Rylstone Water Treatment Plant in accordance with ADWG and distributed to the Rylstone, Kandos, Charbon and Clandulla communities via a distribution system incorporating trunk mains, reservoirs, pumping stations, re-chlorination units, reticulation pipework and metered customer connections.

Mudgee and Gulgong potable water treatment plants were constructed in the early 2000's, utilising current technology available for water treatment specific to treat hardness. The majority of Mudgee's old unlined cast iron reticulation pipes have been replaced, however Gulgong's reticulation system comprises approximately 20km (1/3 of pipelines in Gulgong) of deteriorating unlined cast iron reticulation pipe that is having regular impact on the aesthetic quality of potable water received at the consumer in Gulgong.

Rylstone water treatment plant was constructed in the 1960's. The treatment technologies will require upgrading in the medium term to ensure Council can supply water quality in accordance with Australian Drinking Water Guidelines (ADWG).

The Water Supply Systems Service

The potable water supply systems network comprises:

- Groundwater borefields
- Dams
- Potable water treatment plants
- Raw water mains
- Potable water distribution and reticulation mains
- Potable water reservoirs
- Pump stations
- Metered customer connections

The chlorinated borewater supply systems network comprises:

- Groundwater borefields
- Pump stations
- Raw water mains
- Chlorinated bore water distribution and reticulation mains
- Chlorinated bore water reservoirs
- Pump stations
- Metered customer connections

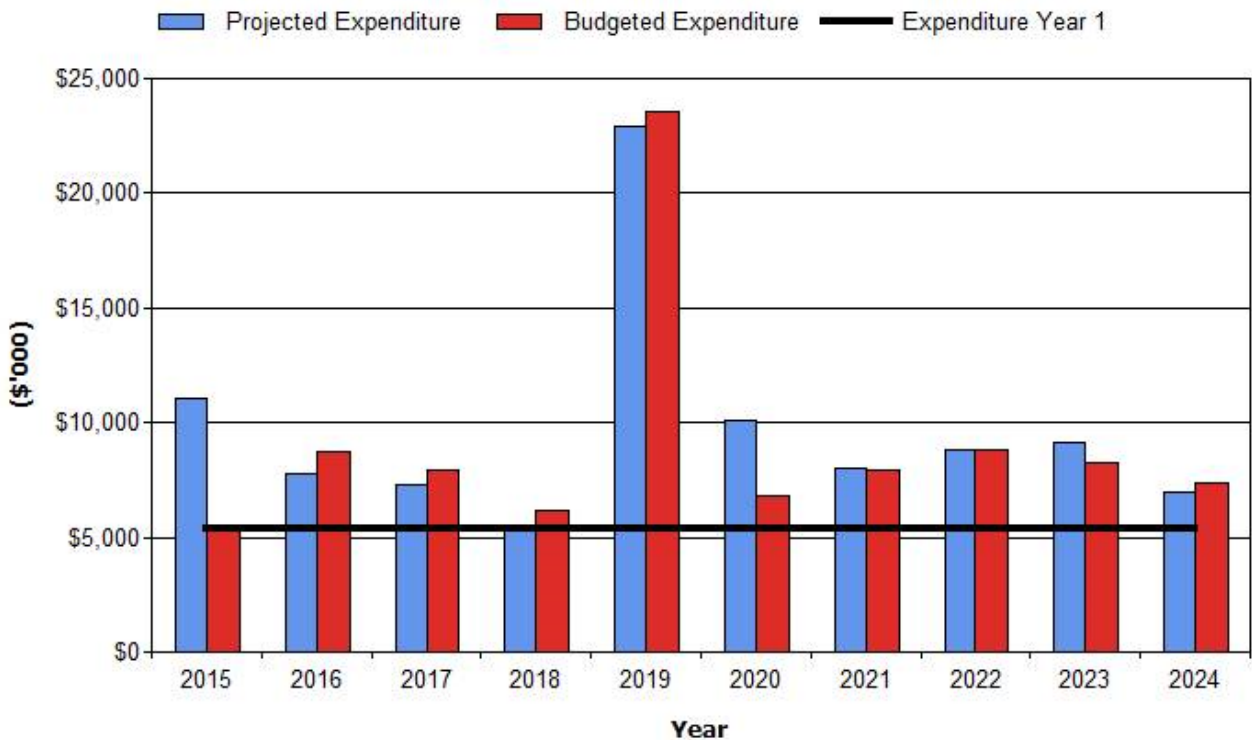
The above infrastructure assets have a replacement value of \$104,891,000.

1.2 What does it cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan (AM Plan) includes operations, maintenance, renewal and upgrade of existing assets over the 10 year planning period is \$97,447,000 or \$9,745,000 on average per year.

Estimated available funding for this period is \$91,019,000 or \$9,102,000 on average per year which is 93% of the cost to provide the service. This is a funding shortfall of \$643,000 on average per year. Projected expenditure required to provide services in the AM Plan compared with planned expenditure currently included in the Long Term Financial Plan are shown in the following graph.

Mid-Western RC - Projected and Budgeted Expenditure for (Water_S1_V3)



1.3 What we will do

We plan to provide resources for the following:

- Operation, maintenance, renewal and upgrade of water supply system infrastructure to meet service levels set by Council in annual budgets.
- Renewals and upgrades within the 10 year planning period to the extent of the current budget.
- Review and refine our knowledge of Council's water supply assets.

1.4 What we cannot do

We do **not** have enough funding to provide all services at the desired service levels or provide new services. Works and services that cannot be provided under present funding levels are:

- Renewal or replacement of all water supply system infrastructure currently older than its accepted/assessed "useful life" in year one.
- Extension of services to existing urban or village areas that are not experiencing growth.

1.5 Managing the risks

There are risks associated with providing the service and not being able to complete all identified activities and projects. We have identified major risks as:

- Managing existing potable water supply systems to meet ADWG standards
- General deterioration of aging systems
- Inadequate systems
- Funding of operation and maintenance activities associated with new infrastructure
- Current level of service alignment with community expectations

We will endeavour to manage these risks within available funding by:

- Operate within Council's Drinking Water Management System relevant to each potable water supply system.
- Monitor the condition of the water supply system networks and regularly assess renewal priorities
- Regularly review the priorities for new work to ensure they meet corporate objectives

1.6 Confidence Levels

This AM Plan is based on medium level of confidence information.

1.7 The Next Steps

The actions resulting from this asset management plan are:

- Analyse available performance data
- Investigate asset criticality and program scheduled maintenance and capital renewals for critical assets as a priority.
- Undertake detailed condition assessment
- Revise and document asset failure modes and risks
- Detail a renewals plan based on the above actions
- Integrate the asset management system with linkages to Council's finance system.

1.8 Questions you may have

WHAT IS THIS PLAN ABOUT?

This asset management plan covers the infrastructure assets that serve the Mid-Western Region community's water supply servicing needs. These assets include:

- 28 groundwater bores

- 2 dams
- 3 water treatment plants
- 324km water mains
- 17 water reservoirs
- 13 pump stations
- 7,972 metered customer connections

The above assets are provided throughout the urban areas of Mudgee, Gulgong, Rylstone, Kandos, Charbon and Clandulla, contributing to community public health.

WHAT IS AN ASSET MANAGEMENT PLAN?

Asset management planning is a comprehensive process to ensure delivery of services from infrastructure is provided in a financially sustainable manner.

An asset management plan details information about infrastructure assets including actions required to provide an agreed level of service in the most cost effective manner. The plan defines the services to be provided, how the services are provided and what funds are required to provide the services.

WHY IS THERE A FUNDING SHORTFALL?

Most of the Council's water supply network was constructed by developers and from government grants, often provided and accepted without consideration of ongoing operations, maintenance and replacement needs.

Many of these assets are approaching the later years of their life and require replacement, services from the assets are decreasing and maintenance costs are increasing.

Our present funding levels are insufficient to continue to provide existing services at current levels in the medium term.

WHAT OPTIONS DO WE HAVE?

Resolving the funding shortfall involves several steps:

1. Improving asset knowledge so that data accurately records the asset inventory, how assets are performing and when assets are not able to provide the required service levels,
2. Improving our efficiency in operating, maintaining, renewing and replacing existing assets to optimise life cycle costs,
3. Identifying and managing risks associated with providing services from infrastructure,
4. Making trade-offs between service levels and costs to ensure that the community receives the best return from infrastructure,
5. Identifying assets surplus to needs for disposal to make saving in future operations and maintenance costs,
6. Consulting with the community to ensure that water supply system services and costs meet community needs and are affordable,

7. Developing partnership with other bodies, where available to provide services,
8. Seeking additional funding from governments and other bodies to better reflect a 'whole of government' funding approach to infrastructure services.

WHAT HAPPENS IF WE DON'T MANAGE THE SHORTFALL?

It is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found.

WHAT CAN WE DO?

We can develop options, costs and priorities for future water supply system services, consult with the community to plan future services to match the community service needs with ability to pay for services and maximise community benefits against costs.

WHAT CAN YOU DO?

You can contribute your thoughts on the issues raised in this asset management plan and suggestions on how we may change or reduce its mix of services to ensure that the appropriate level of service can be provided to the community within available funding.

2. Introduction

2.1 Background

The purpose of water supply systems in the Mid-Western Regional Local Government Area are to source, treat and distribute water to meet the Australian Drinking Water Guidelines and the community's expectations in contributing to a healthy community.

Mid-Western Regional Council is responsible for the management of five existing water supply systems:

- Mudgee potable system
- Gulgong potable system
- Rylstone, Kandos, Charbon, Clandulla potable system
- Mudgee chlorinated bore water irrigation system
- Gulgong chlorinated bore water irrigation system.

This asset management plan is to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service over a 20 year planning period.

The asset management plan follows the format for AM Plans recommended in Section 4.2.6 of the International Infrastructure Management Manual¹.

The asset management plan is to be read with the organisation's Asset Management Policy, Asset Management Strategy and the following associated planning documents:

- Mid-Western Regional Council Delivery Plan
- Mid-Western Regional Council Community Plan
- Mid-Western Regional Operational Plan 2015-2016
- Mid-Western Regional Council Strategic Business Plan for Water Supply Services

This infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are used to provide potable and chlorinated bore water (non-potable) water supply services to the community.

¹ IPWEA, 2011, Sec 4.2.6, *Example of an Asset Management Plan Structure*, pp 4|24 – 27.

TABLE 2.1: ASSETS COVERED BY THIS PLAN

Asset category	Dimension	Replacement Value
Water mains	323 (km)	\$45,573,500
Pump stations	13 (number of)	\$5,509,000
Reservoirs	17 (number of)	\$15,328,000
Treatment Plants	3 (number of)	\$22,502,500
Bores	28 (number of)	\$1,398,000
Dams	2 (number of)	\$14,580,000
TOTAL		\$104,891,000

Key stakeholders in the preparation and implementation of this asset management plan are: Shown in Table 2.1.1.

TABLE 2.1.1: KEY STAKEHOLDERS IN THE AM PLAN

Key Stakeholder	Role in Asset Management Plan
Councillors	Represent needs of community/shareholders, Allocate resources to meet the organisation's objectives in providing services while managing risks, Ensure organisation is financial sustainable.
Executive Management Team	Endorse the development of asset management plans and provide the resources required to complete the task. Support the implementation of actions resulting from this plan. Support for an asset management driven budget and long term financial plan.
Corporate Directorate	Consolidate the asset register and ensure valuations are accurate. Preparation of asset sustainability and financial reports including asset depreciation in accordance with current Australian accounting standards.
Operations Directorate	Development of AM Plan and administration support. Staff provide local knowledge detail and verification of asset data including attributes and condition via opportunistic visual assessment during operational and maintenance activities
Asset Management Contractors	Undertake asset condition assessment via specialised methodology, mechanical and electrical testing.
Community	Provide feedback on levels of service

Our organisational structure for service delivery from infrastructure assets is detailed below:



2.2 Goals and Objectives of Asset Management

The organisation exists to provide services to its community. Some of these services are provided by infrastructure assets. We have acquired infrastructure assets by ‘purchase’, by contract, construction by our staff and by donation of assets constructed by developers and others to meet increased levels of service.

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and

- Having a long-term financial plan which identifies required, affordable expenditure and how it will be financed.²

2.3 Plan Framework

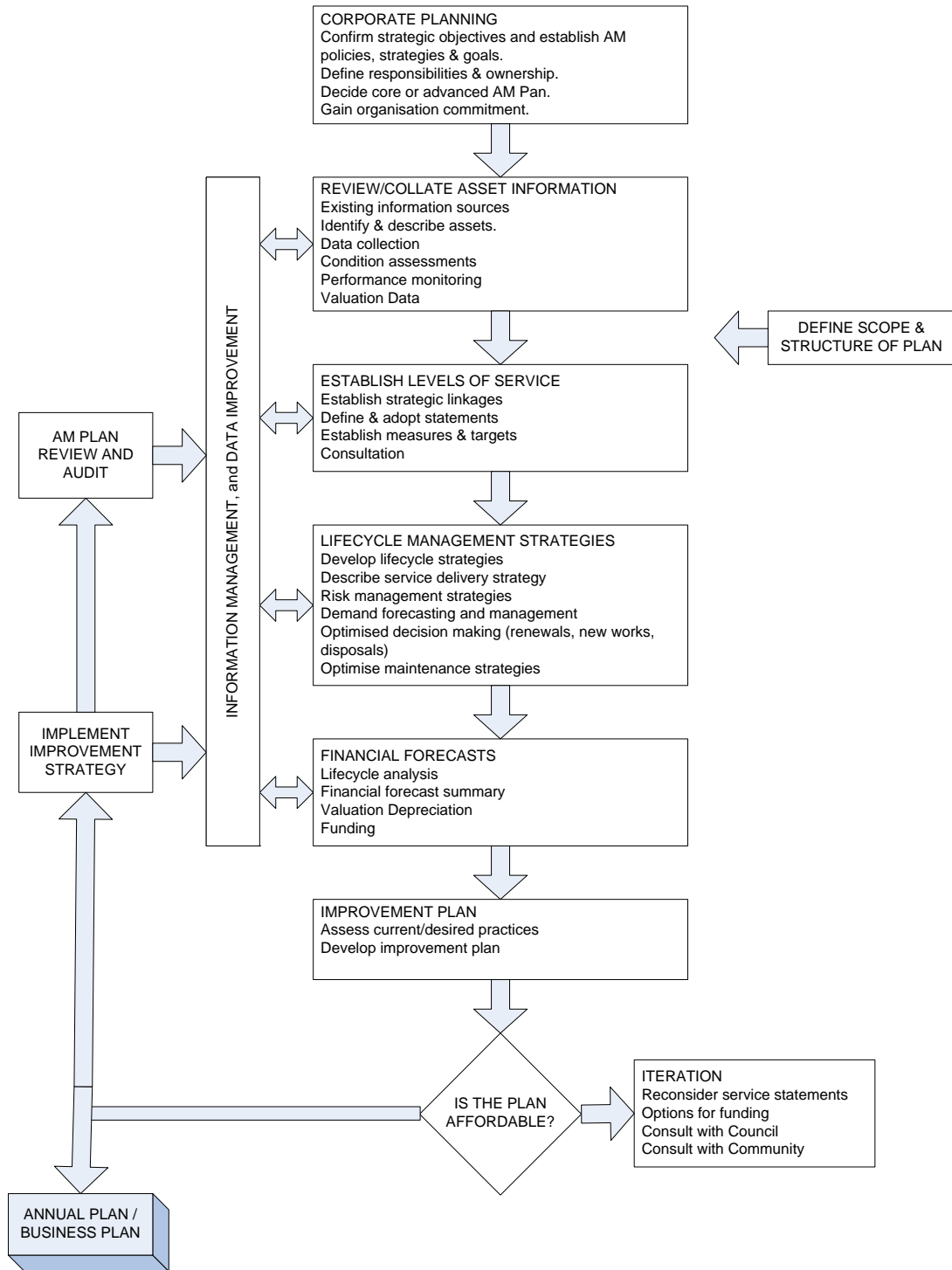
Key elements of the plan are

- Levels of service – specifies the services and levels of service to be provided by the organisation,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Life cycle management – how Council will manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices,
- Monitoring – how the plan will be monitored to ensure it is meeting organisation's objectives,
- Asset management improvement plan.

A road map for preparing an asset management plan is shown below.

² Based on IPWEA, 2011, IIMM, Sec 1.2 p 1|7.

ROAD MAP FOR PREPARING AN ASSET MANAGEMENT PLAN



SOURCE: IPWEA, 2006, IIMIM, FIG 1.5.1, p 1.11.

2.4 Core and Advanced Asset Management

This asset management plan is prepared as a 'core' asset management plan over a 20 year planning period in accordance with the International Infrastructure Management Manual³. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long term financial planning and reporting. Core asset management is a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this asset management plan will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels in a financially sustainable manner.

2.5 Community Consultation

This 'core' asset management plan is prepared to facilitate community consultation initially through feedback on public display of draft asset management plans prior to adoption by the Council. Future revisions of the asset management plan will incorporate community consultation on service levels and costs of providing the service. This will assist the Council and the community in matching the level of service needed by the community, service risks and consequences with the community's ability and willingness to pay for the service.

³ IPWEA, 2011, IIMM.

3. Levels of Service

3.1 Customer Research and Expectations

The organisation has not carried out any research on customer expectations specifically related to water supply infrastructure asset management. This will be investigated for future updates of the asset management plan. The community were consulted when preparing Mid-Western Regional Council’s *Towards 2030 Community Plan* and minimising water consumption was identified as an issue of interest to the community.

3.2 Strategic and Corporate Goals

This asset management plan is prepared under the direction of the organisation’s vision, mission, goals and objectives.

Our vision is:

A prosperous and progressive community that we are proud to call home.

Relevant organisational goals and objectives and how these are addressed in this asset management plan are:

TABLE 3.2: ORGANISATIONAL GOALS AND HOW THESE ARE ADDRESSED IN THIS PLAN

Goal	Objective	How Goal and Objectives are addressed in AM Plan
Looking after our community	Effective and efficient delivery of infrastructure	Asset Management Plans identify and plan for the delivery of and ongoing management and disposal of sewerage system infrastructure.
Protecting our natural environment	Provide total water cycle management	Delivery and management of infrastructure will consider our environment in terms of managing both water quality and quantity including consideration of sustainable water usage and conservation practices.

The organisation will exercise its duty of care to ensure public safety is accordance with the infrastructure risk management plan prepared in conjunction with this AM Plan. Management of infrastructure risks is covered in Section 5.2.

3.3 Legislative Requirements

The organisation has to meet many legislative requirements including Australian and State legislation and State regulations. These include:

TABLE 3.3: LEGISLATIVE REQUIREMENTS

Legislation	Requirement
Local Government Act	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
Workplace Health and Safety Act 2011	Protects workers and other persons against harm to their health and safety and welfare through elimination or minimisation of risks arising from work.
OLG Integrated Planning and Reporting framework	Sets out standards for asset management plans and requires the plan to integrate with community plans and resourcing strategy
Environmental Planning & Assessment Act 1979	Sets out assessment and approval processes of community services and facilities
Protection of the Environment Operations Act 1997	Protect, restore and enhance the quality of the environment in NSW
Water Act 2000	Provide sustainable and integrated management of water sources in NSW

3.4 Levels of Service

Council's levels of service as published in the 2008 Strategic Business Plan for Water Supply Services are detailed in Table 3.4.

TABLE 3.4: CURRENT LEVELS OF SERVICE

DESCRIPTION	LEVEL OF SERVICE / TARGET
AVAILABILITY OF SERVICE	
Normal Quantity Available	
Domestic Peak Day	3000 L/tenement/day
Domestic Annual	370 kL/tenement/yr (Target 350kL/tenement/yr)
Total Annual Average Consumption	Mudgee 2000 ML/yr Gulgong 600 ML/yr Rylstone 600 ML/yr
Total Peak Daily Consumption	Mudgee 14 ML/day Gulgong 5 ML/day Rylstone 4 ML/day
Peak/Average daily consumption	250%
Fire Fighting:	
Compliance with the Water Supply Investigation Manual* (AS 2419.1 classifications 2, 3, 4 & 9 with floor area less than 1000sqm)	100% urban residential areas serviced
Pressure:	
Minimum pressure when delivering 0.15L/s	10 metres head (target 20 metres head)
Maximum static pressure	90 metres head (target 70 metres head)
Consumption Restrictions in Droughts:	
Level of restriction applied through a repeat of the worst drought on record	Mudgee and Gulgong – 0% normal usage Rylstone - Target 80%)
Average frequency of restrictions	Target 1/10 year period
Supply Interruptions to Consumers	
Temporary supply arrangements during interruptions	Where possible

DESCRIPTION	LEVEL OF SERVICE / TARGET
<p>Planned (95% of time):</p> <p>Notice given to domestic customers</p> <p>Notice given to commercial customers</p> <p>Notice given to major industrial customers</p> <p>Unplanned:</p> <p>Maximum duration</p> <p>Frequency</p>	<p>4 working days</p> <p>4 working days</p> <p>4 working days</p> <p><4 hours</p> <p>Major – 30 events/year (target < 25 events/year)</p> <p>Minor – 200 events/year (target < 150 events/year)</p>
<p>RESPONSE TIMES</p> <p>(Defined as time to have staff on-site to commence rectification after notification of problem by public or own staff)</p>	
<p>Supply Failure:</p> <p>Priority 1 (defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time)</p> <ul style="list-style-type: none"> - During working hours - Out of working hours <p>Priority 2 (defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical use at a non-critical time)</p> <ul style="list-style-type: none"> - During working hours - Out of working hours <p>Priority 3 (Defined as failure to maintain continuity or quality of supply to a single customer)</p> <p>Priority 4 (Defined as a minor problem or complaint, which can be dealt with at a time convenient to the customer and the Council)</p>	<p>0.5 hour</p> <p>1 hour</p> <p>1 hour</p> <p>1 hour</p> <p>2 hours</p> <p>1 working day</p>

DESCRIPTION	LEVEL OF SERVICE / TARGET
Customer Enquiries / Complaints: Personal / Oral Written Note: Times apply for 95% of occasions	2 working days (target 1 working day) 10 working days
Service Provision: Time to provide a domestic individual connection to water supply in serviced area (95% of times)	20 working days (target 10 working days)
WATER QUALITY	
Microbiological Parameters: Total coliforms Thermo tolerant coliforms Sampling frequency	100 CFU/100mL 100 CFU/100mL 4 samples/month
Physico-chemical Parameters: pH Turbidity Iron Manganese Arsenic Flouride Free available chlorine (WTP) Free available chlorine (Reticulation) Sampling frequency	7.5 – 8.5 < 1 NTU 0.3mg/L 0.6mg/L (target 0.1mg/L) 0.007mg/L 0.5-1.5mg/L 0.2-0.6mg/L 0.2-0.6mg/L 365 samples/WTP/year
Percentage Compliance with 2001 NHMRC / AWRCM ADW Guidelines: NOTE: Council's Strategic Business Plan for Water Supply (2008) was produced prior to latest release of ADWG 2011)	
Physical parameters Chemical parameters	Target 100% Target 100%

DESCRIPTION	LEVEL OF SERVICE / TARGET
Total coliforms	Target 100%
Thermo tolerant coliforms	Target 100%

4. Future Demand

4.1 Demand Drivers

Drivers affecting demand include population change, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

4.2 Demand Forecast

The present position and projections for demand drivers that may impact future service delivery and utilisation of assets were identified and are documented in Table 4.3.

