

Water and Sewer Asset Management Plan



27.04.2017

Adopted on 27th April 2017

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Document Control

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1	04/04/2017	Draft 1	Jayantha Ediriweera (JE)	Derek Francis (DF) Graeme Bourke(GB) Steph Waterhouse(SW)	
2	12/04/2017	Draft 2	JE	DF/GB/SW	<i>Adopted by Council on 27th April 2017 Minute No: 091/2017</i>

1. Executive Summary

Council's intention is to provide the Shire with reticulated water via infrastructure that is serviced and maintained to a level which reflects the community's expectations and operates in a manner that is both functional and cost effective. The Water System had a current replacement cost of **\$46 million** as of 30 June 2016.

This plan assists Council in the decision making process and is presented at a high level to provide key information that can be used in the determination of levels of service and funding required. Table 1.1 identifies the asset categories in this plan, whilst Table 1.2 shows the ten (10) year average costs for the various expenditure types. Figure 1.1, on the following page, also indicates the proposed expenditure over the next 10 years.

Table 1.1 Water Asset Portfolio Overview (in 2016 \$,000)

Asset Class	Asset Type	Description	Current Replacement Cost
Water Canal	Earth Channel -Trunk	67 km	\$4,134,720
Water Mains	Reticulation(potable and no potable)	70	\$9,714,227
	Trunk (potable and no potable)	37	\$4,736,001
Water Pumping Stations	Distribution	7	\$1,151,320
Water Reservoirs	Standpipe	7	\$5,215,631
	Dams	5	\$2,137,623
	Concrete	1	\$8,541
Water Treatment Works	Conventional	1	\$7,300,646
Water Assets			\$34,398,709
Sewerage Pump Stations	Submersible 50m head	1	\$1,174,748
	Submersible 25m head	3	\$1,293,830
Sewerage Treatment Works	Effluent Lagoons	1	\$269,775
	Preliminary	1	\$104,640
	Siteworks	1	\$386,950
Sewer Mains	Gravity Reticulation	18	\$7,502,105
	Rising Mains	2	\$781,876
Effluent reuse	Effluent reuse reservoir	1	\$559,214
Sewer Assets			\$12,073,138
		TOTAL	\$46,471,847

Table 1.2 What will we spend each year over the next ten years (in 2016 \$)?

Expenditure Type	Planned Expenditure
Water Operations Budget	\$1,674
Water Maintenance Budget	\$623
Water Renewal Budget	\$462
Water Upgrade and New Budget	\$328
Sewer Operations Budget	\$410
Sewer Maintenance Budget	\$210
Sewer Renewal Budget	\$125
Sewer Upgrade and New Budget	\$55

Notes:

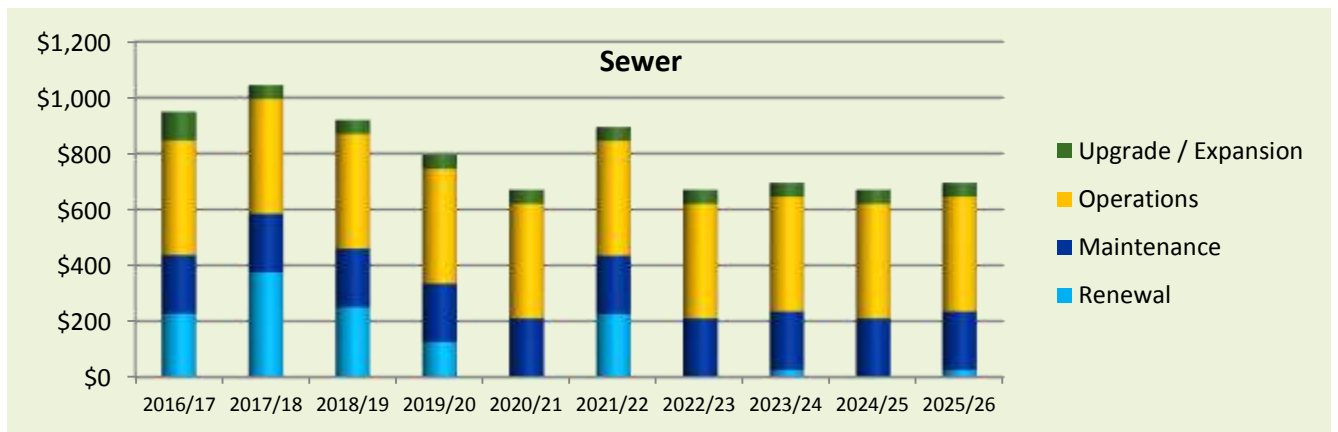
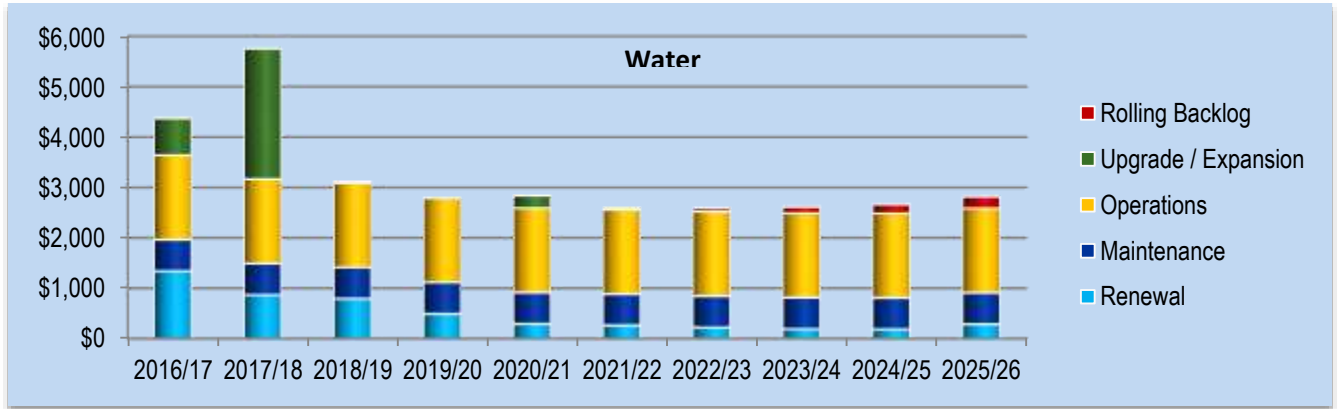
1. Planned Expenditures are the 10 year annual average amounts
2. Upgrade/ new projects proposed in 2016 and 2019 only

Water and Sewer Asset Management Plan

What will we spend over the next 10 years (2016 \$M)?

Projected The expenditure required to provide the target level of service in the AM Plan, compared with planned expenditure currently included in the Long Term Financial Plan, is shown in the following graphs.

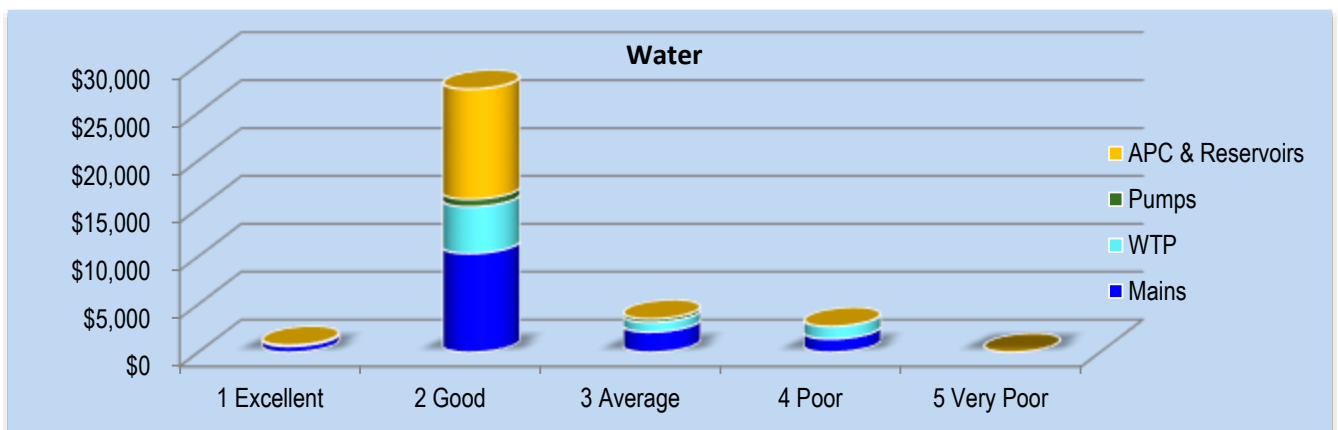
Figure 1.1: What will we spend over the next 10 years (2016 \$M)?



