



ASSET MANAGEMENT PLAN

Berrigan Shire Council

Stormwater Asset Management Plan 2020

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The entity can choose either template to write/update their plan regardless of their level of asset management maturity and in some cases may even choose to use only the Executive Summary.

The illustrated content is suggested only and users should feel free to omit content as preferred (e.g. where info is not currently available).

This Asset Management Plan may be used as a supporting document to inform an overarching Strategic Asset Management Plan.

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1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

Asset management planning is a comprehensive process ensuring delivery of services from infrastructure is financially sustainable.

This Asset Management Plan (AM Plan) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided and what funds are required to provide over the 20 year planning period. The Asset Management Plan will link to a Long-Term Financial Plan which typically considers a 10 year planning period.

This plan covers the infrastructure assets that provide stormwater management facilities including gravity mains, rising mains, pumping stations, detention and storage basins and also levee banks.

1.2 Asset Description

The stormwater asset network comprises:

Table 5.1.1: Assets covered by this Plan

Asset Category	Dimension	Replacement Value
Gravity Mains	63,318 m	\$15,089,421
Rising Mains/Valves	10,982 m	\$1,264,433
Pits/Headwalls	2022 No.	\$3,201,451
Pumpstations	26 No.	\$2,055,000
Detention Basins and Storage Dams	18 No.	\$894,765
Open Drains	17,266 m	\$284,314
Levee Banks	15,622m	\$4,587,110
TOTAL		\$22,789,385

The above infrastructure assets have significant total renewal value estimated at \$22,789,385.

1.3 Levels of Service

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

The Planned Budget should be sufficient to maintain existing service levels for the Stormwater assets with some gradual expansion of the stormwater pipe networks to service new kerb and gutter.

1.4 Future Demand

The main demands for new services are created by:

- Population Increase will result in increased expectations for kerb & gutter and stormwater management in currently unserviced urban areas.

These demands will be approached using a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.

- Assets for new developments will generally be donated by the developer.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AM Plan may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AM Plan is the forecast of 10 year total outlays, which for the Stormwater assets is estimated as \$3,666,890 or \$366,689 on average per year.

1.6 Financial Summary

1.6.1 What we will do

Estimated available funding for the 10 year period is \$3,666,890 or \$366,689 on average per year as per the Long-Term Financial plan or Planned Budget. This is 100% of the cost to sustain the current level of service at the lowest lifecycle cost.

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The Informed decision making depends on the AM Plan emphasising the consequences of Planned Budgets on the service levels provided and risks.

The anticipated Planned Budget for [Enter Asset Group] leaves a shortfall of \$0 on average per year of the forecast lifecycle costs required to provide services in the AM Plan compared with the Planned Budget currently included in the Long-Term Financial Plan. This is shown in the figure below.

Forecast Lifecycle Costs and Planned Budgets

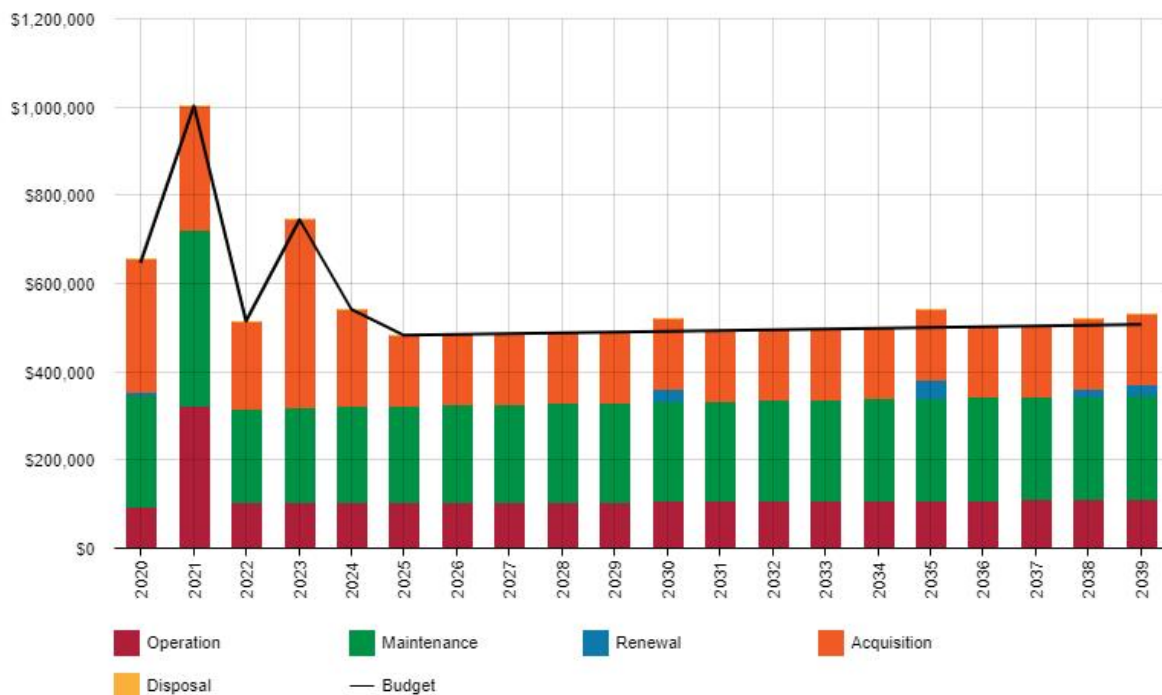


Figure Values are in current dollars.

We plan to provide Stormwater asset services for the following:

- Operation, maintenance, renewal and upgrade of gravity mains, rising mains, pumping stations, detention and storage basins and also levee banks to meet service levels set by this plan and provided for in annual budgets.

1.6.2 What we cannot do

We currently do **not** allocate enough budget to sustain these services at the proposed standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Construction of Levee 5a if Flood Study confirms it is required
- Drainage at the following locations have had minor improvements carried out and are being monitored for performance in high intensity storms – There is no provision in budget for further improvements in this program:
Hughes St and Snell Rd, Barooga, Davis St, Berrigan, Anthony Av and Lorelle Ct, Tocumwal.
- Extension of Stormwater drainage network to service all residential streets
- Upgrade of Stormwater drainage network to comply with current recommended capacity standards.

1.6.3 Managing the Risks

Our present budget levels are sufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Higher flooding levels in some areas
- Risk of more property damage due to flooding

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

- Maintaining a high level of inspection of assets and correction of defects
- Improving networks to meet greater level of conformance with adopted service levels
- Updating the floodstudy of leveed area to identify all low areas of levees to allow implementation of a works program to upgrade them

1.7 Asset Management Practices

Our systems to manage assets include:

Council's 'Practical' accounting software and 'AssetFinda' asset management system in conjunction with MapInfo mapping and database.

Assets requiring renewal/replacement are identified from either the asset register or an alternative method. These methods are part of the Lifecycle Model.

- If Asset Register data is used to forecast the renewal costs this is done using the acquisition year and the useful life,
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems (such as Pavement Management Systems) and may be supplemented with, or based on, expert knowledge.

The Asset Register was used to forecast the renewal life cycle costs for this Asset Management Plan.

1.8 Monitoring and Improvement Program

The next steps resulting from this AM Plan to improve asset management practices are:

- Condition rating of Assets
- Review remaining life of assets
- Componentisation of assets such as drainage structures, signs and traffic facilities including review of unit costs
- Develop chart of accounts to allow separation of operation costs and maintenance costs and to split the maintenance costs into reactive, planned and cyclic and to separate capital expenditure into renewal, new and upgrade works.

- Investigate options to integrate Asset Management system with the Accounting / financial system
- Review customer request /complaint settings in customer request management system to reflect desirable data being collected
- Ensure all assets in Asset Management System have a condition score

2.0 Introduction

2.1 Background

This Asset Management Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the long term planning period.