4.3 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and utilisation of assets are shown in Table 4.3.

TABLE 4.3: DEMAND DRIVERS, PROJECTIONS AND IMPACT ON SERVICES

Demand Drivers	Present Position	Projection	Impact On Services
Growth Development	Population fluctuations due to mining industry fluctuations has had a significant impact on planning for services required. Large subdivision releases have recently rapidly occurred to accommodate potential population surges.	New growth areas will continue to be released, although at a more sustained rate.	Increased demand on existing water supply infrastructure. Increase in developer contributed assets to operate and maintain
Increasing community health and water quality aesthetics standards	Council maintains three treatment plants that utilise technology that may not meet future environmental standards	Requirements are to become more stringent	Increased treatment cost High cost of replacement plant Redundancy of existing plant
Increasing costs	The cost to construct, maintain and renew infrastructure is increasing at a rate greater than Council's revenue	Anticipated to continue. Cost of renewing water supply systems is increasing as development density increases.	The need to carefully target and plan infrastructure is increasing in importance as maximising the service that can be delivered within funding limitations will be under pressure

4.4 Changes in Technology

Technology changes are also forecast to affect the delivery of services covered by this plan as detailed in Table 4.4.

TABLE 4.4: CHANGES IN TECHNOLOGY AND IMPACT ON SERVICES

CHANGE IN TECHNOLOGY	EFFECT ON SERVICE DELIVERY
Improved trenchless pipeline renewal/construction techniques	Reduced cost of pipeline renewal and maintenance Reduced impact of works on the community and environment
Treatment process improvement	Renewal of treatment processes being able to produce increased water quality
Telemetry system	Increased reliability of historic data for use in future asset renewal planning and improved response to maintenance issues
Non-invasive/insitu inspection data	Use of digital data for asset assessment and future referral
Pump efficiencies and increased reliability	Increased reliability of service provision and reduced power consumption costs.

4.5 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures.

Non-asset solutions focus on providing the required service without the need for the organisation to own the assets and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures⁵. Examples of non-asset solutions include providing services from existing infrastructure such as aquatic centres and libraries that may be in another community area or public toilets provided in commercial premises.

Opportunities identified to date for demand management are shown in Table 4.5. Further opportunities will be developed in future revisions of this asset management plan.

⁵ IPWEA, 2011, IIMM, Table 3.4.1, p 3|58.

TABLE 4.5: DEMAND MANAGEMENT PLAN SUMMARY

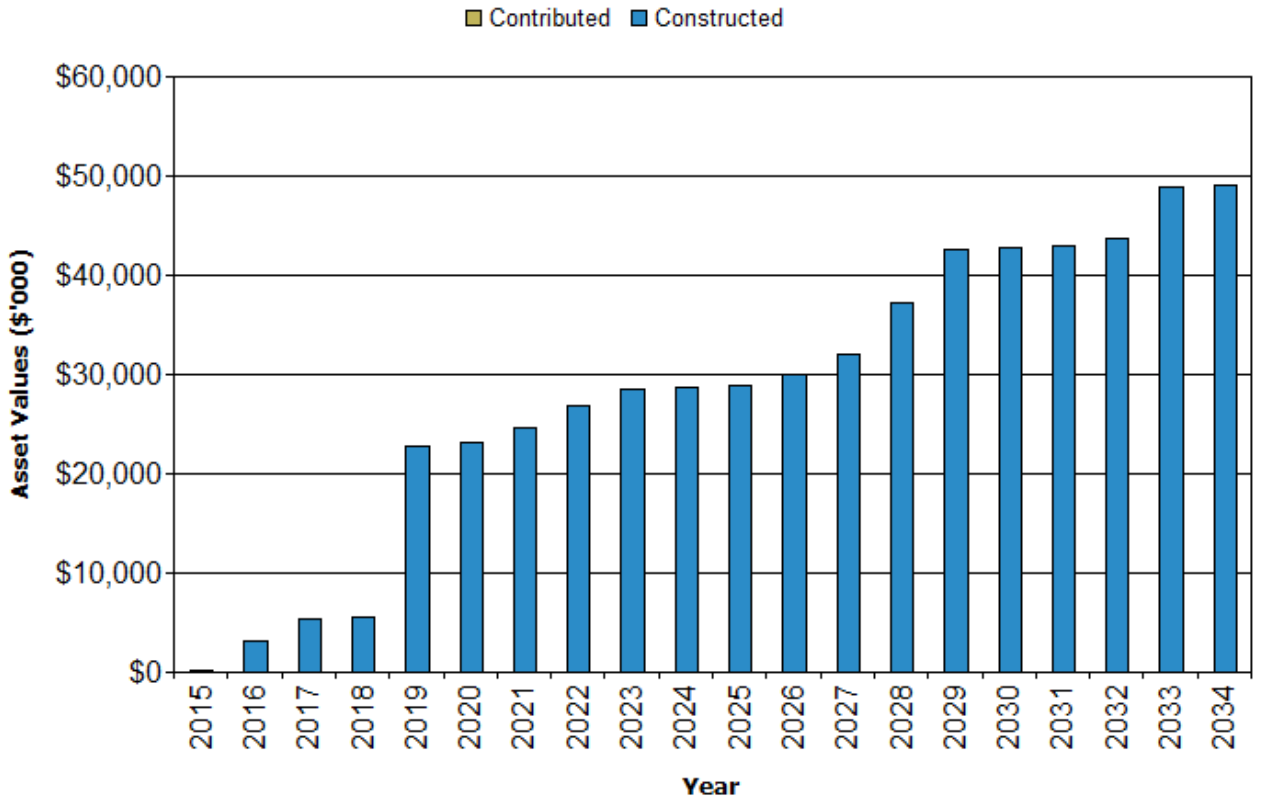
Demand Driver	Impact on Services	Demand Management Plan
Community expectations	Pressure to expand Council's water supply system networks	Monitor community expectations and communicate levels of service and financial capacity with the community to balance priorities for infrastructure with what the community is prepared to pay for. Ensure developer contributed assets are in accordance with Australian Standards that ensure new assets do not become a burden to Council.
Funding availability	Pressure to expand Council's water supply systems without full prioritisation of community needs or knowledge of whole of life costs	Seek grant funding for projects identified as priorities in the Community Plan and Asset Management Plan
Preventative action vs reactive action	Increased maintenance budget for inspections and reactive or "emergency" maintenance	Initiate inspection scheduling. Ensure developer contributed assets are in accordance with Australian Standards that ensure new assets do not become a burden to Council.

4.6 Asset Programs to meet Demand

The new assets required to meet growth will be acquired free of cost from land developments and constructed/acquired by the organisation. New assets constructed/acquired by the organisation are discussed in Section 5.5. The cumulative value of new contributed and constructed asset values are summarised in Figure 1.

FIGURE 1: UPGRADE AND NEW ASSETS TO MEET DEMAND

Mid-Western RC - Upgrade & New Assets to meet Demand (Water_S1_V3)



If the current budget for additional assets continues, the result will be the creation of \$49M additional assets over the next twenty years.

Acquiring these new assets will commit the organisation to fund ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs in Section 5.

It should be noted that we do not have a formal process in place when recognising developer contributed assets. Moving forwards, Council is implementing processes to ensure this information is picked up in a timely manner with clear information pertaining to ownership built in to the new asset register.

5. Lifecycle Management Plan

The lifecycle management plan details how the organisation plans to manage and operate the assets at the agreed levels of service (defined in Section 3) while optimising life cycle costs.

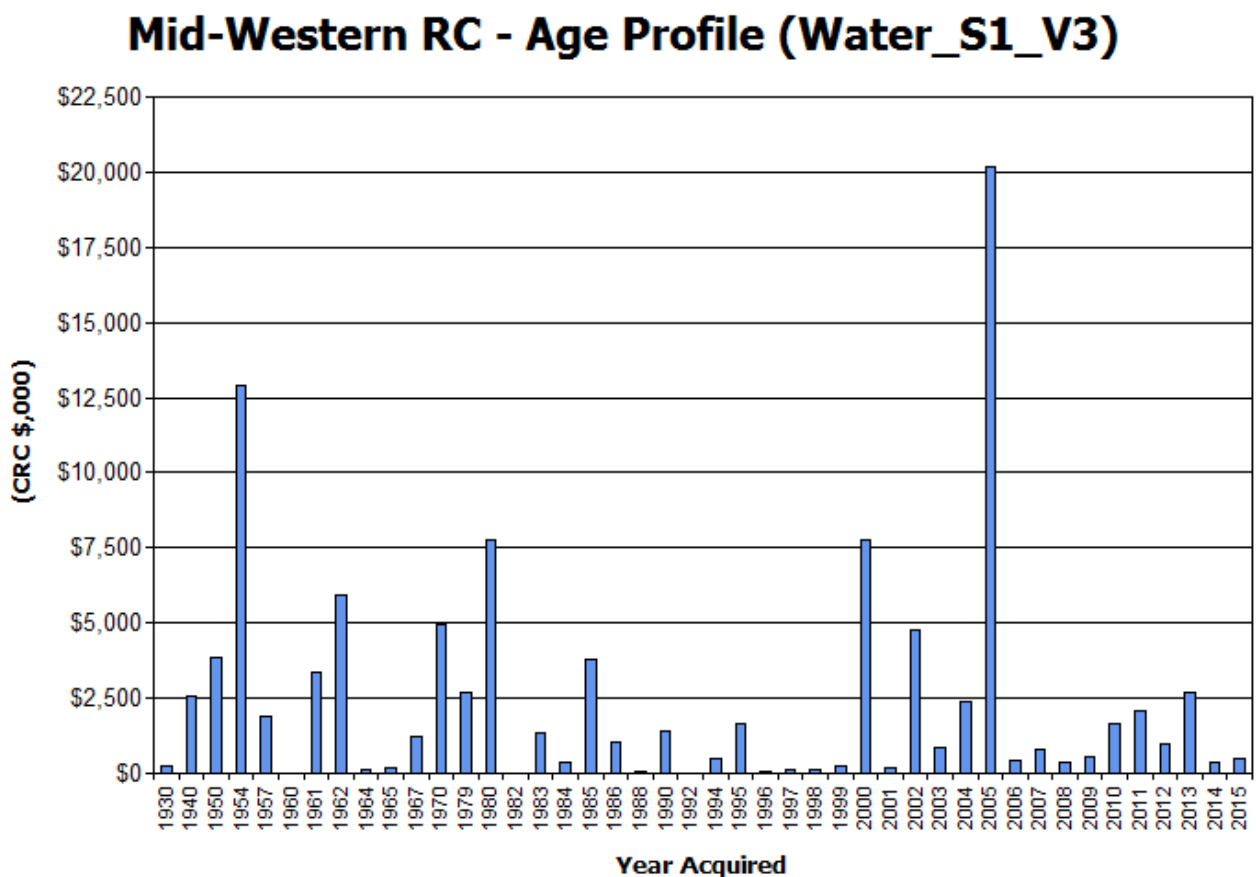
5.1 Background Data

5.1.1 Physical parameters

The assets covered by this asset management plan are shown in Table 2.1.

The age profile of the assets included in this AM Plan is shown in Figure 2.

FIGURE 2: ASSET AGE PROFILE



5.1.2 Asset capacity and performance

The organisation’s services are generally provided to meet design standards where these are available.

Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

TABLE 5.1.2: KNOWN SERVICE PERFORMANCE DEFICIENCIES

Location	Service Deficiency
Gulgong Water Supply System	Water quality aesthetics impacted by deteriorating unlined cast iron reticulation pipe work
Mudgee Raw Water Irrigation system	Loading on system is greater than source capacity
All systems reticulation mains	Remaining Asbestos Cement pipelines have experienced increased service failure in comparison to alternate material pipelines

The above service deficiencies were identified from Council’s Draft Integrated Water Cycle Management Evaluation Study, customer request records and works request records.

5.1.3 Asset condition

Condition is monitored presently during reactive maintenance when an issue develops. The condition profile of our water supply network assets is not very well understood and remains a major knowledge gap.

A mains cleaning program via “ice pigging” was conducted in 2015 in which some inference of pipe condition was attained. Ice pigging was completed for the whole of the Gulgong potable water supply network, along with small sections in Mudgee and Kandos.

There are new technologies now available to assess water pipe condition insitu (without disturbance to the pipe integrity or temporary disturbance to water supply) such as pressure transient wave monitoring. It is proposed that when condition monitoring is implemented, condition be measured using a 1 – 5 grading system as detailed in Table 5.1.3.

TABLE 5.1.3: SIMPLE CONDITION GRADING MODEL

Condition Grading	Description of Condition
1	Very Good: only planned maintenance required
2	Good: minor maintenance required plus planned maintenance
3	Fair: significant maintenance required
4	Poor: significant renewal/rehabilitation required
5	Very Poor: physically unsound and/or beyond rehabilitation

Criticality is defined by the consequences that will occur if an asset fails. It is the assessment of how important an asset is to the safe operation of sewerage services. The criticality rating allows comparative analysis of asset risk because of its consistency of application across all asset classes.

A criticality assessment has been undertaken for water supply and sewerage asset groups. The resultant report is attached as Appendix E

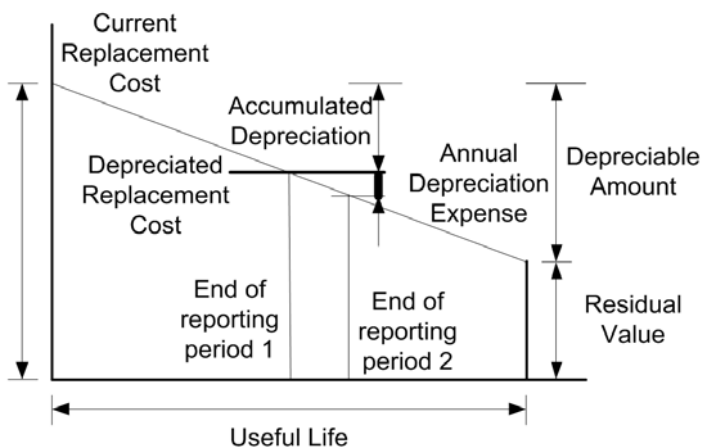
5.1.4 Asset valuations

The value of assets recorded in the asset register as at 30/06/2015 covered by this asset management plan is shown below. Assets were last revalued at 30/06/2012. Assets are valued at

Current Replacement Cost	\$104,891,000
Depreciable Amount	\$104,891,000
Depreciated Replacement Cost ⁷	\$60,072,000
Annual Depreciation Expense	\$1,580,000

Key assumptions made in preparing the valuations were:

- The fair value of assets held is a reflection of replacement cost less accumulated depreciation
- NSW Reference Rates Manual for Valuation of Water and Sewerage Assets has been used to identify the unit rates
- A physical inspection of underground assets is impractical, so the useful life has been applied.
- Assets have been componentised



Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time.

⁷ Also reported as Written Down Current Replacement Cost (WDCRC).

Rate of Annual Asset Consumption
1.5%

(Depreciation/Depreciable Amount)

Rate of Annual Asset Renewal
0.60%

(Capital renewal exp/Depreciable amount)

In 2016 the organisation plans to renew assets at 39.6% of the rate they are being consumed (based on original budget) and will be increasing its asset stock by 0.1% (based on written down value) in the year.

5.1.5 Historical Data

Based on the data held within the existing asset register.

5.2 Infrastructure Risk Management Plan

An assessment of risks⁸ associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a 'financial shock' to the organisation. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

Critical risks, being those assessed as 'Very High' - requiring immediate corrective action and 'High' – requiring prioritised corrective action identified in the Infrastructure Risk Management Plan, together with the estimated residual risk after the selected treatment plan is operational are summarised in Table 5.2. These risks are reported to management and Council.

⁸ MWRC Water Supply and Sewerage Assets Criticality Assessment June 2014

TABLE 5.2: CRITICAL RISKS AND TREATMENT PLANS

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Asset register and spatial information not accurate	Financial shock to organisation	VH	Detailed survey and update of asset register and GIS over 5 year program	Low	\$33k per year over 5 year period
Cudgegong River Intake and low lift pump station, Mudgee	Peak demand system failure affecting >1,000 customers. Demand expected to exceed current capacity within 5 years	H	Demand management investigation through current IWCM process. Installation of additional pump and investigation of intake quality/capacity upgrade	Medium	Pump Installation: \$40K Intake capacity upgrade not yet assessed
Pre chemical dosing systems at WTP clarifiers/mixing tanks	System failure due to lime dosing technology performance - Inability to provide water quality in accordance with ADWG.	H	Process technology investigation and upgrade. Increased system maintenance being undertaken to mitigate immediate risks.	Medium	Potential upgrade costs not yet assessed
Chlorine Dosing System at Gulgong and Mudgee WTP	System failure due to increased demand creating unsustainable pressure on current dosing technology – Inability to provide water quality in accordance with ADWG.	H	Process technology investigation and upgrade. Increased system maintenance being undertaken to mitigate immediate risks.	Medium	Potential upgrade costs not yet assessed
Water transfer between Mudgee Low Zone and High Zone Reservoirs	System failure associated with water transfer between reservoirs - Inability to provide water quality in accordance with ADWG.	H	Construct dedicated trunk main between Low zone and High zone reservoirs	Low	Not yet assessed
Gulgong Reticulation System	Decreased aesthetic water quality associated with condition of unlined cast iron pipes	H	Replacement program for poor condition pipelines	Low	2016-17 - \$500K budgeted. To be addressed on ongoing annual renewal capital budget

Note * The residual risk is the risk remaining after the selected risk treatment plan is operational.

5.3 Routine Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety and amenity, eg main cleaning, water quality testing, pump maintenance and telemetry.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again.

5.3.1 Operations and Maintenance Plan

Operations activities affect service levels including quality and function through such things as pipe inspections and cleaning, valve exercising, hydrant maintenance, scouring or pigging. Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating, eg pump maintenance but excluding rehabilitation or renewal. Maintenance may be classified into reactive, planned and specific maintenance work activities. Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.

Planned maintenance is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, replacing air conditioning units, etc. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Actual past maintenance expenditure for water supply forms part of operational and maintenance budgets. Planned maintenance and specific maintenance are not budgeted separately, so expenditure trends have not been identified. The total water supply system operation and maintenance budget for 2014/15 was \$4,487,084.

Planned maintenance work as a percentage of total maintenance expenditure is not identified. Information on this should be developed for future revision of this asset management plan, as higher proportions of planned maintenance expenditure to reactive maintenance will provide a better value service.

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified and service consequences highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

Assessment and prioritisation of reactive maintenance is undertaken by Council staff using experience and judgement.

5.3.2 Operations and Maintenance Strategies

The organisation will operate and maintain assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner,
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50 – 70% planned desirable as measured by cost),
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council,
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs,
- Review asset utilisation to identify underutilised assets and appropriate remedies, and over utilised assets and customer demand management options,
- Maintain a current hierarchy of critical assets and required operations and maintenance activities,
- Develop and regularly review appropriate emergency response capability,
- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

ASSET HIERARCHY

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

The organisation's service hierarchy is shown in Table 5.3.2.

TABLE 5.3.2: ASSET SERVICE HIERARCHY

Service Hierarchy	Service Level Objective
System Failures:	
Major - Defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time	Less than 25 failures/year, less than 4 hours duration/event.
Minor - Defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical use at a non-critical time.	Less than 150 failures/year, less than 4 hours duration/event.

CRITICAL ASSETS

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, organisations can target and refine investigative activities, maintenance plans and capital expenditure plans at the appropriate time.