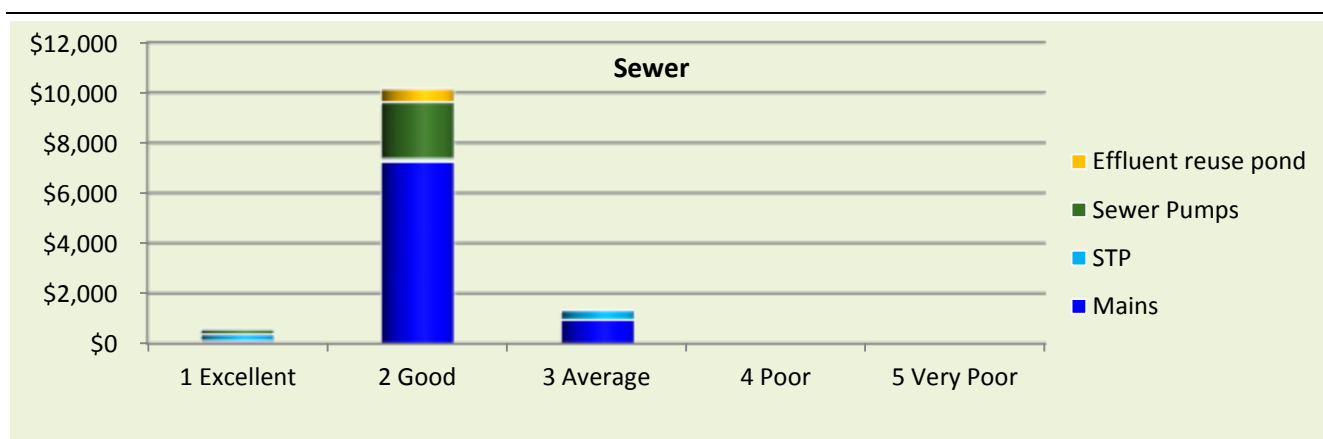
The current condition of our assets is shown in the following graph based on the value of each asset in each of 5 conditions ranging from 1 to 5, with 1 being near new and 5 as a completely failed asset. A condition grading of zero (0) indicates that the condition of the asset was not determined during most recent valuation (January 2016).

What condition are our assets currently (\$M)?

Figure 1.2: Condition profile



Water and Sewer Asset Management Plan



The process of managing our water supply assets is one of continually improving the knowledge of Council. This includes maintaining up to date asset registers, condition ratings, the cost of maintenance on the asset and the rate at which assets deteriorate and reach their intervention level. Section 13 contains tasks to further improve the details contained in the next Water Asset Management Plan.

What is the age of our assets?

- **Headworks**

The Council's primary source of water for Council's water supply schemes is the Bogan River, where water is stored in a series of pools formed by a weir and several earthen embankments. Being an ephemeral stream, the flows in Bogan River are inadequate and unreliable. Therefore, the Council depends on water released from Macquarie River via the Albert Priest Channel (APC). The APC, constructed in the year 1942 is of earthen construction and is approximately 65 Km long.

The active river suction point for Nyngan is from a weir pool on the Bogan River, which is supplied by the Albert Priest Channel from the Gunningbar Creek (Macquarie River system) near Warren under a multi-party arrangement regarding the operation. The Bogan pool weir is in fair condition though requires remedial repair works to the concrete erosion capping. The Nyngan Raw water pumping station has a capacity of 100L/s (8.6 ML/day) and can adapt to the water level in the weir dropping up to 0.75m, after the augmentation work undertaken in 1983. The intake pumping station delivers raw water to the Bogan Street Filtration Plant for treatment.

- **Storage Towers**

There are two (2) steel storage towers; the Cobar Street treated water steel standpipe being a 1965, 2.2 ML steel tower, and the Terangion Street tower being a 4.0 ML structure of 1989. The maintenance history of both should ensure that both towers will achieve service lives.

- **Water Treatment**

The plant is in good condition and displays the usual array of deferred maintenance, non-compliant, and asset deterioration issues that can be resolved with appropriate renewals, upgrades, and remediation. The original treatment capacity of the Bogan Street filtration plant constructed in 1939 was 7.9 ML/day. In 1983, the filtration plant was augmented with the objective of increasing the capacity to 100 L/s (8.6 ML/day), same as that of raw water intake capacity

- **Reticulation**

There is treated water reticulation system, with very limited raw water availability.

The raw water supply consists primarily of the original AC treated water reticulation system. The service history suggests that the AC pipe should achieve a 80 year service life, with the exception of the pre 1975 Class B AC which should be rated at 70 years.

2. Strategic Objectives

Council operates and maintains these water supply assets to achieve the following strategic objectives.

1. Provide water to our customers at a standard that supports the outcomes identified in the Council Community Strategic Plan.
2. Ensure that infrastructure is maintained at a safe and functional standard as set out in this asset management plan.
3. Ensure that Water Supply Infrastructure assets are managed to deliver the requirements of Council's Asset Management Policy and Asset Management Strategy.

Bogan Shire Council has developed a comprehensive community engagement strategy to ensure a broad range of opinions; ideas and visions were captured to help shape the Bogan Shire Community Strategic Plan.

To assist in the delivery of the objectives in this plan, a number of key documents & systems have been prepared and should be referred to in considering the findings presented:

Table 2.1: Where can I find additional information?

Document / System	Content
Community Strategic Plan	Outcomes and Strategies identified by the community.
Council's Asset Policy	How we manage assets.
Asset Management Strategy	Overall direction of asset management and portfolio summary.
Condition Assessment Manual	Details on the process of assessing condition, including photographic examples of various conditions.
GIS	Geographical information system that produces maps of assets.
Water Supply and Sewerage Strategic Business Plan	It gives details and supporting information for Council's Community Strategic Plan, Delivery Program and Operational Plan and Budget. To be developed following completion of this Water Asset Management Plan.
Regional Water and Drought Security Report (2014)	Bogan Shire Council is responsible for the water supply reticulation, sewerage and stormwater management services within the Bogan local government area (LGA). As a local water utility (LWU), Bogan Shire Council aims to be consistent with the DPI Water (formerly the NSW Department of Water and Energy), Best Practice Management of Water Supply and Sewerage Guidelines (DWE, 2007). This Drought Security report addresses localised emergency actions for drought conditions.

The Bogan Shire Council CSP Outcomes supported by the Water Asset Management Plan include:

- ✓ 4.1.1 Develop and implement asset management policies, strategies and plans
- ✓ 4.1.2 Develop and implement forward works infrastructure programs and plans

3. Services Provided & Classification

Council provides the Shire of Bogan and its wider rural community with a reticulated water supply that meets current drinking water standards at minimum pressures as outlined in our Customer Service Levels.

The criticality ratings and condition ratings have been reviewed and updated to reflect optimum asset management practices. This will allow Council to have a more relevant grading of its assets to determine intervention levels and renewal costs based on risk.