The asset management plan is to be read with the Berrigan Shire Council's Asset Management Policy (2020), and the following associated planning documents:

- Berrigan Shire 2023
- Berrigan Shire Council Asset Accounting Policy 2019
- Engagement Framework 2011
- Resourcing Strategy 2013-2023 (includes Asset Management Strategy and LTFP)
- Delivery Program 2020-2024

Berrigan Shire Council is well advanced in Asset Management practices. This is the fourth version of asset management plans prepared for these assets using the NAMS process with the initial plan being developed in 2009. All plans have been developed by Council staff and processes have been set up for inspection and management of assets along with long term financial planning to ensure the assets are maintained and improved to satisfy adopted service levels.

The infrastructure assets covered by this Asset Management Plan include stormwater pipes, pits pump stations, detention basins, storage dams and levee banks. For a detailed summary of the assets covered in this Asset Management Plan refer to Table 5.1.1 in Section 5.

These assets are used to provide an adequate stormwater drainage network to alleviate flooding and nuisance in the urban areas of Barooga, Berrigan, Finley and Tocumwal.

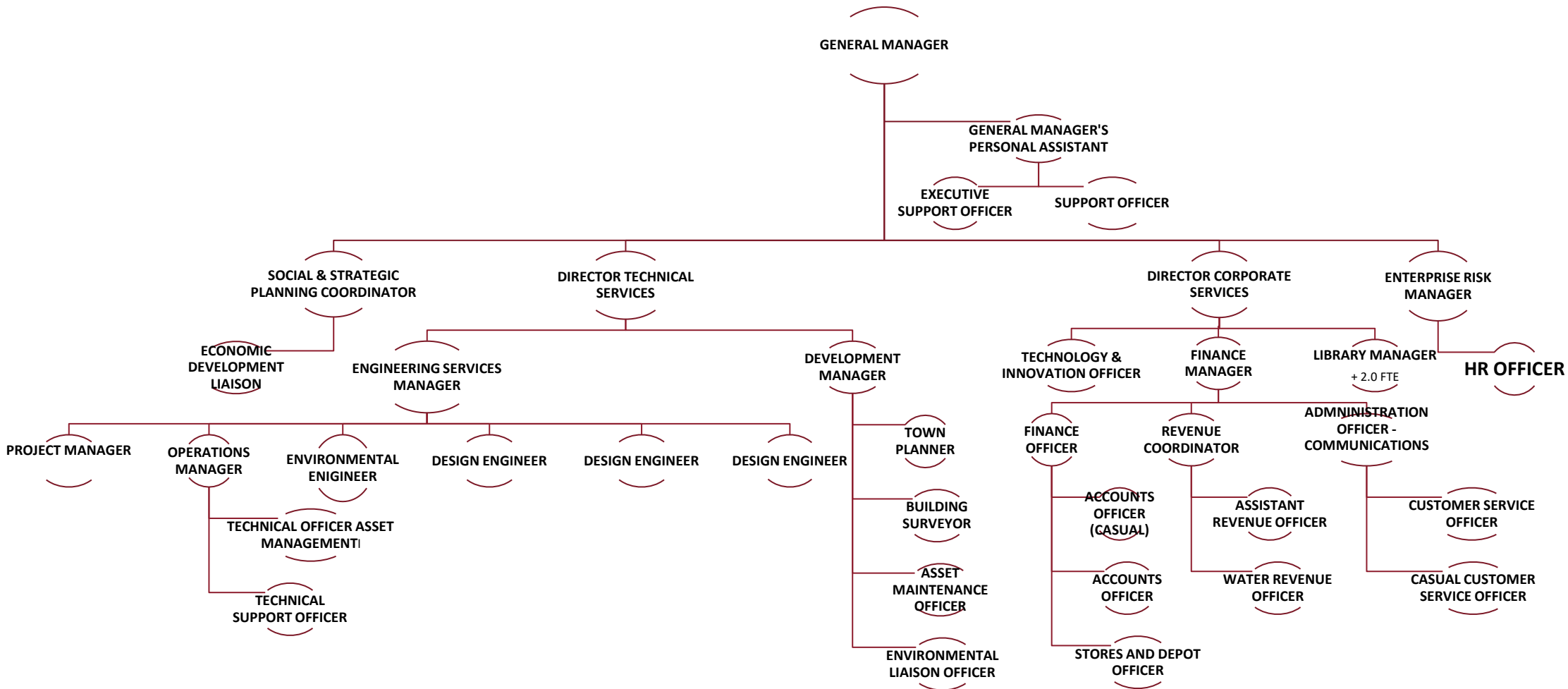
The infrastructure assets included in this plan have a total replacement value of \$27,362,046

Key stakeholders in the preparation and implementation of this Asset Management Plan are shown in Table 2.1.

Table 2.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
State Local Member	<ul style="list-style-type: none"> Represents community interests
Shire Councillors	<ul style="list-style-type: none"> Represent needs of community/shareholders, Allocate resources to meet the organisation's objectives in providing services while managing risks, Ensure organisation is financial sustainable.
Department of Planning Industry and Environment	<ul style="list-style-type: none"> Protection of the natural environment and the equitable use of natural resources
Local Land Services	<ul style="list-style-type: none"> Coordinate management strategies within the Murray Catchment for the sustainable use of its natural resources
Roads and Traffic Authority	<ul style="list-style-type: none"> Minimising flooding and transport disruption Comply with EPA directive
The General Public	<ul style="list-style-type: none"> Improved recreational opportunities Improved visual amenity Maximise property values Reduction of flooding disruption
Finley Tidy Towns	<ul style="list-style-type: none"> Protection of visual amenity of towns
Murray Irrigation Ltd	<ul style="list-style-type: none"> Protection of irrigation canals and drainage channels from polluting discharges
NSW Environmental Protection Agency	<ul style="list-style-type: none"> Pollution prevention Protection of environmental values Legislative requirements are met
Local businesses	<ul style="list-style-type: none"> Minimise disruption from flooding Improve recreational opportunities and visual amenity
Berrigan Golf Club	<ul style="list-style-type: none"> Utilisation of stormwater for irrigation of greens and fairways
Tocumwal Golf Club	<ul style="list-style-type: none"> Utilisation of stormwater for irrigation of greens and fairways
Water Customers	<ul style="list-style-type: none"> Protection of water supply from disruption due to flooding, and contamination of sources

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



2.2 Goals and Objectives of Asset Ownership

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
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are

- Levels of service – specifies the services and levels of service to be provided,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to 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 – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

