Livingstone SHIRE COUNCIL

SEWER ASSET MANAGEMENT PLAN

2024-2033

DOCUMENT CONTROL

Rev No.	Date	Detail	Author	Verified	Approved
1.0	22/10/2020	Draft Document	M Wilson	D Strugnell	
1.1	08/02/2021	Second Draft – aligned with LGIP and other planning documents	D Strugnell		
1.2	24/06/2021	Third Draft – Sustainable Materials section added, years changed to 2022-2032	T Henderson		
1.3	02/05/2023	Update to applicable sections following 2022-23 Sewer Revaluation	M Wilson	D Pearce	
2.0	18/07/2023	Formally Adopted by Council	M Wilson	M Kriedemann	Councillors

This asset management plan was developed by Livingstone Shire Council.

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DISCLAIMER

EXECUTIVE SUMMARY

BACKGROUND

Livingstone Shire Council's Sewer Supply assets are critical to the removal and treatment of wastewater and wastewater products which is vital to the economic, social, and physical well-being of our community. Their effective management is crucial to the sustainable delivery of those services to meet community needs and aspirations now and in the future. Local Governments exercise their duties to maintain, operate and improve their infrastructure networks under increasing pressures that include:

- Limited budgets: with competition for funding across a range of services
- Limited resources: both human resources and materials
- Mature networks: which have a significant maintenance demand
- Increased accountability: to customers and funding providers
- Increasing public expectations: the public are increasingly informed and expect a higher level of service from their assets

Despite these challenges, Council is responsible for effectively accounting for and managing its assets and having regard for the long term and cumulative effects of its decisions. This is a core function of local government authorities and is reflected in the Local Government Act. Furthermore, a strong and sustainable local government system requires a robust planning process to ensure that these assets are managed in the most appropriate way on behalf of local communities.

The aim of this plan is to enhance the sustainable management of Livingstone Shire Council's sewer assets by encouraging 'whole of life' and 'whole of organisation' approaches and the effective identification and management of risks associated with the use of the assets. It encourages a long-term view of asset management and requires Council to understand and then meet the impacts of social, economic and environmental change in ways that ensure sustainable use of physical and financial resources.

Asset management plans form part of Council's Asset Management System that supports the Community's Plan. The Community Plan provides a vehicle for the community to express its long-term aspirations. However, these aspirations will not be achieved without sufficient resources – time, money, assets and people – to carry them out. The Asset Management System is a critical link when it comes to translating strategic objectives into actions.

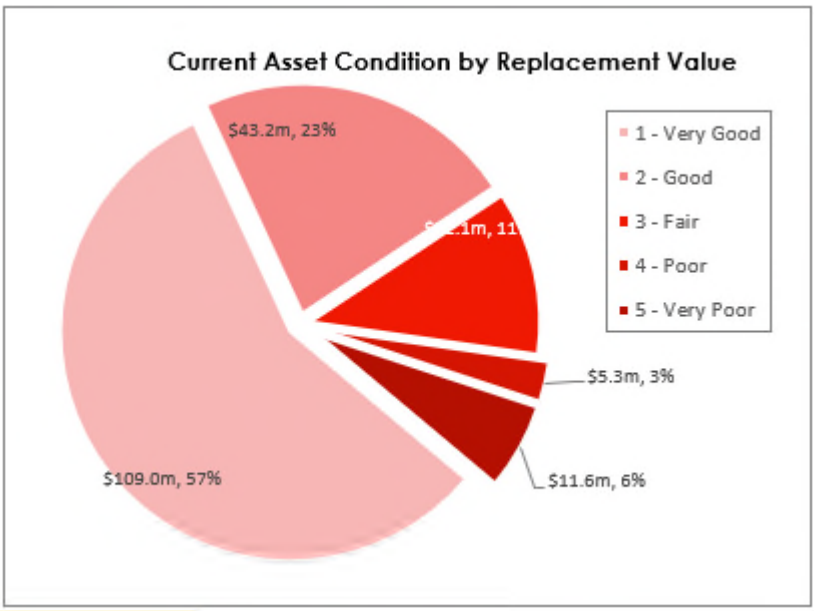
This plan documents asset management planning information. It includes a review of strategic trends facing the Council and potential impacts on the asset stock; asset condition and performance against key indicators; long term financial forecasts; and an improvement plan for managing the assets. Financial implications for providing the required levels of service into the future are also provided based on the associated modelling.

ASSETS

Assets covered by this Asset Management Plan are listed below:

Access Chambers	Gravity Mains	Jump Ups	Rising Mains	Valves	Wastewater Pump Stations	Wastewater Treatment Plants
7,067	288,731m	8,173	50,413m	97	58	2

These assets have a current replacement value of approximately $191 million. Assessment of the condition of our sewer assets was undertaken in 2022 during a comprehensive revaluation. The assets are rated on a one to five scale with one being the highest (best) rating and five the lowest (worst).



LEVELS OF SERVICE

Livingstone Shire Council aims to provide a reticulated sewer service to the consumer to meet the demands imposed upon it by both consumers and trade waste requirements. It is acknowledged that in some cases, the desired standards of service may not be met. In these situations, Council aims to meet the standards to the greatest degree practicable.

Council has adopted the following Customer Level of Service objectives in relation to its sewer assets:

Level of Service	Objective
Reliability	Livingstone Shire Council is to provide prompt, courteous and effective sewerage services to its customers. Staff make every effort to ensure the sewerage system operates adequately and with minimal disruption.
Quality of Service	Livingstone Shire Council uses every effort to continue to operate the sewerage system efficiently and effectively, ensuring the highest value for effluent is received for all sewerage treatment plants. The quality of treatment ensures the health of the community, the safe and appropriate level of treatment and proper disposal of treated effluent.
Value for Money	Sewerage services will be priced fairly, costs recovered equitably, and sustainability ensured for future generations.
Environmental Impacts	Livingstone Shire Council uses every effort to continue to operate the sewerage system efficiently and effectively and minimise sewage overflows and interruptions. The environmental impacts of the sewerage network are minimised in accordance with community expectations.

FUTURE DEMAND AND CAPACITY

Future demand is catered for by expenditure for new works in the forward capital works program.

The main demands for new services are created by:

- Population Growth
- Property Development

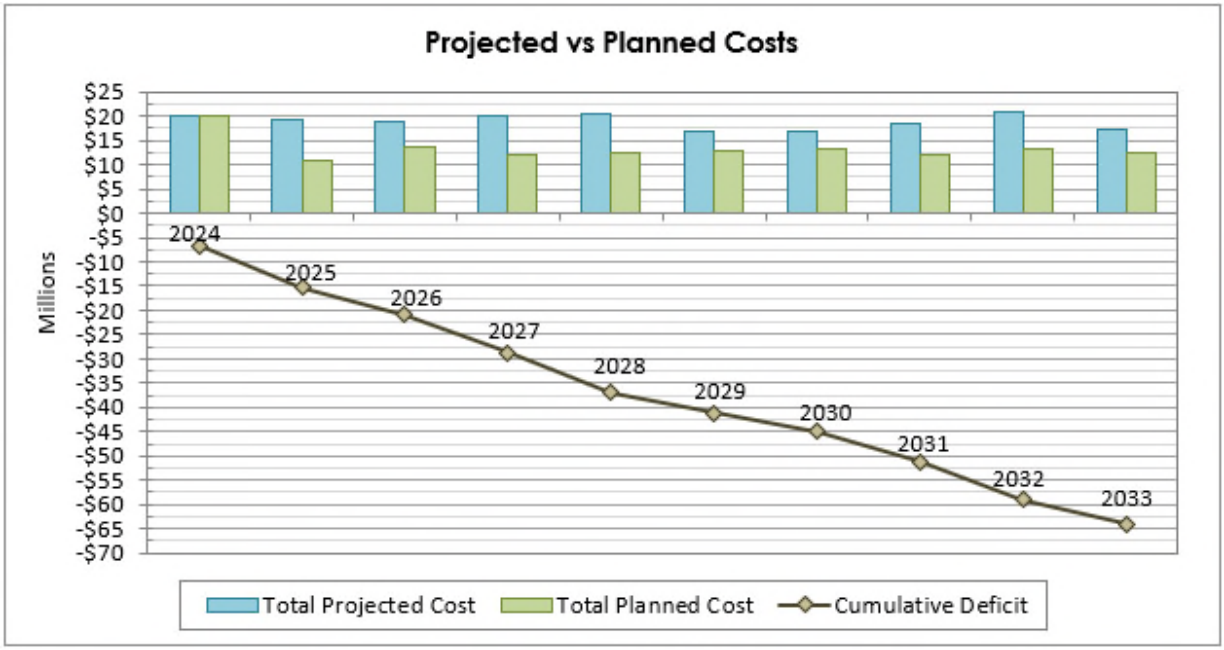
Additional actions which will have an effect on future demand include:

- Livingstone Shire Council Planning Scheme – Part 4 Local Government Infrastructure Plan (LGIP)
- Livingstone Shire Council Yeppoon Sewage Treatment Plant Environmental Management Plan
- Livingstone Shire Council Emu Park Sewage Treatment Plant Environmental Management Plan
- Livingstone Shire Council Trade Waste Environmental Management Plan
- Livingstone Shire Council Customer Service Standards – Water & Sewerage Services
- Our Living Coast - Livingstone Coastal Hazards Adaptation Strategy (CHAS)

LIFECYCLE EXPENDITURE

The projected outlays necessary to provide the services covered by this Asset Management Plan (AMP) includes operations, maintenance, depreciation, renewal and upgrade of existing assets over the planning period is $190 million or $19 million on average per year. Estimated available funding for this period is $133 million or $13.3 million on average per year which is 70% of the cost to provide the service. This is a funding deficit of $5.7 million on average per year.

There is obvious risk exposure here that Council is prepared to accept that could see over the ten-year life of the AMP the number of assets in condition 5 – poor – increase, this would come with a corresponding likely increase in maintenance costs particularly reactive maintenance costs and an increase in service failures and failure to meet Council's desired level of service.



OPERATIONS AND MAINTENANCE

The average of the previous 9 years of sewer maintenance is $3.3 million per annum with a projected maintenance expenditure of $4.4 million in 2023/24.

NEW AND UPGRADE WORKS

Planned (Budgeted) new and upgrade works over the next 10 years to 2032/33 totals approximately $21 million, as outlined in Councils Forward Works Program. This will increase annual depreciation by approximately $1.2 million by 2032/33.

RENEWALS

Total 'planned' renewal spend as outlined in Councils Forward Works Program is $18 million over the next 10 years.

The 'projected' renewals have been determined from a combination of the 2022/23 comprehensive sewer revaluation and associated condition assessments. These are renewals based on the desired levels of service or engineering life of assets and total approximately $35 million over the next 10 years or 18.5% of the current total sewer replacement cost.

At present, comparison between projected and planned renewals has identified a possible trend of underspending on renewals by approximately $1.7 million per annum over the 10-year life of this plan.

IMPROVEMENT PROGRAM AND PLAN MONITORING

A 12-month program is included in this AMP for implementing the improvement actions identified in preparing this plan. This AMP and Improvement Program will be reviewed and updated annually.

ASSET SUSTAINABILITY

A financial measure of satisfactory levels of expenditure on asset replacements is the Asset Sustainability Ratio – the net capital expenditure on renewals as a percentage of depreciation. It indicates whether the amount of replacement exceeds or is less than the amount of depreciation, that is whether assets are being replaced at the rate they are wearing out.

CONTENTS

INTRODUCTION

PURPOSE OF THE PLAN

The purpose of this Asset Management Plan (AMP) is to assist Council in:

- Demonstrating responsible management
- Outlining the measurable service levels
- Communicate & justify funding requirements
- Complying with regulatory requirements

This plan documents asset management planning information for the sewer assets of the Livingstone Shire Council. This includes a review of strategic trends facing the Council and potential impacts on the asset stock, asset condition and performance against key indicators, long term financial forecasts for the 10-years 2023/24 to 2032/33 and an improvement plan for managing the assets. Financial implications for providing the required levels of service into the future are based on the associated separate spreadsheet model for the AMP.