Table 3.1: Criticality ratings for assets

Criticality Grade	Water
AAA	Nyngan Water Treatment Plant ,LLP ,HLP, Water intake , 250 mm Trunk and Reticulation Pumping Mains
AA	Mains 200mm,Reservoirs, APC
A	Mains 150mm
B	Mains 100mm
C	Mains < 100mm

Criticality Grade	Sewer
AAA	Sewerage Pump Stations, Sewer Mains < 225 mm
AA	Sewer Mains - 150 mm and 100mm
A	Sewerage Treatment Works

The criticality rating identifies different intervention levels for different assets depending on their assessed criticality and consequence rating. The water assets had a current replacement cost of \$34 million and sewer assets had \$12 million as of 30 June 2016. Details of the major components are contained in Table 3.2 together with their renewal cost.

Table 3.2: What is provided?

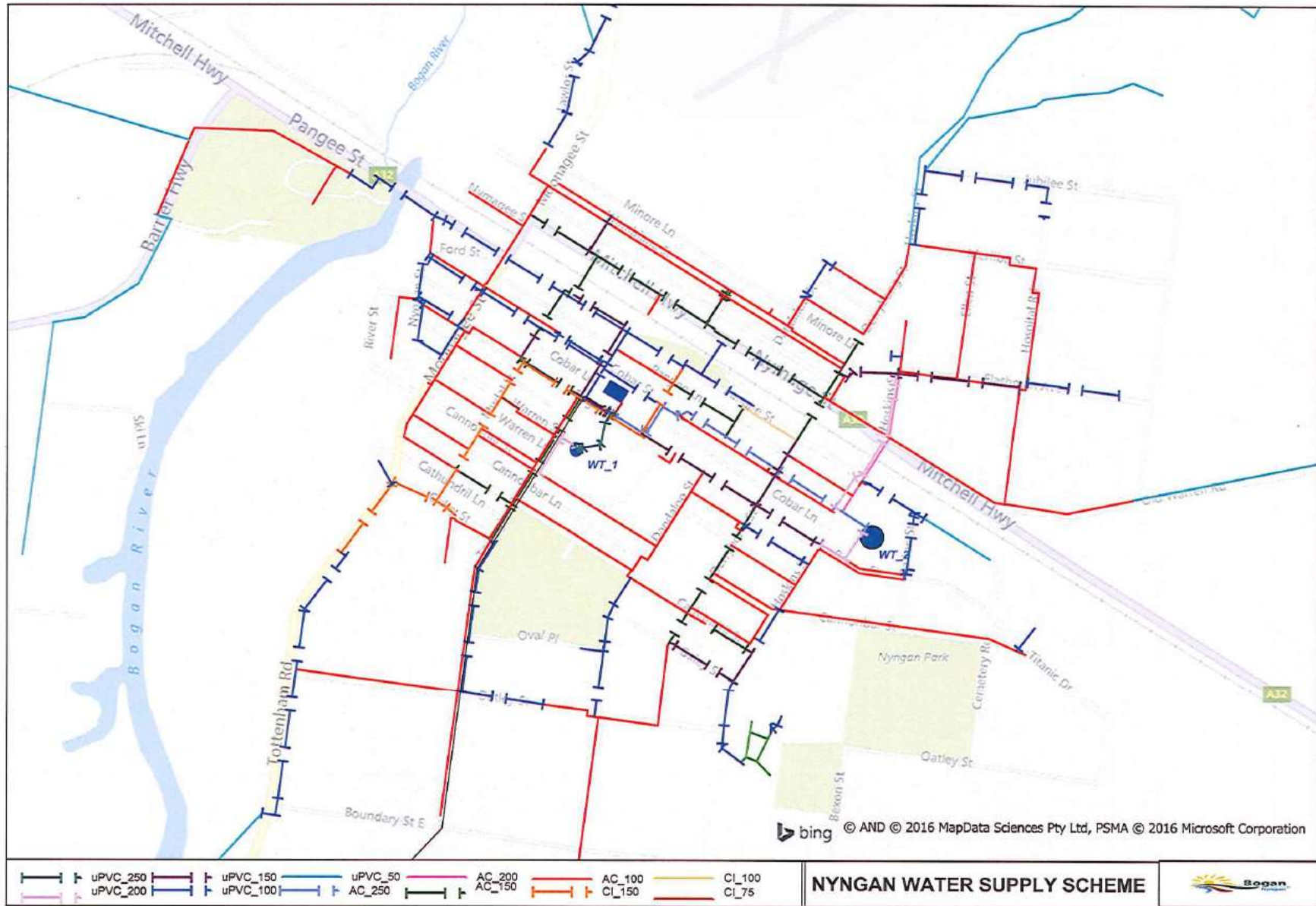
Classification	Asset	Dimension	Unit	Current Replacement Cost (\$)
Criticality AAA	Nyngan Water Treatment Plant	1	Nos	\$7,300,646
Criticality AAA	Raw Water Pumps (RWP) (including village schemes)	5	Nos	\$814,988
Criticality AAA	Treated Water Pumps (TWP)	2	Nos	\$315,937
Criticality AAA	Intake	1	Nos	\$20,395
Criticality AAA	250 mm Trunk and Reticulation Pumping Mains	4.2	km	\$962,683
Criticality AA	Mains 200mm	1.4	km	\$287,458
Criticality AA	Reservoirs and Ground tanks	14.0	Nos	\$7,361,794
Criticality AA	Albert Priest Channel (APC)	63.0	km	\$4,134,720
Criticality A	Mains 150mm	9.1	km	\$1,513,387
Criticality B	Mains 100mm	41.0	km	\$6,650,034
Criticality C	Mains < 100mm	51.5	km	\$5,036,667
	Total Water			\$ 34,398,709