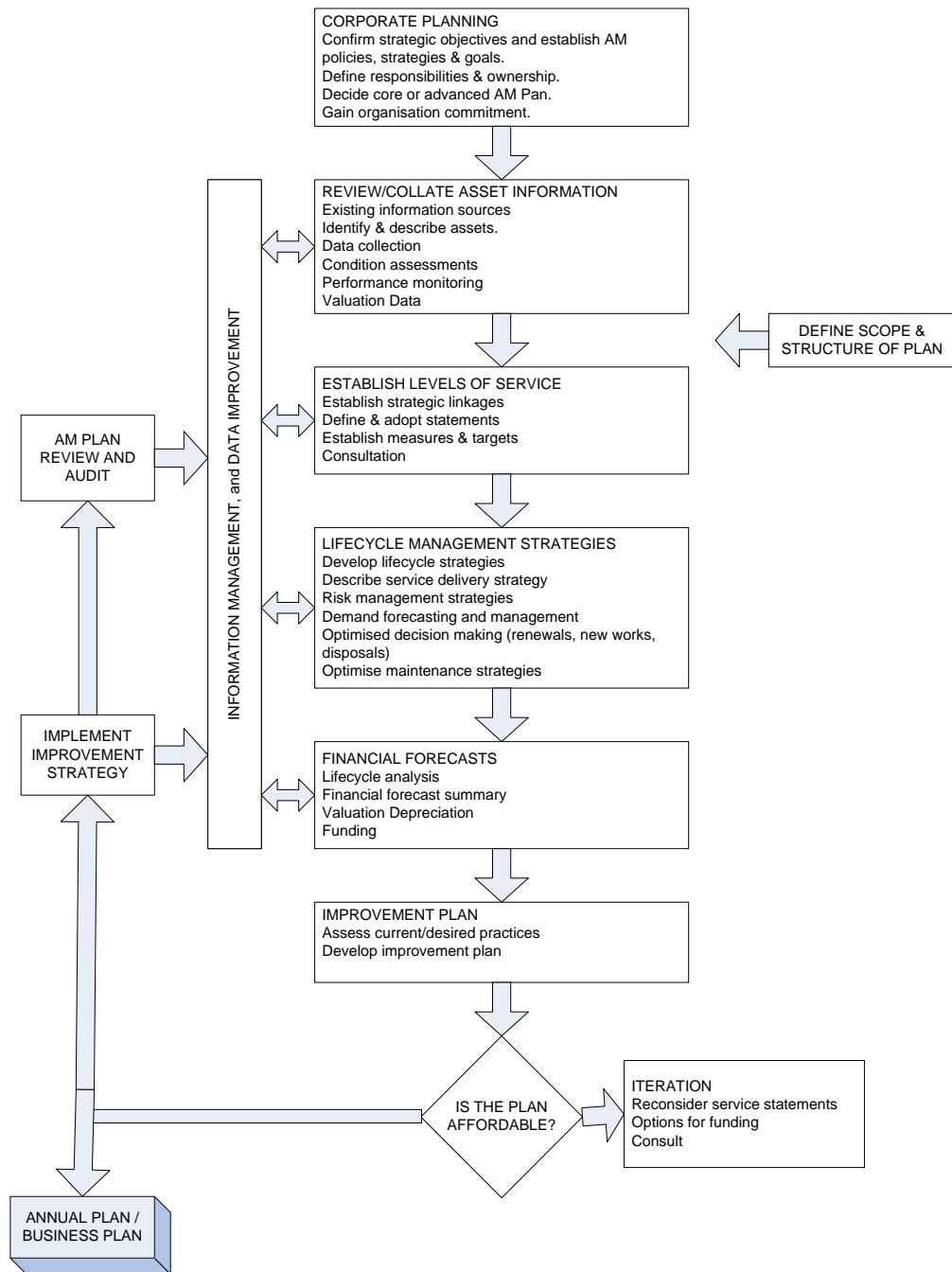
A road map for preparing an Asset Management Plan is shown below.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology



2.3 Community Consultation

This asset management plan includes community comments and feedback on service levels and the condition of the Council's stormwater network prior to adoption by the Council. This revision of the asset management plan will assist the Council and the community to match the level of service needed by the community, service risks and the benefits with our community's ability and willingness to pay for the service.

3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

Council has not carried out any direct research on customer expectations with community expectations being gauged by the low level of complaints and requests received. The possibility of incorporating a level of customer research will be investigated for future updates of the asset management plan.

3.2 Strategic and Corporate Goals

This asset management plan is prepared under the direction of Berrigan Shire Council's vision, mission, goals and objectives.

Our vision is:

In 2027 we will be recognised as a Shire that builds on and promotes our natural assets and advantages to create employment and economic activity to attract residents, families and tourists.

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

Table 3.2: Organisation Goals and how these are addressed in this Plan

Outcome	Objective	How Goal and Objectives are addressed in AM Plan
Sustainable and Natural Built Landscapes	Support sustainable use of our natural resources and built landscape	Ensuring that Council's services and infrastructure are provided in a sustainable manner, with the appropriate levels of service to residents, visitors and the environment. (Asset Management Strategy 2019)
	Connect and protect our communities	
Good Government	Ensure effective governance by Council of Council operations and reporting	Establishing processes that integrate asset management and community strategic planning with Council corporate and long-term financial planning. Creating an environment where all Council employees take an integral part in overall management of Council assets by creating and sustaining asset management awareness throughout the Council. Meeting legislative requirements for asset management. Ensuring resources and operational capabilities are identified and responsibility for asset management is allocated. Demonstrating transparent and responsible asset management processes that align with demonstrated best practice. (Asset Management Strategy 2019)
Supported and Engaged Communities	Create safe, friendly and accessible communities	Adequate drainage to provide safe paths and travel our towns and protect private and public assets.
	Support community engagement through life-long learning, culture and recreation	
Diverse and Resilient	Strengthen and diversify the local economy	Adequate drainage to support expansion of business and residential interests and protect transport routes.
	Connect local, regional and national road, rail and aviation infrastructure	

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

2.4 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the Transport service are outlined in Table 3.3.

Table 3.3: Legislative Requirements

Legislation	Requirement
Local Government Act 1993 No 30	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.
Environmental Planning and Assessment Act 1979 No 203	Requirement for Local Environmental Plans and Development Control Plans. Provides for Council control of development of towns and approval of infrastructure expansion.
Local Land Services Act 2013 No 51	Requirement for ongoing management plan. Promotes the coordination of activities within catchment areas. Under the provision of this Act, Local Catchment Management Authorities oversee this process in the region. Also oversee travelling stock routes
Soil Conservation Act 1938 No 10	Preservation of water course environment.
Work Health and Safety Act 2011 No 10	Impacts all operations in relation to safety of workers and the public. Council's responsibility to ensure health, safety and welfare of employees and others at places of work.
Roads Act 1993 No 33	Provides authority to Council for administration and development of roads and streets and associated drainage.

2.5 Customer Values

Service levels are defined in three ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

- what aspects of the service is important to the customer,
- whether they see value in what is currently provided and
- the likely trend over time based on the current budget provision

Table 3.4: Customer Values

Service Objective:			
Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Drainage system copes with significant rainfall event without impacting safe access or damaging properties.	Customer Requests received and periodic community consultation.	Customers are reasonably happy with the current level of service.	Council budgets for continual improvement of the stormwater network extent and capacity and therefore it is expected that the trend will be greater satisfaction
Rainfall events do not significantly affect the environment or amenity of the area.	Customer Requests received and periodic community consultation.	Customers are reasonably happy with the current level of service.	Council budgets for continual improvement of the stormwater network extent and capacity and therefore it is expected that the trend will be greater satisfaction.
Levee system does not fail in flood event	No levee failures	No historical failure issues	Continued performance

2.6 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Quality How good is the service ... what is the condition or quality of the service?

Function Is it suitable for its intended purpose Is it the right service?

Capacity/Use Is the service over or under used ... do we need more or less of these assets?

In Tables 3.5.1 to 3.5.4 under each of the service measures types (Quality, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current funding level.

These are measures of fact related to the service delivery outcome e.g. number of occasions when service is not available, condition %'s of Very Poor, Poor/Average/Good, Very Good and provide a balance in comparison to the customer perception that may be more subjective.

Table 3.5.1: Stormwater and Levee Network Customer Level of Service Measures

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Extent of flooding, water over road or blocked drains	Customer Requests	<15	Expected to trend down
	Confidence levels		Medium	Medium
Function	Meet user requirements for: <ul style="list-style-type: none"> • Accessibility • location 	Customer Requests	<5	Expected to trend down
	Confidence levels		Medium	Medium
Safety	No dangerous flooding or subsidence	Accident Reports Customer Requests	<5	Expected to trend down
	Confidence levels		Medium	Medium

2.7 Technical Levels of Service

Technical Levels of Service – To deliver the customer values, and impact the achieved Customer Levels of Service, are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Acquisition** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).
- **Operation** – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc).
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs),
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.³

Tables 3.6.1 to 3.6.4 show the activities expected to be provided under the current Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

³ IPWEA, 2015, IIMM, p 2 | 28.