KEY STAKEHOLDERS

The key stakeholders in the preparation, implementation and future revisions of this asset management plan are all those who have an interest in sewer assets and their operations. Stakeholders are summarised in Table 1.

It should be noted that the below expectations can only be achieved in full if council provides the necessary funding to do so. It is anticipated that service trade-offs may well be required because of inadequate funds being available to meet the required funding requirements outlined within this plan.

Table 1: Stakeholders and Expectations

Stakeholder	Expectations
The Community of Livingstone Shire as represented by their Councillors	Assets are maintained and operated in good condition. Assets are safe to use.
Council staff in particular Community Assets Team as custodians of the plan and Water & Waste as custodians of the assets	Assets are maintained and operated in a financially sustainable manner. Appropriate systems and tools are in place to perform the required asset management functions. Risks to the assets are known and managed at the appropriate level. A robust evidenced based decision-making process enables applicable funding applications to be made to enable the assets to be operated and maintained to the required LOS.
Livingstone Shire Council - Councillors	Financially sustainable decision-making ensuring inter-generational equity and an appropriate level of risk exposure.
Suppliers/ Contractors/ Consultant	Contractual obligations are upheld. A partnership approach is adopted.
Developers	Development Application and Legislative obligations are upheld. A partnership approach is adopted.
State, Federal Government including the Department of Environment and Science & Queensland Health	Assets are built, operated, maintained and disposed in compliance with any legislative and regulatory requirements. All financial and reporting obligations are upheld.

COUNCIL SYSTEMS

ASSET MANAGEMENT

An asset management system (AMS) provides the framework for assets to contribute to the delivery of Council's goals and strategies included in the Corporate Plan 2020-30 and assists by providing evidenced-based decision-making to inform the annual planning process and Long-Term Financial Plan. The AMS comprises the following asset management documents:

The Asset Management Policy provides the guiding principles and framework to strategically manage infrastructure services and physical assets owned or controlled by Council with a focus on the organisations long life infrastructure assets.

The Strategic Asset Management Plan (SAMP) documents information that specifies how organisational objectives are to be converted into asset management objectives, the approach for developing asset management plans, and the role of the asset management system in supporting achievement of the asset management objectives and the portfolio level decision making criteria.

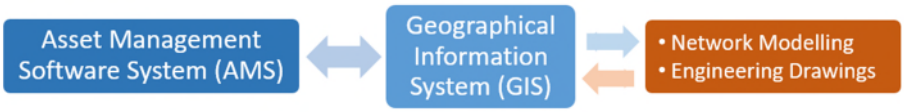
Service Delivery Plans direct Council's operational plan and budget toward achieving community plan goals and report on progress toward achieving corporate plan outcomes and deliverables against key performance indicators.

ENABLING SYSTEMS

Council's AMS has a direct connection and interdependency with the following council systems:

MODELLING & ANALYSIS

Sewer asset information recorded in Council's AMS has direct and indirect links to other databases and systems used for modelling and analysis:



COUNCIL'S GOALS

Council's Corporate Plan 2020-2030 centres on the goals of our community (as outlined in the Community Plan) and guides strategic direction, operational activities and annual budget. The Corporate Plan is structured around the five (5) themes of the Community Plan and outlines the following:

- Council's Statement of Intent
- Goals
- What we will do (outcomes & deliverables)
- Performance Indicators

THE COMMUNITY'S VISION

Livingstone Community Plan: Towards 2050 is a 30-year community planning project guided by the Livingstone community, for the community. Livingstone Shire Council led a whole of community planning process to develop a 30-year vision with clear community priorities for the region. The process will shape and define the future priority projects and strategies which Council implements and / or influences. This asset management plan has been developed to align with the Community's vision:

> *"Livingstone is welcoming, connected, and resilient with a relaxed community spirit, celebrated for its natural beauty, vibrant culture and thriving economy.*

The five (5) key themes from the Community Plan are outlined below with the relevant statement of intent.

Table 2: Community Plan Themes

Strategic Theme		Statement of Intent
1	Liveable Livingstone	A 'Liveable Livingstone' will support and advocate for services for the wellbeing of the people of Livingstone at any age and with any ability
2	Thriving Livingstone	A 'Thriving Livingstone' will prioritise the Traditional Owners and the importance of the place and country of Indigenous people; offer a diverse range of cultural activities and events; and develop and sustain a diverse economy
3	Natural Livingstone	A 'Natural Livingstone' will protect, sustainably manage and enhance the natural beauty, landscapes and resources of the country of the Darumbal and Woppaburra people in order to safeguard the sustainability and environmental resilience of the region into the future
4	Leading Livingstone	A 'Leading Livingstone' will provide transparent, accountable leadership which listens to the needs of the Livingstone community and advocates for Livingstone's interests to State and Federal Governments
5	Future Livingstone	A 'Future Livingstone' will become a resilient community prepared for future economic, social, environmental and infrastructure challenges to ensure Livingstone retains its unique character and thrives into the future

INTERLINKED PLANS & STRATEGIES

In addition to the abovementioned strategic framework, several other Council planning documents inform and influence this Asset Management Plan. These include:

- Livingstone Shire Council Planning Scheme – Part 4 Local Government Infrastructure Plan (LGIP)
- Livingstone Shire Council Yeppoon Sewage Treatment Plant Environmental Management Plan
- Livingstone Shire Council Emu Park Sewage Treatment Plant Environmental Management Plan
- Livingstone Shire Council Trade Waste Environmental Management Plan
- Livingstone Shire Council Customer Service Standards – Water & Sewerage Services
- Our Living Coast - Livingstone Coastal Hazards Adaptation Strategy (CHAS)

SUSTAINABLE MATERIAL SELECTION

Council is committed to sustainable construction material selection when constructing new or renewing existing sewer assets. Council's goal is to increase recycled material content by investigating the use of recycled plastics, glass and other technologies.

Environmental protection is a sound contracting principle in Council's Procurement Policy set out in the Local Government Act 2009. Council's Environmental Sustainability Policy includes principles relevant to sustainable material selection, *Procuring Goods & Services, Sustainable Planning, Design & Infrastructure*. Council as a participating local government in the Capricorn Municipal Development Guidelines committee will explore options to incorporate sustainable material selection principals into CMDG technical documents.

ASSET MANAGEMENT PLAN ACTIONS

The actions taken by the Sewer Asset Management Plan to address Council's community and corporate planning goals and outcomes are outlined below.

Table 3: Strategic Planning Linkages to this AMP

Strategic Themes			Community Plan Goals	Corporate Plan Outcomes	Asset Management Actions
2	Thriving Livingstone	2.3 A welcoming & desirable place to visit	2.3.3 Maintain foreshore facilities to a high standard for the benefit of the community and to continue to attract visitors	2.3.2 Council provides and maintains infrastructure which encourages business and tourism growth	Develop clear level of service for Foreshore assets
3	Natural Livingstone	3.1 Enhanced reuse & recycling of resources	3.1.1 Investigate options for locally-based, accessible re-use and recycling systems for waste, water and energy	3.1.1 Enable and support sustainable waste management technologies, services and facilities which provide innovative and compliant solutions to reduce the environmental impacts of Council's waste collection & resource recovery operations	Identify opportunities for expansion of recycled water supply. Review impact of expanded resource recovery operations in future AMP's
			3.1.2 Support transitions to alternative forms of energy	3.1.2 Partner with the community to divert and minimise waste and invest in renewable energy	Identify opportunities for transition to renewable energy, reduce council's energy use and increase energy efficiency.
		3.2 Protection of coastlines & waterways	3.2.2 Develop coastline and ocean health strategies to minimise pollution, protect Livingstone's unique marine environment and manage future sea level rise	3.2.2 Progress and support plans which protect coastal and marine environments	Align Asset Management Plan with Coastal Hazard Adaptation Strategy
				3.2.4 Plan Council's response to climate change by implementing the actions in the Coastal Hazard Adaption Strategy	Align Asset Management Plan with Coastal Hazard Adaptation Strategy
			3.2.3 Pursue excellence in environmental and industry practices to protect and enhance environmental health	3.2.3 Collaborate with partners to reduce sediments and nutrients in waterways	Collaborate with State Government and relevant agencies to develop catchment health strategies.
				3.2.5 Develop and implement a Livingstone Shire Carbon Strategy	LSC Carbon Strategy referenced in AMP Improvement Program.
4	Leading Livingstone	4.1 Innovative & accountable leadership to achieve a shared future	4.1.1 Ensure that all decisions are strategically aligned with Livingstone Community Plan: Towards 2050 and regularly report the progress against the Plan to the community.	4.1.1 Implementation of the Community Plan and Corporate Plan is well co-ordinated across Council and through a delivery mechanism which provides clear line of sight, accountability, and performance measurement for all employees	AMP is a delivery mechanism for implementation of Community and Corporate Plan.
			4.1.2 Ensure that Council expenditure is sustainable and rating systems are equitable	4.1.2 Council produces and delivers against sustainable financial forecasts as a result of best practice Capital and Asset Management Plans which guide project planning and service delivery across the Shire	AMP forecasts and analysis are used to assess financial sustainability across all asset classes. This guides project planning and service delivery.
			4.1.3 Provide financial data to the community which makes transparent costs and subsidies of all services and to all locations across Livingstone	4.1.3 A continuous improvement focus underpins the organisation, creating a supportive environment for ideas and positive, well-managed change which enhances internal and external outcomes	Continuous improvement of council's asset management facilited by Strategic Asset Management Plan (SAMP) and AMP improvement program actions. AMP's published on the LSC website for transparency.
			4.1.4 Pursue financial sustainability through effective use of Council's assets and resources and prudent risk management	4.1.4 Provide leadership and contemporary management systems which drive a co-ordinated and connected organisation	Review AMP to ensure assets are managed and maintained to target service levels. This AMP includes commentary on required financial expenditure to ensure sustainability of the Council's assets.
				4.1.6 Risk management practices are embedded into decision making processes	AMP references Enterprise Risk Management Proceedure (ERMP) and Asset Criticality Management Plan.
		4.3 Engagement with the community as advisors & partners	4.3.1 Serve the community by providing great customer experience, valued for money and quality services	4.3.1 Plan, develop and implement high-quality customer-focused services	Review and update AMP to ensure Council's assets are managed and maintained to target service levels.
			4.3.3 Engage with the community in meaningful dialogue and demonstrate how community participation is being used to inform decisions	4.3.3 Take actions to enable the use of meaningful tools to engage the community on diverse issues so that the community is well informed and can contribute to decision making	Explore opportunities for community engagement with Council's Asset Management processes.
5	Future Livingstone	5.1 Balanced environmental & development outcomes	5.1.1 Maintain the distinct qualities of the Livingstone identity and ensure that new development is sympathetic to the characteristics and local needs of particular localities	5.1.1 Maintain a clear and comprehensive planning vision for the region	Develop a methodology for identifying characteristics and local needs of particular localities to inform Asset Management Planning

UNDERSTANDING OUR ASSETS

Livingstone Shire Council provides sewer services to several localities throughout its local government area. Council's Sewer asset class incorporates both Active and Passive assets. The Active assets include items such as Sewage Treatment Plants, Pumping Stations and General Plant and Equipment. The passive assets include items such as Mains, Access Chambers, Jump-Ups and Valves.

ASSET INVENTORY AS AT JULY 2022

The total of the asset stock covered by this plan is outlined below.