Water and Sewer Asset Management Plan

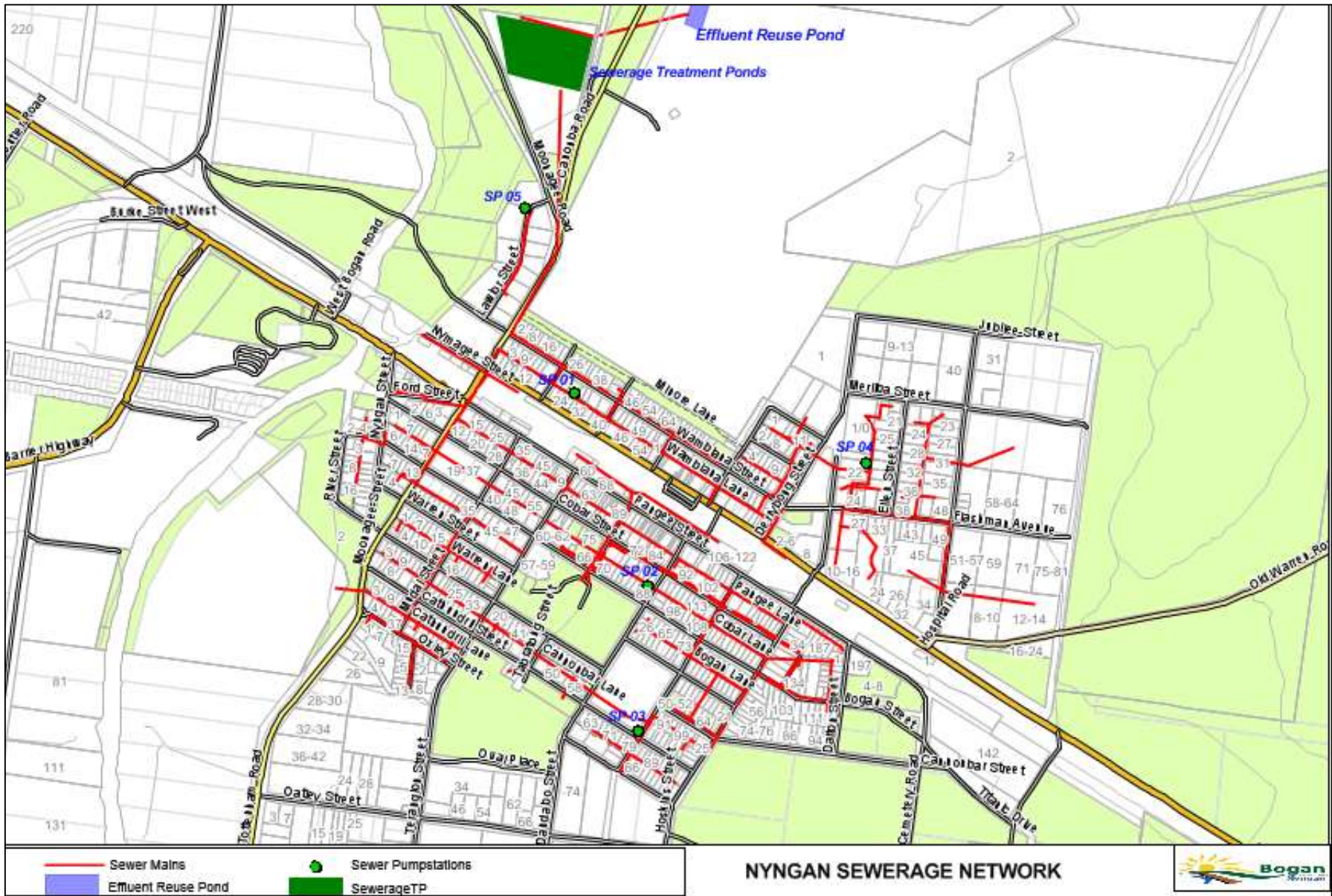
Classification	Asset	Dimension	Unit	Current Replacement Cost (\$)
Criticality AAA	Sewerage Pump Stations	4	Nos	\$2,468,577
Criticality AAA	Sewer Mains - 300 mm DI Rising main	1.3	km	\$578,398
Criticality AAA	Sewer Mains - 300 mm Conc Gravity reticulation	1.5	km	\$1,143,263
Criticality AAA	Sewer Mains - 225 mm Conc and VC gravity reticulation	1.8	km	\$1,176,977
Criticality AA	Sewer Mains - 150 mm CI and uPVC Rising mains	0.7	km	\$153,943
Criticality AA	Sewer Mains - 150 mm VC and uPVC Gravity reticulation	14.4	km	\$5,181,865
Criticality AA	Sewer Mains - 100 mm uPVC Rising mains	0.3	km	\$49,535
Criticality A	Sewerage Treatment Works(includes effluent reuse)	1	Nos	\$1,320,579
	Total Sewer			\$12,073,137

Water and Sewer Asset Management Plan

Figure 3.1 What are the key elements of our water supply?



Water and Sewer Asset Management Plan



4. Levels of Service

Council is responsible for providing a safe, reliable and cost effective drinking water supply that is customer focused, enhances the Bogan Shire environment and caters for the sustainable growth of the Shire. Ongoing consultation is undertaken with the community to ensure the provision of the potable water supply is acceptable to the wider community.

Levels of service indicators have been developed for the services provided by the Water Supply Network based on the objectives set in the Community Strategic Plan. These objectives have been used to define Community Levels of Service (CLOS) which relates to how the community receives the service in terms of safety, quality, quantity, reliability responsiveness, cost efficiency and legislative compliance. From these CLOS, Technical LOS (TLOS) have been developed that detail how these services will be delivered in terms of quantity, frequency and standard. Finally, Key Performance Measures and how they will be measured provide the detail on how we determine whether we are delivering what they community are asking for.

Table 4.1 summarises at a high level what the community desires for each asset and how Council will deliver it. The CSP Ref column identifies the Community Strategic Plan objective that is being supported by the asset group and the LOS defined.

Table 4.1: What does the Community want?

Water supply

Key Performance Measure	Level of Service Objective	Performance Measure Process	Desired Level of Service	Current Level of Service
COMMUNITY LEVELS OF SERVICE				
Quality	Physical water quality parameters conform to standards (Odour, colour, taste, turbidity).	Customer complaints per annum	Nil per annum	Less than 5 per annum
Function	Provide reliable water supply system that is operated and maintained with minimum interruption.	Number of interruption per annum	Nil per annum	Less than 5 per annum
Safety	Provide a safe water supply system that is low risk to the community and safe to operate.	Number of Incidents per annum	Nil per annum	Nil
TECHNICAL LEVELS OF SERVICE				
Condition	Plant and Equipment are reliable and well maintained	Condition inspection	Once per annum	
Function	Chemical dosing of water quality parameters conform to standards (pH, Fluoride, Chlorine, Hardness etc).	Customer complaints	< 5 per annum	Nil
	Drinking water quality	Complies/meet Australian Drinking Water Guidelines (ADWG)	100%	100%
Cost effectiveness	System operation expense is cost effective	\$/KI	\$1.87/KI	\$1.87/KI
Safety	Water supply service is safe	Reported accidents	Zero reported accidents	Nil

Water and Sewer Asset Management Plan

Sewer

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Quality	Provide efficient method of collection and disposal of sewerage	Customer service request	Less than 10 per annum	Less than 5 per annum
Function	Ensure sewerage system meets community expectations	Customer requests relating to sewer main blockages	Less than 10 per annum	Less than 5 per annum
Safety	Provide sewerage system that's low risk to the community	Number of accidents and injury	Less than one per annum	Nil
TECHNICAL LEVELS OF SERVICE				
Condition	Periodic visual assessment to determine condition	Routine cleaning and inspection	CCTV Programme for condition assessment report	Assessment report current
Function	Ensure sewer system has appropriate design capacity	Number of properties connected	Sewer overflows less than 5 p.a.	Nil
Cost Effective	Provide cost effective sewerage system	Effluent reuse	100% reuse for irrigation purpose	100% achieved
Safety	Provide sewerage system that's low risk to the community	Number of accident and injury	Less than one per annum	Nil

Note: The CSP reference number relates to the Community Strategic Plan outcome that are supported by the Community LOS identified.

5. Condition of Our Assets

Prior to commencement of this Water Asset Management Plan Bogan Shire Council's portfolio of water and sewer assets were valued in accordance with "Fair Valuation" principles. The valuation relied upon a current condition assessment of the assets.

Hence in June 2012 a field survey, involving a physical inspection of the ground-level facility assets in Council's water supply system was conducted. Items such as treatment plants, pumping stations and reservoir exteriors were inspected. Dams or the interior of reservoirs were not inspected, given the highly specialised nature of this work.

The new revaluation process for Water and Sewer assets are in progress under LMWUA contract and expect to be completed by the end of June 2017. This AMP has been prepared based on 2012 revaluation and the renewal costs have been updated to 2016, according to the NSW reference rates manual.

The object of the survey was to uncover any evidence that would challenge the default useful life for that asset class such as corrosion (or lack of), obvious mechanical/electrical defects or structural damage. Field survey sheets were completed and a photographic record was made.

Field surveyors used this information to determine a grading of condition according to the criteria in Table 5.11.

Table 5.1 Description of condition gradings (NZWWA, 2008, p29)

Grade	Condition	Description¹
1	Very Good	Some wear or discolouration but no evidence of damage. Can include repaired assets where the repair is as good as the original. New or near new condition
2	Good	Deterioration or minor damage that may affect performance. Includes most repaired assets.
3	Moderate	Includes repaired where the repair is deteriorated. Clearly needs some attention but is still working. Structure in need of repair.
4	Poor	Either not working or is working poorly because of damage or deterioration. Condition or structure is poor or structural integrity in question.
5	Very Poor	Replace or repair. Needs urgent attention.

A grading of zero (0) was allocated if the condition could not be determined and valuation proceeded based on typical useful life.

For pressure pipelines, useful lives were reviewed in terms of pipe media and breakage history. The breakage history of the various material/age/sizes of pipe in the network was used to challenge the default useful lives provided in the Local Government Asset Accounting Manual, and considering the experience of other comparable utilities.