Table 3.6.1: Stormwater and Levee Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
TECHNICAL LEVELS OF SERVICE				
Acquisition	Extend stormwater network to serve unserviced areas	Percentage of unserviced urban areas	33%	20%
	Upgrade pumpstations and/or retarding basins to increase capacity	Flooding due to insufficient capacity of pumpstations	Several areas being monitored for performance following upgrade works	Zero flooding due to insufficient pumping capacity
	Constsruct new Levee 5a and at Barooga Library	Levee protection to 1% flood	Protection not provided at these locations	Levee protection to 1% flood
		Budget	<i>\$191,400</i>	<i>\$191,400</i>
Operation	Ensure stormwater drainage network is managed in a sustainable manner	AMP Reviewed and Updated on time Adopted inspection and reporting timelines adhered to Council reporting on budget and achievement completed on time Environmental requirements are complied with. Design, Supervision and Contract Management are provided in a professional manner	Non Compliant Compliant Compliant Compliant Compliant	Compliant Compliant Compliant Compliant Compliant
	Comply with adopted Standard Operating Procedures for pumpstations and control structures	Inspection records and check lists	Compliant	Compliant
	Levees operated in accordance with Levee Owners Manual	No failures	No failures	No failures
		Budget	<i>\$118,542</i>	<i>\$118,542</i>

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
Maintenance	To maintain the stormwater drainage network including pumpstations and control structures in a safe and functional state	Adopted inspections intervals and response times achieved	Compliant	Compliant
	What is the purpose of the Activity	Describe the Measure being used for performance monitoring	The Maintenance activities that can be done within the current Planned Budget restraints	The Maintenance activities we would like to do as per the Lifecycle Forecast
	Levees maintained in accordance with Levee Owners Manual	No failures	No failures	No failures
		Budget	<i>\$235,697</i>	<i>\$235,697</i>
Renewal	To replace or reline segments of the pipe network before they become unserviceable	Condition Rating Useful life	All pipework is currently serviceable	Renewal as per budget developed in AMP
	To refurbish or replace pumpstation components and control structures before they become unserviceable	Condition Rating Useful life	All components are currently serviceable	Renewal as per budget developed in AMP
		Budget	<i>Nil</i>	<i>\$8,813</i>
Disposal	Dispose of pipe segments and other drainage assets that are being renewed prior to the end of the adopted useful life	Asset inventory and data maintained to be current at the end of financial year.	Compliant	Compliant
		Budget	<i>Nil</i>	<i>Nil</i>

Note: * Current activities related to Planned Budget.

** Forecast required performance related to forecast lifecycle costs.

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time.

3.0 FUTURE DEMAND

3.1 Demand Drivers

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

3.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

3.3 Demand Impact and Demand Management Plan

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

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 can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this Asset Management Plan.

Table 4.3: Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population	8863	9404	Increase in system size due to new subdivision (Developer Funded)	Assets for new developments will generally be donated by the developer.
Climate Change/Storm Intensity	Stormwater System capacity exceeded once in 5 years	System capacity exceeded more regularly	More regular localized flooding	The stormwater drainage network will be continually upgraded generally in accordance with priorities set out in this plan and within capital budget constraints.
	Levees generally provide protection for 1% floods	Could increase the level of probable maximum floods	Could result in levee failure	New flood study being prepared to better predict likely flood levels and expected performance of levee system
Demographics	Average age of population greater than State average	Will become even greater	Insignificant	NA

3.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

Acquiring new assets will commit the Berrigan Shire Council to 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 for inclusion in the long-term financial plan (Refer to Section 5).

3.5 Climate Change and Adaption

The impacts of climate change can have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change will impact on assets can vary significantly depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.

As a minimum we should consider both how to manage our existing assets given the potential climate change impacts, and then also how to create resilience to climate change in any new works or acquisitions.

Opportunities identified to date for management of climate change impacts on existing assets are shown in Table 4.5.1

Table 4.5.1 Managing the Impact of Climate Change on Assets

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
System capacity exceeded once in 5 years	System capacity exceeded more regularly	More regular localized flooding	The stormwater drainage network will be continually upgraded generally in accordance with priorities set out in this plan and within capital budget constraints.
Could result in increased flood levels on Murray River	Flood levels will increase	Could diminish levee factor of safety	New flood study being prepared to better predict likely flood levels and expected performance of levee system

Additionally, the way in which we construct new assets should recognise that there is opportunity to build in resilience to climate change impacts. Buildings resilience will have benefits:

- Assets will withstand the impacts of climate change
- Services can be sustained
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 4.5.2 summarises some asset climate change resilience opportunities.

Table 4.5.2 Building Asset Resilience to Climate Change

New Asset Description	Climate Change impact These assets?	Build Resilience in New Works
Drainage connection Chanter Street to Davis Street, Berrigan	Reduce flooding to Berrigan CBD and Apex Park	Pipe connection will provide outlet for increased flows that would otherwise have to surface flow to discharge points
New pumpstation and rising main for Davis Street Berrigan retard basin	Pumping capacity increased to cope with higher rainfall events	Increasing the pumping capacity of this critical pumpstation will reduce flooding from predicted higher intensity storms.
Drainage connection east side Murray Street to Wollamai Street, Finley	Reduce flooding to Finley CBD	Pipe connection will provide outlet for increased flows that would otherwise have to surface flow to discharge points

New retard basin and connecting pipework to Brookmans Road, Finley retard basin	Storage capacity increased to cope with higher rainfall events	Increasing the storage capacity of this critical retard basin and pumpstation will reduce flooding from predicted higher intensity storms.
Underground drainage system extended to south east of Finley Township	Reduce flooding to residential areas	Pipe connections will provide outlet for increased flows that would otherwise have to surface flow to discharge points
New pumpstation and rising main for Collie/Hughes Street, Barooga	Pumping capacity increased to cope with higher rainfall events	Increasing the pumping capacity of this critical pumpstation will reduce flooding from predicted higher intensity storms.
Known deficiencies in levee system to be rectified	Will bring system to 1% flood protection	Level of levees to be determined by new flood study

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this Asset Management Plan.

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Berrigan Shire Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

4.1 Background Data

4.1.1 Physical parameters

The assets covered by this Asset Management Plan are shown in Table 5.1.1.

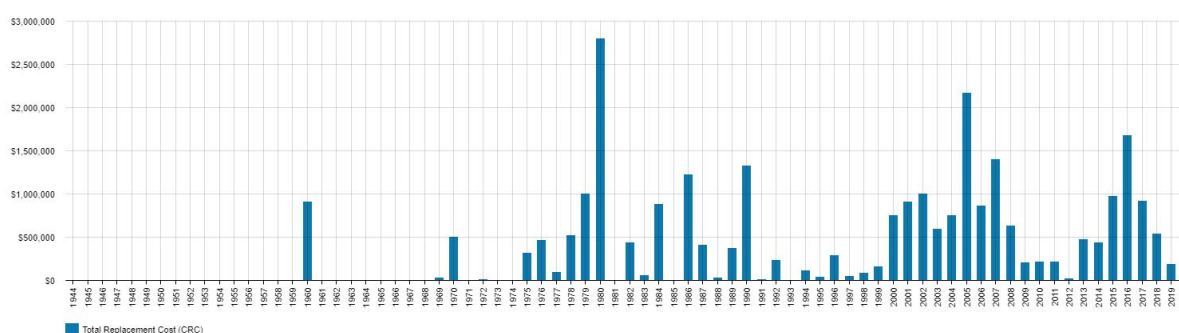
They include stormwater pipes, pits/headwalls, pumpstations, detention basins, open drains and storage dams that service the stormwater management in the towns of Barooga, Berrigan, Finley and Tocumwal.

The age profile of the assets included in this AM Plan are shown in Figure 5.1.1.

Table 5.1.1: Assets covered by this Plan

Asset Category	Dimension	Replacement Value
Gravity Mains	63,318 m	\$15,089,421
Rising Mains/Valves	10,982 m	\$1,264,433
Pits/Headwalls	2022 No.	\$3,201,451
Pumpstations	26 No.	\$2,055,000
Detention Basins and Storage Dams	18 No.	\$894,765
Open Drains	17,266 m	\$284,314
Levee Banks	15,622m	\$4,587,110
TOTAL		\$22,789,385

Figure 5.1.1: Asset Age Profile



All figure values are shown in current day dollars.