Operations and maintenances activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc. Critical assets failure modes and required operations and maintenance activities are detailed in Appendix E, Water Supply and Sewerage Assets Criticality Assessment Report 2014.

STANDARDS AND SPECIFICATIONS

Maintenance work is carried out in accordance with the following Standards and Specifications.

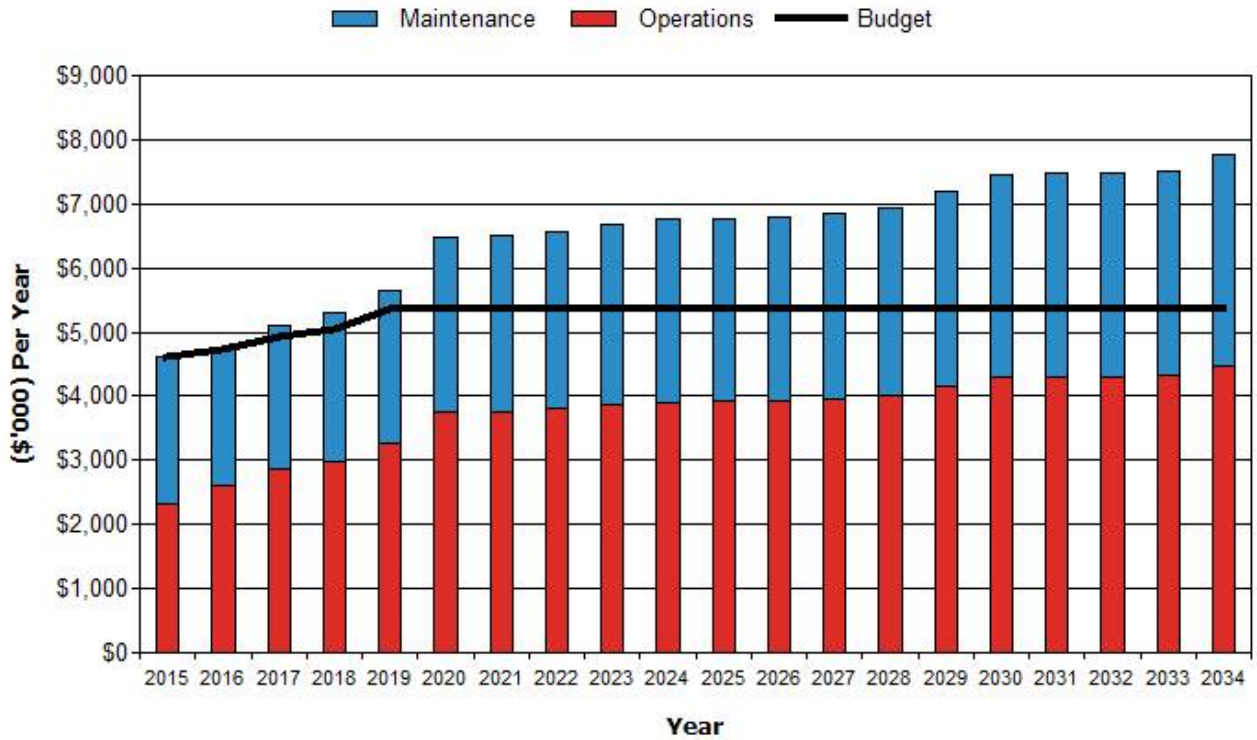
- WSAA Sewerage Code of Australia
- Relevant Australian Standards
- MWRC Development Control Plan 2013
- Development Servicing Plan for MWRC Water Supply 2008

5.3.3 Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in 2014/15 dollar values.

FIGURE 4: PROJECTED OPERATIONS AND MAINTENANCE EXPENDITURE

Mid-Western RC - Projected Operations & Maintenance Expenditure (Water_S1_V3)



The increase is indicative of the need to fund operations and maintenance associated with new assets constructed within the planning period.

Deferred maintenance, ie works that are identified for maintenance and unable to be funded are to be included in the risk assessment and analysis in the infrastructure risk management plan.

Maintenance is funded from the operating budget where available. This is further discussed in Section 6.2.

5.4 Renewal/Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original or lesser required service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

5.4.1 Renewal plan

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template'.

- Method 1 uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- Method 2 uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems), or
- Method 3 uses a combination of average *network renewals* plus *defect repairs* in the *Renewal Plan* and *Defect Repair Plan* worksheets on the 'Expenditure template'.

Method 1 was used for this Asset Management Plan.

The useful lives of assets used to develop projected asset renewal expenditures are shown in Table 5.4.1. Asset useful lives were last reviewed on 30 June 2012.¹⁰

TABLE 5.4.1: USEFUL LIVES OF ASSETS

Asset (Sub)Category	Useful life (years)
Treatment works structure	70
Treatment works mechanical	30
Treatment works electrical	30
Pumping stations structure	50
Pumping stations mechanical	25
Pumping stations electrical	25
Mains	80
Dams structure	100
Dams mechanical & electrical	25
Bores	30

5.4.2 Renewal and Replacement Strategies

The organisation will plan capital renewal and replacement projects to meet level of service objectives and minimise infrastructure service risks by:

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
 - the service delivery 'deficiency', present risk and optimum time for renewal/replacement,
 - the project objectives to rectify the deficiency,
 - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,

¹⁰ MWRC Methodology for Assessing Fair Value of Water and Sewer Assets 30 June 2012

- and evaluate the options against evaluation criteria adopted by the organisation, and
- select the best option to be included in capital renewal programs,
- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible,
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council/Board,
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs,
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required ,
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

RENEWAL RANKING CRITERIA

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (eg replacing a pump that has a high breakdown incidence history), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (eg treatment works capacity).¹¹

It is possible to get some indication of capital renewal and replacement priorities by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have a high utilisation and subsequent impact on users would be greatest,
- The total value represents the greatest net value to the organisation,
- Have the highest average age relative to their expected lives,
- Are identified in the AM Plan as key cost factors,
- Have high operational or maintenance costs, and
- Where replacement with modern equivalent assets would yield material savings.¹²

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 5.4.2.

¹¹ IPWEA, 2011, IIMM, Sec 3.4.4, p 3|60.

¹² Based on IPWEA, 2011, IIMM, Sec 3.4.5, p 3|66.

TABLE 5.4.2: RENEWAL AND REPLACEMENT PRIORITY RANKING CRITERIA

CRITERIA	WEIGHTING
Risk	No weighting criteria adopted
Condition	No weighting criteria adopted
Regulatory standards	No weighting criteria adopted
Available budget	No weighting criteria adopted
Total	100%

RENEWAL AND REPLACEMENT STANDARDS

Renewal work is carried out in accordance with the following Standards and Specifications.

- WSAA Sewerage Code of Australia
- Relevant Australian Standards
- MWRC Development Control Plan 2013
- Development Servicing Plan for MWRC Sewerage 2008

5.4.3 Summary of future renewal and replacement expenditure

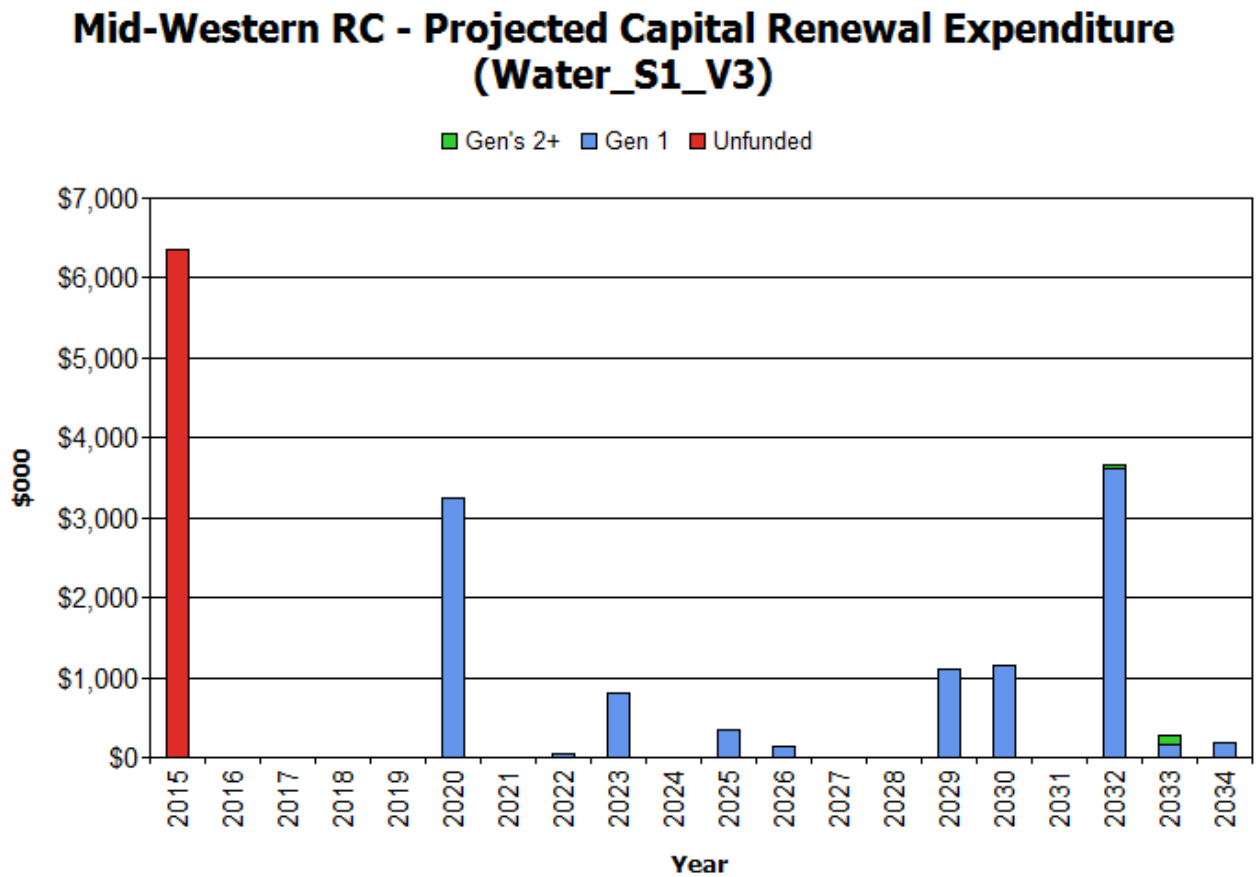
Projected future renewal and replacement expenditures are forecast to increase over time as the asset stock increases from growth. The expenditure is summarised in Fig 5. Note that all amounts are shown in real values.

The projected capital renewal and replacement program is shown in Appendix B.

Deferred renewal and replacement, ie those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.

Renewals and replacement expenditure in the organisation's capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2.

FIG 5: PROJECTED CAPITAL RENEWAL AND REPLACEMENT EXPENDITURE



5.5 Creation/Acquisition/Upgrade Plan

New works are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost to the organisation from land development. These assets from growth are considered in Section 4.4.

5.5.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from various sources such as councillor/director or community requests, proposals identified by strategic plans or partnerships with other organisations. Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed below.

TABLE 5.5.1: NEW ASSETS PRIORITY RANKING CRITERIA

Criteria	Weighting
Available budget	No weighting criteria adopted
Land use planning priorities	No weighting criteria adopted
Public health risk	No weighting criteria adopted
Regulatory requirements	No weighting criteria adopted
Total	100%

5.5.2 Capital Investment Strategies

The organisation will plan capital upgrade and new projects to meet level of service objectives by:

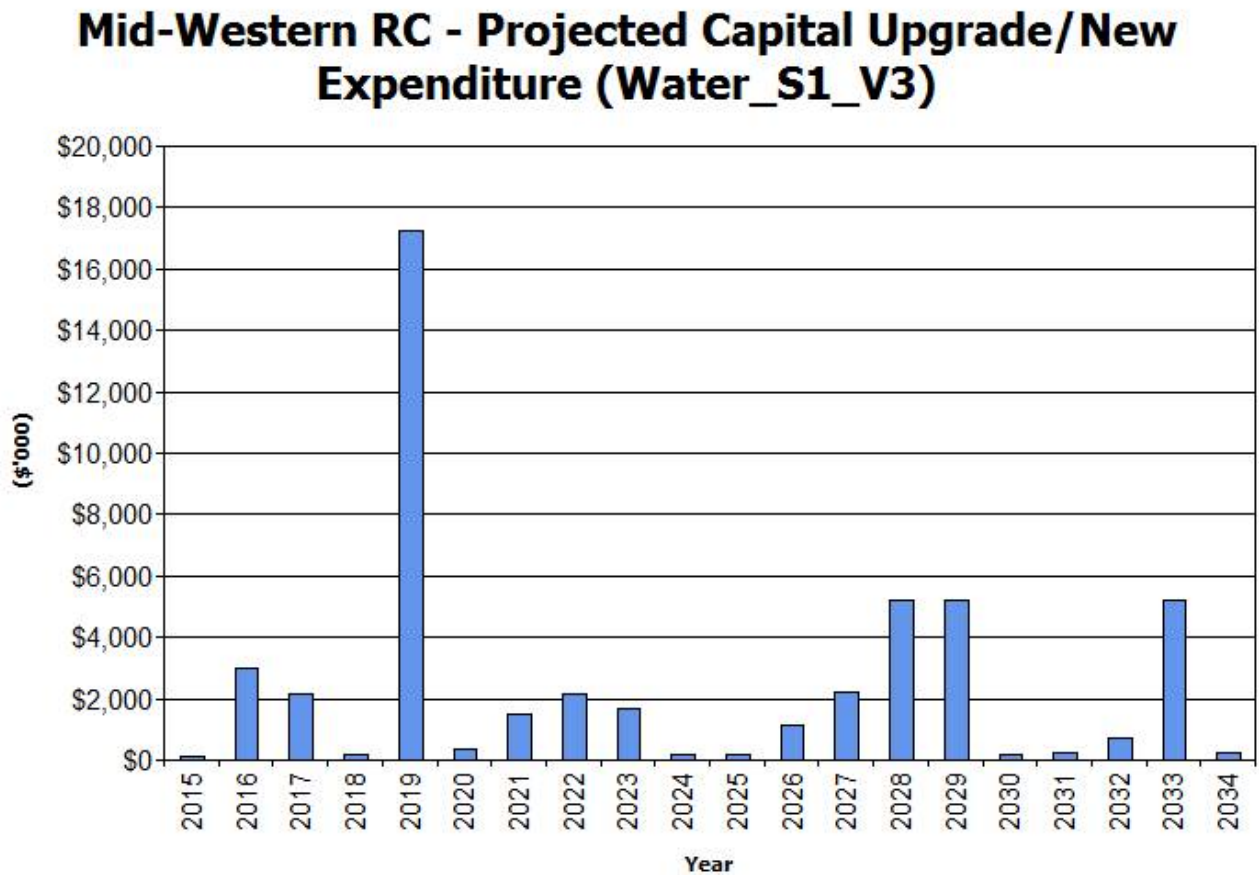
- Planning and scheduling capital upgrade and new projects to deliver the defined level of service in the most efficient manner,
- Undertake project scoping for all capital upgrade/new projects to identify:
 - the service delivery 'deficiency', present risk and required timeline for delivery of the upgrade/new asset,
 - the project objectives to rectify the deficiency including value management for major projects,
 - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
 - management of risks associated with alternative options,
 - and evaluate the options against evaluation criteria adopted by Council, and
 - select the best option to be included in capital upgrade/new programs,
- Review current and required skills base and implement training and development to meet required construction and project management needs,
- Review management of capital project management activities to ensure Council is obtaining best value for resources used.

Standards and specifications for new assets and for upgrade/expansion of existing assets are the same as those for renewal shown in Section 5.4.2.

5.5.3 Summary of future upgrade/new assets expenditure

Projected upgrade/new asset expenditures are summarised in Fig 6. The projected upgrade/new capital works program is shown in Appendix C. All amounts are shown in real values.

FIG 6: PROJECTED CAPITAL UPGRADE/NEW ASSET EXPENDITURE



Expenditure on new assets and services in the organisation’s capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2.

5.6 Disposal Plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are as per the water mains renewal program. These assets will be further investigated to determine the required levels of service and see what options are available for alternate service delivery, if any. Any revenue gained from asset disposals is accommodated in Council’s long term financial plan.

Where cashflow projections from asset disposals are not available, these will be developed in future revisions of this asset management plan.

5.7 Service Consequences and Risks

The organisation has prioritised decisions made in adopting this AM Plan to obtain the optimum benefits from its available resources. Decisions were made based on the development of 3 scenarios of AM Plans.

Scenario 1 - What we would like to do based on asset register data

Scenario 2 – What we should do with existing budgets and identifying level of service and risk consequences (ie what are the operations and maintenance and capital projects we are unable to do, what is the service and risk consequences associated with this position). This may require several versions of the AM Plan.

Scenario 3 – What we can do and be financially sustainable with AM Plans matching long-term financial plans.

The development of scenario 1 and scenario 2 AM Plans provides the tools for discussion with the Council/Board and community on trade-offs between what we would like to do (scenario 1) and what we should be doing with existing budgets (scenario 2) by balancing changes in services and service levels with affordability and acceptance of the service and risk consequences of the trade-off position (scenario 3).

5.7.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Replacement of aged assets that are still performing adequately, in accordance with current Level of Service (MWRC Strategic Business Plan for Water Supply 2008).
- Renewal or replacement of all sewerage system infrastructure currently older than its accepted/assessed “useful life” in year one.
- Extension of services to existing urban or village areas that are not experiencing growth

5.7.2 Service consequences

Operations and maintenance activities and capital projects that cannot be undertaken will maintain or create service consequences for users. These include:

- Reduced levels of service
- Damage to property and public assets
- Damage to utilities (roads network)
- Maintain current health standards despite increasing standards being enforced by regulators

5.7.3 Risk consequences

The operations and maintenance activities and capital projects that cannot be undertaken may maintain or create risk consequences for the organisation. These include:

- Increasing reactive maintenance costs
- Exposure to claims and litigation against Council
- Political pressure for improved levels of service
- Lower performance on asset and financial indicators

These risks have been included with the Infrastructure Risk Management Plan summarised in Section 5.2 and risk management plans actions and expenditures included within projected expenditures.

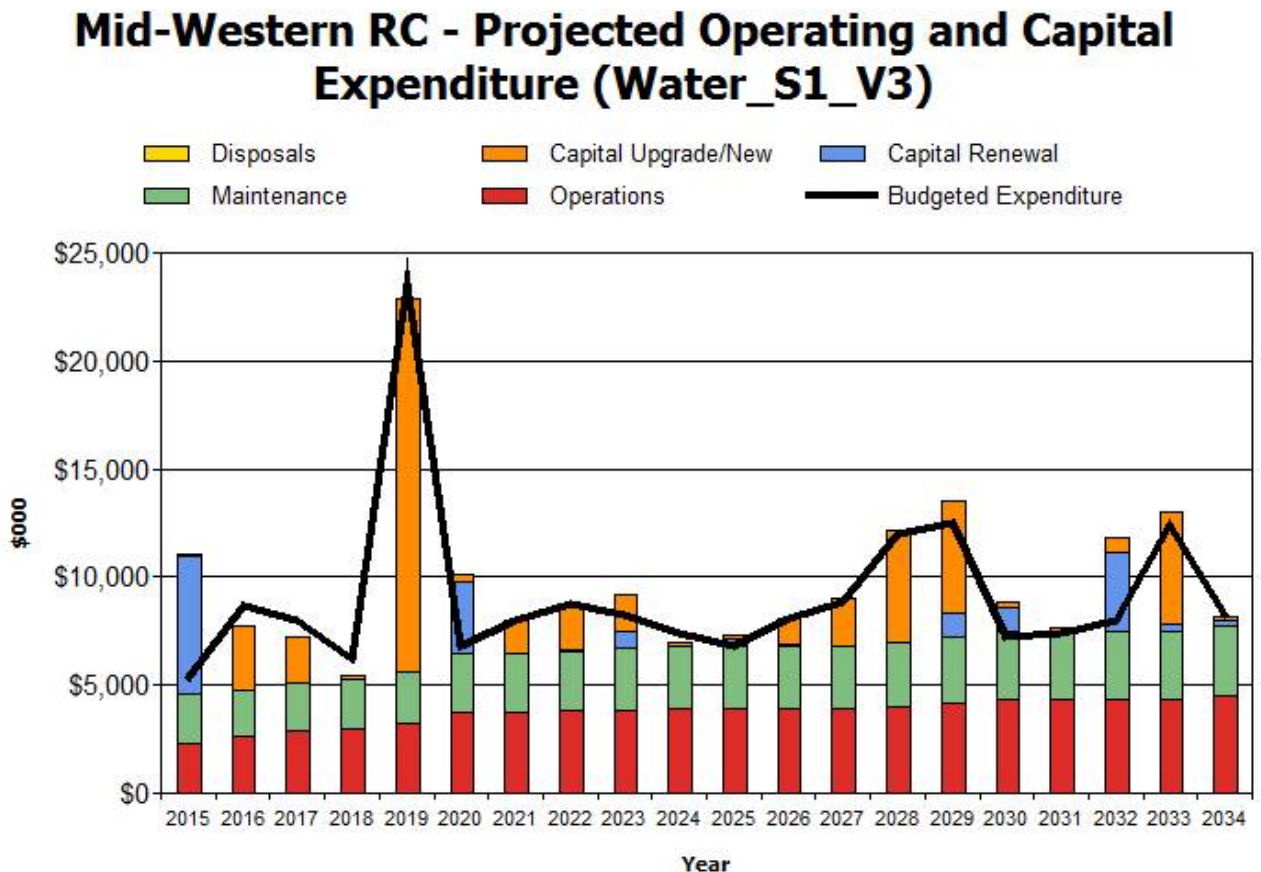
6. Financial Summary

This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset performance.