Table 4: Total Asset Inventory

Function	Quantities		Replacement Value	No. of Assets	Annual Depreciation	Written Down Value	% Written Down
Access Chambers	*Number*	*7,067*	$37,057,747	7,067	$741,155	$19,575,347	53%
Gravity Mains	*Pipe Length*	*288,731m*	$70,392,911	14,960	$790,306	$51,204,206	73%
Jump Ups	*Number*	*8,173*	$3,539,920	8,173	$70,798	$1,893,784	53%
Rising mains	*Pipe Length*	*50,413m*	$15,632,696	290	$228,646	$11,005,854	70%
	Valves	*97*					
Wastewater Pump Stations	*Number*	*58*	$15,128,221	492	$314,759	$9,598,839	61%
Wastewater Treatment Plants	*Number*	*2*	$49,415,521	156	$1,364,191	$40,224,650	82%
		TOTALS	$191,167,016	31,138	$3,509,855	$133,502,679	

SEWERAGE SERVICE SCHEMES

Livingstone Shire Council operates two sewerage schemes.

YEPPOON SEWERAGE SCHEME

The Yeppoon Sewerage Scheme services localities along the Capricorn Coast adjacent to Yeppoon, from Pacific Heights in the north to Causeway Lake in the south and west out to parts of Hidden Valley and Barmaryee. The sewerage system is a legacy system, raw sewage from the town of Yeppoon and surrounding is collected and lifted via 37 pump stations toward the previous treatment plant for Yeppoon at Cordingley Street. From there, a sewage pump station conveys the sewage to the current Yeppoon Sewage Treatment Plant (YSTP) on Rockhampton-Yeppoon Road.

The Yeppoon STP is a 3-Stage Bardenpho treatment process, which treats sewage to the tertiary level. This particular design is a biological nutrient reduction (BNR) activated sludge system which is the modern standard for effectively treating raw sewage. The plant was originally constructed to treat effluent to a capacity of 21,000 equivalent persons (EP) but has recently been upgraded to include membrane technology (ultrafiltration), which was retrofitted to the plant in April 2019 and has increased capacity to 31,000 EP. The improvement in treatment technology introduced by the new membrane ultrafiltration system has rendered the clarifiers and the existing tertiary filters redundant.

The STP is fully automated and requires minimal intervention from operators. The plant is managed by a state-of-the-art Supervisory Control and Data Acquisition (SCADA) system which continuously controls critical processes such as the aeration process in the bioreactors, chlorine dosing and sludge removal. It performs the essential task of ensuring in-situ water quality instrumentation is working as required, and

alerts operators by alarm when issues arise. The SCADA system is constantly making the necessary minor adjustments to operation of the plant to ensure the plant performs to the necessary treatment standard.

The STP treats raw effluent to the standard required by the environmental authority (EA), the environmental licence issued by the Department of Environment and Science (DES). Treated effluent is then discharged into the Yeppoon Recycled Water Scheme (YRWS) where it is used by a number of community organisations and schools as well as by LSC to irrigate sports fields, parks and gardens. Assets included in the YRWS are managed under a separate Asset Management Plan. Overall, the Yeppoon Sewerage Scheme consists of:

- 5,242 Access Chambers
- 214,578m Gravity Mains
- 5,661 Jump Ups
- 31,419m Rising Mains
- 41 Pumping Stations
- 1 Treatment Plant

EMU PARK SEWERAGE SCHEME

The Emu Park STP was commissioned in January 2011 and receives raw sewage from Emu Park and the adjoining localities of Zilzie, Kinka Beach and Tanby via a network of 17 pump stations. The STP is a 10,000 EP sequencing batch reactor (SBR) process, which is a fill-and-draw activated sludge system. In this type of treatment system, raw sewage is delivered to the two 'batch' reactors, where the main treatment stages all occur within those tanks and include equalisation, biological treatment and secondary clarification. After screening and grit removal, raw effluent is pumped into one of the two batch reactors where aeration and mixing allow the biological treatment process to occur. The treatment process involves using a timed control sequence after the biological processes are complete, the biomass settles on the bottom via gravity, and the treated supernatant is removed and disinfected before storage in the treated effluent tank, and ultimately the onsite storage lagoons. The SBR system treats sewage to a tertiary level. After facing issues with the aerators that were determined to have been caused by ragging and blockages, a package inlet works was installed in 2015.

The STP is fully automated and requires minimal intervention from operators. The plant generally operates unmanned, so relies on the state-of-the-art Supervisory Control and Data Acquisition (SCADA) system in place to continuously control critical processes and alerts operators or managers in the event of an issue arising. The SCADA system performs the essential task of ensuring in situ water quality instrumentation is working as required, and alerts operators by alarm when issues arise. The SCADA system is constantly making the necessary minor adjustments to operation of the plant to ensure the plant performs to the necessary treatment standard.

The STP treats raw effluent to the standard required by the environmental authority (EA), the environmental licence issued by the Department of Environment and Science (DES). Treated effluent is then stored in a series of lagoons also on the subject land parcel. Treated effluent is then forwarded onto third parties around Emu Park for use in irrigation through a distribution system of underground pipes. The STP has continued to face persistent poor process results, an investigation of which has identified augmentations that are now underway. Overall, the scheme consists of:

- 1,825 Access Chambers
- 74,153m Gravity Mains
- 2,512 Jump Ups
- 18,994m Rising Mains
- 17 Pumping Stations
- 1 Treatment Plant

ASSET REPLACEMENT VALUE

The replacement value of assets included in this Asset Management Plan are shown below and are based on the information provided following completion of the 2022-23 Sewer revaluation. Assets are valued at Fair Value in accordance with the relevant Australian Accounting Standards Board (AASB) Standards.

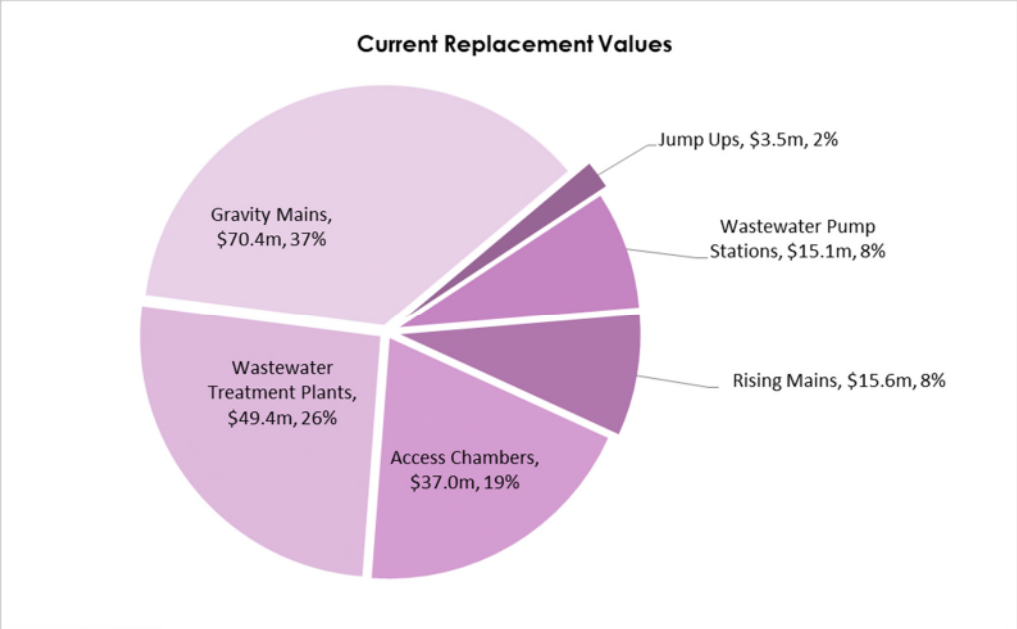


Figure 1. Current Asset Replacement Value

AGE & CONDITION

Council rates the condition of its assets on a one to five scale in line with the Institute of Public Works Engineers' *Condition Assessment & Asset Performance Guidelines, Practice Note 7, Water Supply & Sewerage* with 1 being the highest rating (best) and 5 the lowest (worst).

In 2022-23 a comprehensive revaluation was carried out on the sewer asset class that included an assessment of condition. Given the inherent difficulty in determining condition of underground assets, passive asset condition was determined based on age and remaining life. Adjustments were also made to expiry dates for assets that had known issues, for example mains with a history of overflows. Age based condition was then assigned on a straight line based on remaining useful life.

Ongoing condition assessment of all asset classes will ensure that up to date information is provided to plan for condition forecasting as the assets age and the level of service they provide begins to decline.

This plan will be monitored and updated to ensure that changes are reflected when condition information is reviewed.

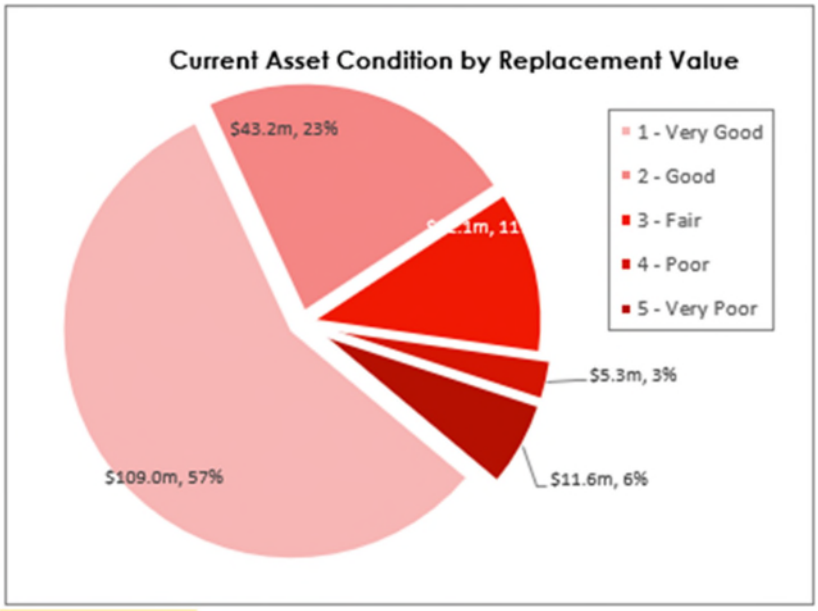


Figure 2. Current Asset Condition Profile

While the current condition profile in Figure 2 shows that Council has generally kept its assets in good condition, there is a minor backlog (approximately 6% of the overall replacement cost of the class or $11.6 million) of renewal work that is required to be completed to ensure that some of our aged assets meet the community's expectations.

Figure 3 below attempts to illustrate the effect on these same assets condition should council elect to not adequately fund the above-mentioned renewal backlog, or adequately fund any future projects or programs as outlined in this plan. A future council of the day would need to fund a predicted $23.2 million dollar backlog (or 12% of the overall replacement costs of the class in current dollars).

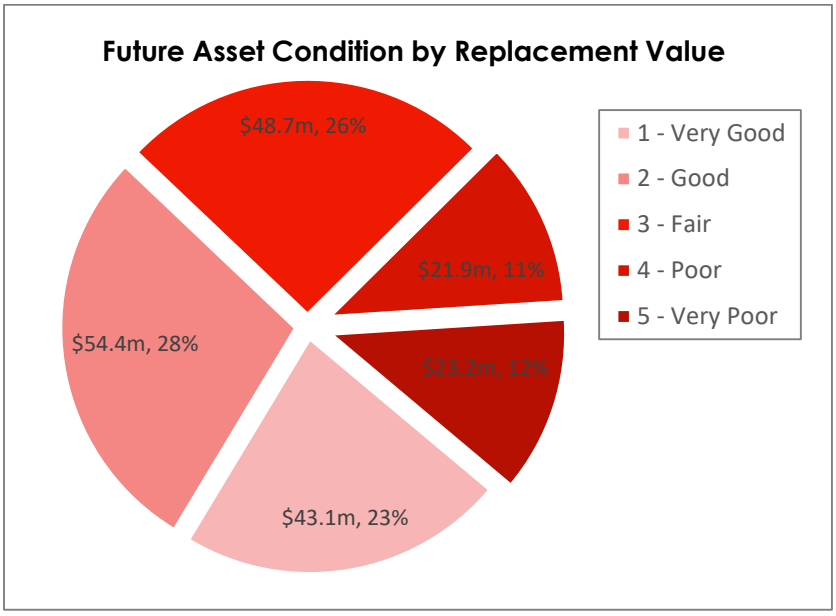


Figure 3. Future Asset Condition Profile

The modelled Future Asset Condition in Figure 3 above was calculated by assuming that an asset stays in each of the 5 condition states for a quarter of its life. By comparing the difference between an assets age

and its useful life one can then determine what condition it currently is in and then forecast forward to see what theoretical condition it will be in the future.