Add discussion about the age asset profile. Outline how past peaks of investment that may require peaks in renewals in the future. Comment on the overall age versus useful lives of the assets.

4.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. 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
Hughes St, Barooga at Collie St, Barooga	Pump Station inadequate during Severe Storms
Snell Rd, Barooga	Drainage system inadequate during Severe Storms
Davis St, Berrigan at Momalong St, Berrigan	Drainage system inadequate during Severe Storms
Davis St, Berrigan South End	Drainage system inadequate during Severe Storms
Anthony Avenue, Tocumwal	Drainage system inadequate during Severe Storms - Has been improved with drainage retention and pump in Tessier Drive but still reliant on pump.
Lorelle Ct, Tocumwal	Drainage system inadequate during Severe Storms
Murray Street, Finley – East side south of Wollamai Street.	Drainage system inadequate during Severe Storms
South East quadrant of Finley	Drainage system inadequate during Severe Storms
Chanter Street, Hayes Park, Davis Street, Berrigan	Drainage system inadequate during Severe Storms
Jerilderie Street Pumpstation, Berrigan	Rising Main discharges to Kerb and Gutter causing flooding in Severe Storms
Levee 1 – Ch 9100-9560	Sand layer underlying levee could result in failure in long severe event
Levee 5a	The need for this levee has been identified in the flood study but it has never been constructed
Barooga Foreshore Levee	This levee has been partially constructed in conjunction with other works but is incomplete.
Seppelts Levee	This levee has been identified as being below the required 1% protection level.

The above service deficiencies were identified from observed issues, routine service inspections and 2011 – Murray River Regional Flood Study carried out by Water Technology.

4.1.3 Asset condition

Condition of stormwater pipes and pits is currently monitored only by service issues such as blockages or subsidence. There are few issues reported in relation to poor condition of these assets.

Condition of levees are monitored by regular inspections in accordance with the Levee Owners Manual and maintenance is carried out in a timely manner to ensure all levees are in sound condition.

Condition of pumps and storages are also monitored by regular inspection and maintenance is carried out to in a timely manner to ensure they are in sound operational condition.

Condition is measured using a 1 – 5 grading system⁴ as detailed in Table 5.1.3. It is important that consistent condition grades be used in reporting various assets across an organisation. This supports effective communication. At the detailed level assets may be measured utilising different condition scales, however, for reporting in the AM plan they are all translated to the 1 – 5 grading scale.

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

While condition of stormwater and levee assets is not currently monitored in a formal way it is considered that all assets would be at least rated as 2.5 using the above model.

4.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

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. Examples of typical maintenance activities include pipe repairs, asphalt patching, and equipment repairs.

The trend in maintenance budgets are shown in Table 5.2.1.

Table 5.2.1: Maintenance Budget Trends

Year	Maintenance Budget \$
2019/20	\$252,400
2020/21	\$398,143

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

Reactive maintenance is carried out in accordance with response levels of service detailed in Appendix C.

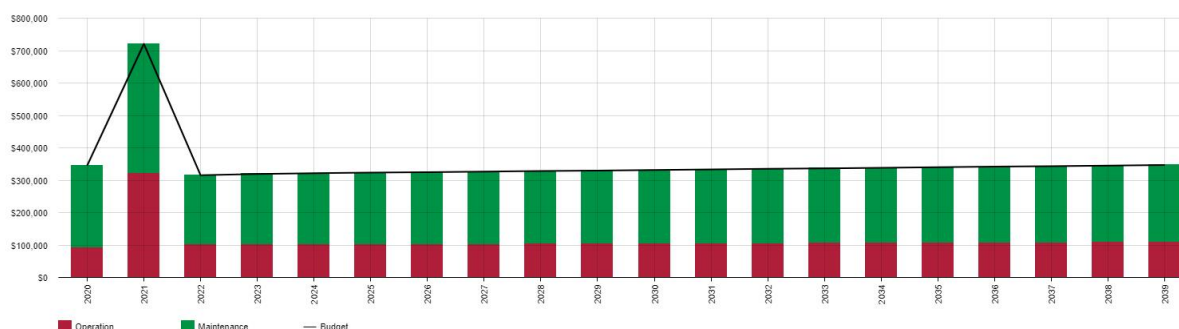
Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2

⁴ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: Operations and Maintenance Summary



All figure values are shown in current day dollars.

There is currently budget provision to catch up on a backlog of maintenance to remove trees from the vicinity of the levee and improve access to the crest with gravel sheeting. There is also provision for a new flood study to be prepared and therefore a short term increase in operational costs associated with this work. Maintenance and operational costs are then expected to stabilize for the balance of the forecast period with only minor increases due to acquisitions.

4.3 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed are reviewed annually along with current replacement costs.

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Headwalls	60
Pits	100
Valves and Gates	40
Dams and Ponds	1000
Pump Stations	60
Gross Pollutant Traps	40
Gravity Mains – Precast Concrete	100

Gravity Mains - PVC	80
Rising Mains - PVC	80
Flood Levees	1000

The estimates for renewals in this Asset Management Plan were based on the asset register.

4.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁵

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁶

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.3.1.

Table 5.3.1: Renewal Priority Ranking Criteria

Criteria	Weighting
Stormwater Quality	10
Stormwater Collection	20
Visual Amenity	10
Safe Waters	10
Flooding	30
Efficiency Measure	10
Cost Benefit Ration	10
Total	100%

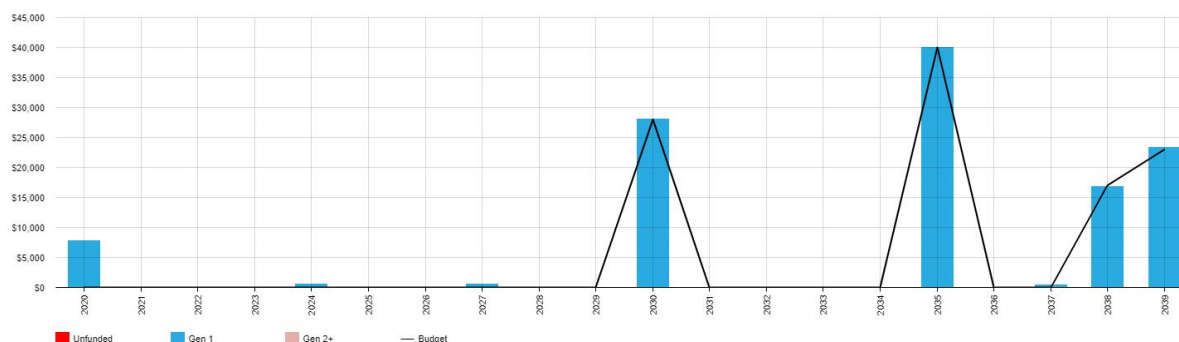
⁵ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁶ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

4.4 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 5.4.1: Forecast Renewal Costs



All figure values are shown in current day dollars.

Renewals are to be funded from Council's capital works program and grants where available. This is further discussed in Section 6.2.

Deferred renewal (assets identified for renewal and not scheduled in capital works programs) relate to pumps and valves and these are currently maintained in a satisfactory operational condition and the useful life of these assets can be reasonably extended at the next review.

4.5 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to the Berrigan Shire Council.

4.5.1 Selection criteria

Proposed upgrade of existing assets, and new assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 5.4.1.