6.1 Financial Statements and Projections

The financial projections are shown in Fig 7 for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets). Note that all costs are shown in real values.

FIG 7: PROJECTED OPERATING AND CAPITAL EXPENDITURE



SUSTAINABILITY OF SERVICE DELIVERY

There are four key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category, these being the asset renewal funding ratio, long term life cycle costs/expenditures and medium term projected/budgeted expenditures over 5 and 10 years of the planning period.

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio¹³ 93%

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years, Council is forecasting that it will have 93% of the funds required for the optimal renewal and replacement of its assets.

LONG TERM - LIFE CYCLE COST

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the asset life cycle. Life cycle costs include operations and maintenance expenditure and asset consumption (depreciation expense). The life cycle cost for the services covered in this asset management plan is \$7,418,000 per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years).

Life cycle costs can be compared to life cycle expenditure to give an initial indicator of affordability of projected service levels when considered with age profiles. Life cycle expenditure includes operations, maintenance and capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure over the 10 year planning period is \$6,238,000 per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years).

A shortfall between life cycle cost and life cycle expenditure is the life cycle gap. The life cycle gap for services covered by this asset management plan is \$1,180,000 per year.

Life cycle expenditure is 84% of life cycle costs.

The life cycle costs and life cycle expenditure comparison highlights any difference between present outlays and the average cost of providing the service over the long term. If the life cycle expenditure is less than that life cycle cost, it is most likely that outlays will need to be increased or cuts in services made in the future.

Knowing the extent and timing of any required increase in outlays and the service consequences if funding is not available will assist organisations in providing services to their communities in a financially sustainable manner. This is the purpose of the asset management plans and long term financial plan.

MEDIUM TERM – 10 YEAR FINANCIAL PLANNING PERIOD

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

¹³ AIFMG, 2012, Version 1.3, Financial Sustainability Indicator 4, Sec 2.6, p 2.16

These projected expenditures may be compared to budgeted expenditures in the 10 year period to identify any funding shortfall. In a core asset management plan, a gap is generally due to increasing asset renewals for ageing assets.

The projected operations, maintenance and capital renewal expenditure required over the 10 year planning period is \$6,881,000 on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is \$6,238,000 on average per year giving a 10 year funding shortfall of \$643,000 per year. This indicates that Council expects to have 91% of the projected expenditures needed to provide the services documented in the asset management plan.

MEDIUM TERM – 5 YEAR FINANCIAL PLANNING PERIOD

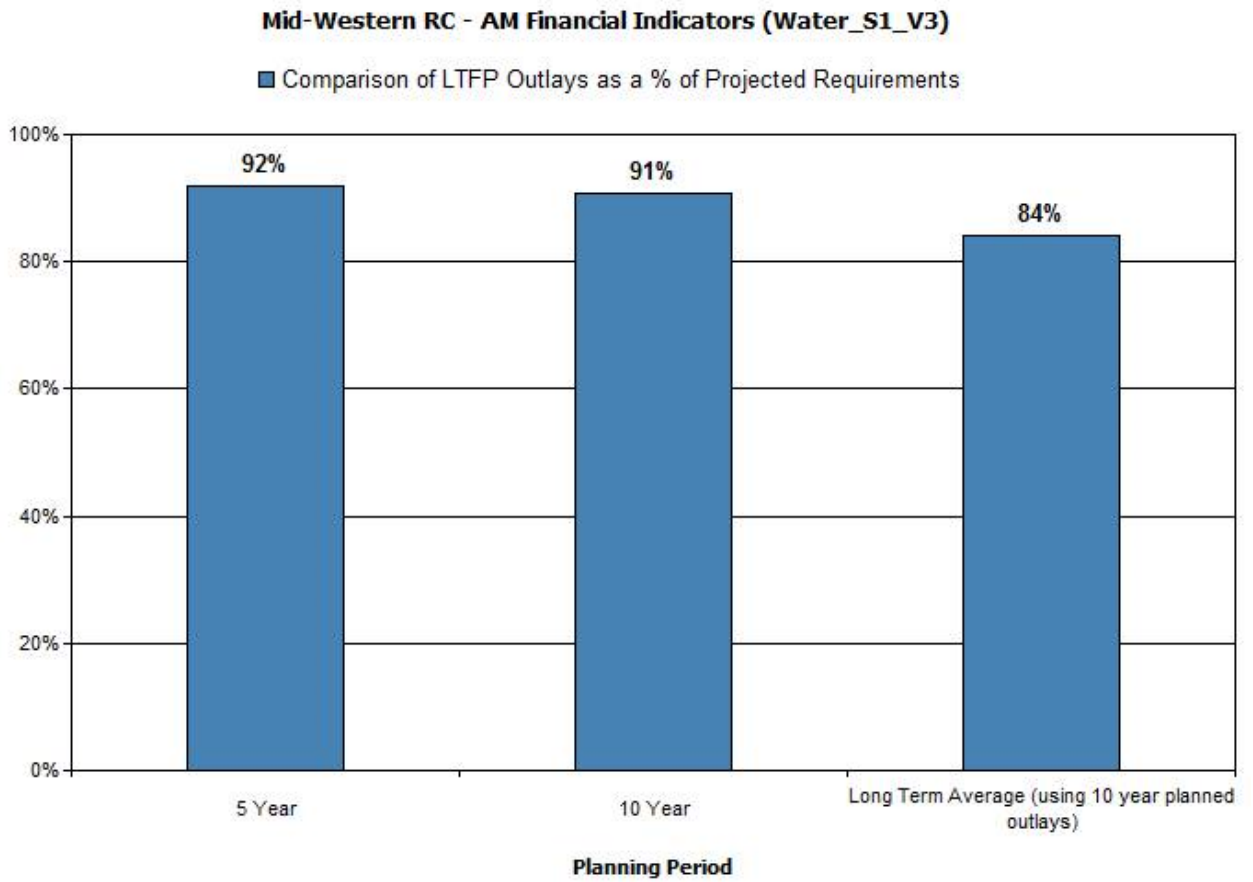
The projected operations, maintenance and capital renewal expenditure required over the first 5 years of the planning period is \$6,340,000 on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is \$5,819,000 on average per year giving a 5 year funding shortfall of \$521,000. This indicates that Council expects to have 92% of projected expenditures required to provide the services shown in this asset management plan.

ASSET MANAGEMENT FINANCIAL INDICATORS

Figure 7A shows the asset management financial indicators over the 10 year planning period and for the long term life cycle.

FIGURE 7A: ASSET MANAGEMENT FINANCIAL INDICATORS



Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 1.0 for the first years of the asset management plan and ideally over the 10 year life of the Long Term Financial Plan.

Figure 8 shows the projected asset renewal and replacement expenditure over the 20 years of the AM Plan. The projected asset renewal and replacement expenditure is compared to renewal and replacement expenditure in the capital works program, which is accommodated in the long term financial plan

FIGURE 8: PROJECTED AND LTFP BUDGETED RENEWAL EXPENDITURE

Mid-Western RC - Projected & LTFP Budgeted Renewal Expenditure (Water_S1_V3)

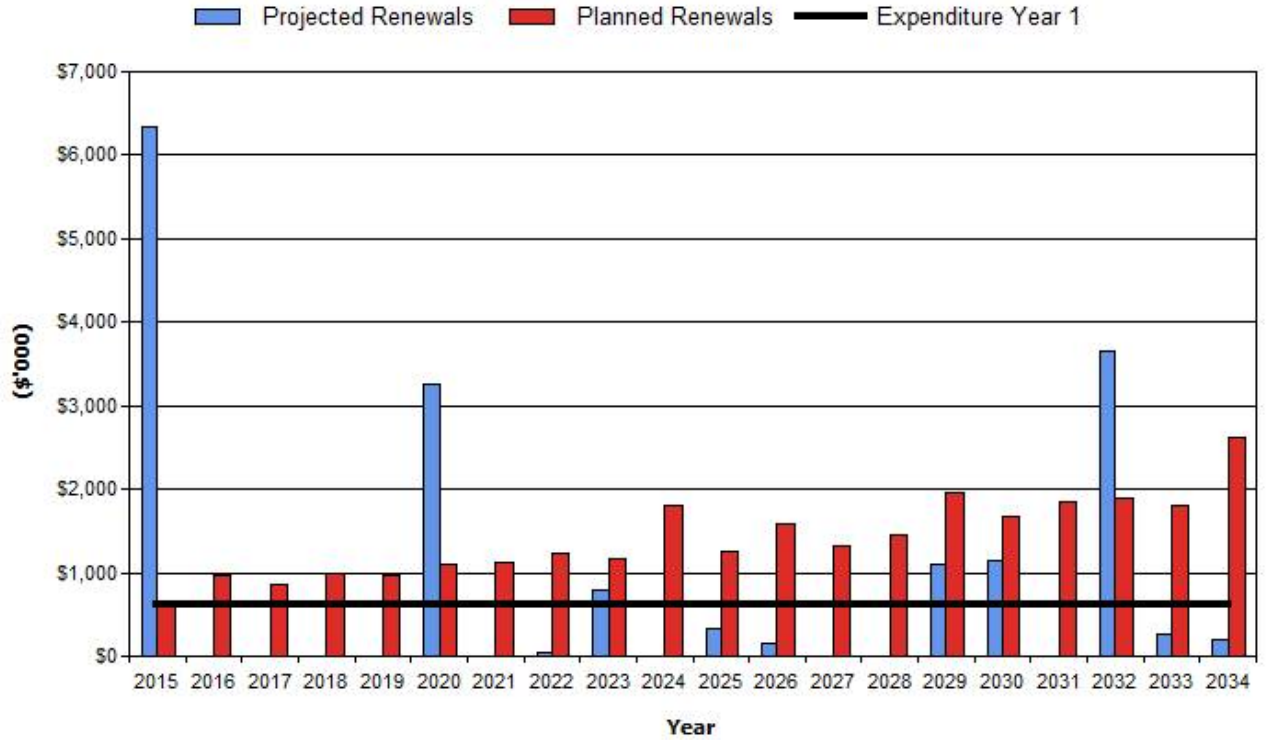


Table 6.1.1 shows the shortfall between projected renewal and replacement expenditures and expenditure accommodated in long term financial plan. Budget expenditures accommodated in the long term financial plan or extrapolated from current budgets are shown in Appendix D.

TABLE 6.1.1: PROJECTED AND LTFP BUDGETED RENEWALS AND FINANCING SHORTFALL

Year End June 30	Projected Renewals (\$'000)	LTFP Renewal Budget (\$'000)	Renewal Financing Shortfall (- gap, + surplus) (\$'000)	Cumulative Shortfall (- gap, + surplus) (\$'000)
2015	\$6,344	\$626	\$-5,718	\$-5,718
2016	\$0	\$975	\$975	\$-4,743
2017	\$0	\$857	\$857	\$-3,886
2018	\$0	\$996	\$996	\$-2,890
2019	\$0	\$978	\$978	\$-1,912
2020	\$3,254	\$1,101	\$-2,153	\$-4,065
2021	\$0	\$1,124	\$1,124	\$-2,941
2022	\$37	\$1,234	\$1,197	\$-1,744
2023	\$796	\$1,177	\$381	\$-1,363
2024	\$0	\$1,798	\$1,798	\$435
2025	\$341	\$1,256	\$915	\$1,350
2026	\$143	\$1,581	\$1,438	\$2,788
2027	\$0	\$1,316	\$1,316	\$4,104
2028	\$0	\$1,452	\$1,452	\$5,556
2029	\$1,108	\$1,952	\$844	\$6,400
2030	\$1,149	\$1,673	\$524	\$6,925
2031	\$0	\$1,839	\$1,839	\$8,764
2032	\$3,661	\$1,894	\$-1,767	\$6,996
2033	\$268	\$1,801	\$1,533	\$8,529
2034	\$192	\$2,628	\$2,436	\$10,965

Note: A negative shortfall indicates a financing gap, a positive shortfall indicates a surplus for that year.

Providing services in a sustainable manner will require matching of projected asset renewal and replacement expenditure to meet agreed service levels with **the corresponding** capital works program accommodated in the long term financial plan.

6.1.1 Projected expenditures for long term financial plan

Table 6.1.2 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2015 real values.

TABLE 6.1.2: PROJECTED EXPENDITURES FOR LONG TERM FINANCIAL PLAN (\$000)

Year	Operations	Maintenance	Projected Capital Renewal	Capital Upgrade/New	Disposals
2015	\$2,309	\$2,295	\$6,344	\$134	\$0
2016	\$2,622	\$2,101	\$0	\$3,021	\$0
2017	\$2,878	\$2,216	\$0	\$2,172	\$0
2018	\$2,979	\$2,316	\$0	\$163	\$0
2019	\$3,268	\$2,372	\$0	\$17,243	\$0
2020	\$3,749	\$2,738	\$3,254	\$372	\$0
2021	\$3,759	\$2,746	\$0	\$1,477	\$0
2022	\$3,800	\$2,777	\$37	\$2,181	\$0
2023	\$3,861	\$2,823	\$796	\$1,686	\$0
2024	\$3,908	\$2,859	\$0	\$191	\$0
2025	\$3,913	\$2,863	\$341	\$176	\$0
2026	\$3,918	\$2,867	\$143	\$1,111	\$0
2027	\$3,949	\$2,891	\$0	\$2,187	\$0
2028	\$4,010	\$2,937	\$0	\$5,192	\$0
2029	\$4,155	\$3,047	\$1,108	\$5,198	\$0
2030	\$4,300	\$3,158	\$1,149	\$204	\$0
2031	\$4,305	\$3,162	\$0	\$210	\$0
2032	\$4,311	\$3,166	\$3,661	\$717	\$0
2033	\$4,331	\$3,182	\$268	\$5,223	\$0
2034	\$4,477	\$3,293	\$192	\$230	\$0

6.2 Funding Strategy

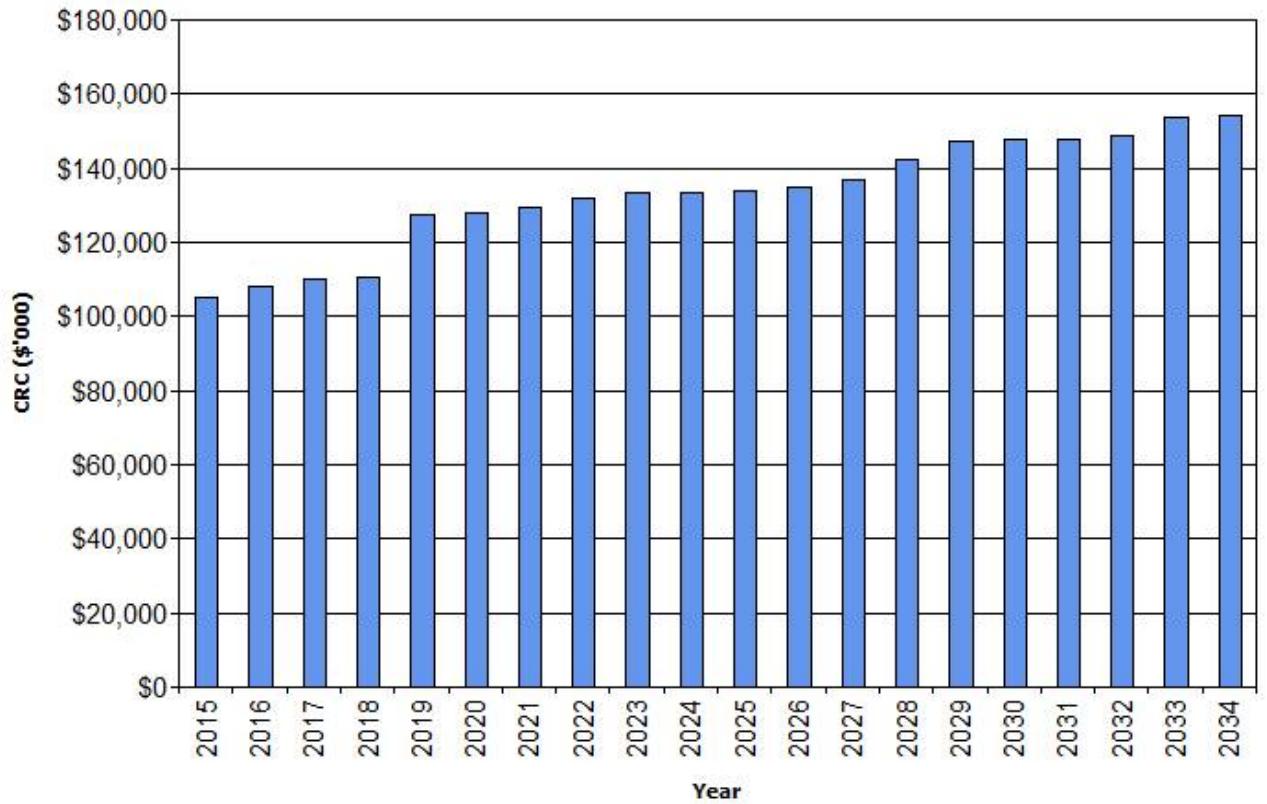
After reviewing service levels, as appropriate to ensure ongoing financial sustainability projected expenditures identified in Section 6.1.2 will be accommodated in the Council's 10 year long term financial plan.

6.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council. Figure 9 shows the projected replacement cost asset values over the planning period in real values.

FIGURE 9: PROJECTED ASSET VALUES

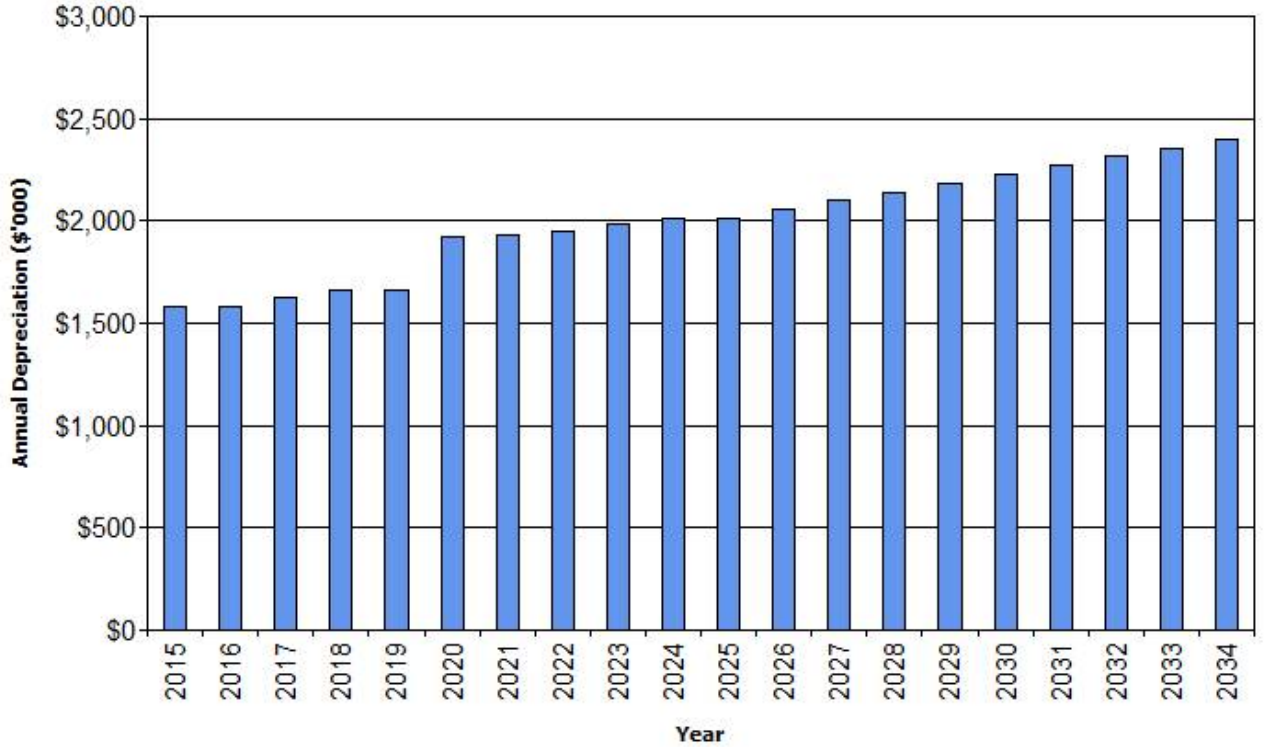
Mid-Western RC - Projected Asset Values (Water_S1_V3)



Depreciation expense values are forecast in line with asset values as shown in Figure 10.