USEFUL SERVICE LIVES

Council's Long Term Financial Plan provides for renewals and upgrades over the life of this plan (see Renewing the Sewer Network section of this plan for details). The Useful Life of an asset is the period over which it is expected to provide a service to the community. It is the estimated or expected time between placing the asset into service and removing it from service. The actual time between commissioning a new asset and disposing of it will vary significantly within each class.

The following table provides a breakdown of useful service lives for asset functions groups and associated asset types.

Table 5: Useful Service Lives

Asset Function	Asset Type	Useful Life (years)
Access Chambers & Lamp Holes	Manholes - all diameters, all materials and all depths	50
Gravity Mains	Gravity mains - all diameters, Asbestos Cement & Concrete materials and all depths	40
	Gravity mains - all diameters, Lining materials and all depths	80
	Gravity mains - all diameters, all other materials and all depths	80
	Earthworks - all diameters, all materials and all depths	80 - 160
Jump-ups	Sewer jump-ups - all dimaters, all materials and all depths	50
Rising Mains	Risiing Mains - all diameters, all materials and all depths	70
	Sewer Valves - all diameters	30
Wastewater Pumping Stations	Civil & Structural	50
	Instrumentation & Telemetry	15
	Mechanical & Electrical	20
	Valves & Pipework	40
Wastewater Treatment Plant	Civil & Structural	80
	Instrumentation & Telemetry	15
	Mechanical & Electrical	20
	Treatment Process	15
	Valves & Pipework	40

SETTING STANDARDS & MEASURING PERFORMANCE

A key objective of asset management is to match the standard of service the organisation provides with what the community expects. To ensure we are meeting the expectations of our community it is important for Council to describe what level of service we intend to deliver and then to measure both what we have done to deliver that service and how well our community has received it.

STATUTORY REQUIREMENTS

Statutory requirements often set the framework for managing infrastructure. The following legislative instruments are relevant to this asset management plan.

- The *Water Supply (Safety and Reliability) Act 2008* provides a regulatory framework for providing water and sewerage services in Queensland.
- The Local Government Regulation 2012 sets out the mechanisms to enable local governments to develop their own approaches to meet communities' needs through rates and charges. The Regulation also expressly requires the development of long-term asset management plans.
- The Environmental Protection Act 1994 protects Queensland's environment. It is relevant to this plan in particular by imposing environmental protection obligations on Council and regulating and issuing Environmental Approvals for Environmentally Relevant Activities including treatment of sewage.
- The *Australian Accounting Standards* set out the financial reporting standards relating to the valuation and depreciation of Councils infrastructure assets.

LEVELS OF SERVICE

Levels of Service (LoS) are a key business driver and influence all of Council's asset management decisions. LOS are defined in two terms, customer levels of service and technical standards of service.

CUSTOMER LEVELS OF SERVICE

Levels of Service measure how the customer (i.e., the community) receives the service and whether value is provided to the customer. Council has adopted the following Customer Level of Service objectives in relation to its potable water supply assets:

Table 6: Customer Level of Service Objectives

	Objective
Reliability	Provide prompt, courteous and effective sewerage services to its customers. Staff make every effort to ensure the sewerage system operates adequately & with minimal disruption.
Quality of Service	Use every effort to continue to operate the sewerage system efficiently and effectively, ensuring the highest value for effluent is received for all sewerage treatment plants. The quality of treatment ensures the health of the community. The safe and appropriate level of treatment and proper disposal of treated effluent.
Value for Money	Sewerage services will be priced fairly, costs recovered equitably, and sustainability ensured for future generations.
Environmental Impacts	Use every effort to continue to operate the sewerage system efficiently and effectively and minimise sewage overflows and interruptions. The environmental impacts of the sewerage network are minimised in accordance with community expectations.

TECHNICAL STANDARDS OF SERVICE

Livingstone Shire Council aims to provide reticulated sewer service to the consumer to meet the demands imposed upon it by both general and trade waste customers. It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met.

In these situations, sewer infrastructure aims to meet the standards to the greatest degree practicable. The desired standards of service for the sewer system are detailed below.

Table 7: Desired Service Standards

Criteria	Measure
One (1) equivalent person (EP)	200 litres per equivalent person per day (L/EP/day)
One (1) equivalent tenement (ET)	2.7 equivalent person (EP)
Average Dry Weather Flow (ADWF)	540 litres per equivalent tenement per day (L/ET/day)
Peak Dry Weather Flow (PDWF)	2.5 x Average Dry Weather Flow (ADWF)
Wet Weather Flow (WWF)	Five (5) x Average Dry Weather Flow (ADWF)
Sewage pump station emergency storage	Four (4) hours minimum
Total sewage pump station capacity	Wet Weather Flow or Five (5) x Average Dry Weather Flow (ADWF) min
Gravity Main Flow Capacity	75% of full depth at Wet Weather Flow (WWF) capacity
Gravity Main Minimum velocity at Peak Dry Weather Flow (PDWF)	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity
Gravity Main Maximum velocity at wet weather flow (WWF)	2 m/sec at Wet Weather Flow (WWF) capacity
Rising main minimum scouring velocity	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity
Rising main maximum velocity	1.5m/sec for new trunk sewer rising mains at Wet Weather Flow (WWF) capacity
	2 m/sec for augmentation of existing trunk sewer rising mains at Wet Weather Flow (WWF) capacity
Planning Horizon	Ultimate for reticulation (non-trunk) network
	20 years for trunk gravity mains, trunk sewage pump stations, trunk sewer rising mains, trunk effluent pressure mains
Odour Protection	Required for new trunk sewage pump stations where initial loadings cause long detention times
	Not required for augmented sewage pump stations
Air Release and Air Scour	Air Venting in all gravity sewer mains at locations of excessive turbulence – particularly where a steep (super-critical flow) meets a flat section (sub-critical flow), and discharge chambers
	Air scours on rising mains where air lock is a risk

TECHNICAL PERFORMANCE MEASURES

Technical Performance Measures support the customer service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities to best achieve the desired customer outcomes and demonstrate effective performance. To support sewer service providers in delivering safe and reliable services, the Department of Regional Development, Manufacturing and Water (DRDMW) has introduced a mandatory performance reporting framework which requires annual reporting on key performance indicators (KPIs). Council has adopted a number of these KPIs as Performance Targets.

Table 8: Technical Levels of Service and Performance Measures

	Technical Performance Measure	Target	EMU 2022	YPN 2022
Reliability	AS39 Sewerage mains breaks/chokes per 100 km sewer main	<20	<1	5.3
	CS65 Percent CSS response target met sewerage incidents	100	100	100
Quality of Service	CS11 Sewerage service complaints per 1000 connections	<5	0	0
Value for Money	Operation and maintenance cost per connection as a percentage of PR46 Typical residential bill: sewerage	70-80%	75%	75%
Environment	Compliance with Environmental Approvals	100%	100%	100%

PLANNING FOR THE FUTURE

This section of the Sewer Asset Management Plan attempts to predict future demand for services in order to identify the most effective means of managing that demand. This allows Council to make optimised decisions regarding its asset investment proposals.

DEMAND FORECASTS

It is important to note that demand forecasts are often proven wrong given the passage of time. Influences on demand such as changes in government policy, technological advances and community preferences cannot be predicted with certainty over long periods. Consequently, assumptions made about factors may change between and during the development of forecasts.

Assumptions are often based on judgements that consider past performance and the likelihood of future change. Therefore, the following forecasts should be treated with some caution and taken as possible future outcomes rather than definitive statements. Any assumptions essential to the following forecasts have been noted for each factor considered.

POPULATION GROWTH

Population change is generally the key driver for growth in all areas and drives demand for services provided by Council and, in turn, the number and type of assets that are required to provide these services.

Livingstone Shire's population is projected to increase modestly over the next 10 years with an increase from the current 37,638 residents (at June 2018) to an estimated 46,480 residents (by June 2031) (QGSO, 2018).This increasing population will necessitate additional land development that will in turn lead to an expanded sewer network.

The Livingstone Planning Scheme 2018 anticipates land development to produce over 3,200 equivalent tenements over the life of this plan. The Queensland Government Statisticians Office's Regional land development activity profile is less optimistic and projects a total dwelling yield of 1,808 for the same period (QGSO, 2020). It is likely that the eventually realised number of tenements will be somewhere between these two figures. Much of this development is expected to take place within the Priority Infrastructure Areas identified by the Planning Scheme 2018.

PROPERTY DEVELOPMENT

The draft strategic framework in Council's Planning Scheme establishes the preferred urban growth areas for the next 20 years. This growth pattern balances the efficient supply of infrastructure with the need to protect natural features and avoid areas of natural hazard risk. New development will include higher levels of infill and medium density development within existing urban areas, to consolidate the use of existing infrastructure. New urban expansion will occur mostly in existing, approved subdivisions, with longer term expansion south of Yeppoon. Urban growth in the strategic framework is divided broadly into four categories:

- Urban consolidation - redevelopment to accommodate medium density residential close to facilities, within 10 years (2015 – 2025)
- Urban – existing urban areas and extensions within 10 years (2015 -2025)
- New urban – urban development beyond 2025
- Future urban - possible expansion beyond 2036

Development is expected in four main locations as indicated on the strategic framework maps:

- 2015 – 2025: Urban consolidation in Yeppoon and Emu Park centres
- 2015 – 2025: Infill and small expansion areas around Yeppoon, Lammermoor, Emu Park and Zilzie
- 2025 – 2036: new urban development south of Yeppoon and infill areas in Emu Park and Great Barrier Reef International Resort
- 2036 and beyond: future urban between the Pines and Yeppoon, Great Barrier Reef International Resort and Emu Park west

CONSTRAINTS

LICENCE LIMITATIONS

Sewage treatment is a prescribed environmentally relevant activity (ERA) under the Environmental Protection Regulation 2019. LSC is a registered suitable operator (RSO, reference # 595278) under the Environmental Protection Act 1994 and holder of Environmental Approval EPPR01823814, which prescribes conditions under which the ERA must be undertaken. The approval covers the activities of sewage treatment at both STPs and is subject to several conditions including:

- Yeppoon STP inflows must not exceed 3 x Design Average Dry Weather Flow of 6.2ML/Day unless treatment processes are bypassed.
- Emu Park STP inflows must not exceed Design Average Dry Weather Flow of 2.3ML/Day on any dry weather day and a maximum release of 11.5ML/day on any day.

MANAGING DEMAND

MANAGING SEWER INFLOWS

During wet weather, flows within the system would suggest that there is a significant infiltration problem within the Yeppoon network. This could be due to broken or leaking mains and services, illegal connections or infiltration through maintenance holes. Council has not yet developed a program of flow monitoring to determine the exact source of the stormwater entering the network. Investigating these excessive flows and wherever possible undertaking network repairs and upgrades to minimise infiltration is likely to have a strong impact on inflows at the STP.

Livingstone Shire Council encourages water efficiency in the community including the reuse of greywater as permitted by the Queensland Plumbing and Wastewater Code. Council has also introduced residential rebates to encourage the use of water saving products, which in turn reduces sewer inflows.

MANAGING DEMAND FOR INFRASTRUCTURE

Demand for new services will be managed through a combination of upgrading of existing assets and providing new assets to meet demand.