Table 5.5.1: Acquired Assets Priority Ranking Criteria

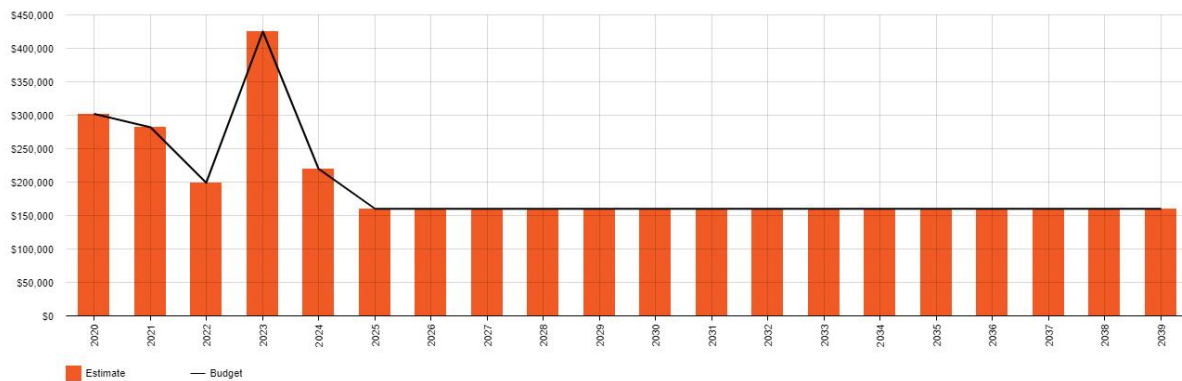
Criteria	Weighting
Stormwater Quality	10
Stormwater Collection	20
Visual Amenity	10
Safe Waters	10
Flooding	30
Efficiency Measure	10

Cost Benefit Ratio	10
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.4.1 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

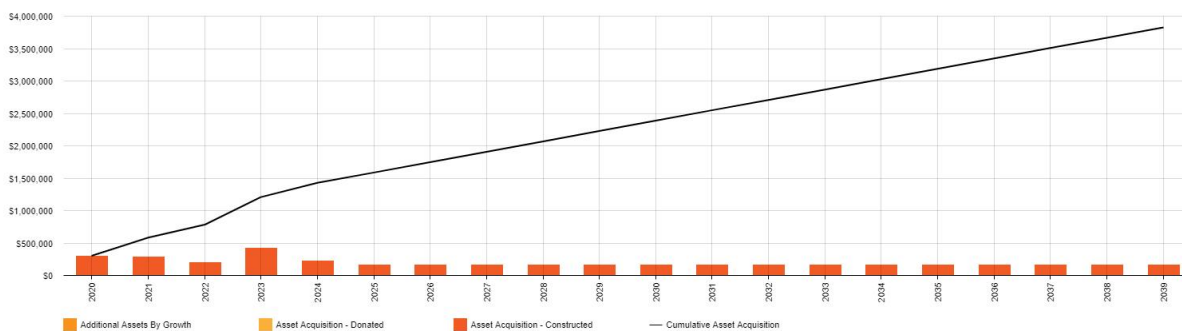
Figure 5.5.1: Acquisition (Constructed) Summary



All figure values are shown in current day dollars.

When an Entity commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Entity. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.4.2.

Figure 5.5.2: Acquisition Summary



All figure values are shown in current dollars.

Expenditure on new assets and services in the capital works program will be accommodated in the long-term financial plan, but only to the extent that there is available funding.

The long useful life of stormwater and levee assets determines that renewal costs will be minimal in life of this plan. The majority of capital expenditure within the life of this plan is therefore related to constructing new assets to cater for known deficiencies in the system or service unserved areas. There will also be some donated assets received from property developments, however, there has been no attempt to factor these in as the development rate is unpredictable and they will have only a minor effect on the total asset quantum.

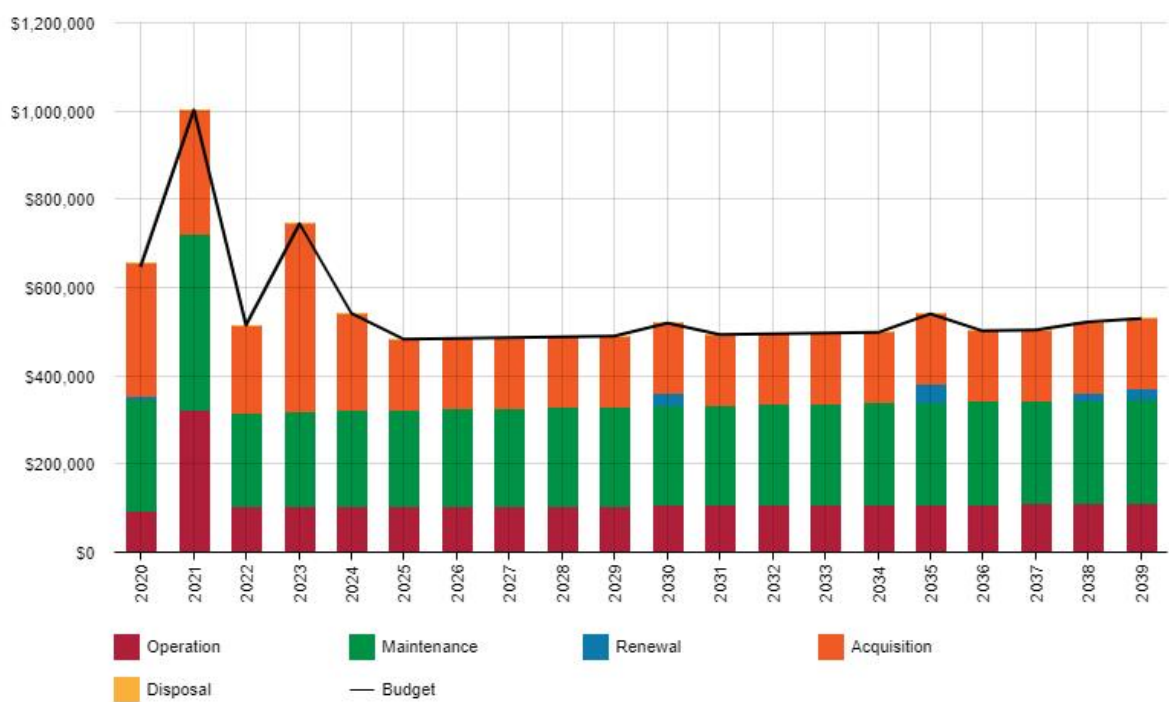
The continued expansion of the system will add to the maintenance and operational costs of the system but as only minor expenditure is required in pumpstations it is not envisaged that the will be major impact on budget going forward.

Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.4.3. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.5.3: Lifecycle Summary



All figure values are shown in current day dollars.

Budget and forecast cost are very well matched and required expenditure should be able to provided without stressing the available budget.

4.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

There are no assets identified for disposal within the forecast period.

RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from

infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁷.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

4.7 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Pumpstations	Electrical Failure	Flooding of properties
Pumpstations	Mechanical Failure	Flooding of properties
Levee Banks	Overtopping	Flooding of properties

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

4.8 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁷ ISO 31000:2009, p 2

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

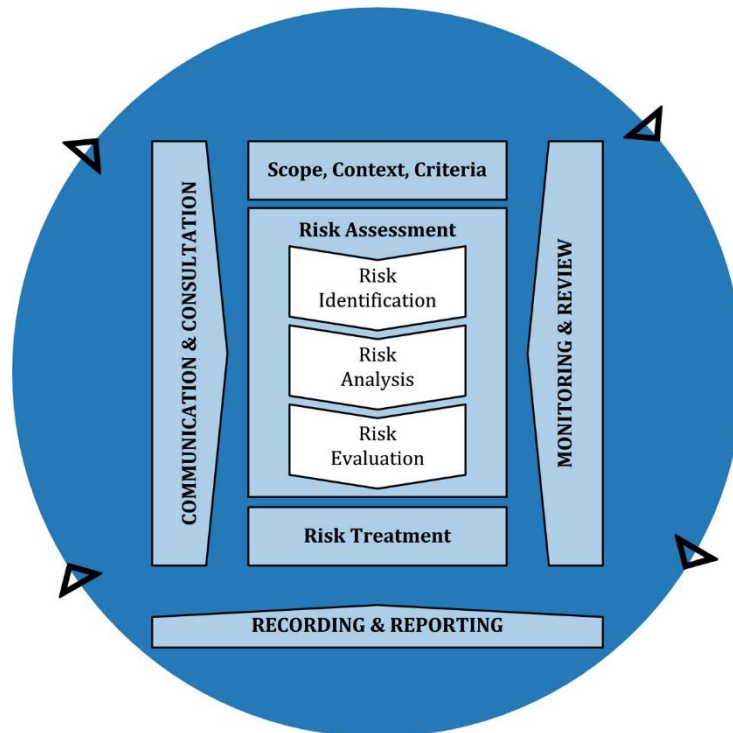


Fig 6.2 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁹ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the Berrigan Shire Council.