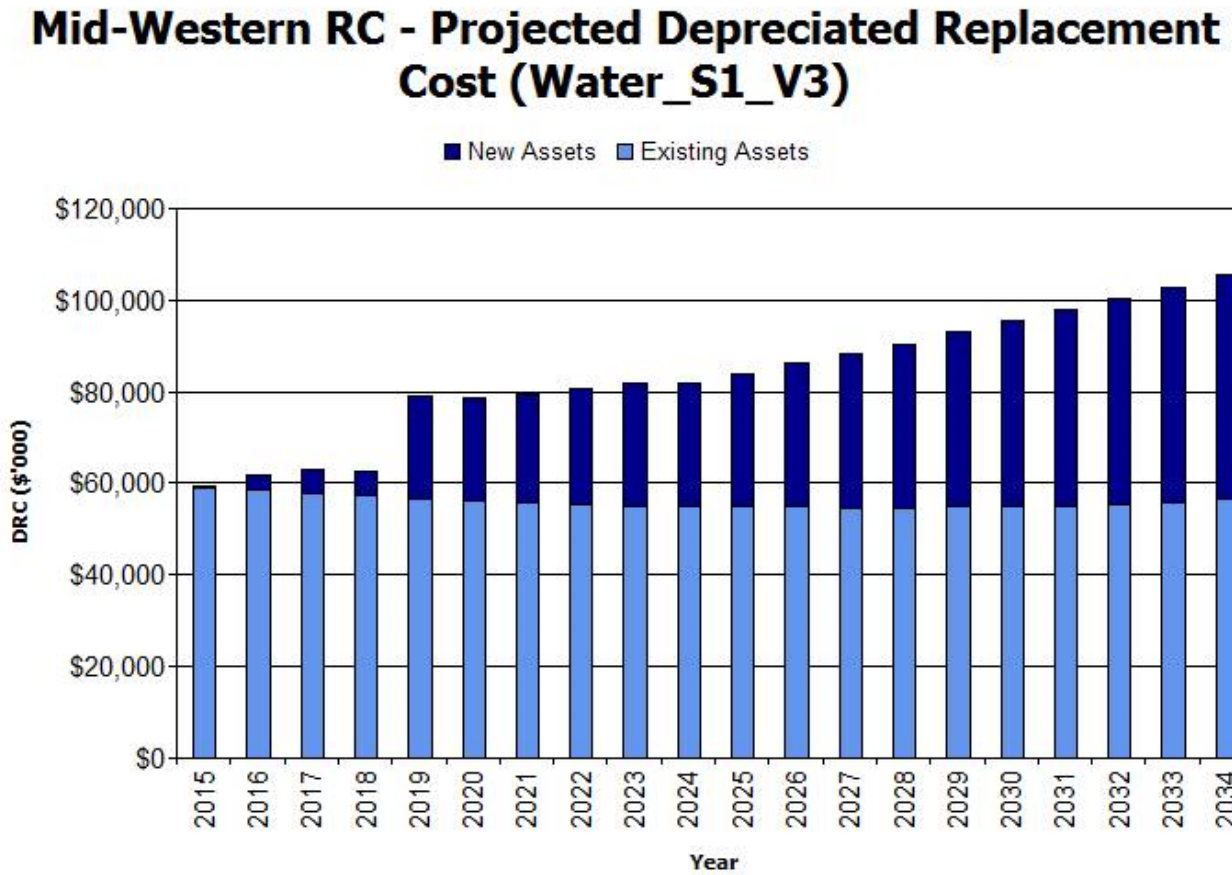
FIGURE 10: PROJECTED DEPRECIATION EXPENSE

Mid-Western RC - Projected Depreciation Expense (Water_S1_V3)



The depreciated replacement cost will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets. Forecast of the assets' depreciated replacement cost is shown in Figure 11. The depreciated replacement cost of contributed and new assets is shown in the darker colour and in the lighter colour for existing assets.

FIGURE 11: PROJECTED DEPRECIATED REPLACEMENT COST



6.4 Key Assumptions made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan and risks that these may change are shown in Table 6.4.

TABLE 6.4: KEY ASSUMPTIONS MADE IN AM PLAN AND RISKS OF CHANGE

Key Assumptions	Risks of Change to Assumptions
Data in asset register accurate	Change in asset data may impact financial forecasts
Forecasts based on maintaining current levels of service	Current levels of service cannot be maintained
Expenditure projections accurate	Actual replacement costs differ from preliminary projections

6.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale¹⁴ in accordance with Table 6.5.

TABLE 6.5: DATA CONFIDENCE GRADING SYSTEM

Confidence Grade	Description
A Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%
E Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 6.5.1.

¹⁴ IPWEA, 2011, IIMM, Table 2.4.6, p 2|59.

TABLE 6.5.1: DATA CONFIDENCE ASSESSMENT FOR DATA USED IN AM PLAN

Data	Confidence Assessment	Comment
Demand drivers	C Uncertain	Timing of growth and increasing environmental standards uncertain, however has potential for significant impact on level of service
Growth projections	C Uncertain	Fluctuates dependant on source of projection
Operations expenditures	C Uncertain	Direct from budget, but breakdown into operations and maintenance and renewal is estimated and requires further development
Maintenance expenditures	C Uncertain	Direct from budget, but breakdown into operations and maintenance and renewal is estimated and requires further development
Projected Renewal exps. - Asset values	C Uncertain	Direct from budget, but breakdown into operations and maintenance and renewal is estimated and requires further development
- Asset residual values	C Certain	Assets are capitalised and realised upon completion based on total project costs. Residual values are calculated at 5% of the total asset cost for components of the sewer treatment plant and at 40% for the sewer pipelines.
- Asset useful lives	C Uncertain	Estimated using NSW Reference Rates Manual. Further substantiation required for future revision of asset management plan
- Condition modelling	D Very uncertain	Estimated based on very small sample of actual condition assessment
- Network renewals	D Very uncertain	Estimated. Further substantiation required for future revision of asset management plan
- Defect repairs	E Unknown	No regular inspection schedule in place
Upgrade/New expenditures	D Very Uncertain	Annual budget not matched to assessment of need
Disposal expenditures	C Certain	Not considered to be significant

Over all data sources the data confidence is assessed as medium confidence level for data used in the preparation of this AM Plan.

7. Plan Improvement and Monitoring

7.1 Status of Asset Management Practices

7.1.1 Accounting and financial systems

Mid-Western Regional Council uses software package Technology One for financial and asset management. Council's water supply infrastructure was revalued 30 June 2012 in accordance with the Fair Value accounting standards and the Office of Local Government requirements.

ACCOUNTABILITIES FOR FINANCIAL SYSTEMS

The Finance Department is responsible for the financial systems operating at Mid-Western Regional Council.

ACCOUNTING STANDARDS AND REGULATIONS

Local Government Act (NSW) 1993

Local Government Amendment (Planning and Reporting) Act 2009

Local Government (Finance Plans and Reporting) Regulation 2010

AASB 116 – Property, Plant and Equipment

CAPITAL/MAINTENANCE THRESHOLD

Assets are capitalised if their cost of acquisition exceeds the following;

- Water and sewer assets > \$10,000
- Buildings > \$5,000
- Plant and Equipment > \$2,000
- Land 100% Capitalised
- Other structures > \$2,000

REQUIRED CHANGES TO ACCOUNTING FINANCIAL SYSTEMS ARISING FROM THIS AM PLAN

- Develop expenditure reporting, with separation of costs for operations as opposed to maintenance.
- Continued development of corporate asset registers
- Create a work order process that links the customer service system to the corporate asset register

- Further develop valuation unit rates through improved project cost accounting and project management documentation

7.1.2 Asset management system

The asset management system is TechnologyOne, managed currently by the Finance Department. Moving forwards, the responsibility of maintaining the asset management system will sit with the Operations Department in order to best meet the needs of the organisation.

ASSET REGISTERS

A corporate asset register specific to water supply and sewerage infrastructure, is being developed in 2015/16.

LINKAGE FROM ASSET MANAGEMENT TO FINANCIAL SYSTEM

Depreciation and asset capitalisation are linked to the finance system. Operation and maintenance data (Customer and works requests and their outcomes) are not presently linked to the asset system

ACCOUNTABILITIES FOR ASSET MANAGEMENT SYSTEM AND DATA MAINTENANCE

Primary accountability for asset management lies with the Plant and Facilities Department within the Operations Directorate. This is supported by the Finance Department which is responsible for the financial aspect of asset management.

REQUIRED CHANGES TO ASSET MANAGEMENT SYSTEM ARISING FROM THIS AM PLAN

- Review of asset data accuracy.
- Continued development of the corporate asset register.
- Development of work orders for scheduling maintenance activities and recording reactive maintenance at an individual asset level.

7.2 Improvement Plan

The asset management improvement plan generated from this asset management plan is shown in Table 7.2.

TABLE 7.2: IMPROVEMENT PLAN

Task No	Task	Responsibility	Resources Required	Timeline
1	Integrate TechnologyOne 'water one' templates for recording and managing asset data, works request and orders and maintenance scheduling into current asset maintenance processes	Water And Sewerage, Plant And Facilities	Water And Sewerage Team, Assets Co-Ordinator	Commenced July 2015
2	Implement Maintenance Scheduling based on performance data where available	Water And Sewerage	Water And Sewerage Team	Commence July 2016
3	Review Asset Criticality and Program Scheduled Maintenance and Capital Renewals for Critical Assets as a priority	Water And Sewerage	Water And Sewerage Team	Commence March 2016
4	Investigate detailed condition assessment options – non-invasive technologies	Water And Sewerage	External Contractor	JUNE 2016
5	Review and Document Asset Failure Modes and Risks	Water And Sewerage	Water And Sewerage Team	July 2016
6	Separation of reactive and planned maintenance, operations and system (location) activities	Water And Sewerage, Plant And Facilities, Finance	Water And Sewerage Team, Assets Co-Ordinator, Finance Team	2016/17 Financial year
7	Review Existing Levels of Service	Water And Sewerage	Water And Sewerage Team, Consultancy	During IWCM Planning Project, 2016
8	Detail a renewals plan based on above actions	Water And Sewerage	Water And Sewerage Team	June –Dec 2016
9	Review Asset Management Plan	Water And Sewerage, Finance	Water And Sewerage Team, Finance Team	During IWCM Planning Project 2016
10	Review And Document MWRC Engineering Requirements For Development	Water And Sewerage, Development Engineering	Water And Sewerage Team, Development Engineering Team	June 2016

7.3 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget planning processes and amended to recognise any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The AM Plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the organisation's long term financial plan.

The AM Plan has a life of 4 years (Council election cycle) and is due for complete revision and updating within 12 months of each Council election.

7.4 Performance Measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into Council's long term financial plan,
- The degree to which 1-5 year detailed works programs, budgets, business plans and organisational structures take into account the 'global' works program trends provided by the asset management plan,
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Council's Strategic Plan and associated plans,
- **The Asset Renewal Funding Ratio achieving the target of 1.0.**

8. References

IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.

IPWEA, 2009, 'Australian Infrastructure Financial Management Guidelines', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMG.

IPWEA, 2011, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

Mid-Western Regional Council, 'Community Plan Towards 2030,

Mid-Western Regional Council, 'Delivery Program and Operational Plan.

9. Appendices

Appendix A Maintenance Response Levels of Service

Appendix B Projected 10 year Capital Renewal and Replacement Works Program

Appendix C Projected 10 year Capital Upgrade/New Works Program

Appendix D LTFP Budgeted Expenditures Accommodated in AM Plan

Appendix E MWRC Water Supply and Sewerage Assets Criticality Assessment Report (2014)

Appendix F Abbreviations

Appendix G Glossary

Appendix A Maintenance Response Levels of Service

The following describes Council's current maintenance response levels of service as published in the 2008 Strategic Business Plan for Water Supply Services

DESCRIPTION	LEVEL OF SERVICE / TARGET
Response Times for System Failure (Defined as maximum time to have staff on site to commence rectification after notification)	
Supply Failure: <i>Priority 1</i> (defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time) <ul style="list-style-type: none"> - During working hours - Out of working hours <i>Priority 2</i> (defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical use at a non-critical time) <ul style="list-style-type: none"> - During working hours - Out of working hours <i>Priority 3</i> (Defined as failure to maintain continuity or quality of supply to a single customer)	 0.5 hour 1 hour 1 hour 1 hour 2 hours
<i>Priority 4</i> (Defined as a minor problem or complaint, which can be dealt with at a time convenient to the customer and the Council)	1 working day
Customer Enquiries / Complaints: Personal / Oral Written Note: Times apply for 95% of occasions	2 working days (target 1 working day) 10 working days
Service Provision: Time to provide a domestic individual connection to water supply in serviced area (95% of times)	20 working days (target 10 working days)

Appendix B Projected 10 year Capital Renewal and Replacement Works Program

Asset ID	Sub Category	Asset Name	From	To	Rem Life (Years)	Planned Renewal Year	Renewal Cost (\$)	Useful Life (Years)
WT00227		Rylstone Dam Electrical			-36	1979	\$651,249	25
WT00226		Rylstone Dam Mechanical			-36	1979	\$651,249	25
Subtotal							\$1,302,498	
WT00265		Farrelly St Pump Station (PS3) - Electrical			-33	1982	\$168,335	25
WT00264		Farrelly St Pump Station (PS3) - Mechanical			-33	1982	\$168,335	25
Subtotal							\$336,670	
WT00224		Church Street Reservoir 3ML Concrete Roof			-25	1990	\$220,439	40
WT00210		Flirtation Hill Gulgong Reservoir 1.3ML Concrete Roof			-25	1990	\$102,925	40
WT00009		Wait-A-While Pump Station;;37 Racecourse Rd, Gulgong.			-25	1990	\$276,014	40
Subtotal							\$599,378	
WT00208		Rylstone Water Treatment Plant 5ML/day Electrical			-23	1992	\$1,175,675	30
WT00207		Rylstone Water Treatment Plant 5ML/day Mechanical			-23	1992	\$1,241,029	30
Subtotal							\$2,416,704	
WT00237		Charbon Reservoir 0.3ML Concrete Roof			-18	1997	\$25,651	40
WT00233		Kandos Reservoir 1.8ML Cement Works Concrete Roof			-18	1997	\$138,195	40
WT00229		Rylstone Reservoir 0.7ML Concrete Roof			-18	1997	\$61,563	40
Subtotal							\$225,409	
WT00222		Flirtation Hill Reservoir 9ML Concrete Roof			-14	2001	\$500,998	40
WT00049		Flirtation Hill Reservoir Mudgee Hatch and seal			-14	2001	\$15,378	40
Subtotal							\$516,375	
WT00266		Cooper Drive No 4 Pump Station - Civil/Structural			-8	2007	\$41,683	50
Subtotal							\$41,683	
WT00259		Court St Well Field & Pump Station - Electrical			-7	2008	\$192,878	25
WT00258		Court St Well Field & Pump Station - Mechanical			-7	2008	\$190,780	25

				Subtotal	\$383,658	
--	--	--	--	-----------------	------------------	--

WT00250	Elcom Pump Station - Electrical	-6	2009	\$99,131	25
WT00249	Elcom Pump Station - Mechanical	-6	2009	\$99,131	25

				Subtotal	\$198,261	
--	--	--	--	-----------------	------------------	--

WP01135	Water Pipe Segment	-5	2010	\$3,292	80
WP01537	Water Pipe Segment	-5	2010	\$12,120	80
WP01666	Water Pipe Segment	-5	2010	\$6,501	80
WP01892	Water Pipe Segment	-5	2010	\$19,011	80
WP00250	Water Pipe Segment	-5	2010	\$2,405	80
WP00251	Water Pipe Segment	-5	2010	\$741	80
WP00253	Water Pipe Segment	-5	2010	\$29,462	80
WP00258	Water Pipe Segment	-5	2010	\$1,731	80
WP00320	Water Pipe Segment	-5	2010	\$2,843	80
WP00323	Water Pipe Segment	-5	2010	\$11,110	80
WP00332	Water Pipe Segment	-5	2010	\$9,793	80
WP00396	Water Pipe Segment	-5	2010	\$1,154	80
WP00405	Water Pipe Segment	-5	2010	\$51,366	80
WP00406	Water Pipe Segment	-5	2010	\$770	80
WP00407	Water Pipe Segment	-5	2010	\$1,539	80
WP00583	Water Pipe Segment	-5	2010	\$165	80
WP00585	Water Pipe Segment	-5	2010	\$8,724	80
WP00586	Water Pipe Segment	-5	2010	\$9,300	80
WP00591	Water Pipe Segment	-5	2010	\$38,861	80
WP00596	Water Pipe Segment	-5	2010	\$823	80
WP00597	Water Pipe Segment	-5	2010	\$15,966	80
WP00651	Water Pipe Segment	-5	2010	\$15,225	80
WP00701	Water Pipe Segment	-5	2010	\$770	80
WP00702	Water Pipe Segment	-5	2010	\$962	80
WP00708	Water Pipe Segment	-5	2010	\$14,236	80

				Subtotal	\$258,870	
--	--	--	--	-----------------	------------------	--

WT00271	Cement Ave Pump Station - Electrical	-4	2011	\$28,056	25
WT00270	Cement Ave Pump Station - Mechanical	-4	2011	\$36,635	25

				Subtotal	\$64,690	
--	--	--	--	-----------------	-----------------	--

WT00262	Camping Tree Well & Pump Station - Electrical	5	2020	\$28,056	25
WT00261	Camping Tree Well & Pump Station - Mechanical	5	2020	\$28,056	25
WT00038	Glen Willow Well Field	5	2020	\$617,724	40
WP01985	Water Pipe Segment	5	2020	\$41,961	80
WP01986	Water Pipe Segment	5	2020	\$2,326	80
WP01987	Water Pipe Segment	5	2020	\$3,613	80
WP01988	Water Pipe Segment	5	2020	\$6,530	80
WP02001	Water Pipe Segment	5	2020	\$104,624	80
WP02002	Water Pipe Segment	5	2020	\$695	80
WP02025	Water Pipe Segment	5	2020	\$17,699	80

WP02026	Water Pipe Segment	5	2020	\$17,699	80
WP02089	Water Pipe Segment	5	2020	\$102,348	80
WP02091	Water Pipe Segment	5	2020	\$102,348	80
WP02092	Water Pipe Segment	5	2020	\$102,348	80
WP02126	Water Pipe Segment	5	2020	\$14,621	80
WP01768	Water Pipe Segment	5	2020	\$11,949	80
WP01769	Water Pipe Segment	5	2020	\$28,900	80
WP01540	Water Pipe Segment	5	2020	\$12,313	80
WP01604	Water Pipe Segment	5	2020	\$15,006	80
WP01209	Water Pipe Segment	5	2020	\$15,968	80
WP01210	Water Pipe Segment	5	2020	\$770	80
WP01211	Water Pipe Segment	5	2020	\$8,806	80
WP00847	Water Pipe Segment	5	2020	\$5,387	80
WP00848	Water Pipe Segment	5	2020	\$6,349	80
WP00849	Water Pipe Segment	5	2020	\$577	80
WP00850	Water Pipe Segment	5	2020	\$19,335	80
WP00851	Water Pipe Segment	5	2020	\$1,347	80
WP00852	Water Pipe Segment	5	2020	\$280,943	80
WP00853	Water Pipe Segment	5	2020	\$962	80
WP00873	Water Pipe Segment	5	2020	\$10,293	80
WP00874	Water Pipe Segment	5	2020	\$24,315	80
WP00875	Water Pipe Segment	5	2020	\$13,371	80
WP00876	Water Pipe Segment	5	2020	\$11,735	80
WP00877	Water Pipe Segment	5	2020	\$3,751	80
WP00878	Water Pipe Segment	5	2020	\$1,250	80
WP00879	Water Pipe Segment	5	2020	\$7,311	80
WP00880	Water Pipe Segment	5	2020	\$577	80
WP00881	Water Pipe Segment	5	2020	\$1,389	80
WP00882	Water Pipe Segment	5	2020	\$2,212	80
WP00883	Water Pipe Segment	5	2020	\$16,353	80
WP00884	Water Pipe Segment	5	2020	\$1,154	80
WP00885	Water Pipe Segment	5	2020	\$29,338	80
WP00886	Water Pipe Segment	5	2020	\$15,968	80
WP00887	Water Pipe Segment	5	2020	\$3,944	80
WP00890	Water Pipe Segment	5	2020	\$1,667	80
WP00891	Water Pipe Segment	5	2020	\$1,806	80
WP00892	Water Pipe Segment	5	2020	\$1,806	80
WP00905	Water Pipe Segment	5	2020	\$1,058	80
WP00906	Water Pipe Segment	5	2020	\$1,443	80
WP00926	Water Pipe Segment	5	2020	\$17,924	80
WP00931	Water Pipe Segment	5	2020	\$973	80
WP00932	Water Pipe Segment	5	2020	\$59,885	80
WP00935	Water Pipe Segment	5	2020	\$17,646	80
WP00939	Water Pipe Segment	5	2020	\$38,487	80
WP00940	Water Pipe Segment	5	2020	\$11,639	80
WP00941	Water Pipe Segment	5	2020	\$14,333	80
WP00942	Water Pipe Segment	5	2020	\$1,443	80
WP00944	Water Pipe Segment	5	2020	\$5,868	80