Table 5.2 on the following page, provides a suggested series of responses based on the condition grading applied. For longer life assets (say, having a typical life of 50 years or greater), a timeframe for repair or renewal is suggested.

¹ Based on New Zealand Water & Wastes Association (2008) Visual Assessment of Utility Assets. The terminology used in the International Infrastructure Management Manual is unhelpful as it refers to 'repairs' while many water supply and sewerage assets are not subject to any maintenance until they are near end of life.

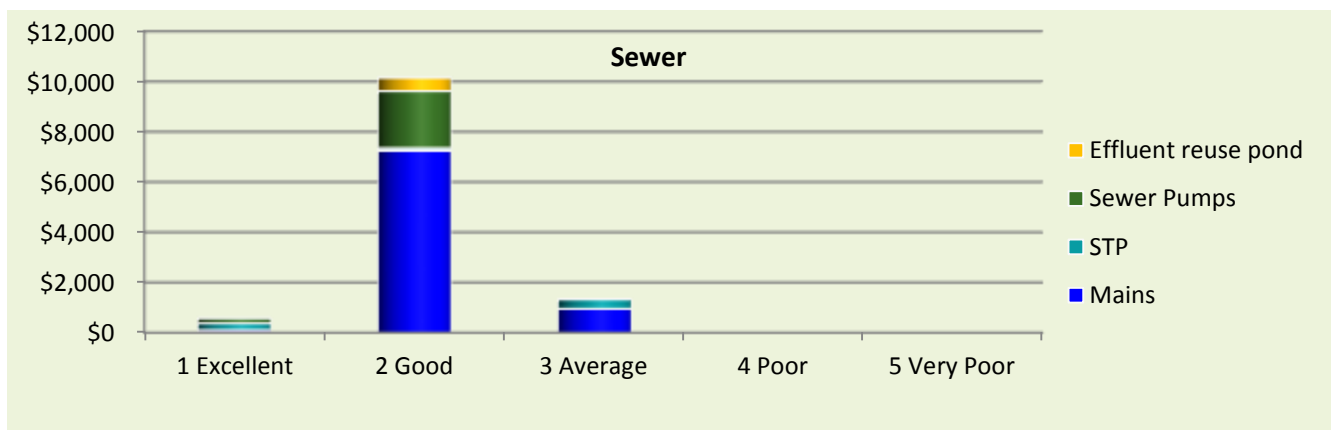
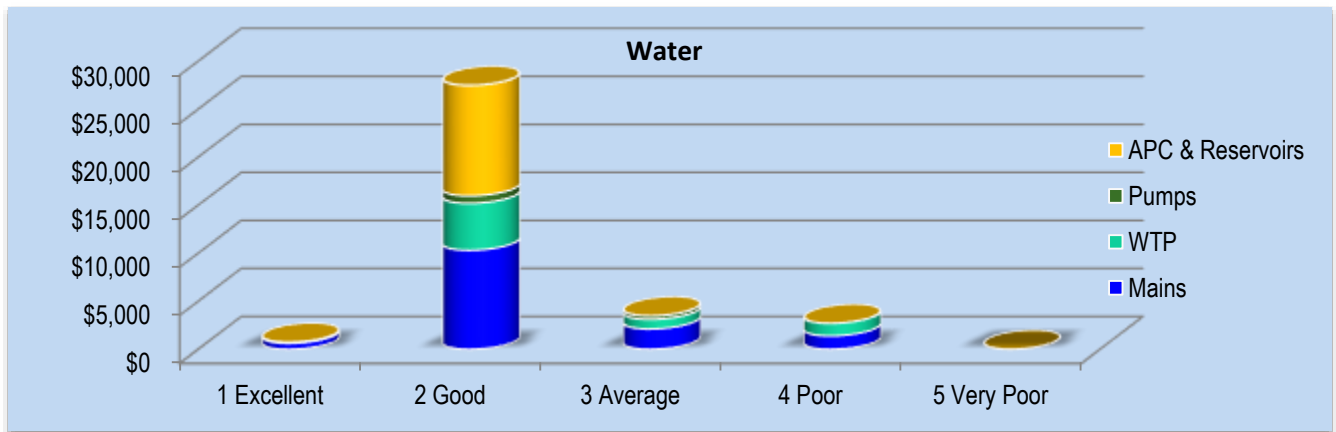
Water and Sewer Asset Management Plan

Table 5.2 Suggested action timescales for condition gradings (NZWWA, 2008, p30)

Grade	Condition	Action	Repair for longer life assets
1	Very Good	No Action required	No action needed within 20 years.
2	Good	Monitor to see if there are changes	Some action needed within 20 years
3	Moderate	Consider specialist assessment.	Some action needed within 10 years
4	Poor	Get specialist assessment or repair.	Action needed within 3 years
5	Very Poor	Replace or repair	Action required within one year.

The condition of asset is maintained in the Asset Register. Note, a condition grading for most water mains was not formally determined (condition grade zero) as to date there is no evidence to suggest that their useful life would be significantly greater or less than typical for these long life assets. Their true useful life will become evident later in their life cycle. Therefore for the purposes of this asset management plan, pipes with a condition grading of zero can be interpreted as having a condition grading of 1.

Figure 5.1: What Conditions are our assets?



It is recommended that Council refine the 30-year capital works plan to align with the recommendations of the valuation report.

6. Operations

Operational activities are those regular activities that are required to continuously provide the service. These activities include asset inspection, electricity costs, fuel and overheads. The Operational Plan summarises the specific projects and activities to be achieved to meet the commitments in the Delivery Program. It spells out how the commitments of Delivery Program will be delivered as individual projects and activities that will be undertaken each year. It also forms the council's operating budget for the year.

Regular inspection and maintenance of the above ground infrastructure is completed by the field operations staff.

Council conducts regular Hydrant and Dead-End Flushing programmes as part of the reticulation maintenance for the water supply for Bogan Shire

Cleaning – There is an allocated budget for the reticulation network pipe cleaning. Council has a developed plan for cleaning of the reticulation network and is able to use specialist contractors to carry out this work.

Inspections – Due to the sensitivity of contamination of the Water Supply Service Council does not internally inspect the reticulation network.

The Operational Plan for Councils water supply includes but is not limited to:

- Water Treatment Operations/Maintenance;
- Water Supply Storage Systems Maintenance;
- Pipelines, Hydrant and Meter Operation/Maintenance; and

Table 6.1: When do we undertake Inspections?

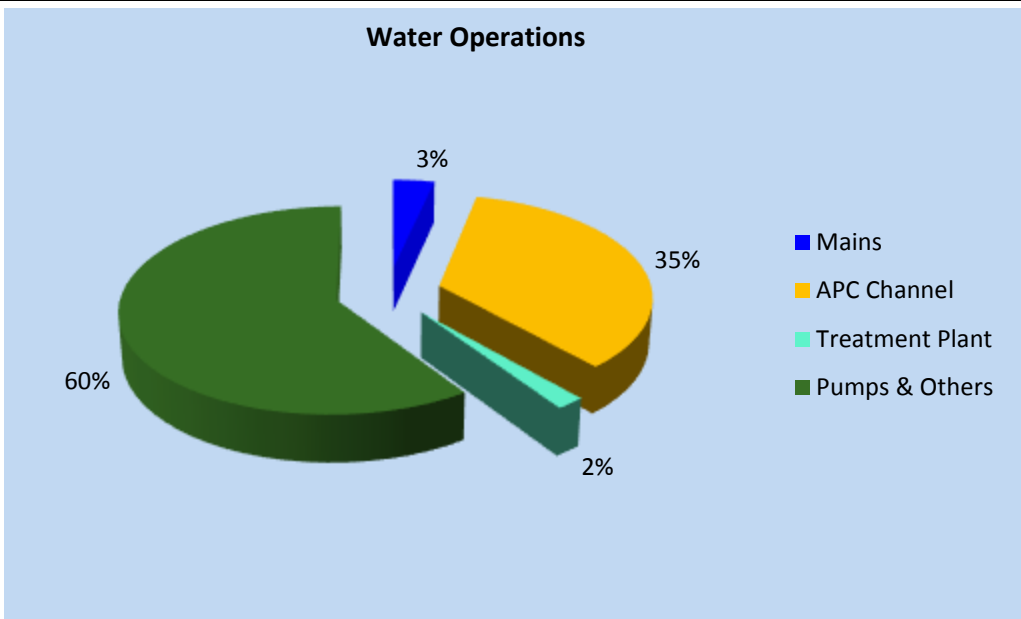
Inspection	Frequency
Condition Assessments of all Above Ground External Assets	6 monthly
Dead End Flushing	Quarterly
Hydrant Maintenance and Reticulation Mains Cleaning	Every 4 years
Safety Inspections	Quarterly
Water Storage Reservoirs	Every 4 years