Expansion of the reticulation network is not anticipated to impact Council's capital expansion expenditure as these assets are generally constructed and contributed by developers. Similarly, upgrades to treatment and collection facilities are funded through infrastructure charges levied on developers and will not subject Council to direct capital cost impositions.

ASSET RESILIENCE

CLIMATE CHANGE – EFFECT ON WEATHER

There is moderate consensus among climate models under all RCP scenarios that the East Coast of Australia is likely to experience more variable rainfall and warmer temperatures by 2030 (CSIRO, n.d.). The effect is difficult to predict or model within the 10-year timeframe of this plan however the following potential outcomes might be expected by 2030:

- the average annual temperature is expected to be around 1°C warmer than in the 1990's.
- the average number of days over 35 °C is expected to increase from 16 to 26.
- longer dry periods interrupted by more intense rainfall events will occur, increasing the likelihood of flooding affecting infrastructure in low lying areas.

CLIMATE CHANGE – COMMUNITY AWARENESS

Another climate change impact that is already affecting Council is the community's awareness of the issue motivating a change in water consumption patterns and a demand for sustainable practices. The Australia Institute's Climate of the Nation 2019 research report found that "78% of Australians are concerned climate change will lead to water shortages in our cities". The report also found that 55% of Australians think their governments (at all levels) are not doing enough on climate change (Quicke & Bennett, 2020).

The community of Livingstone Shire has further emphasised their conservation and climate change concerns when developing the Livingstone Community Plan. Council has in turn committed to conservation and sustainability efforts including:

- Selection of sustainable construction material when constructing new or renewing existing assets. Council's goal is to increase recycled material content by investigating the use of recycled plastics, glass, and other technologies
- Investing in renewable energy
- Investigating options for recycling biosolids

COASTAL HAZARDS

In 2022 Council adopted its coastal hazard adaptation strategy (CHAS) that addresses climate change impacts on our coastal communities. The Our Living Coast Strategy is intended to provide a strong evidence base for future decision making and a coordinated response for what actions Council will take to adapt to and manage coastal hazard risks. The strategy identified potential risks to the community, assets and values associated with coastal hazards, specifically:

- Temporary flooding of coastal areas due to storm tide;
- Temporary loss of land due to coastal erosion; and
- Permanent loss of land due to coastal erosion and sea level rise.

The CHAS found that:

- Sewer assets around Emu Park, Mulambin, Rosslyn and Yeppoon are impacted by all coastal hazards under all planning horizons, including present day Highest Astronomical Tide (HAT).

- Sewer assets around Farnborough/Bangalee are not impacted under present day hazards but are impacted by all coastal hazards under all other planning horizons.

A range of strategic adaptation actions have been identified in the CHAS for each impacted area (refer to *Our Living Coast – Livingstone Coastal Hazards Adaptation Strategy* section 4.5).

SEWER NETWORK PROJECTS

This section of the Asset Management Plan looks at expansion and renewal requirements, compared with projects which have been identified in Council's Forward Works Program. The total value of the Sewer asset class is expected to grow by almost $24.6 million over the life of this plan.

Table 9: Forward Works Program Summary

FORWARD WORKS PROGRAM SUMMARY						
Year	Total	Cost Split		Funding Split		No. of Projects
		Expansion	Renewal	Developer	Council	
2023	$6,356,943	$2,749,553	$3,607,390	$706,000	$5,650,943	15
2024	$12,303,628	$6,556,526	$5,747,102	$1,846,000	$10,457,628	11
2025	$2,416,629	$1,419,100	$997,529	$930,000	$1,486,629	8
2026	$4,935,000	$2,564,000	$2,371,000	$764,000	$4,171,000	8
2027	$3,249,000	$1,562,200	$1,686,800	$785,200	$2,463,800	7
2028	$3,326,300	$2,211,300	$1,115,000	$0	$3,326,300	5
2029	$3,389,022	$1,509,200	$1,879,822	$1,370,700	$2,018,322	10
2030	$3,600,475	$1,469,400	$2,131,075	$1,368,000	$2,232,475	5
2031	$2,061,650	$1,105,000	$956,650	$1,105,000	$956,650	5
2032	$2,825,650	$1,869,000	$956,650	$1,869,000	$956,650	6
2033	$1,858,650	$1,636,200	$222,450	$1,636,200	$222,450	7

EXPANDING THE SEWER NETWORK

Capital expenditure is a relatively large (in accounting terms, material) expenditure, which has benefits expected to last for more than twelve months. Expansion works are those that create a new asset that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. Assets may also be acquired at no cost. They may result from growth, social or environmental needs.

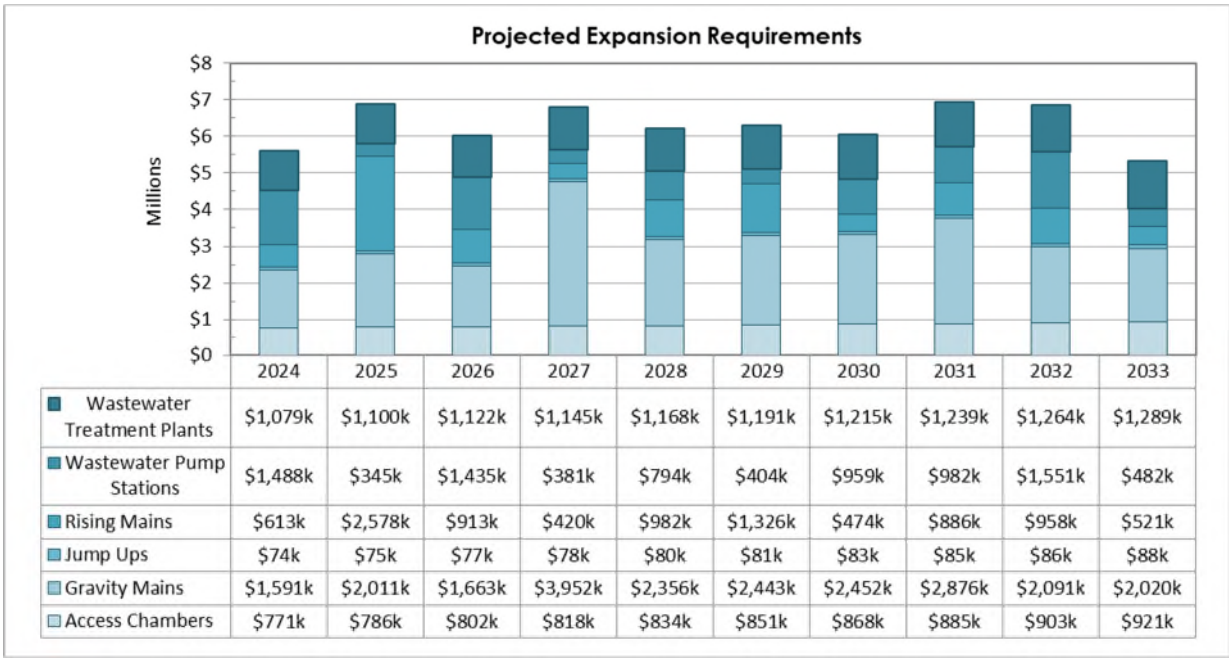
Much of the projected increase in Livingstone Shire Council's sewer network is expected to come from developer contributions or private works. These assets will not impose a direct capital expenditure burden on Council, but their operation, maintenance and eventual replacement could have a significant effect on the Sewer Asset Class over the life of this plan.

Trunk mains and active supply and distribution assets such as reservoirs and pumping stations have been identified in Council's Local Government Infrastructure Plan (LGIP); a part of the Livingstone Planning Scheme 2018. One of the purposes of the LGIP is to identify those assets that will be required to support future growth and allow Council to fund the construction of these assets through infrastructure charges levied on development.

PROJECTED EXPANSION REQUIREMENTS

Including the above expansions. Expenditure on new assets and services in the capital works program will be accommodated in Council's Long Term Financial Plan where required, but only to the extent of the available funds. The acquisition of new assets will have lifecycle cost implications, as the organisation will need to commit to the funding of ongoing operations, maintenance, and renewal costs for the period that the service provided by the assets is required. The increased maintenance and renewal burden caused by these assets is included in the maintenance and renewal sections of this plan.

Based on the demands predicted in this plan, Figure 4 below provides an estimate of the projected expansion requirements.



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Wastewater Treatment Plants	$1,079k	$1,100k	$1,122k	$1,145k	$1,168k	$1,191k	$1,215k	$1,239k	$1,264k	$1,289k
Wastewater Pump Stations	$1,488k	$345k	$1,435k	$381k	$794k	$404k	$959k	$982k	$1,551k	$482k
Rising Mains	$613k	$2,578k	$913k	$420k	$982k	$1,326k	$474k	$886k	$958k	$521k
Jump Ups	$74k	$75k	$77k	$78k	$80k	$81k	$83k	$85k	$86k	$88k
Gravity Mains	$1,591k	$2,011k	$1,663k	$3,952k	$2,356k	$2,443k	$2,452k	$2,876k	$2,091k	$2,020k
Access Chambers	$771k	$786k	$802k	$818k	$834k	$851k	$868k	$885k	$903k	$921k

Figure 4. Projected Expansions Requirements

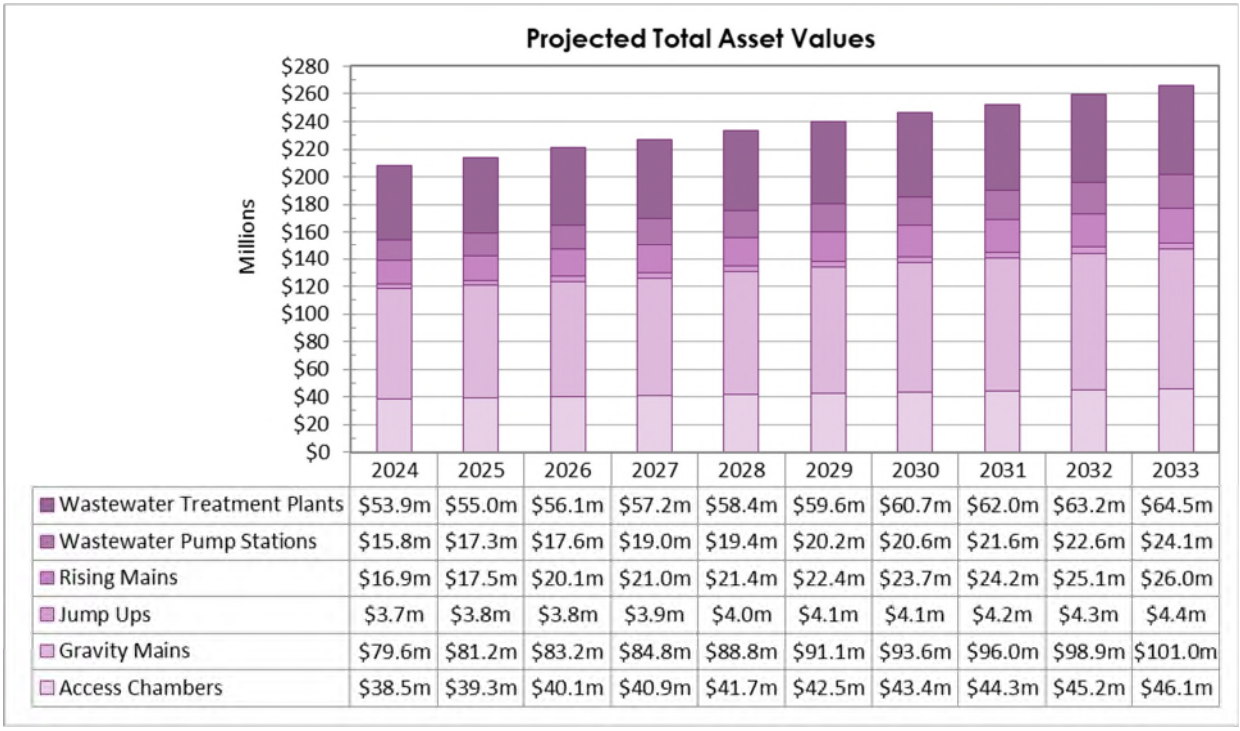
PLANNED EXPANSION PROJECTS

At time of writing the following expansion projects are currently identified in Council's Forward Capital Works Program:

- 2024 - Scenic Highway – Gravity Main
- 2024 – Tanby Road South – Gravity Main
- 2024 – Emu Park Sewer Treatment Plant Upgrade
- 2025 – Svendsen Road – Rising Main
- 2025 – Arthur Street - Sewerage Pump Station
- 2026 – Arthur Street – Gravity Main
- 2028 – Tanby Road South – Gravity Main
- 2031 – Carige Boulevard – Gravity Main
- 2031 – Emu Park West – Sewerage Pump Station
- 2032 – Tanby Road South – Gravity Main

- 2032 – Reef Street – Rising Main& Sewerage Pump Station
- 2033 – Tanby Road – Rising Main
- 2033 – Anthea Street - Sewerage Pump Station
- 2033 – Scenic Highway (Kinka Beach) - Sewerage Pump Station

Should the above projected and planned expansion projects occur as predicted, Figure 5 provides an estimate of the future replacement cost of the sewer assets. Modelling indicates that by 2033 the sewer asset class will have a replacement cost of $266 million (shown in real dollars).