WP00945	Water Pipe Segment	5	2020	\$9,715	80
WP00946	Water Pipe Segment	5	2020	\$13,178	80
WP00947	Water Pipe Segment	5	2020	\$7,792	80
WP00950	Water Pipe Segment	5	2020	\$24,433	80
WP00955	Water Pipe Segment	5	2020	\$18,276	80
WP00956	Water Pipe Segment	5	2020	\$10,389	80
WP00957	Water Pipe Segment	5	2020	\$3,463	80
WP00959	Water Pipe Segment	5	2020	\$15,294	80
WP00967	Water Pipe Segment	5	2020	\$15,102	80
WP00968	Water Pipe Segment	5	2020	\$1,539	80
WP00969	Water Pipe Segment	5	2020	\$13,371	80
WP00971	Water Pipe Segment	5	2020	\$6,252	80
WP00972	Water Pipe Segment	5	2020	\$20,393	80
WP00973	Water Pipe Segment	5	2020	\$20,040	80
WP00974	Water Pipe Segment	5	2020	\$6,252	80
WP00975	Water Pipe Segment	5	2020	\$6,252	80
WP00978	Water Pipe Segment	5	2020	\$1,250	80
WP00979	Water Pipe Segment	5	2020	\$16,064	80
WP00980	Water Pipe Segment	5	2020	\$44,729	80
WP00981	Water Pipe Segment	5	2020	\$10,773	80
WP00982	Water Pipe Segment	5	2020	\$21,066	80
WP00983	Water Pipe Segment	5	2020	\$32,801	80
WP00984	Water Pipe Segment	5	2020	\$21,547	80
WP00985	Water Pipe Segment	5	2020	\$192	80
WP00986	Water Pipe Segment	5	2020	\$192	80
WP00991	Water Pipe Segment	5	2020	\$481	80
WP00992	Water Pipe Segment	5	2020	\$1,806	80
WP00993	Water Pipe Segment	5	2020	\$577	80
WP00994	Water Pipe Segment	5	2020	\$14,589	80
WP00995	Water Pipe Segment	5	2020	\$44,537	80
WP00999	Water Pipe Segment	5	2020	\$10,196	80
WP01004	Water Pipe Segment	5	2020	\$18,063	80
WP01005	Water Pipe Segment	5	2020	\$417	80
WP01008	Water Pipe Segment	5	2020	\$33,859	80
WP01009	Water Pipe Segment	5	2020	\$577	80
WP01010	Water Pipe Segment	5	2020	\$9,170	80
WP01011	Water Pipe Segment	5	2020	\$20,286	80
WP01012	Water Pipe Segment	5	2020	\$695	80
WP01013	Water Pipe Segment	5	2020	\$18,202	80
WP01015	Water Pipe Segment	5	2020	\$24,529	80
WP01016	Water Pipe Segment	5	2020	\$192	80
WP01017	Water Pipe Segment	5	2020	\$12,890	80
WP01018	Water Pipe Segment	5	2020	\$8,946	80
WP01019	Water Pipe Segment	5	2020	\$10,196	80
WP01020	Water Pipe Segment	5	2020	\$673	80
WP01021	Water Pipe Segment	5	2020	\$9,619	80
WP01024	Water Pipe Segment	5	2020	\$1,443	80
WP01025	Water Pipe Segment	5	2020	\$17,026	80

WP01026	Water Pipe Segment	5	2020	\$5,675	80
WP01027	Water Pipe Segment	5	2020	\$417	80
WP01028	Water Pipe Segment	5	2020	\$278	80
WP01029	Water Pipe Segment	5	2020	\$695	80
WP01031	Water Pipe Segment	5	2020	\$8,337	80
WP01034	Water Pipe Segment	5	2020	\$8,369	80
WP01035	Water Pipe Segment	5	2020	\$11,832	80
WP01037	Water Pipe Segment	5	2020	\$1,924	80
WP01039	Water Pipe Segment	5	2020	\$3,463	80
WP01040	Water Pipe Segment	5	2020	\$14,429	80
WP01041	Water Pipe Segment	5	2020	\$17,314	80
WP01042	Water Pipe Segment	5	2020	\$11,832	80
WP01045	Water Pipe Segment	5	2020	\$962	80
WP01056	Water Pipe Segment	5	2020	\$16,160	80
WP01058	Water Pipe Segment	5	2020	\$12,793	80
WP01061	Water Pipe Segment	5	2020	\$673	80
WP01062	Water Pipe Segment	5	2020	\$31,743	80
WP01063	Water Pipe Segment	5	2020	\$50,212	80
WP01064	Water Pipe Segment	5	2020	\$8,080	80
WP01065	Water Pipe Segment	5	2020	\$1,347	80
WP01066	Water Pipe Segment	5	2020	\$6,669	80
WP01067	Water Pipe Segment	5	2020	\$23,182	80
WP01068	Water Pipe Segment	5	2020	\$13,563	80
WP01069	Water Pipe Segment	5	2020	\$23,065	80
WP01070	Water Pipe Segment	5	2020	\$7,920	80
WP01071	Water Pipe Segment	5	2020	\$3,474	80
WP01072	Water Pipe Segment	5	2020	\$62,386	80
WP01073	Water Pipe Segment	5	2020	\$18,896	80
WP01074	Water Pipe Segment	5	2020	\$26,934	80
WP01075	Water Pipe Segment	5	2020	\$10,004	80
WP01076	Water Pipe Segment	5	2020	\$8,946	80
WP01077	Water Pipe Segment	5	2020	\$16,930	80
WP01080	Water Pipe Segment	5	2020	\$8,476	80
WP01081	Water Pipe Segment	5	2020	\$45,018	80
WP01082	Water Pipe Segment	5	2020	\$42,228	80
WP01083	Water Pipe Segment	5	2020	\$1,347	80
WP01084	Water Pipe Segment	5	2020	\$7,792	80
WP01085	Water Pipe Segment	5	2020	\$12,890	80
WP01088	Water Pipe Segment	5	2020	\$7,364	80
WP01090	Water Pipe Segment	5	2020	\$12,409	80
WP01091	Water Pipe Segment	5	2020	\$6,926	80
WP01092	Water Pipe Segment	5	2020	\$2,309	80
WP01093	Water Pipe Segment	5	2020	\$7,022	80
WP01094	Water Pipe Segment	5	2020	\$15,775	80
WP01095	Water Pipe Segment	5	2020	\$7,599	80
WP01096	Water Pipe Segment	5	2020	\$9,908	80
WP01097	Water Pipe Segment	5	2020	\$9,726	80
WP01100	Water Pipe Segment	5	2020	\$6,252	80

WP01101	Water Pipe Segment	5	2020	\$8,369	80
WP01103	Water Pipe Segment	5	2020	\$10,677	80
WP01104	Water Pipe Segment	5	2020	\$15,102	80
WP01105	Water Pipe Segment	5	2020	\$26,068	80
WP01106	Water Pipe Segment	5	2020	\$3,078	80
WP01108	Water Pipe Segment	5	2020	\$9,908	80
WP01115	Water Pipe Segment	5	2020	\$31,743	80
Subtotal				\$3,254,008	
WT00275	Rylstone River Pump Station - Telemetry	7	2022	\$36,802	10
Subtotal				\$36,802	
WT00037	Burrundulla Well Field	8	2023	\$691,340	40
WT00044	Water Loss Management Works 2013 - Mag Flow meters	8	2023	\$40,393	10
WT00045	WATER TELEMETRY	8	2023	\$19,570	10
WT00043	Weather Station & control panel, Gulgong Weather Station & control panel, Gulgong Raw water irrigation project;;	8	2023	\$44,679	10
Subtotal				\$795,981	
Program Total				\$10,430,988	

Appendix C Projected Upgrade/Exp/New 10 year Capital Works Program

NAMS.PLUS3 Asset Management Form 2C Upgrade/New Plan

© Copyright. All rights reserved. The Institute of Public Works Engineering Australasia



Mid-Western RC Water_S1_V3

Projected Capital Upgrade/New Plan 2015

Year	Item No.	Capital Upgrade and New Projects	Estimate (\$000)	Running total (\$000)
2015	1	40030 - WATER NEW CONNECTIONS	\$103	\$103
2015	2	40406 - WATER AUGMENTATION - MUDGEE HEADWORKS	\$8	\$111
2015	3	40407 - WATER AUGMENTATION - WEST MUDGEE EXTENSION	\$3	\$114
2015	4	Telemetry	\$20	\$134
2015	5			
2015	6			
2015	7			
2015	8			
2015	9			
2015	10			
2015	Total Projected Capital Upgrade/New Plan		\$134	

Water_S1_V3

Projected Capital Upgrade/New Plan 2016

2016	1	New Connections	\$135	\$135
2016	2	40407 - WATER AUGMENTATION - WEST MUDGEE EXTENSION	\$1,266	\$1,401
2016	3	40408 - WATER AUGMENTATION - ULAN RD EXTENSION	\$1,600	\$3,001
2016	4	Telemetry	\$20	\$3,021
2016	5			
2016	6			
2016	7			
2016	8			
2016	9			
2016	10			
2016	Total Projected Capital Upgrade/New Plan		\$3,021	

**Mid-Western RC
Water_S1_V3**

Projected Capital Upgrade/New Plan 2017

Year	Item No.	Capital Upgrade and New Projects	Estimate (\$000)	Running total (\$000)
2017	1	New Connections	\$139	\$139
2017	2	Reservoir - Gulgong Flirtation Hill	\$1,500	\$1,639
2017	3	Mudgee Water Distribution - West	\$513	\$2,152
2017	4	Telemetry	\$20	\$2,172
2017	5			
2017	6			
2017	7			
2017	8			
2017	9			
2017	10			
2017	Total Projected Capital Upgrade/New Plan		\$2,172	

Water_S1_V3

Projected Capital Upgrade/New Plan 2018

2018	1	New Connections	\$143	\$143
2018	2	Telemetry	\$20	\$163
2018	3			
2018	4			
2018	5			
2018	6			
2018	7			
2018	8			
2018	9			
2018	10			
2018	Total Projected Capital Upgrade/New Plan		\$163	

**Mid-Western RC
Water_S1_V3**

Projected Capital Upgrade/New Plan 2019

Year	Item No.	Capital Upgrade and New Projects	Estimate (\$000)	Running total (\$000)
2019	1	New Connections	\$148	\$148
2019	2	40406 - WATER AUGMENTATION - MUDGEE HEADWORKS	\$11,755	\$11,903
2019	3	40407 - WATER AUGMENTATION - WEST MUDGEE EXTENSION	\$5,320	\$17,223
2019	4	Telemetry	\$20	\$17,243
2019	5			
2019	6			
2019	7			
2019	8			
2019	9			
2019	10			
2019	Total Projected Capital Upgrade/New Plan		\$17,243	

Water_S1_V3

Projected Capital Upgrade/New Plan 2020

2020	1	New Connections	\$152	\$152
2020	2	Augmentation - Kandos and Rylstone	\$200	\$352
2020	3	Telemetry	\$20	\$372
2020	4			
2020	5			
2020	6			
2020	7			
2020	8			
2020	9			
2020	10			
2020	Total Projected Capital Upgrade/New Plan		\$372	

**Mid-Western RC
Water_S1_V3**

Projected Capital Upgrade/New Plan 2021

Year	Item No.	Capital Upgrade and New Projects	Estimate (\$000)	Running total (\$000)
2021	1	New Connections	\$157	\$157
2021	2	Augmentation - Kandos and Rylstone	\$1,300	\$1,457
2021	3	Telemetry	\$20	\$1,477
2021	4			
2021	5			
2021	6			
2021	7			
2021	8			
2021	9			
2021	10			
2021	Total Projected Capital Upgrade/New Plan		\$1,477	

Water_S1_V3

Projected Capital Upgrade/New Plan 2022

2022	1	New Connections	\$161	\$161
2022	2	Augmentation - Kandos and Rylstone	\$2,000	\$2,161
2022	3	Telemetry	\$20	\$2,181
2022	4			
2022	5			
2022	6			
2022	7			
2022	8			
2022	9			
2022	10			
2022	Total Projected Capital Upgrade/New Plan		\$2,181	

**Mid-Western RC
Water_S1_V3**

Projected Capital Upgrade/New Plan 2023

Year	Item No.	Capital Upgrade and New Projects	Estimate (\$000)	Running total (\$000)
2023	1	New Connections	\$166	\$166
2023	2	Augmentation - Kandos and Rylstone	\$1,500	\$1,666
2023	3	Telemetry	\$20	\$1,686
2023	4			
2023	5			
2023	6			
2023	7			
2023	8			
2023	9			
2023	10			
2023	Total Projected Capital Upgrade/New Plan		\$1,686	

Water_S1_V3

Projected Capital Upgrade/New Plan 2024

2024	1	New Connections	\$171	\$171
2024	2	Telemetry	\$20	\$191
2024	3			
2024	4			
2024	5			
2024	6			
2024	7			
2024	8			
2024	9			
2024	10			
2024	Total Projected Capital Upgrade/New Plan		\$191	

Appendix D Budgeted Expenditures Accommodated in LTFP

NAMS.PLUS3 Asset Management Mid-Western RC

© Copyright. All rights reserved. The Institute of Public Works Engineering Australasia



Water_S1_V3 Asset Management Plan

Water First year of expenditure projections **2015** (financial yr ending)

Asset values at start of planning period

Current replacement cost	\$104,891 (000)
Depreciable amount	\$104,891 (000)
Depreciated replacement cost	\$60,072 (000)
Annual depreciation expense	\$1,580 (000)

Calc CRC from Asset Register
 \$104,891 (000)
 This is a check for you.

Operations and Maintenance Costs for New Assets

Additional operations costs	2.79%
Additional maintenance	2.12%
Additional depreciation	1.51%
Planned renewal budget (information only)	

You may use these values calculated from your data or overwrite the links.

Planned Expenditures from LTFP

20 Year Expenditure Projections Note: Enter all values in current 2015 values

Financial year ending	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Expenditure Outlays included in Long Term Financial Plan (in current \$ values)										
Operations										
Operations budget	\$2,309	\$2,618	\$2,790	\$2,831	\$3,115	\$3,115.00	\$3,115.00	\$3,115.00	\$3,115.00	\$3,115.00
Management budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
AM systems budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total operations	\$2,309	\$2,618	\$2,790	\$2,831	\$3,115	\$3,115	\$3,115	\$3,115	\$3,115	\$3,115
Maintenance										
Reactive maintenance budget	\$2,295	\$2,098	\$2,149	\$2,203	\$2,255	\$2,255.00	\$2,255.00	\$2,255.00	\$2,255.00	\$2,255.00
Planned maintenance budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total maintenance	\$2,295	\$2,098	\$2,149	\$2,203	\$2,255	\$2,255	\$2,255	\$2,255	\$2,255	\$2,255
Capital										
Planned renewal budget	\$626	\$975	\$857	\$996	\$978	\$1,101	\$1,124	\$1,234	\$1,177	\$1,798
Planned upgrade/new budget	\$134	\$3,021	\$2,172	\$163	\$17,243	\$372	\$1,477	\$2,181	\$1,686	\$191
Non-growth contributed asset value	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Asset Disposals										
Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed asse	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)										
Additional Expenditure Outlays required and not included above	2015 \$000	2016 \$000	2017 \$000	2018 \$000	2019 \$000	2020 \$000	2021 \$000	2022 \$000	2023 \$000	2024 \$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Renewal	to be incorporated into Forms 2 & 2.1 (where Method 1 is used) OR Form 2B Defect Repairs (where Method 2 or 3 is used)									
Capital Upgrade	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										
Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)										
Forecast Capital Renewal from Forms 2A & 2B	2015 \$000	2016 \$000	2017 \$000	2018 \$000	2019 \$000	2020 \$000	2021 \$000	2022 \$000	2023 \$000	2024 \$000
Forecast Capital Upgrade from Form 2C	\$134	\$3,021	\$2,172	\$163	\$17,243	\$372	\$1,477	\$2,181	\$1,686	\$191

Appendix E MWRC Water Supply and Sewerage Asset Criticality Assessment Report 2014

Mid-Western Regional Council



Water Supply and Sewerage Assets Criticality Assessment

HydroScience Consulting

A.B.N. 79 120 716 887

Email: hsc@hydroscience.net.au

Sydney Office

Level 1, 189 Kent Street

Sydney, NSW, 2000

Telephone: 02 9249 5100

Facsimilie: 02 9251 4011

Byron Bay Office

6/64 Centennial Circuit

Byron Bay, NSW, 2481

Telephone: 02 6639 5600

Facsimilie: 02 6680 9319

Document Control					
Approved for Issue					
Issue	Author	Reviewer	Name	Signature	Date
2	HHA	AFR	Andrew Fraser	<i>Andrew Fra</i>	16 June 2014

Contents

Contents.....	3
1 Introduction	4
2 Methodology	5
2.1 Levels of Service	5
2.2 Criticality Assessment.....	10
2.2.1 Asset Level	10
2.2.2 Failure Event.....	10
2.2.3 Consequence of Failure.....	10
2.2.4 Sewerage	12
2.2.5 Likelihood of Failure.....	13
2.3 Asset Management Risk Matrix	14
3 Workshop Outcome	15
4 Recommendation	32

1 Introduction

Mid-Western Regional Council (MWRC) wishes to better focus their asset management by prioritising their water supply and sewerage assets based on the asset criticality. To do this a high level assets criticality assessment was undertaken with Council staff at the Mudgee's RFS meeting room next door to MWRC's Depot on 28 May 2014. A list of attendees for the workshop is included in Table 1. HydroScience facilitated the workshop.

Table 1: List of Participants

Participant	Organisation
Steven Hanthorn	MWRC
Peter Dunn	MWRC
Allan Michelmore	MWRC
Enrique Castillo	MWRC
Steven Neely	MWRC
Gary O'Connell	MWRC
Claire Cam	MWRC
Andrew Fraser	HydroScience
Himali Hadungoda	HydroScience

The criticality assessment process and workshop outcomes are discussed in the following sections.

2 Methodology

Asset criticality assessment is a tool to identify the importance of major assets in meeting the Council's water supply and sewerage levels of service (LOS) and other regulatory requirements.

2.1 Levels of Service

MWRC has levels of service (LOS) that are used to define explicitly the standards required for the water supply and sewerage schemes from the perspective of the individual customer. Council's adopted LOS targets and performance are summarised in Table 2 and Table 3.

Table 2: Water Supply Levels of Service

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current Target	2012/13 Performance
AVAILABILITY OF SUPPLY			
Normal Quantity Available			
Domestic Peak day	L/tenement /day	3,000	Being met
Domestic Annual	kL/tenement /year	350	Being met
Total Annual Average Consumption	ML/year	Mudgee – 2000	1430
		Gulgong – 600	270
		Rylstone - 600	320
Total Peak Daily Consumption	ML/day	Mudgee – 14	13
		Gulgong – 5	2.2
		Rylstone - 4	2.5
Peak/Average consumption	%	250	285-330
Fire Fighting:			
Compliance with The Water Supply Investigation Manual* (AS 2419.1 classifications 2,3,5 & 9 with floor area less than 1000 m2)	% area served	100	Being met
Pressure:			
Min. pressure when delivering 0.15 L/s	Meters head	20	Being met
Max. static pressure	Meters head	70	Being met

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current Target	2012/13 Performance
Consumption Restrictions in Droughts:			
Level of restriction applied through a repeat of the worst drought on record	% normal usage	Mudgee - 100	Being met
		Gulgong - 100	Being met
		Rylstone - 80	Being met
Average frequency of restrictions	No./ 10 year period	1	Being met
Supply Interruptions to Consumers:			
Temporary supply arrangements during interruptions		Where feasible	Being met
Planned (95% of time):			
Notice given to domestic customers	Working Days	4	Being met
Notice given to commercial customers	Working Days	4	Being met
Notice given to major industrial customers	Working Days	4	Being met
Unplanned:			
Maximum duration	Hours	< 4	Being met
Maximum number per two years	Times	Major - 25	Being met
		Minor - < 150	344
RESPONSE TIMES			
(Defined as time to have staff on-site to commence rectification after notification of problem by public or own staff)			
Supply Failure:			
Priority 1: (Defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time)			
During working hours	Hours	0.5	Being met
Out of working hours	Hours	1	Being met
Priority 2: (Defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical use at a non-critical time)			
During working hours	Hours	1	Being met
Out of working hours	Hours	1	Being met

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current Target	2012/13 Performance
Priority 3: (Defined as failure to maintain continuity or quality of supply to a single customers)	Hours	2	Being met
Priority 4: (Defined as a minor problem or complaint, which can be dealt with at a time convenient to the customer and the Council)	Working Day	1	Not being met
Customer Inquiries/ Complaints:			
Note: Times apply for 95% of occasions			
Personnel/Oral inquiry	Working Days	1	Being met
Written inquiry	Working Days	10	Being met
SERVICE PROVIDED			
Time to provide an individual connection to water supply in serviced area (95% of times)	Working Days	10	Being met
WATER QUALITY			
Percentage compliance with 2011 ADWG			
Physical parameters	%	80	Being met
Chemical parameters	%	90	Being met
Microbiological parameters	%	98	Being met

Table 3: Sewerage Levels of Service

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current Target	2012/13 Performance
AVAILABILITY OF SERVICE			
Extent of area serviced	% designated service area	100% of Urban areas of Mudgee, Gulgong, Rylstone and Kandos	Being met
System Failures:			
Category 1: Failure due to rainfall and deficient capacity (overflows)	Number/year	4	Being met
Category 2: Failures due to pump or other breakdown including power failure	Number/year	6 due to maintenance	Being met
		12 due to power failure (standby pumps provided)	Being met
Category 3: Failures due to main blockages and collapses	Number/year	250	319
RESPONSE TIMES			
System Failure: (Defined as the maximum time to have staff on site to commence rectification after notification)			
Priority 1: (Major spill, significant environmental or health impact, or affecting large number of consumers i.e. a major main)			
During working hours	Hours	0.5	Being met
After hours	Hours	1	Being met
Priority 2: (Moderate spill, some environmental or health impact, or affecting small number of consumers i.e. other mains)			
During working hours	Hours	1	Being met
After hours	Hours	1	Being met

DESCRIPTION	UNIT	LEVEL OF SERVICE	
		Current Target	2012/13 Performance
Priority 3: (Minor spill, little environmental or health impact, or affecting a couple of consumers)	Working Day	1	Being met
Customer Complaints:			
General Complaints and Inquiries: (Note: times for 95% of complaints)			
Written complaints	Working Day	10	Being met
Oral complaints	Working Day	1	Being met
Odour Complaints:			
Treatment works (outside designated buffer zone)	Number/year	0	14
Pumping Stations	Number/year	0	
Reticulation system	Number/year	0	
EFFLUENT DISCHARGE AND SLUDGE MANAGEMENT			
Failure to meet licence limits and statutory requirements (100 percentile)	%	0	Not being met
Discharge Licence Conditions:			
Discharge Site		River and Land	
Effluent Reuse	%	25	5
Biochemical Oxygen Demand (BOD)	mg/L	10	Not being met
Total Suspended Solids (TSS)	mg/L	10	Not being met
Total Nitrogen (TN)	mg/L	7	Not being met
Oil and Grease	mg/L	2	Being met
Total Phosphorus (TP)	mg/L	0.3 (Mudgee)	Not being met

A high level asset criticality assessment was undertaken based on the likelihood and consequence of system failures in meeting the Council's LOS. Although the process appears to be quantitative the assessment is best utilised as a preliminary comparison of the relative criticality of water and sewerage assets.