⁹ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 6.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Levee Bank	Flood when Levee Bank Overtopped due to inadequate height	High	Update floodstudy of leveed area to identify all low areas of levees and implement works program to upgrade them	Nil	\$1,050,000
Levee Bank	Flood when Levee undermined due to sand underlying foundations	High	Provide cutoff wall to prevent levee being undermined	Low	\$200,000
Pipe discharge terminal	Child could enter pipe and become trapped or drowned	High	Fit guards to discharge terminals of pipes larger than 375mm diameter	Low	\$20,000

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

4.9 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', 1 and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

We do not currently measure our resilience in service delivery. This will be included in future iterations of the Asset Management Plan.

4.10 Service and Risk Trade-Offs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

4.10.1 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 without revising the budget. These include:

- Construction of Levee 5a if Flood Study confirms it is required

- Drainage at the following locations have had minor improvements carried out and are being monitored for performance in high intensity storms – There is no provision in budget for further improvements in this program:

Hughes St and Snell Rd, Barooga, Davis St, Berrigan, Anthony Av and Lorelle Ct, Tocumwal.

4.10.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Higher flooding levels in some areas

4.10.3 Risk trade-off

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

- Risk of more property damage due to flooding

These actions and expenditures are considered and included in the forecast costs and the Risk Management Plan.

5.0 FINANCIAL SUMMARY

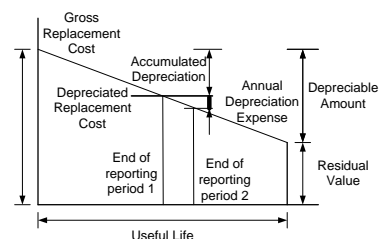
This section contains the financial requirements resulting from the information presented in the previous sections of this Asset Management Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

5.1 Financial Statements and Projections

5.1.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. The assets are valued at fair value at cost to replace service capacity:

Current (Gross) Replacement Cost	\$27,362,046
Depreciable Amount	\$ 22,774,936
Depreciated Replacement Cost ¹⁰	\$22,336,134
Depreciation	\$242,009



5.1.2 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the Asset Management Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹¹ 100%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have \$100% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

Medium term – 10 year financial planning period

This Asset Management Plan identifies the forecast operations, maintenance and renewal costs 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.

This forecast work can be compared to the proposed budget over the 10 year period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is \$366,689 on average per year.

The proposed (budget) operations, maintenance and renewal funding is \$366,689 on average per year giving a 10 year funding shortfall or funding excess of \$0 per year. This indicates that 100% of the forecast costs needed to provide the services documented in this Asset Management Plan are accommodated in the proposed budget. This excludes acquired assets.

¹⁰ Also reported as Written Down Value, Carrying or Net Book Value.

¹¹ AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays 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.

5.1.3 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.3 shows the forecast costs (outlays) for the 10 year long-term financial plan.

Forecast costs are shown in 2020 dollar values.

Table 7.1.3: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Forecast Acquisition	Forecast Operation	Forecast Maintenance	Forecast Renewal	Forecast Disposal
2020	\$302,000	\$92,981	\$252,440	\$7,718	\$0
2021	\$282,000	\$322,565	\$398,143	\$0	\$0
2022	\$199,000	\$102,565	\$213,143	\$0	\$0
2023	\$425,000	\$104,114	\$216,361	\$0	\$0
2024	\$220,000	\$104,916	\$218,028	\$548	\$0
2025	\$160,000	\$105,498	\$219,239	\$0	\$0
2026	\$160,000	\$106,082	\$220,451	\$0	\$0
2027	\$160,000	\$106,665	\$221,663	\$547	\$0
2028	\$160,000	\$107,248	\$222,874	\$0	\$0
2029	\$160,000	\$107,831	\$224,086	\$0	\$0
2030	\$160,000	\$108,414	\$225,298	\$28,059	\$0
2031	\$160,000	\$108,997	\$226,509	\$0	\$0
2032	\$160,000	\$109,580	\$227,721	\$0	\$0
2033	\$160,000	\$110,163	\$228,933	\$0	\$0
2034	\$160,000	\$110,746	\$230,144	\$0	\$0
2035	\$160,000	\$111,329	\$231,356	\$40,000	\$0
2036	\$160,000	\$111,912	\$232,568	\$0	\$0
2037	\$160,000	\$112,495	\$233,779	\$382	\$0
2038	\$160,000	\$113,078	\$234,991	\$16,777	\$0
2039	\$160,000	\$113,662	\$236,203	\$23,328	\$0

5.2 Funding Strategy

The proposed funding for assets is outlined in the Entity's budget and Long-Term financial plan.

The financial strategy of the entity determines how funding will be provided, whereas the Asset Management Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

5.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts.

5.4 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 are:

Key Assumptions	Risks of Change to Assumptions
The useful life and unit cost of stormwater drainage assets have been taken from the asset management model.	Assets could deteriorate more quickly and require earlier expenditure.
As condition of stormwater and levee assets is not currently monitored in a formal way it is assumed that all assets would be at least rated as 2.5.	Condition assessment may result in useful lives being either shortened or extended.
It is assumed that asset utilisation frequency will not change	Acceleration / deceleration of asset condition

5.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale¹² in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
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 $\pm 10\%$
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 $\pm 25\%$
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 $\pm 40\%$

¹² IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Confidence Grade	Description
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 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Reliable	Low growth rate
Growth projections	Reliable	Low growth rate and known areas of network expansion
Acquisition forecast	Reliable	Historical costs but no allowance for additional costs associated with network expansion
Operation forecast	Reliable	Historical costs but no allowance for additional costs associated with network expansion
Maintenance forecast	Reliable	Historical costs but no allowance for additional costs associated with network expansion
Renewal forecast	Reliable	Worked on current costs
- Asset values	Reliable	
- Asset useful lives	Reliable	Required to be substantiated by condition inspections
- Condition modelling	Uncertain	Currently done mainly on assumption
Disposal forecast	Highly Reliable	No saleable assets

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Reliable.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹³

6.1.1 Accounting and financial data sources

This Asset Management Plan utilises accounting and financial data. The source of the data is Berrigan Shire Council Annual Report, Management Plan, Financial Statements and Budget and costings contained in the corporate accounting system.

6.1.2 Asset management data sources

This Asset Management Plan also utilises asset management data. The source of the data is Berrigan Shire Council corporate asset management system "AssetFinda".

6.2 Improvement Plan

It is important that an entity recognise areas of their Asset Management Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this Asset Management Plan is shown in Table 8.2.

Table 8.2: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Condition rating of Assets	EXE	Staff	June 2021
2	Review remaining life of assets	EXE	Staff	June 2021
3	Componentisation of assets such as drainage structures, signs and traffic facilities including review of unit costs	Exe, TOA	Staff	June 2023
4	Develop chart of accounts to allow separation of operation costs and maintenance costs and to split the maintenance costs into reactive, planned and cyclic and to separate capital expenditure into renewal, new and upgrade works.	FM	Staff	June 2022
5	Investigate options to integrate Asset Management system with the Accounting / financial system	DTS DCS EXE FM	Staff	June 2022
6	Review customer request /complaint settings in customer request management system to reflect desirable data being collected	AOM	Staff	June 2022
7	Ensure all assets in Asset Mangement System have a condition score	AOM	Staff	June 2021

6.3 Monitoring and Review Procedures

This Asset Management Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed

¹³ ISO 55000 Refers to this the Asset Management System

budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each Berrigan Shire Council election.

6.4 Performance Measures

The effectiveness of this Asset Management Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this Asset Management Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate 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, risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 1.0).