Figure 6.2: What is the breakup of our Operating Costs? ('000)

Water operating cost

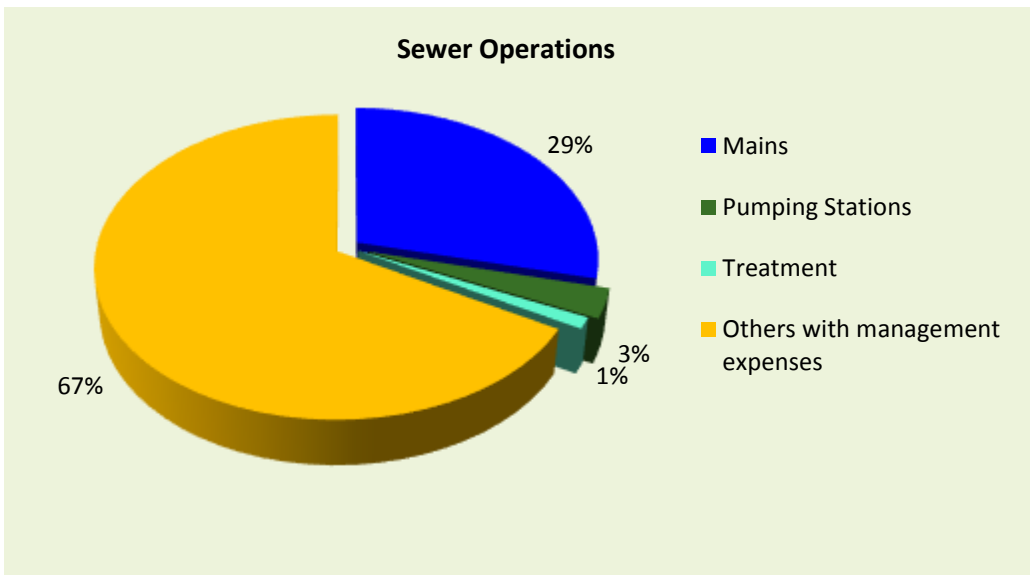
Activity	Year 2016/17
Mains	\$59
APC Channel	\$585
Treatment Plant	\$33
Pumps & Others	\$997
Total	\$1,674

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Sewer operating cost

Activity	Year 2016/17
Mains	\$118
Pumping Stations	\$13
Treatment Plant	\$5
Others with management expenses	\$274
Total	\$410



7. Maintenance

Routine maintenance is the regular on-going work that is necessary to keep assets operating to ensure they reach their expected useful life. It includes work on an asset where a portion may fail and need immediate repair to make it operational again. It may be either planned (where works are programmed based on condition or according to a cycle), or reactive (in response to a failure, an event which leads to damage such as a storm or vandalism).

Repairs – As this is a critical service provided by Council all repairs are completed so that agreed customer service levels are maintained.

Table 7.1: What are some of our Maintenance Activities and the frequency we undertake them?

Activity	Frequency
Mains Cleaning	Every 10 years
Hydrant Maintenance	Every 3 years
Water Leakage Detection	Ongoing
Reservoir Overflow Check	Ongoing
Dead End Hydrant Flushing	Quarterly
PRV Maintenance	Annually
Pumps	10,000 hours
Reservoir Cleaning	Every 4 years

Adjusting Levels of Service

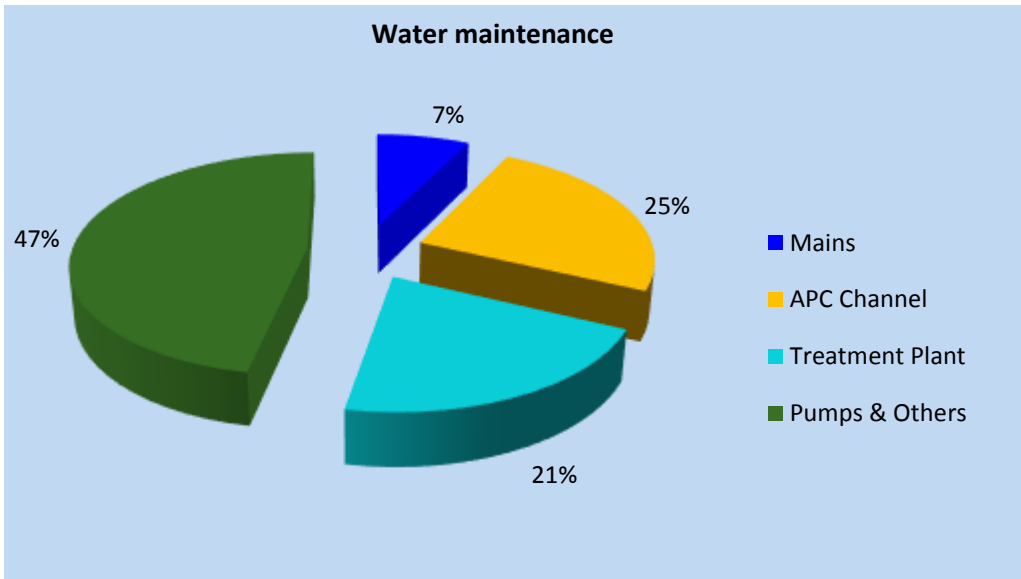
The adjustment of LOS for a critical service, such as potable water supply, is only undertaken after consultation with the community ensuring it is still within statutory regulations and health guidelines.

Table 7.2: What are our Maintenance Costs? ('000)

Water asset maintenance cost

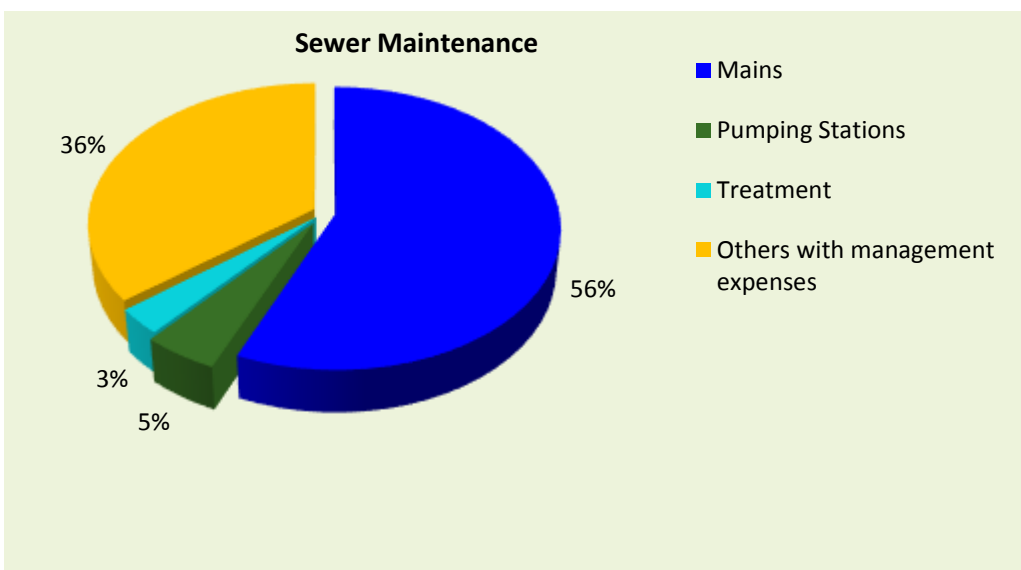
Activity	Year 2016/17
Mains	\$46
APC Channel	\$153
Treatment Plant	\$131
Pumps & Others	\$293
Total	\$623

Figure 7.1: What is the breakup of our Maintenance Costs?