2.2 Criticality Assessment

A high level (level 3) asset criticality assessment was used to identify the critical asset systems prioritised based on consequence and likelihood of system failures. The following definitions have been used in the criticality analysis:

- ❑ Asset Criticality: The product of consequence of failure multiplied by Likelihood of failure
- ❑ Consequence of Failure: Refers to the severity of the impact of a failure in an asset
- ❑ Likelihood of Failure: Refers to the probability that the asset will fail

2.2.1 Asset Level

Assets can be rated on:

- ❑ Level 1 asset – The whole of MWRC water supply / sewerage asset system
- ❑ Level 2 assets – Individual water supply/sewerage systems (e.g. Mudgee, Gulgong, Rylstone and Kandos systems)
- ❑ Level 3 assets – Sub systems (e.g. Mudgee water treatment plant, Reservoirs, Reticulation systems, Gulgong sewage treatment plant, Rylstone dam, etc.)
- ❑ Level 4 assets - - Individual major items in the sub systems (e.g. Mudgee sewage treatment plant inlet works, biological reactors, sludge lagoons, individual pumps in sewage pumping stations, etc.)

At the workshop, a criticality matrix was used which included a list of level 3 water supply and sewerage assets and rated them against the consequence and likelihood of failure to meet the Council's LOS and regulatory requirements.

2.2.2 Failure Event

Failure means inability to meet the levels of service targets or regulatory requirements MWRC is focused on achieving.

For the criticality assessment Council has defined the water supply and sewerage failure event as follows:

- ❑ Water Level 3 Assets: failure of the particular Level 3 system asset for a week in summer
- ❑ Sewerage Level 3 Assets: failure of the particular Level 3 system asset for two days

2.2.3 Consequence of Failure

Water Supply

For water supply assets the process considered consequences due to the failure of six different consequence factors (see below) for level 3 system asset failure for a week during in summer.

Six consequence factors for MWRC's consequence analysis were used as described below:

- ❑ Pressure (20-70 m)
- ❑ Domestic Peak Demand (3 kL/d/tenement)

- ❑ Unplanned Supply Interruption:
 - Maximum duration of the failure less than 4 hrs
 - Less than 12 major failure events per year
- ❑ Fire Fighting supply:
 - Positive head fire flow and 75% of design peak
- ❑ Water Quality meets Australian Drinking water Guidelines (ADWG) (2011)
- ❑ Environmental

Work Health & Safety (WHS) Hazards were initially identified as a consequence factor to be considered. However at the workshop all the participants agreed that WHS hazards were not relevant for this type of assessment. It was assumed that all asset work must be performed in a safe manner according to Council’s WH&S systems. Therefore WHS was not considered as a consequence factor

The table below shows the definitions used for assessing the specific consequence of failure if the water supply sub – system (level 3) fails for a week in summer. Consequence is assessed on a logarithmic scale, increasing in factors of 10, from 1 (Minor) up to 5 (Catastrophic).

Table 4: Consequence of Failure for Water

Consequence of Failure	Levels of Service					Environmental
	Pressure (20-70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/y)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG	
5	Lose Pressure (P) more than 10,000 Customers (C)	Not Meet Peak Demand for more than 10,000 Customers (C)	Lose Supply more than 10,000 Customers (C)	Lose Supply more than 10,000 Customers (C)	More than 10,000 Customers (C) Boil Water (BW)	Catastrophic impact to environment
4	Lose P more than 1,000 C	Not Meet Peak Demand for more than 1,000 C	Lose Supply more than 1,000 C	Lose Supply more than 1,000 C	More than 1,000 C BW	Long term negative impact to the environment
3	Lose P more than 100 C or Major Hospital	Not Meet Peak Demand for more than 100 C	Lose Supply more than 100 C or Major Hospital	Lose Supply more than 100 C or Major Hospital	More than 100 C BW	Serious impact to the environment but reversible
2	Lose P more than 10 C or Major Industry	Not Meet Peak Demand for more than 10 C	Lose Supply more than 100 C or Major Industry	Lose Supply more than 10 C or Major Industry	More than 10 C BW	Significant impact to the environment

Consequence of Failure	Levels of Service					Environmental
	Pressure (20-70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/yr)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG	
1	Lose P 1 to 10 C or Minor Industry	Not Meet Peak Demand for 1 to 10 C	Lose Supply 1 to 10 C or Minor Industry	Lose Supply 1 to 10 C or Minor Industry	1 to 10 C BW or aesthetic	On-site minor environment impact

Note: Customers (C) means people

2.2.4 Sewerage

For sewerage assets it was considered that consequence due to the failure of four consequence factors (see below) as per level 3 system asset failure for two days.

Four consequence factors for MWRC’s sewerage consequence analysis were used as described below:

- System Failure
- Odour Complaints
 - None per year for treatment works
 - None per year for pumping stations (PS)
 - Non per year for reticulation system
- Raw sewage overflow
- Environmental

The table below shows the definitions used for assessing the specific consequence of failure if the system fails for two days. Consequence is assessed on a logarithmic scale, increasing in factors of 10, from 1 (Minor) up to 5 (Catastrophic).

Table 2: Consequence of Failures for Sewerage

Consequence of Failure	Levels of Service			Environmental
	System Failure	Odour Complaints (none per year for treatment, for PS & reticulation system)	Raw Sewage Overflow	
5	Lose service to more than 10,000 Customers (C)	More than 10,000 complaints	Raw sewage flows through more than 10,000 Customers (C) properties	Catastrophic impact to environment

Consequence of Failure	Levels of Service			Environmental
	System Failure	Odour Complaints (none per year for treatment, for PS & reticulation system)	Raw Sewage Overflow	
4	Lose service to more than 1,000 Customers (C)	More than 1,000 complaints	Raw sewage flows through more than 1,000 C properties	Long term negative impact to the environment
3	Lose service to more than 100 C	More than 100 complaints	Raw sewage flows through more than 100 C properties	Serious impact to the environment but reversible
2	Lose service to more than 10 C	More than 10 complaints	Raw sewage flows through more than 10 C properties	Significant impact to the environment
1	Lose service to 1 to 10 C	Less than 10 complaints	Raw sewage flows through less than 10 C properties	On-site minor environment impact

Note: Customers (C) means people

2.2.5 Likelihood of Failure

Three factors were used to assess the likelihood of failure. Each of these is assessed on a logarithmic scale between Rare (1) and Almost Certain (5).

- ❑ Condition: The ability of the asset to perform acceptably refers to the likelihood of failure due to the asset’s condition. For instance if the asset is failing now then the likelihood of failing is rated at 5. While if the asset is in excellent condition it would be expected to perform acceptably and be rated at 1
- ❑ Capacity: The likelihood of this asset to fail to meet the capacity requirement is rated between 5 – it won’t meet current or future (in 30 years) levels of service and 1- it will meet current and Future LOS 30 years
- ❑ Technology: This relates to the likelihood of failure due to obsolescence. For instance this is less likely to occur with pumps and pipes but may be more likely with faster changing technologies and quality requirements such as water treatment plants

The definitions used to assess the various level 3 systems likelihood of failures are shown in table below.

Table 3: Likelihood of Failures Definitions

Likelihood of Failure	1 Rare	2 Unlikely	3 Possible	4 likely	5 Almost Certain
Condition (Performs Acceptably)	Excellent	Adequate	Action required	Poor	Very Poor (Failing now)
Capacity (Performs Acceptably)	Will Meet Current & Future LOS (30 year)	Adequate Current LOS (15 year)	Adequate Current LOS (1 year)	Action Needed Soon	Won't Meet Current & Future LOS (30 year)
Technology (Performs Acceptably)	Will Meet Current & Future LOS (30 year)	Adequate Current LOS (15 year)	Adequate Current LOS (1 year)	Action Needed Soon	Won't Meet Current & Future LOS (30 year)

2.3 Asset Management Risk Matrix

Council’s risk matrix (see below) was used to analyse the level 3 assets systems against the consequence and likelihood of failure.

The matrix below illustrates a theoretical approach in terms of which form of asset management actions might be applied.

CONSEQUENCE	5	Moderate	High	Critical	Critical	Critical
	4	Moderate	Moderate	High	Critical	Critical
	3	Low	Moderate	Moderate	High	Critical
	2	Low	Low	Moderate	High	High
	1	Low	Low	Low	Moderate	High
		1	2	3	4	5
LIKELIHOOD						

The action required at each risk level is summarised in the table below.

Risk Level	Action Required
Low	Likely Covered normal operations
Moderate	Likely Covered Unscheduled Maintenance
High	Likely Covered by Scheduled Maintenance
Critical	Likely that Capital Works will be required

3 Workshop Outcome

In Table 5 and Table 7 the “Worst Case” Scenario columns at right combines the highest consequence figures with the highest likelihood to indicate the most critical assets for addressing MWRC’s levels of service and meet the environmental requirements.

Table 5: Water Supply Criticality Outcome
Level 3 system failure for a week in summer

MSS	Reference No	Asset Description (Level 3 Assets)	Consequence of Failure (5= Catastrophic; 1 = Minor)						Likelihood of Failure (5= Almost Certain; 1 = Rare)			Worst Case Scenario			
			Levels of Service						Condition	Capacity	Technology	Consequence	Likelihood	Risk	
			Pressure (20-70 m)	Peak Demand (3 K/L/renement)	Unplanned Supply Interrupt (4hrs per event, 12 times/yr)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG	Environmental							
Mudgee	1	Cudgong River Intake including Low Lift Pumping Station (LPS)	2	5	2	2	2	0	0	2	3	2	5	3	Critical
Mudgee	2	Raw Water Rising Main from LPS to Mudgee Raw Water Balance Tank	2	5	2	2	2	0	0	1	2	1	5	2	High
Mudgee	3	Burrundulla Borefield including Transmission Main to Balance Tank	1	1	1	1	1	1	1	2	2	2	1	2	Low
Mudgee	4	Raw Water Balance Tank	2	5	2	2	4	0	0	1	1	1	5	1	High
Mudgee	5	Pre Chemical Dosing System at Clarifier	0	0	0	0	4	0	0	2	3	4	4	4	Critical
Mudgee	6	Mudgee WTP	5	5	5	5	5	0	0	1	3	2	5	3	Critical
Mudgee	7	Chlorine Dosing System at Mudgee Clear Water Tank	0	0	0	0	5	0	0	2	3	2	5	3	Critical

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service					Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			Pressure (20 -70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/y)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG							
Mudjee	8	Mudjee Clear Water Tank (CWT)	5	5	5	5	4	4	0	1	2	2	2	High
Mudjee	9	Rising Main from Burrundulla Borefields to Clear Water Tank	1	1	1	1	1	1	1	1	1	1	1	Low
Mudjee	10	Mudjee Clear Water Pumps	5	5	5	5	4	4	0	2	2	2	2	High
Mudjee	11	Clear Water Rising Main from CWT to Filtration Hill Reservoir including Pumps	5	5	5	5	4	4	0	1	1	1	1	High
Mudjee	12	Filtration Hill Reservoir	5	5	5	5	4	4	0	2	2	2	2	High
Mudjee	13	Mudjee Low Zone Reticulation System	4	4	4	4	4	4	0	2	1	2	2	High
Mudjee	14	Rising main from Filtration Hill Reservoir to Colliers Hill Reservoir including pumps	4	4	4	4	4	4	0	3	4	4	4	Critical
Mudjee	15	Mudjee High Zone reservoir	4	4	4	4	4	4	0	3	1	3	3	High

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service						Environmental	Condition	Capacity	Technology	Likelihood	Risk
			Pressure (20 -70 m)	Peak Demand (3 KL/d/tenement)	Unplanned Supply Interrupt (hrs per event, 12 times/yr)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG							
Mudgee	16	Mudgee High Zone Reticulation System	4	4	4	4	4	4	0	2	1	1	2	High
Mudgee		Mudgee Raw water system												
Mudgee	17	Glenwillow Borefield and Court Street Bore Borefield												
Mudgee	18	Rising Main from Glenwillow & Court Street Borefields to Court Street Reservoir including Pumps												
Mudgee	19	Court Street Reservoir												
Mudgee	20	Rising Main from Court Street Reservoir to Church Street Reservoir including Pumps												
Mudgee	21	Gravity Main from Flirtation Hill Reservoir to Church Street Reservoir												

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service					Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			Pressure (20 -70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/y)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG							
Mudgee	22	Church Street Reservoir												
Mudgee	23	Gravity Pipeline to Parks and Gardens Watering												
Gulgong	24	Cudgegong River Intake including Intake Pumping Station	2	5	2	2	0	0	2	3	2	5	3	Critical
Gulgong	25	Raw Water Pipeline to River Intake to Turkey Nest Dam (TND)	4	4	4	4	4	1	1	2	4	2	4	High
Gulgong	26	Turkey Nest Dam (TND)	0	4	4	0	0	0	1	1	4	1	4	Moderate
Gulgong	27	Raw Water Pipeline from TND to Raw Water Balance Tank including Pumping Station	4	4	4	4	4	4	3	1	4	3	4	High
Gulgong	28	Raw Water Balance Tank	0	0	0	0	4	4	1	1	4	1	4	Moderate
Gulgong	29	Pre Chemical Dosing System at Gulgong Clarifier	0	0	0	0	4	4	4	4	4	4	4	Critical

MSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service						Environmental	Consequence	Likelihood	Risk
			Pressure (20-70 m)	Peak Demand (3 kl/d/renement)	Unplanned Supply Interrupt (4hrs per event, 12 times/yr)	Fire Fighting (Positive Head)	Water Quality 2011 ADWG					
Gulgong	30	Gulgong WTP	4	4	4	4	4	4	1	4	5	Critical
Gulgong	31	Chlorine Dosing System at Gulgong Clear Water Tank	0	0	0	0	4	0	0	4	5	Critical
Gulgong	32	Gulgong Clear Water Tank (CWT)	4	4	4	4	4	0	0	4	3	High
Gulgong	33	Gulgong Clear Water Pumps	4	4	4	4	4	0	0	4	4	Critical
Gulgong	34	Clear Water Rising Main from CWT to Gulgong Reservoir	4	4	4	4	0	0	0	4	1	Moderate
Gulgong	35	Gulgong Reticulation System	4	4	4	4	4	1	0	4	4	Critical
Gulgong	36	Gulgong Raw Water System Fletchers Borefields	1	1	1	0	0	0	0	1	3	Low
Gulgong	37	Wait-a-Whale Borefield	1	1	1	0	0	0	0	1	3	Low

Condition	Capacity	Technology
2	5	5
1	5	1
1	3	1
1	4	1
1	1	1
3	3	4
1	3	1
1	3	1

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service						Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			Pressure (20 -70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/y)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG								
Gulgong	38	Raw Water Pipeline from Borefields to Elcom Reservoir	1	1	1	0	0	0	2	1	2	1	2	Low	
Gulgong	39	Gas Chlorination system at Elcom Reservoir	0	0	0	0	1	0	1	1	1	1	1	Low	
Gulgong	40	Elcom Reservoir	1	1	1	0	0	0	1	1	1	1	1	Low	
Gulgong	41	Chlorinated Borewater Pipeline from Elcom Reservoir to Parks and Gardens Reservoir	1	1	1	0	0	0	3	3	3	1	3	Low	
Gulgong	42	Parks and Gardens Reservoir	1	1	1	0	0	0	2	2	2	1	2	Low	
Gulgong	43	Gravity Pipeline to Parks and Gardens Irrigation	1	1	1	0	0	0	1	1	1	1	1	Low	
Rylstone & Kandos	44	Rylstone Dam	4	4	4	4	4	4	1	3	3	4	3	High	
Rylstone &	45	Dam Intake and Raw Water Pump	4	4	4	4	4	0	1	1	1	4	1	Moderate	

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service						Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			Pressure (20 -70 m)	Peak Demand (3 KL/d/renement)	Unplanned Supply Interrupt (hrs per event, 12 times/yr)	Fire Fighting (Positive Head)	Water Quality 2011 ADWG								
Kandos		Station													
Rylstone & Kandos	46	Raw Water Pipeline from Rylstone Dam to Mixing Tank	4	4	4	4	4	0		2	1	2	4	2	High
Rylstone & Kandos	47	Pre Chemical Dosing System at Mixing Tank	0	0	0	0	4	4		3	2	4	4	4	Critical
Rylstone & Kandos	48	Rylstone WTP	4	4	4	4	4	0		3	2	4	4	4	Critical
Rylstone & Kandos	49	Chlorine Dosing System at Rylstone Clear Water Tank	0	0	0	0	4	0		2	2	2	4	2	High
Rylstone & Kandos	50	Rylstone Clear Water Tank (CWT)	4	4	4	4	4	0		3	2	2	4	3	High
Rylstone & Kandos	51	Rylstone Clear Water Pumps	4	4	4	4	4	0		2	2	3	4	3	High

WSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service					Environmental
			Pressure (20 -70 m)	Peak Demand (3 kL/d/tenement)	Unplanned Supply Interrupt (4hrs per event, 12 times/y)	Fire Fighting (Positive Head Fire Flow at 75% Design Peak)	Water Quality 2011 ADWG	
Rylstone & Kandos	51.1							
Rylstone & Kandos	51.2							
Rylstone & Kandos	51.3							
Rylstone & Kandos	52	Rylstone Reticulation System	4	4	4	4	4	0
Rylstone & Kandos	53	Rylstone Reservoirs	4	4	4	4	4	0
Rylstone & Kandos	54	Pipeline from Rylstone Reservoirs to Kandos Reservoir 1 including Pump Station	4	4	4	4	4	0
Rylstone & Kandos	55	Kandos Reticulation System	4	4	4	4	4	0

Condition	Capacity	Technology
2	2	2
3	2	3
2	1	1
2	1	1

Consequence	Likelihood	Risk
4	2	High
4	2	High
4	3	High
4	2	High

MSS	Reference No	Asset Description (Level 3 Assets)	Levels of Service						Condition	Capacity	Technology	Likelihood	Risk		
			Pressure (20 -70 m)	Peak Demand (3 Kl/d/renement)	Unplanned Supply Interrupt (4hrs per event, 12 times/yr)	Fire Fighting (Positive Head)	Water Quality 2011 ADWG	Environmental							
Rylstone & Kandos	56	Rising Main from Kandos Reticulation System to Charbon Reservoir including Pumps	3	3	3	3	3	3	0	2	2	1	3	2	Moderate
Rylstone & Kandos	57	Charbon Reticulation System	3	3	3	3	3	3	0	2	1	1	3	2	Moderate
Rylstone & Kandos	58	Rising Main from Charbon Reticulation System to Clandulla Reservoir including Pumps	3	3	3	3	3	3	0	2	1	1	3	2	Moderate
Rylstone & Kandos	59	Clandulla Reticulation System	3	3	3	3	3	3	0	2	1	1	3	2	Moderate

Note: MWRC will update the Gray Cells at the mini workshop that is planning to held at Council office afetr finalise this report

A summary of worst case critical water supply assets which may be inferred to require capital works over the next 30 years are summarised in the table below.