7.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
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- Berrigan Shire Council Asset Management Strategy 2020 – 2030,
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- Berrigan Shire Council Annual Report, Management Plan, Financial Statements and Budget.

8.0 APPENDICES

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

The majority of capital expenditure within the life of this plan is related to constructing new assets to cater for known deficiencies in the system or service unserved areas. There will also be some donated assets received from property developments, however, there has been no attempt to factor these in as the development rate is unpredictable and they will have only a minor effect on the total asset quantum.

A.2 – Acquisition Project Summary

The project titles included in the lifecycle forecast are included here.

Year	Project	\$ Estimate
2020	Stormwater Network Extension	302000
2021	Stormwater Network Extension	282000
2022	Stormwater Network Extension	199000
2023	Stormwater Network Extension	125000
2023	Levee 1 - Ch 9100-9560 Cut Off	200000
2023	Levee Network Extension	100000
2024	Stormwater Network Extension	220000
2025	Stormwater Network Extension	160000
2026	Stormwater Network Extension	160000
2027	Stormwater Network Extension	160000
2028	Stormwater Network Extension	160000
2029	Stormwater Network Extension	160000
2030	Stormwater Network Extension	160000
2031	Stormwater Network Extension	160000
2032	Stormwater Network Extension	160000
2033	Stormwater Network Extension	160000
2034	Stormwater Network Extension	160000
2035	Stormwater Network Extension	160000
2036	Stormwater Network Extension	160000
2037	Stormwater Network Extension	160000
2038	Stormwater Network Extension	160000
2039	Stormwater Network Extension	160000

A.3 – Acquisition Forecast Summary

Table A3 - Acquisition Forecast Summary

Year	Constructed	Contributed	Planned Budget
2020	302000	0	302000
2021	282000	0	282000

2022	199000	0	199000
2023	425000	0	425000
2024	220000	0	220000
2025	160000	0	160000
2026	160000	0	160000
2027	160000	0	160000
2028	160000	0	160000
2029	160000	0	160000
2030	160000	0	160000
2031	160000	0	160000
2032	160000	0	160000
2033	160000	0	160000
2034	160000	0	160000
2035	160000	0	160000
2036	160000	0	160000
2037	160000	0	160000
2038	160000	0	160000
2039	160000	0	160000

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

Operational costs are expected to increase slightly for the forecast period to service acquisitions and budgets have been prepared to balance expected costs.

B.2 – Operation Forecast Summary

Table B2 - Operation Forecast Summary

Year	Operation Forecast	Additional Operation Forecast	Total Operation Forecast
2020	92981	0	92981
2021	322565	0	322565
2022	102565	0	102565
2023	104113.8	0	104113.8
2024	104915.5	0	104915.5
2025	105498.5	0	105498.5
2026	106081.6	0	106081.6
2027	106664.7	0	106664.7
2028	107247.7	0	107247.7
2029	107830.8	0	107830.8
2030	108413.9	0	108413.9
2031	108996.9	0	108996.9
2032	109580	0	109580
2033	110163.1	0	110163.1
2034	110746.1	0	110746.1
2035	111329.2	0	111329.2
2036	111912.3	0	111912.3
2037	112495.3	0	112495.3
2038	113078.4	0	113078.4
2039	113661.5	0	113661.5

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

Maintenance costs are expected to increase slightly for the forecast period to service acquisitions and budgets have been prepared to balance expected costs.

C.2 – Maintenance Forecast Summary

Table C2 - Maintenance Forecast Summary

Year	Maintenance Forecast	Additional Maintenance Forecast	Total Maintenance Forecast
2020	252440	0	252440
2021	398143	0	398143
2022	213143	0	213143
2023	216361.5	0	216361.5
2024	218027.6	0	218027.6
2025	219239.3	0	219239.3
2026	220451	0	220451
2027	221662.6	0	221662.6
2028	222874.3	0	222874.3
2029	224086	0	224086
2030	225297.7	0	225297.7
2031	226509.4	0	226509.4
2032	227721.1	0	227721.1
2033	228932.7	0	228932.7
2034	230144.4	0	230144.4
2035	231356.1	0	231356.1
2036	232567.8	0	232567.8
2037	233779.5	0	233779.5
2038	234991.2	0	234991.2
2039	236202.8	0	236202.8

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

Asset renewals are determined using Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year). The useful life of assets is reviewed periodically following condition assessments of the assets and a reassessment of the remaining useful life.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed are reviewed annually along with current replacement costs.

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Headwalls	60
Pits	100
Valves and Gates	40
Dams and Ponds	1000
Pump Stations	60
Gross Pollutant Traps	40
Gravity Mains – Precast Concrete	100
Gravity Mains - PVC	80
Rising Mains - PVC	80
Flood Levees	1000

D.2 – Renewal Project Summary

There are no renewal projects forecast in the 20 year term of this plan.

Although there is \$198,000 of renewals forecast the majority of the assets are pre-cast concrete headwalls and gross pollutant traps and the condition of these will be monitored to determine if useful life should be extended.

There is one pumpstation identified for replacement in 2035 and similarly the condition will be assessed to determine if useful life should be extended.

Budget has been nominally provided for the GPTs and the Pumpstation.

D.3 – Renewal Forecast Summary

Recommend using NAMS+ Outputs Summary for Renewal

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast	Renewal Budget
2020	7718	0

2021	0	0
2022	0	0
2023	0	0
2024	548	0
2025	0	0
2026	0	0
2027	547	0
2028	0	0
2029	0	0
2030	28059	28000
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	40000	40000
2036	0	0
2037	382	0
2038	16777	17000
2039	23328	23000

D.4 –Renewal Plan

In the first 10 years the only renewal budgeted for is replacement of GPTs at a cost of \$28,000.

Appendix E Disposal Summary0

E0.1 – Disposal Forecast Assumptions and Source

There are no assets forecast for disposal.

Appendix F Budget Summary by Lifecycle Activity

Acquisitions will generally be associated with the extension of the stormwater network to service the existing residential areas. There will be some donated assets received from property developments, however, there has been no attempt to factor these in as the development rate is unpredictable and they will have only a minor effect on the total asset quantum.

Operational and maintenance costs are expected to increase slightly for the forecast period to service acquisitions and budgets have been prepared to balance expected costs.

There are no renewal projects forecast in the 20 year term of this plan.

Although there is \$198,000 of renewals forecast the majority of the assets are pre-cast concrete headwalls and gross pollutant traps and the condition of these will be monitored to determine if useful life should be extended.

There is one pumpstation identified for replacement in 2035 and similarly the condition will be assessed to determine if useful life should be extended.

Budget has been nominally provided for the GPTs and the Pumpstation.

There are no assets identified for disposal during life of this plan.

Table F1 – Budget Summary by Lifecycle Activity

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2020	302000	92981	252440	0	0	647421
2021	282000	322565	398143	0	0	1002708
2022	199000	102565	213143	0	0	514708
2023	425000	104113.8	216361.5	0	0	745475.3
2024	220000	104915.5	218027.6	0	0	542943.1
2025	160000	105498.5	219239.3	0	0	484737.8
2026	160000	106081.6	220451	0	0	486532.6
2027	160000	106664.7	221662.6	0	0	488327.3
2028	160000	107247.7	222874.3	0	0	490122
2029	160000	107830.8	224086	0	0	491916.8
2030	160000	108413.9	225297.7	28000	0	521711.6
2031	160000	108996.9	226509.4	0	0	495506.3
2032	160000	109580	227721.1	0	0	497301.1
2033	160000	110163.1	228932.7	0	0	499095.8
2034	160000	110746.1	230144.4	0	0	500890.5
2035	160000	111329.2	231356.1	40000	0	542685.3
2036	160000	111912.3	232567.8	0	0	504480.1
2037	160000	112495.3	233779.5	0	0	506274.8
2038	160000	113078.4	234991.2	17000	0	525069.6
2039	160000	113661.5	236202.8	23000	0	532864.3