Sewer asset maintenance cost

Activity	Year 2016/17
Mains	\$67
Pumping Stations	\$16
Treatment Plant	\$10
Others with management expenses	\$117
Total	\$210



8. Capital Renewal / Rehabilitation

This includes work on an existing asset to replace or rehabilitate it to a condition that restores the capability of the asset back to that which it had originally. Estimated useful lives are shown in Table 8.1. below.

Table 8.1 - Asset Useful Lives

Asset Class	Asset Type	Adopted Useful Life
Water mains	Reticulation (AC or PVC or HDPE)	80
	Trunk	80
Water Pumping Stations	Distribution Civil Works	Varies (Average 50)
	Distribution Mechanical/ Electrical	Varies (Average 25)
Water Reservoirs	Standpipe Structure - Steel	80
	Concrete	100
	Dams -Clay	60
Water treatment Plant	Mechanical/electrical	30
	Structural	70

The adopted useful lives of assets shown in the table above are based on a condition grading approach. The useful life of an asset can vary markedly, due to factors such as construction methods, manufacturing defects, the host environment and the maintenance regime applied. Condition grading was used to adjust the useful life based on the observed condition of the asset.

Renewal will be undertaken using 'low-cost' renewal methods where practical. The aim of 'low-cost' renewals is to restore the service potential or future economic benefits of the asset by renewing the assets at a cost less than the full replacement cost.

This Asset Management Plan contains an analysis based on broad assumptions and best available knowledge to date. Modelling is not an exact science so we deal with long term averages across the entire asset stock. Work will continue on improving the quality of our asset registers and systems to increase the accuracy of our renewal models.

Assets requiring renewal will be generally identified from estimates of remaining life and condition assessments obtained from the asset register. Candidate proposals will be inspected to verify the accuracy of the remaining life estimate and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programmes.

Details of planned renewal activities proposed in the current Delivery Program are detailed in Table 8.2.

Renewal projects described in Table 8.2 (on the following page). were prioritised based on the adopted Water Capital Works 30 year Plan, the outcomes of the 2016 condition assessment and recent advice on the need to replace telemetry. The 2016 condition assessment identified the need to replace or extensively refurbish the aeration tower at the water treatment plant in the short term, due to its current structural condition.

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Table 8.2: What will we spend over the next 10 years on Renewal (2016 \$,000)?

Water Asset Renewals

Year	Item	Description	Estimate
2017		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Treatment Plant	\$995
	4	Pumps & Others	\$84
2017		Total	\$1,339

2018		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Treatment Plant	\$575
	4	Pumps & Others	\$30
2018		Total	\$865

Year	Item	Description	Estimate
2019		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Treatment Plant	\$350
	4	Pumps & Others	\$180
2019		Total	\$790

2020		Network Renewals	Estimate
	1	Mains	\$80
	2	APC Channel	\$180
	3	Pumps & Others	\$230
2020		Total	\$490

Year	Item	Description	Estimate
2021		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Pumps & Others	\$30
2021		Total	\$290

2022		Network Renewals	
	1	Mains	\$50
	2	APC Channel	\$180
	3	Pumps & Others	\$30
2022		Total	\$260

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Year	Item	Description	Estimate
2023		Network Renewals	
	1	Mains	\$40
	2	APC Channel	\$150
	3	Pumps & Others	\$30
2023		Total	\$220

2024		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$135
	3	Pumps & Others	\$30
2024		Total	\$190

Year	Item	Description	Estimate
2025		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$130
	3	Pumps & Others	\$30
2025		Total	\$185

2026		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$130
	3	Pumps & Others	\$130
2026		Total	\$285

Water and Sewer Asset Management Plan

Sewer Asset Renewals

Year	Item	Description	Estimate
2017		Network Renewals	
	1	Sewer Main Renewal	\$30
	2	Pump stations	\$80
	3	STP Improvement	\$117
2017		Total	\$227

2018		Network Renewals	
	1	Pump stations	\$25
	2	STP Improvement	\$350
2018		Total	\$375

Year	Item	Description	Estimate
2019		Network Renewals	
	1	STP Improvement	\$250
2019		Total	\$250

2020		Network Renewals	Estimate
	1	Pump stations	\$25
	2	SCADA System	\$100
2020		Total	\$125

Year	Item	Description	Estimate
2021		Network Renewals	\$0
2021		Total	\$0

2022		Network Renewals	
	1	Sewer Main Renewal	\$200
	2	Pump stations	\$25
2022		Total	\$225

2024		Network Renewals	
	1	Pump stations	\$25
2024		Total	\$25

2026		Network Renewals	
	1	Pump stations	\$25
2026		Total	\$25

9. Capital Upgrades & New Assets

Upgrades enhance an existing asset to provide a higher level of service, for example widening an existing road seal. New assets are those created to meet an additional service level requirement or increase the size of a network, for example, new subdivisions, or extension of the water supply network.

The requirements for new assets may result from growth, social or environmental needs. The impact from growth is included in the demand analysis within the Asset Management Strategy.

Selection criteria

New assets and upgrade/ expansion of existing assets are identified in accordance with Council's Best Practice obligations. The scheduling of new (and upgrade) capital works are based upon an adopted level of service negotiated with the community, total asset management planning and development servicing planning which identifies the need for the new assets and the financial planning required to fund them.

Bogan Shire Council undertakes very limited upgrade and new asset works. These projects only occur when a new subdivision is developed or a deficiency in the actual level of service provided is identified. Table 9.1 below lists the upgrades and new works proposed by Council in the coming 10 years.

Table 9.1: What upgraded / new assets are proposed over the next 10 years?

Water Supply – New Capital Work

Year	Item	Description	Estimate
2017	1	Water Storage project (32%)	\$736
2018	2	Water Storage project (32%) and Automation(25%-New)	\$ 2593
2019	3	Automation (25%-New)	\$ 25
2020	4		0
2021	5	Filter optimisation (100% grant)	\$ 250
2022	6		0
2023	7		0
2024	8		0
2025	9		0
2026	10		0
2017		Total	\$3604

Sewer network – New Capital Work

Year	Item	Description	Estimate
2017	1	SCADA	\$102
2018	2	Pump Stations	\$50
2019	3	Pump Stations	\$50
2020	4	Pump Stations	\$50
2021	5	Pump Stations	\$50
2022	6	Pump Stations	\$50
2023	7	Pump Stations	\$50
2024	8	Pump Stations	\$50
2025	9	Pump Stations	\$50
2026	10	Pump Stations	\$50
2017		Total	\$552

10. Disposal Plan

Disposal is any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Assets with a condition rating of 5 (poor condition), where Council has received no contact through the Customer Request System indicating that the community doesn't require the asset (as they have raised concerns or complaints about the asset condition) may be considered to be a redundant asset or not utilised and therefore decommissioned and disposed unless it is considered critical infrastructure.

Through careful analysis of all the existing assets Council may become aware of assets no longer required, and funds can, therefore, be raised through their sale. An example of this may be surplus areas of land. An added advantage is that, if such assets are sold or disposed, there will be avoided maintenance expenses in relation to those assets.

Table 10.1: What assets are we planning to dispose of?