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Wastewater Treatment Plants	$53.9m	$55.0m	$56.1m	$57.2m	$58.4m	$59.6m	$60.7m	$62.0m	$63.2m	$64.5m
Wastewater Pump Stations	$15.8m	$17.3m	$17.6m	$19.0m	$19.4m	$20.2m	$20.6m	$21.6m	$22.6m	$24.1m
Rising Mains	$16.9m	$17.5m	$20.1m	$21.0m	$21.4m	$22.4m	$23.7m	$24.2m	$25.1m	$26.0m
Jump Ups	$3.7m	$3.8m	$3.8m	$3.9m	$4.0m	$4.1m	$4.1m	$4.2m	$4.3m	$4.4m
Gravity Mains	$79.6m	$81.2m	$83.2m	$84.8m	$88.8m	$91.1m	$93.6m	$96.0m	$98.9m	$101.0m
Access Chambers	$38.5m	$39.3m	$40.1m	$40.9m	$41.7m	$42.5m	$43.4m	$44.3m	$45.2m	$46.1m

Figure 5. Projected Future Total Asset Values

RENEWING THE SEWER NETWORK

Renewal 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 service potential.

Council has identified only one requirement for asset obsolescence resulting in disposal during the life of this plan. The asset identified is the Jabiru Sewer Pump station which has been identified for decommissioning in 2025. For all other assets the capital expenditure is modelled to renew current assets in perpetuity.

The projected renewal and replacement expenditures based on current asset condition assessments are summarised below.

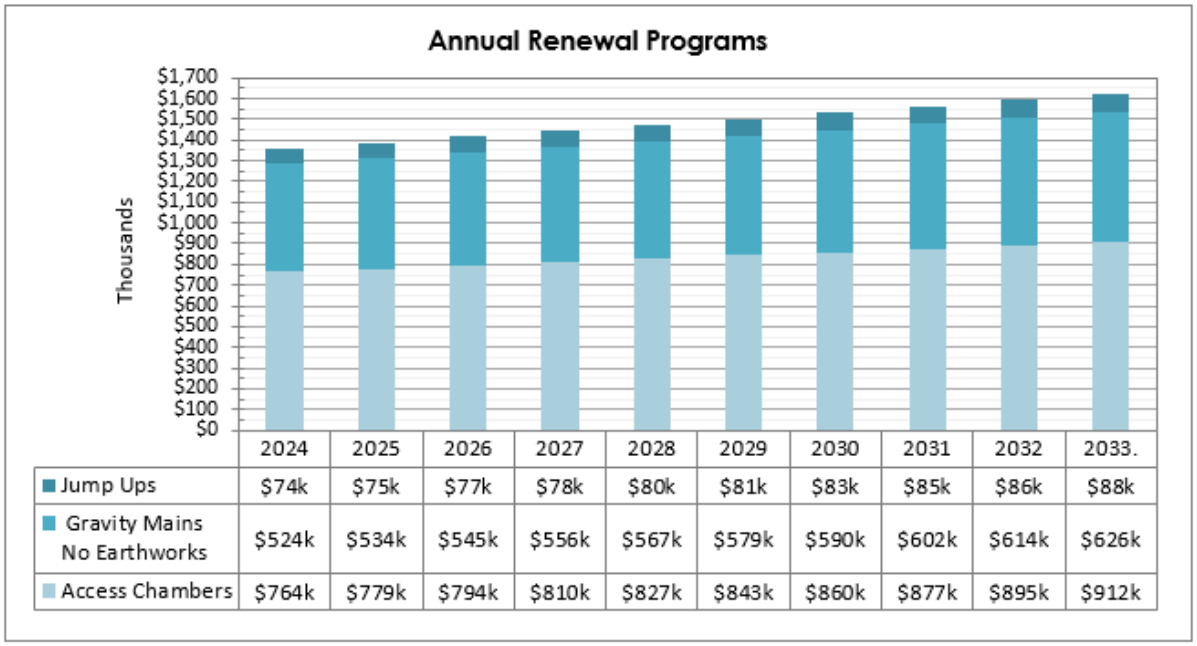
PASSIVE RENEWAL PROGRAMS

Some passive asset types have been allocated projected renewal programs that afford the Water & Waste business unit flexibility of approach to determine which assets are replaced in a given year. This allows the team to realise economies of scale by deploying resources to specific locations or on planned routes, to minimise the cost of establishment and dis-establishment, traffic control, customer notifications etc.

At present, Gravity Mains, Jump-Ups and Maintenance Holes (Access Chambers and Lamp Holes) have been identified as the asset types to be renewed according to an annual program. The programs have been determined based on the following formula:

$$Annual\ Renewal\ Program = \frac{Asset\ Value\ at\ EOFY}{Useful\ Life}$$

Expansion of the network is included in each year's Asset Value at the End of Financial Year (EOFY) figure. For Gravity Mains, a special consideration is necessary due to the unique renewal methods available. In these instances, the Asset Value at EOFY figure is calculated after first excluding the gravity main earthworks assets.

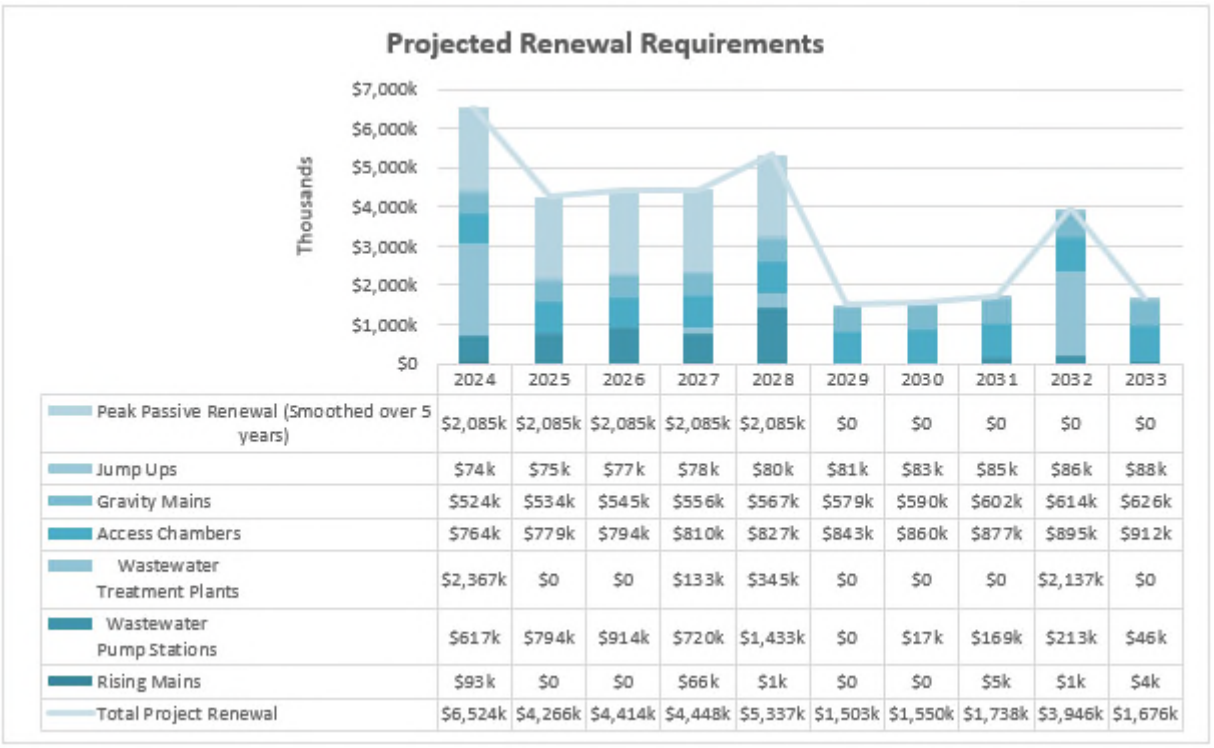


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033.
Jump Ups	$74k	$75k	$77k	$78k	$80k	$81k	$83k	$85k	$86k	$88k
Gravity Mains No Earthworks	$524k	$534k	$545k	$556k	$567k	$579k	$590k	$602k	$614k	$626k
Access Chambers	$764k	$779k	$794k	$810k	$827k	$843k	$860k	$877k	$895k	$912k

Figure 6. Annual Renewal Programs

PROJECTED RENEWAL REQUIREMENTS

For asset types that have not been allocated an annual renewal program, projected renewal requirements are identified from estimates of remaining life obtained from the asset register. It is important to note that the expiry date included in the asset register indicates only a best estimate of end-of-life. In reality each asset type will have a useful life range with some assets failing before their expiry and others remaining in service far past it. The renewal requirements identified are therefore often unlikely to be required to be spent in the years indicated and are provided only as a guide. Further investigations are undertaken to determine true condition before any asset approaching end-of-life is budgeted for renewal.



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Peak Passive Renewal (Smoothed over 5 years)	$2,085k	$2,085k	$2,085k	$2,085k	$2,085k	$0	$0	$0	$0	$0
Jump Ups	$74k	$75k	$77k	$78k	$80k	$81k	$83k	$85k	$86k	$88k
Gravity Mains	$524k	$534k	$545k	$556k	$567k	$579k	$590k	$602k	$614k	$626k
Access Chambers	$764k	$779k	$794k	$810k	$827k	$843k	$860k	$877k	$895k	$912k
Wastewater Treatment Plants	$2,367k	$0	$0	$133k	$345k	$0	$0	$0	$2,137k	$0
Wastewater Pump Stations	$617k	$794k	$914k	$720k	$1,433k	$0	$17k	$169k	$213k	$46k
Rising Mains	$93k	$0	$0	$66k	$1k	$0	$0	$5k	$1k	$4k
Total Project Renewal	$6,524k	$4,266k	$4,414k	$4,448k	$5,337k	$1,503k	$1,550k	$1,738k	$3,946k	$1,676k