Table 6: Critical Water Supply Assets

WSS	Reference No	Asset Description
Mudgee	1	Cudgegong River Intake including Low Lift Pumping Station (LPS)
Mudgee	5	Pre Chemical Dosing System at Clarifier
Mudgee	6	Mudgee WTP
Mudgee	7	Chlorine Dosing System at Mudgee Clear Water Tank
Mudgee	14	Rising main from Filtration Hill Reservoir to Colliers Hill Reservoir including pumps
Gulgong	24	Cudgegong River Intake including Intake Pumping Station
Gulgong	29	Pre Chemical Dosing System at Gulgong Clarifier
Gulgong	30	Gulgong WTP
Gulgong	31	Chlorine Dosing System at Gulgong Clear Water Tank
Gulgong	33	Gulgong Clear Water Pumps
Gulgong	35	Gulgong Reticulation System
Rylstone & Kandos	47	Pre Chemical Dosing System at Mixing Tank
Rylstone & Kandos	48	Rylstone WTP

Table 7: Sewerage Criticality Outcome Level 3 system failure for two days

Sewerage Scheme	Reference No	Asset Description (Level 3 Assets)	Consequence of Failure (5= Catastrophic; 1 = Minor)				Likelihood of Failure (5= Almost Certain; 1 = Rare)			Worst Case Scenario		
			System Failure	Odour Complaints (Non per year for treatment, PS and reticulation system)	Raw Sewage Overflow	Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
Mudgee	1	Mudgee North 1 Gravity Reticulation System	2	1	2	2	3	1	1	2	3	Moderate
Mudgee	2	Mudgee North 3 Gravity Reticulation System	2	0	1	1	1	1	1	2	1	Low
Mudgee	3	Bonnyview Sewerage Pumping Station (SPS)	2	1	1	2	2	2	1	2	2	Low
Mudgee	4	Rising Main from Bonnyview SPS to Mudgee North 2 Reticulation System	2	1	1	2	1	2	1	2	2	Low
Mudgee	5	Mudgee North 2 Reticulation System	3	2	2	3	2	1	1	3	2	Moderate
Mudgee	6	Bombira SPS	3	2	1	2	2	3	2	3	3	Moderate
Mudgee	7	Rising Main from Bombira SPS to Mudgee Central East Reticulation System	3	2	1	3	4	2	4	3	4	High
Mudgee	8	Mudgee Redbank Creek Gravity Reticulation System	2	2	1	3	2	1	1	3	2	Moderate

Sewerage Scheme	Reference No	Asset Description (Level 3 Assets)	Levels of Service				Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			System Failure	Odour Complaints (Non per year for treatment, PS and reticulation system)	Raw Sewage Overflow								
Mudjee	9	Mudjee Central South Gravity Reticulation System	4	2	2	3	3	2	2	4	3	High	
Mudjee	10	Mudjee Sawpit Creek Gravity Reticulation System	4	2	2	3	2	1	1	4	2	High	
Mudjee	11	Industrial SPS	4	1	1	3	1	1	1	4	1	Moderate	
Mudjee	12	Rising main from Industrial SPS to Mudjee East Reticulation System	4	1	1	3	2	2	2	4	2	High	
Mudjee	13	Mudjee East Gravity Reticulation System	4	2	1	3	3	3	4	4	4	Critical	
Mudjee	14	Mudjee East SPS	4	2	1	3	3	3	2	4	3	High	
Mudjee	15	Rising main from Mudjee East SPS to Mudjee Central East Reticulation System	4	2	1	3	3	1	1	4	3	High	
Mudjee	16	Mudjee Central East Gravity Reticulation System	4	2	1	3	4	3	3	4	4	Critical	
Mudjee	17	Mudjee Central West South Gravity Reticulation System	3	2	2	3	1	1	1	3	1	Low	
Mudjee	18	Mudjee Showground Gravity Reticulation System	3	2	2	3	3	1	3	3	3	Moderate	

Sewerage Scheme	Reference No	Asset Description (Level 3 Assets)	Levels of Service				Condition	Capacity	Technology	Consequence	Likelihood	Risk
			System Failure	Odour Complaints (Non per reticulation system)	Raw Sewage Overflow	Environmental						
Mudgee	19	Mudgee Central West Reticulation System	4	3	2	3	2	1	2	4	2	High
Mudgee	20	Mudgee West Gravity Reticulation System	5	3	3	3	3	2	2	5	3	Critical
Mudgee	21	Gravity Main from Mudgee West Reticulation System to Putta Bucca SPS	3	2	1	3	1	1	1	3	1	Low
Mudgee	22	Putta Bucca SPS	5	1	1	3	1	1	1	5	1	High
Mudgee	23	Rising Main from Putta Bucca SPS to Mudgee STP	5	1	1	3	1	1	3	5	3	Critical
Mudgee	24	Mudgee STP	1	1	1	3	1	2	1	3	2	Moderate
Gulgong	25	Gulgong West Gravity Reticulation System	3	2	1	2	2	1	3	3	3	Moderate
Gulgong	26	Hospital Sewerage Pumping Station (SPS)	3	2	1	2	3	4	4	3	4	High
Gulgong	27	Rising Main from Hospital SPS to Gulgong Central Reticulation System	3	2	1	2	3	2	4	3	4	High
Gulgong	28	Gulgong North Gravity Reticulation System	2	2	2	2	2	1	2	2	2	Low
Gulgong	29	Gulgong North Central Gravity Reticulation System	2	2	1	2	2	1	2	2	2	Low

Sewerage Scheme	Reference No	Asset Description (Level 3 Assets)	Levels of Service				Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			System Failure	Odour Complaints (Non per year for treatment, PS and reticulation system)	Raw Sewage Overflow								
Gulgong	30	Mill SPS	3	1	1	2	2	1	1	3	2	Moderate	
Gulgong	31	Rising Main from Mill SPS to Gulgong Central Reticulation System	3	1	1	2	2	1	1	3	2	Moderate	
Gulgong	32	Gulgong North East Gravity Reticulation System	2	1	1	2	1	1	1	2	1	Low	
Gulgong	33	Industrial SPS	2	1	1	2	1	1	1	2	1	Low	
Gulgong	34	Rising Main from Industrial SPS to Gulgong Central Reticulation System	2	1	1	2	3	1	1	2	3	Moderate	
Gulgong	35	Gulgong Central Reticulation System	4	2	2	3	2	1	2	4	2	High	
Gulgong	36	Gulgong East Gravity Reticulation System	3	1	2	2	2	3	1	3	3	Moderate	
Gulgong	37	Gulgong STP	4	1	1	2	1	4	2	4	4	Critical	
Gulgong	38	Gulgong STP Reuse System	1	0	0	0	2	4	3	1	4	Moderate	
Rylstone	39	Rylstone North Gravity Reticulation System	3	1	1	3	2	1	2	3	2	Moderate	
Rylstone	40	Louee Street Sewage Pumping Station (SPS)	3	1	1	3	2	1	2	3	2	Moderate	

Sewerage Scheme	Reference No	Asset Description (Level 3 Assets)	Levels of Service				Environmental	Condition	Capacity	Technology	Consequence	Likelihood	Risk
			System Failure	Odour Complaints (Non per year for treatment, PS and reticulation system)	Raw Sewage Overflow								
Rylstone	41	Rising Main from Louee Street SPS to Melon Street SPS	3	1	0	3	1	1	1	3	1	Low	
Rylstone	42	Rylstone South Gravity Reticulation System	3	2	1	3	2	1	2	3	2	Moderate	
Rylstone	43	Melon Street SPS	3	2	1	3	2	5	2	3	5	Critical	
Rylstone	44	Rising Main from Melon Street SPS to Rylstone Sewage Treatment Plant (STP)	3	2	1	3	4	2	4	3	4	High	
Rylstone	45	Rylstone STP	3	1	1	3	4	1	4	3	4	High	
Kandos	46	Kandos West Gravity Reticulation System	1	1	1	1	2	1	2	1	2	Low	
Kandos	48	Sydney Road Sewage Pumping Station (SPS)	1	1	0	1	1	1	2	1	2	Low	
Kandos	49	Rising Main from Sydney Road SPS to Kandos Central Reticulation System	1	1	1	1	3	1	3	1	3	Low	
Kandos	50	Kandos South West Gravity Reticulation System	3	2	1	2	2	1	2	3	2	Moderate	
Kandos	52	Cairo Street SPS	2	1	1	1	2	1	2	2	2	Low	
Kandos	53	Rising Main from Cairo Street SPS to Kandos Central	2	1	1	1	2	1	3	2	3	Moderate	

Sewerage Scheme		Reference No		Asset Description (Level 3 Assets)				Levels of Service			Condition			Capacity			Technology			Consequence			Likelihood			Risk					
Kandos	54	Reticulation System Kandos Central Reticulation System				3	2	2	3	2	1	2	2	1	2	3	2	Moderate	3	2	Moderate	4	4	4	4	4	4	4	4	4	
Kandos	56	Kandos North Reticulation System				3	1	1	2	2	1	2	2	1	2	3	2	Moderate	3	2	Moderate	4	3	High	4	4	4	4	4	4	
Kandos	57	Gravity Main from Kandos North Reticulation System to Kandos STP				4	2	1	2	4	1	2	4	1	2	4	3	High	4	3	High	4	4	Critical	4	4	4	4	4	4	
Kandos	58	Kandos STP				4	2	1	3	4	1	4	4	1	4	4	1	Critical	4	4	Critical	4	4	Critical	4	4	4	4	4	4	4

A summary of worst case scenario critical sewerage assets which may be inferred to require capital works over the next 30 years are summarised in the table below.

Table 8: Critical Sewerage Assets

Sewerage Scheme	Reference No	Asset Description
Mudgee	13	Mudgee East Gravity Reticulation System
Mudgee	16	Mudgee Central East Gravity Reticulation System
Mudgee	20	Mudgee West Gravity Reticulation System
Mudgee	23	Rising Main from Putta Bucca SPS to Mudgee STP
Gulgong	37	Gulgong STP
Rylstone	43	Melon Street SPS
Kandos	58	Kandos STP

4 Recommendation

It is envisaged that, based on the asset criticality workshop outcomes, Council should revisit the critical assets and develop asset management plan actions. These would be expected to be included in operating plans, maintenance plans and capital works plans that manage the critical assets to better achieve optimal levels of performance.

Appendix F Abbreviations

Abbrev	Description
AAAC	Average annual asset consumption
AM	Asset management
AM Plan	Asset management plan
ARI	Average recurrence interval
ASC	Annual service cost
BOD	Biochemical (biological) oxygen demand
CRC	Current replacement cost
CWMS	Community wastewater management systems
DA	Depreciable amount
DRC	Depreciated replacement cost
EF	Earthworks/formation
IRMP	Infrastructure risk management plan
LCC	Life Cycle cost
LCE	Life cycle expenditure
LTFP	Long term financial plan
MMS	Maintenance management system
PCI	Pavement condition index
RV	Residual value
SoA	State of the Assets
SS	Suspended solids
vph	Vehicles per hour
WDCRC	Written down current replacement cost

Appendix F Glossary

ANNUAL SERVICE COST (ASC)

1. Reporting actual cost

The annual (accrual) cost of providing a service including operations, maintenance, depreciation, finance/opportunity and disposal costs less revenue.

2. For investment analysis and budgeting

An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operations, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

ASSET

A resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity. Infrastructure assets are a sub-class of property, plant and equipment which are non-current assets with a life greater than 12 months and enable services to be provided.

ASSET CATEGORY

Sub-group of assets within a class hierarchy for financial reporting and management purposes.

ASSET CLASS

A group of assets having a similar nature or function in the operations of an entity, and which, for purposes of disclosure, is shown as a single item without supplementary disclosure.

ASSET CONDITION ASSESSMENT

The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action.

ASSET HIERARCHY

A framework for segmenting an asset base into appropriate classifications. The asset hierarchy can be based on asset function or asset type or a combination of the two.

ASSET MANAGEMENT (AM)

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.

ASSET RENEWAL FUNDING RATIO

The ratio of the net present value of asset renewal funding accommodated over a 10 year period in a long term financial plan relative to the net present value of projected capital renewal expenditures identified in an asset management plan for the same period [AIFMG Financial Sustainability Indicator No 8].

AVERAGE ANNUAL ASSET CONSUMPTION (AAAC)*

The amount of an organisation's asset base consumed during a reporting period (generally a year). This may be calculated by dividing the depreciable amount by the useful life (or total future economic benefits/service potential) and totalled for each and every asset OR by dividing the carrying amount (depreciated replacement cost) by the remaining useful life (or remaining future economic benefits/service potential) and totalled for each and every asset in an asset category or class.

BORROWINGS

A borrowing or loan is a contractual obligation of the borrowing entity to deliver cash or another financial asset to the lending entity over a specified period of time or at a specified point in time, to cover both the initial capital provided and the cost of the interest incurred for providing this capital. A borrowing or loan provides the means for the borrowing entity to finance outlays (typically physical assets) when it has insufficient funds of its own to do so, and for the lending entity to make a financial return, normally in the form of interest revenue, on the funding provided.

CAPITAL EXPENDITURE

Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

CAPITAL EXPENDITURE - EXPANSION

Expenditure that extends the capacity of an existing asset to provide benefits, at the same standard as is currently enjoyed by existing beneficiaries, to a new group of users. It is discretionary expenditure, which increases future operations and maintenance costs, because it increases the organisation's asset base, but may be associated with additional revenue from the new user group, eg. extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

CAPITAL EXPENDITURE - NEW

Expenditure which creates a new asset providing a new service/output that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operations and maintenance expenditure.

CAPITAL EXPENDITURE - RENEWAL

Expenditure on an existing asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it generally has no impact on revenue, but may reduce future operations and maintenance expenditure if completed at the optimum time, eg. resurfacing or resheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval.

CAPITAL EXPENDITURE - UPGRADE

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase operations and maintenance expenditure in the future because of the increase in the organisation's asset base, eg. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility.

CAPITAL FUNDING

Funding to pay for capital expenditure.

CAPITAL GRANTS

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

CAPITAL INVESTMENT EXPENDITURE

See capital expenditure definition

CAPITALISATION THRESHOLD

The value of expenditure on non-current assets above which the expenditure is recognised as capital expenditure and below which the expenditure is charged as an expense in the year of acquisition.

CARRYING AMOUNT

The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.

CLASS OF ASSETS

See asset class definition

COMPONENT

Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

CORE ASSET MANAGEMENT

Asset management which relies primarily on the use of an asset register, maintenance management systems, job resource management, inventory control, condition assessment, simple risk assessment and defined levels of service, in order to establish alternative treatment options and long-term cashflow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than detailed risk analysis and optimised decision-making).

COST OF AN ASSET

The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, including any costs necessary to place the asset into service. This includes one-off design and project management costs.

CRITICAL ASSETS

Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than noncritical assets.

CURRENT REPLACEMENT COST (CRC)

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

DEFERRED MAINTENANCE

The shortfall in rehabilitation work undertaken relative to that required to maintain the service potential of an asset.

DEPRECIABLE AMOUNT

The cost of an asset, or other amount substituted for its cost, less its residual value.

DEPRECIATED REPLACEMENT COST (DRC)

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

DEPRECIATION / AMORTISATION

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

ECONOMIC LIFE

See useful life definition.

EXPENDITURE

The spending of money on goods and services. Expenditure includes recurrent and capital outlays.

EXPENSES

Decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or increases in liabilities that result in decreases in equity, other than those relating to distributions to equity participants.

FAIR VALUE

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arms length transaction.

FINANCING GAP

A financing gap exists whenever an entity has insufficient capacity to finance asset renewal and other expenditure necessary to be able to appropriately maintain the range and level of services its existing asset stock was originally designed and intended to deliver. The service capability of the existing asset stock should be determined assuming no additional operating revenue, productivity improvements, or net financial liabilities above levels currently planned or projected. A current financing gap means service levels have already or are currently falling. A projected financing gap if not addressed will result in a future diminution of existing service levels.

HERITAGE ASSET

An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

IMPAIRMENT LOSS

The amount by which the carrying amount of an asset exceeds its recoverable amount.

INFRASTRUCTURE ASSETS

Physical assets that contribute to meeting the needs of organisations or the need for access to major economic and social facilities and services, eg. roads, drainage, footpaths and cycleways. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally the components and hence the assets have long lives. They are fixed in place and are often have no separate market value.

INVESTMENT PROPERTY

Property held to earn rentals or for capital appreciation or both, rather than for:

- use in the production or supply of goods or services or for administrative purposes; or
- sale in the ordinary course of business.

KEY PERFORMANCE INDICATOR

A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.

LEVEL OF SERVICE

The defined service quality for a particular service/activity against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental impact, acceptability and cost.

LIFE CYCLE COST *

1. **Total LCC** The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
2. **Average LCC** The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises average operations, maintenance expenditure plus asset consumption expense, represented by depreciation expense projected over 10 years. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

LIFE CYCLE EXPENDITURE

The Life Cycle Expenditure (LCE) is the average operations, maintenance and capital renewal expenditure accommodated in the long term financial plan over 10 years. Life Cycle Expenditure may be compared to average Life Cycle Cost to give an initial indicator of affordability of projected service levels when considered with asset age profiles.

LOANS / BORROWINGS

See borrowings.

MAINTENANCE

All actions necessary for retaining an asset as near as practicable to an appropriate service condition, including regular ongoing day-to-day work necessary to keep assets operating, eg road patching but excluding rehabilitation or renewal. It is operating expenditure required to ensure that the asset reaches its expected useful life.

- **Planned maintenance**
Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.
- **Reactive maintenance**
Unplanned repair work that is carried out in response to service requests and management/ supervisory directions.
- **Specific maintenance**
Maintenance work to repair components or replace sub-components that needs to be identified as a specific maintenance item in the maintenance budget.
- **Unplanned maintenance**
Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

MAINTENANCE EXPENDITURE *

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the

required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

MATERIALITY

The notion of materiality guides the margin of error acceptable, the degree of precision required and the extent of the disclosure required when preparing general purpose financial reports. Information is material if its omission, misstatement or non-disclosure has the potential, individually or collectively, to influence the economic decisions of users taken on the basis of the financial report or affect the discharge of accountability by the management or governing body of the entity.

MODERN EQUIVALENT ASSET

Assets that replicate what is in existence with the most cost-effective asset performing the same level of service. It is the most cost efficient, currently available asset which will provide the same stream of services as the existing asset is capable of producing. It allows for technology changes and, improvements and efficiencies in production and installation techniques

NET PRESENT VALUE (NPV)

The value to the organisation of the cash flows associated with an asset, liability, activity or event calculated using a discount rate to reflect the time value of money. It is the net amount of discounted total cash inflows after deducting the value of the discounted total cash outflows arising from eg the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.

NON-REVENUE GENERATING INVESTMENTS

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, eg. parks and playgrounds, footpaths, roads and bridges, libraries, etc.

OPERATIONS

Regular activities to provide services such as public health, safety and amenity, eg street sweeping, grass mowing and street lighting.

OPERATING EXPENDITURE

Recurrent expenditure, which is continuously required to provide a service. In common use the term typically includes, eg power, fuel, staff, plant equipment, on-costs and overheads but excludes maintenance and depreciation. Maintenance and depreciation is on the other hand included in operating expenses.

OPERATING EXPENSE

The gross outflow of economic benefits, being cash and non cash items, during the period arising in the course of ordinary activities of an entity when those outflows result in decreases in equity, other than decreases relating to distributions to equity participants.

OPERATING EXPENSES

Recurrent expenses continuously required to provide a service, including power, fuel, staff, plant equipment, maintenance, depreciation, on-costs and overheads.

OPERATIONS, MAINTENANCE AND RENEWAL FINANCING RATIO

Ratio of estimated budget to projected expenditure for operations, maintenance and renewal of assets over a defined time (eg 5, 10 and 15 years).

OPERATIONS, MAINTENANCE AND RENEWAL GAP

Difference between budgeted expenditures in a long term financial plan (or estimated future budgets in absence of a long term financial plan) and projected expenditures for operations, maintenance and renewal of assets to achieve/maintain specified service levels, totalled over a defined time (e.g. 5, 10 and 15 years).

PAVEMENT MANAGEMENT SYSTEM (PMS)

A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

PMS SCORE

A measure of condition of a road segment determined from a Pavement Management System.

RATE OF ANNUAL ASSET CONSUMPTION *

The ratio of annual asset consumption relative to the depreciable amount of the assets. It measures the amount of the consumable parts of assets that are consumed in a period (depreciation) expressed as a percentage of the depreciable amount.

RATE OF ANNUAL ASSET RENEWAL *

The ratio of asset renewal and replacement expenditure relative to depreciable amount for a period. It measures whether assets are being replaced at the rate they are wearing out with capital renewal expenditure expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

RATE OF ANNUAL ASSET UPGRADE/NEW *

A measure of the rate at which assets are being upgraded and expanded per annum with capital upgrade/new expenditure expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

RECOVERABLE AMOUNT

The higher of an asset's fair value, less costs to sell and its value in use.

RECURRENT EXPENDITURE

Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operations and maintenance expenditure.

RECURRENT FUNDING

Funding to pay for recurrent expenditure.

REHABILITATION

See capital renewal expenditure definition above.

REMAINING USEFUL LIFE

The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining useful life is useful life.

RENEWAL

See capital renewal expenditure definition above.

RESIDUAL VALUE

The estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.

REVENUE GENERATING INVESTMENTS

Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, eg public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

RISK MANAGEMENT

The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

SECTION OR SEGMENT

A self-contained part or piece of an infrastructure asset.

SERVICE POTENTIAL

The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset. A measure of service potential is used in the not-for-profit sector/public sector to value assets, particularly those not producing a cash flow.

SERVICE POTENTIAL REMAINING

A measure of the future economic benefits remaining in assets. It may be expressed in dollar values (Fair Value) or as a percentage of total anticipated future economic benefits. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (Depreciated Replacement Cost/Depreciable Amount).

SPECIFIC MAINTENANCE

Replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, replacement of air conditioning equipment, etc. This work generally falls below the capital/ maintenance threshold and needs to be identified in a specific maintenance budget allocation.

STRATEGIC LONGER-TERM PLAN

A plan covering the term of office of councillors (4 years minimum) reflecting the needs of the community for the foreseeable future. It brings together the detailed requirements in the Council's longer-term plans such as the asset management plan and the long-term financial plan. The plan is prepared in consultation with the community and details where the Council is at that point in

time, where it wants to go, how it is going to get there, mechanisms for monitoring the achievement of the outcomes and how the plan will be resourced.

SUB-COMPONENT

Smaller individual parts that make up a component part.

USEFUL LIFE

Either:

- the period over which an asset is expected to be available for use by an entity, or
- the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the Council.

VALUE IN USE

The present value of future cash flows expected to be derived from an asset or cash generating unit. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate net cash inflows, where the entity would, if deprived of the asset, replace its remaining future economic benefits.

Source: IPWEA, 2009, Glossary

Additional and modified glossary items shown *