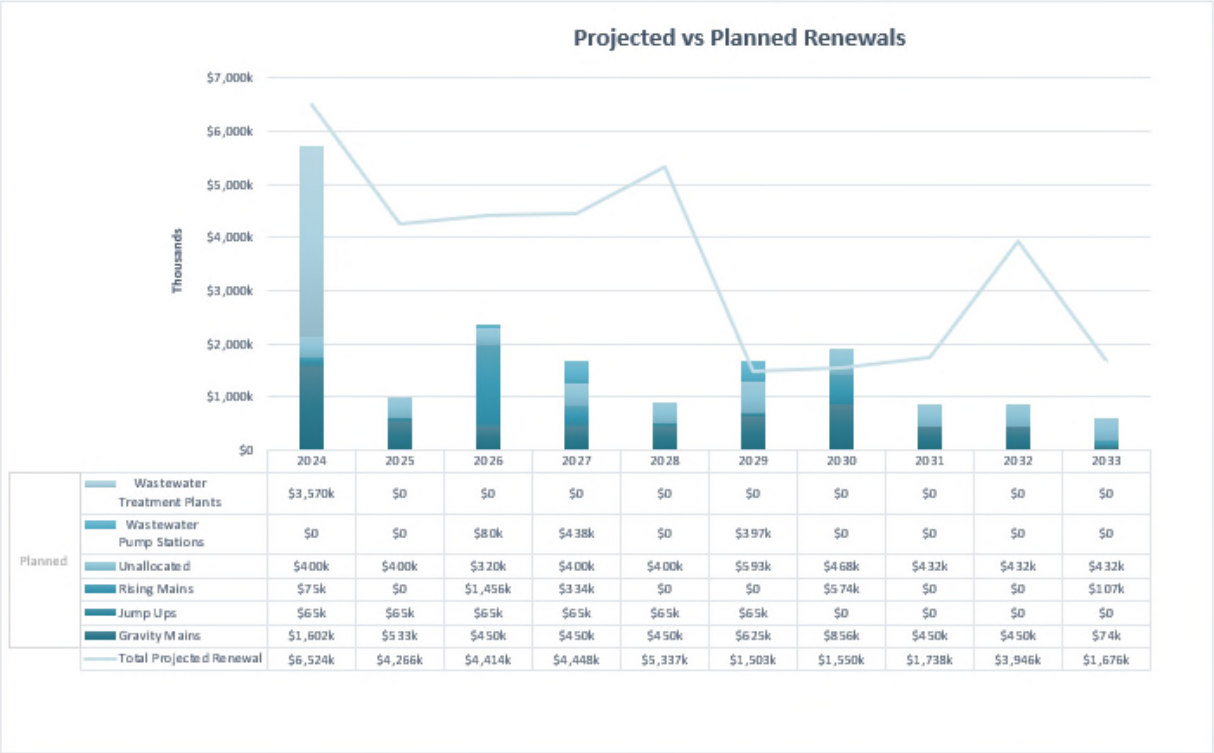
Figure 7. Projected Renewal Requirements

PLANNED RENEWAL PROJECTS

In addition to these allocated projects, the FWP includes provision for renewals based on previous asset management planning exercises. 'Unallocated' renewals are funding that has been identified as a requirement, however the exact asset type and the proportion of spend is yet to be finalised.

Figure 8 provides a forecast of the notional renewal funding required to keep the assets in satisfactory condition ("Projected") and compares it to the available funding provided in Councils adopted FWP ("Planned"). It shows that while Council has allocated sufficient funding in 2029 and 2030; the balance of the years within this 10-year outlook are underfunded.

This underfunding is due to a modelled $10.4 million peak in Passive (underground) asset renewals in 2027. To fund these replacements Council has spread the replacements over the first 5 years of this asset management plan period, resulting in an additional $2.1 million in renewal funding required between 2024 – 2027 (as shown below).



		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Planned	Wastewater Treatment Plants	$3,570k	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Wastewater Pump Stations	$0	$0	$80k	$438k	$0	$397k	$0	$0	$0	$0
	Unallocated	$400k	$400k	$320k	$400k	$400k	$593k	$468k	$432k	$432k	$432k
	Rising Mains	$75k	$0	$1,456k	$334k	$0	$0	$574k	$0	$0	$107k
	Jump Ups	$65k	$65k	$65k	$65k	$65k	$65k	$0	$0	$0	$0
	Gravity Mains	$1,602k	$533k	$450k	$450k	$450k	$625k	$856k	$450k	$450k	$74k
	Total Projected Renewal	$6,524k	$4,266k	$4,414k	$4,448k	$5,337k	$1,503k	$1,550k	$1,738k	$3,946k	$1,676k

Figure 8. Planned verses Projected Renewals

OPERATING & MAINTAINING SEWER ASSETS

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. 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.

Figure 8 below, taken from IPWEA Practice Note 7 shows the relationship between condition, asset remaining useful life and operating & maintenance budgets. What it illustrates is that any potential delay in capital renewal expenditure will lead to an increase in operating and maintenance budgets.

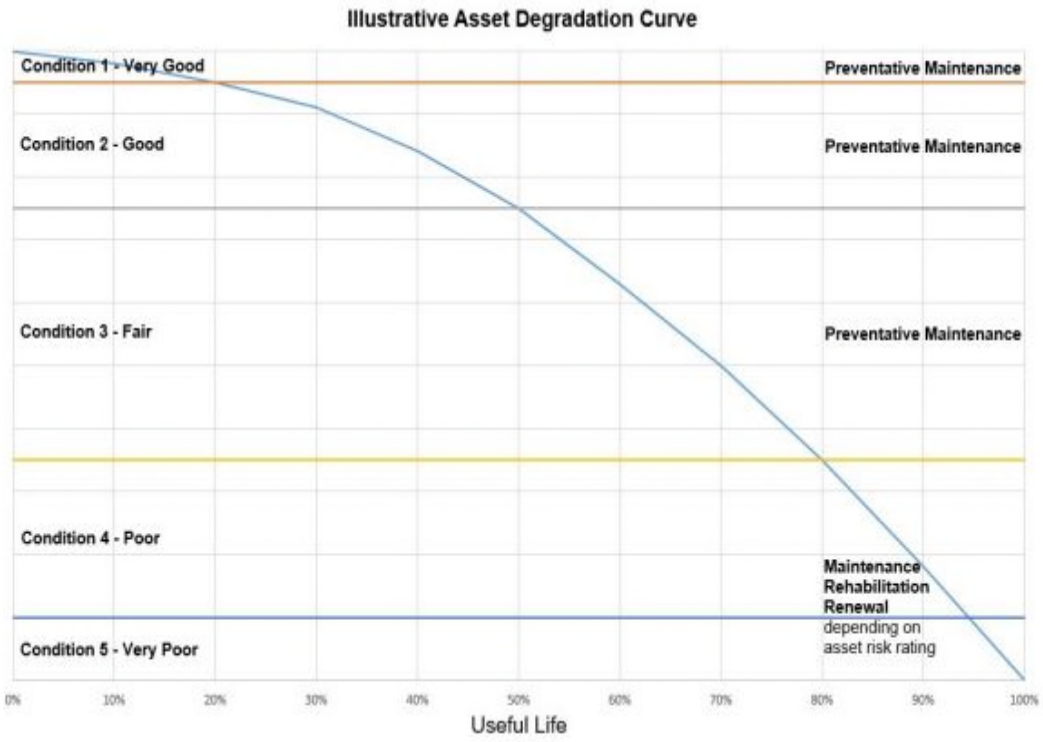


Figure 9. Asset Deterioration verses Remining Useful Life

ROUTINE MAINTENANCE

Routine maintenance includes regular maintenance activities along with cyclical maintenance activities.

PASSIVE ASSETS

Routine maintenance of passive assets generally consists of the following major activities:

- Gravity Main Jetting and Rodding
- Rising Main Flushing
- Maintenance Hole Cleaning

ACTIVE ASSETS

Routine maintenance of active assets consists of:

- Servicing of electrical and mechanical assets
- Inspections of pump stations and treatment plant assets

REACTIVE MAINTENANCE

Maintaining Council's assets through regular investment is the most effective way to preserve their condition and reduce the risk of defects occurring and intervention becoming necessary. However, even with regular investment, defects will occur; reactive maintenance refers to works that are carried out as a matter of urgency, usually to repair these defects for reasons of safety.

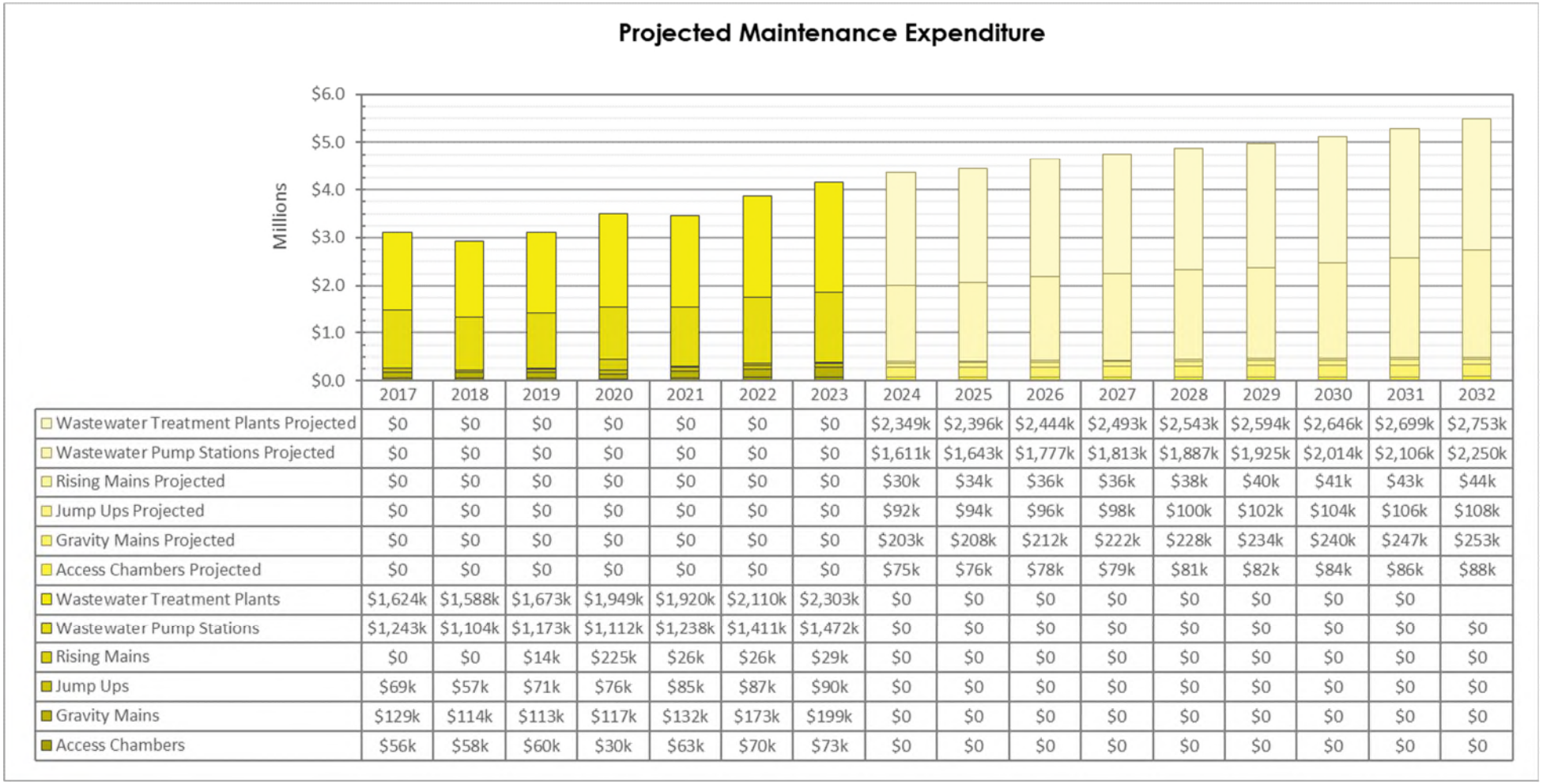
When responding to defects with reactive maintenance, Council takes a safety-first approach. Where there are clear implications for public safety, Council will act to allay the danger. Where danger is not implicit, Council will balance its actions and responses against other criteria and priorities as set out in this plan.

Livingstone Shire Council will endeavor to meet the performance targets outlined in its Customer Service Standards for the delivery of sewer services to customers. This includes responding to Sewer main break and choke incidents within 2 hours.

PROJECTED MAINTENANCE REQUIREMENTS

Projected maintenance is currently forecast using a top-down approach where key analysis has been applied at the 'system' or 'network' level and is based on past costs. Future revisions of this plan will improve maintenance forecasting following development of more granular maintenance plans.

Future maintenance expenditure is forecast to trend in line with the size of the asset stock as shown in the figure below. Note that all costs are shown in current 2022-23-dollar values (i.e., real values). Council has currently accurately budgeted sufficient funds in the LTFP to accommodate future projected maintenance costs.



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Wastewater Treatment Plants Projected	$0	$0	$0	$0	$0	$0	$0	$2,349k	$2,396k	$2,444k	$2,493k	$2,543k	$2,594k	$2,646k	$2,699k	$2,753k
Wastewater Pump Stations Projected	$0	$0	$0	$0	$0	$0	$0	$1,611k	$1,643k	$1,777k	$1,813k	$1,887k	$1,925k	$2,014k	$2,106k	$2,250k
Rising Mains Projected	$0	$0	$0	$0	$0	$0	$0	$30k	$34k	$36k	$36k	$38k	$40k	$41k	$43k	$44k
Jump Ups Projected	$0	$0	$0	$0	$0	$0	$0	$92k	$94k	$96k	$98k	$100k	$102k	$104k	$106k	$108k
Gravity Mains Projected	$0	$0	$0	$0	$0	$0	$0	$203k	$208k	$212k	$222k	$228k	$234k	$240k	$247k	$253k
Access Chambers Projected	$0	$0	$0	$0	$0	$0	$0	$75k	$76k	$78k	$79k	$81k	$82k	$84k	$86k	$88k
Wastewater Treatment Plants	$1,624k	$1,588k	$1,673k	$1,949k	$1,920k	$2,110k	$2,303k	$0	$0	$0	$0	$0	$0	$0	$0	
Wastewater Pump Stations	$1,243k	$1,104k	$1,173k	$1,112k	$1,238k	$1,411k	$1,472k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Rising Mains	$0	$0	$14k	$225k	$26k	$26k	$29k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Jump Ups	$69k	$57k	$71k	$76k	$85k	$87k	$90k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gravity Mains	$129k	$114k	$113k	$117k	$132k	$173k	$199k	$0	$0	$0	$0	$0	$0	$0	$0	$0
Access Chambers	$56k	$58k	$60k	$30k	$63k	$70k	$73k	$0	$0	$0	$0	$0	$0	$0	$0	$0

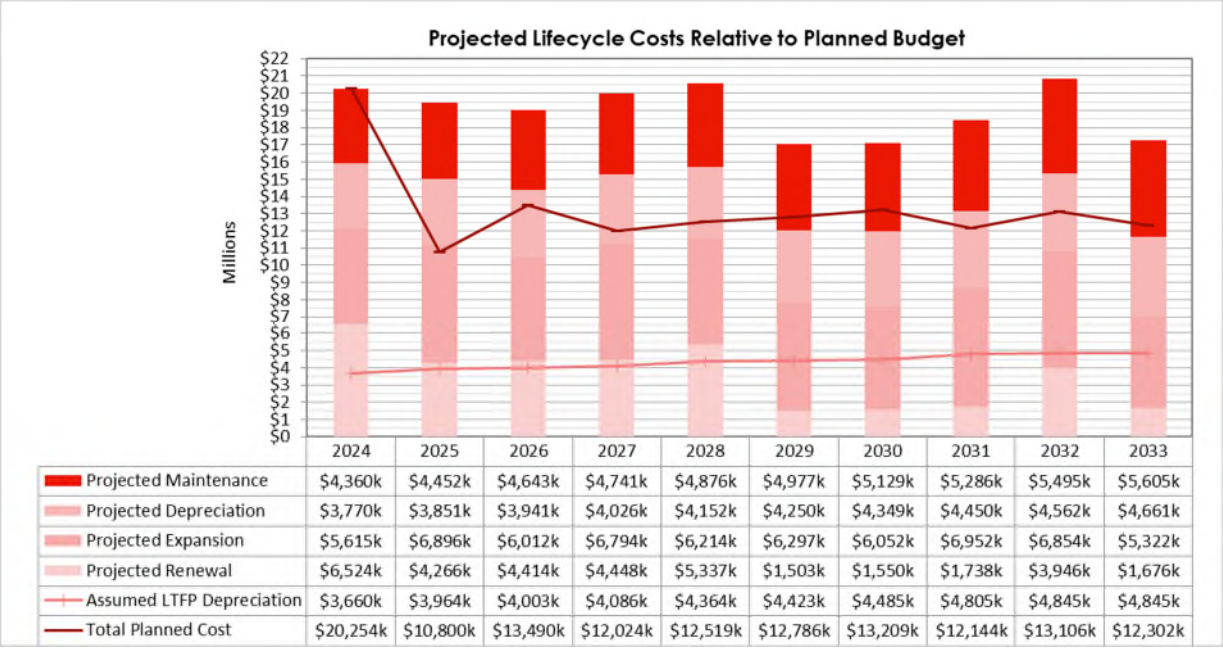
Figure 10: Projected Maintenance Expenditure

LIFECYCLE COSTS

Lifecycle costs are the total costs council needs to budget for to manage and operate its sewer assets at the approved level of service.

The financial projections from this plan are shown below in Figure 11. These projections include forecast costs for maintenance, renewal, expansion, disposal, and depreciation shown relative to the adopted costs in the budget.

The bars in the graph represent the budgeted costs needed to minimise the lifecycle costs associated with providing the service. The proposed budget line indicates the estimate of available funding based on what has been allocated in Councils LTFP. 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.



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Projected Maintenance	$4,360k	$4,452k	$4,643k	$4,741k	$4,876k	$4,977k	$5,129k	$5,286k	$5,495k	$5,605k
Projected Depreciation	$3,770k	$3,851k	$3,941k	$4,026k	$4,152k	$4,250k	$4,349k	$4,450k	$4,562k	$4,661k
Projected Expansion	$5,615k	$6,896k	$6,012k	$6,794k	$6,214k	$6,297k	$6,052k	$6,952k	$6,854k	$5,322k
Projected Renewal	$6,524k	$4,266k	$4,414k	$4,448k	$5,337k	$1,503k	$1,550k	$1,738k	$3,946k	$1,676k
Assumed LTFP Depreciation	$3,660k	$3,964k	$4,003k	$4,086k	$4,364k	$4,423k	$4,485k	$4,805k	$4,845k	$4,845k
Total Planned Cost	$20,254k	$10,800k	$13,490k	$12,024k	$12,519k	$12,786k	$13,209k	$12,144k	$13,106k	$12,302k

Figure 11: Planned verses Projected Lifecycle Costs

The planned (budgeted) expenditure does not meet the forecast costs for most years. The average annual planned and projected expenditures are approximately $13.2 million and $18.9 million respectively. All figures are shown in current (real) dollars.

There is currently a shortfall of funding for sewer assets over the 10-year life of this plan. As illustrated in Figure 8 in "Planned versed Projected Renewal", this is due to the current underfunding of projected renewals.

This underfunding is due to a modelled $10.4 million peak in Passive (underground) asset renewals in 2027. To fund these replacements Council has spread the replacements over the first 5 years of this asset management plan period, resulting in an additional $2.1 million in renewal funding required in each year between 2024 – 2028.

RISK MANAGEMENT

The purpose of infrastructure risk management is to document the results and recommendations resulting from the periodic identification, assessment and treatment of risk associated with providing services from infrastructure, using Council's Enterprise Risk Management Framework, Policy, and Procedure as a guide.

Council's risk management process is detailed in these documents and is an analysis and problem-solving tool designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

Public safety risk assessments are undertaken by:

- Council's inspector as part of the annual routine defect inspections and condition assessments.
- Council officers, with responsibility for asset maintenance, when potential hazards are brought to their attention via requests logged into Council's customer service system (Pathway); and
- Council officers, with responsibility for asset maintenance, when undertaking ad hoc inspections, while undertaking other duties on site.

Any deferred renewal (i.e., assets that have been identified for renewal through this plan and not scheduled in the capital works program) should also be included in the above-mentioned risk management document.

CRITICAL ASSETS

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Similarly, critical failure modes are those which have the highest consequences.

Assessment of an Asset's criticality is fundamentally a risk management process and is undertaken following Council's Enterprise Risk Management Procedure (ERMP). Criticality is the consequence of the asset failing and as such is assessed using Council's Risk Consequence Table as included in Appendix 3 of the ERMP.

For some asset classes, the number of individual assets is relatively small, and assessment can be undertaken at the asset level. For network assets like sewer this process would be arduous. Instead, these assets are assessed based on the information available in Council's Asset Management and Geographic Information Systems.

Council is currently developing an Asset Criticality Management Plan and this plan will be updated to reflect the outcomes of that process.

MONITORING & IMPROVING THE PLAN

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

- The degree to which the required cash flows identified in this plan are incorporated into council's long term financial plan.
- The degree to which 1–3-year detailed works programs, budgets, business plans and organisational structures consider the 'global' works program trends provided by this plan.
- The degree to which sustainability ratios outlined below meet their targets; and
- Progress toward achieving the outcomes listed in the Improvement Plan.

Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures, and funding to achieve financial sustainability over the life of the Asset Management Plan. The following ratios provide a set of Key Performance Indicators that will enable Council to measure and report its overall asset management sustainability more readily.

ASSET SUSTAINABILITY RATIO

A financial measure of satisfactory levels of expenditure on asset replacements is the Asset Sustainability Ratio - the net capital expenditure on replacements as a percentage of the depreciation. It indicates whether the amount of replacement exceeds or is less than the amount of depreciation, that is, whether assets are being replaced at the rate they are wearing out.

An index of less than 100% on an ongoing basis indicates that capital expenditure levels are not being optimised to minimise whole of life cycle costs of assets or that assets may be deteriorating at a greater rate than spending on their renewal. The then Department of Infrastructure, Local Government and Planning proposed a conservative target of equal to or greater than 90%.

The Asset Sustainability Ratio over the life of this plan based on planned renewals and projected depreciation is 46.2%.

Should Council proceed with the adoption of the projected renewal funding outlined in this document the Asset Sustainability ratio over the life of this plan would increase to 90%.

IMPROVEMENT PROGRAM

A 12-month improvement plan is included for implementing improvement actions identified in preparing this Asset Management Plan. This AMP and Improvement Plan will be reviewed annually.

Table 10: Improvement Actions

	Action	Outcome	Responsibility	Due Date
1	Collect and report on emissions data	Ability to report on Environmental outcomes	Manager Water & Waste	July 2023
2	Review asset useful lives as part of next Sewer revaluation considering condition/age data captured in that time	Improve lifecycle costing incorporated into AMP	Asset Engineer	July 2026
3	Migrate current sewer model to Assetic Predictor platform. Update Sewer AMP document accordingly	Improve lifecycle costing incorporated into AMP	Asset Engineer	February 2024
4	Continue to undertake and incorporate condition data captured as part of sewer relining and access chamber inspection programs into AMP model assumptions	Transition asset management system from 'age based' to 'condition based' valuation & analysis	Asset Engineer	Ongoing
5	Update AMP to reflect adoption of Asset Criticality Management Plan	Improved risk management outcomes	Asset Engineer	July 2024
6	Develop a business case for implementing a cloud storage solution (or similar) of historical inspection CCTV footage and potential resourcing of a position to review historic CCTV imagery	Facilitates the transition of the asset management system from 'age based' to 'condition based' valuation & analysis	Manager Water & Waste and Asset Engineer	July 2025
7	Develop a business case for a dedicated access chamber maintenance crew modelled on the current valve & hydrant maintenance crew	Improves preventative maintenance of asset as well as assisting in keeping up to date condition data of assets	Manager Water & Waste	November 2023
8	Update AMP to align with outcomes of LGIP review	Improved understanding of demands and financial impacts	Coordinator Assets	February 2024

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