Asset	Year	Cost
Not available	N/A	N/A

11. Financial Plan

Funding of Water Asset Management

The best practice guidelines set out for the water pricing principles for customers are as follows:

- Pricing must raise enough revenue so that the water supply fund achieves a positive Economic Real Rate of Return (ERRR) in most years over the next 30 years.
- Residential water usage charges must be set to Full Cost Recovery (FCR) of residential revenue.
- Access charges are to be based on the square of the diameter of the water service connection.
- Local Water Utilities (LWUs) must bill at least three times each year (and preferably every quarter).
- No land value based charges (i.e. rates)
- No “free” or “pre-paid” water allowance.

As part of its funding strategy, Council has the option to supplement any or all of the current or new proposals that come into consideration for construction with borrowings. This strategy is heavily influenced by the monitoring of Water Supply Fund’s Debt Servicing Ratio (DSR); the debt servicing ratio is a measure of the degree to which revenues are committed to servicing debt. The purpose of the ratio is to assess the impact of loan principal and interest repayments on the discretionary revenue of the Council. Council’s long term target is to maintain a ratio of less than 50%. DPI Water suggests that a debt servicing ratio of up to 50% may appropriate subject to 30 year modelling demonstrating financial sustainability.

Funding for management of assets can come from a variety of sources as detailed in the table below.

Table 11.1: Where does our Income come from?

Water Fund

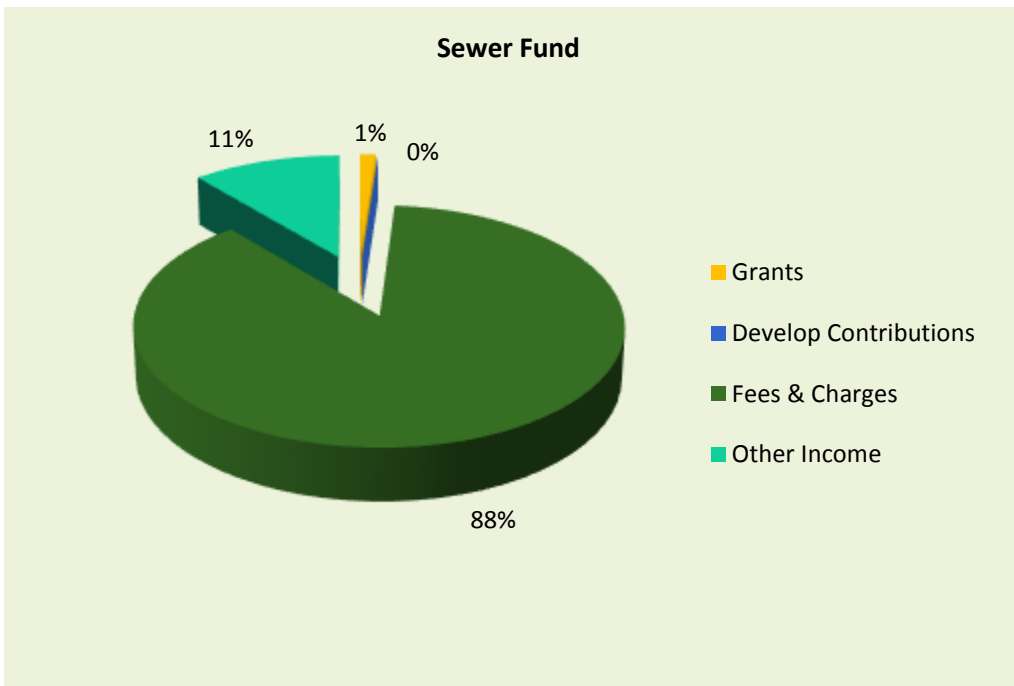
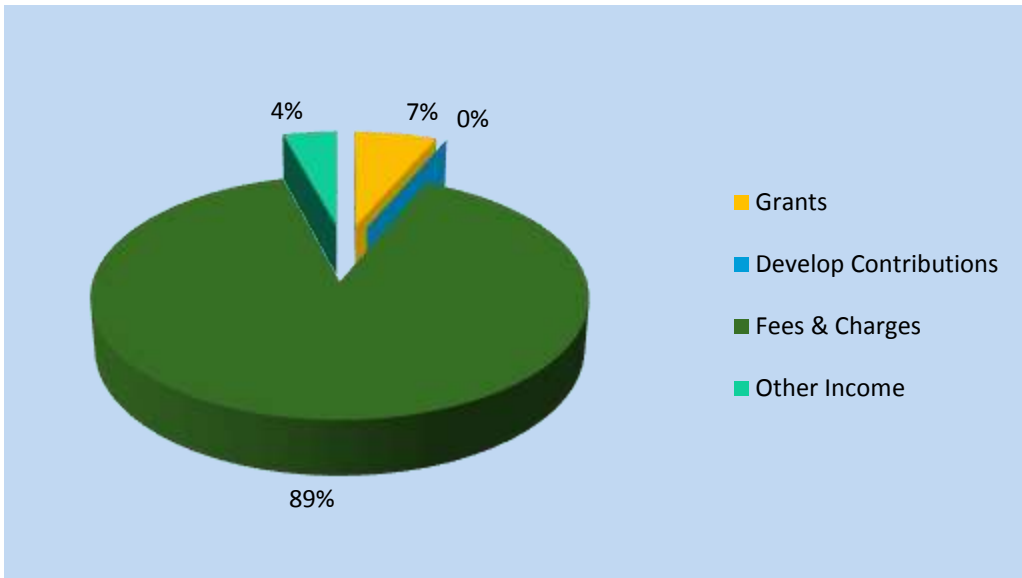
Activity	2015/16
Grants	\$155
Develop Contributions	\$0
Fees & Charges	\$1,769
Other Income	\$1577
Total	\$2,500

Sewer Fund

Activity	2015/16
Grants	\$9
Develop Contributions	\$0
Fees & Charges	\$626
Other Income	\$79
Total	\$714

Source: Council’s LTFP (2016/17 to 2026/27) Forecast Operating Statements

Figure 11.1: What is the breakup of our income streams?



Source: Council's Operational Plans (2013/14, 2014/15 and 2015/16) Forecast Operating Statements, three year average income, excluding Capital Grants.

Water and Sewer Asset Management Plan

Asset Renewal Funding Ratio

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years, Council is forecasting that it will have 100% of the funds required for the optimal renewal and replacement of its assets. Council is prudently replacing assets before they reach end of life and failure occurs.

Sustainability of Service Delivery of Water Supply service

Asset Renewal Funding Ratio	100%
Long Term - Life Cycle Costs	
Life Cycle Cost [average 10 years projected ops, maint exp and deprn.]	\$2,870
Life Cycle Exp [average 10 years LTFP budget ops, maint & capital renewal exp]	\$2,786
Life Cycle Gap [life cycle expenditure – life cycle cost (-ve = gap)]	\$-84
Life Cycle Indicator [life cycle expenditure / life cycle cost]	97%
Medium Term - 10 year financial planning period	
10 yr Ops, Maint & Renewal Projected Expenditure	\$2,981
10 yr Ops, Maint & Renewal LTFP Budget Exp	\$2,786
10 year financing shortfall [10 yr proj exp - LTFP Budget exp]	\$-195
10 year financing indicator [LTFP Budget exp / 10 yr proj exp]	93%
Medium Term – 5 year financial planning period	
5 yr Ops, Maint & Renewal Projected Expenditure	\$3,196
5 yr Ops, Maint & Renewal LTFP Budget Exp	\$3,052
5 year financing shortfall [5 yr proj exp - LTFP Budget exp]	\$-144
5 year financing indicator [LTFP Budget exp / 5 yr proj exp]	95%

Sustainability of Service Delivery of Sewer service

Asset Renewal Funding Ratio	100%
Long Term - Life Cycle Costs	
Life Cycle Cost [average 10 years projected ops, maint exp and deprn.]	\$765
Life Cycle Exp [average 10 years LTFP budget ops, maint & capital renewal exp]	\$745
Life Cycle Gap [life cycle expenditure – life cycle cost (-ve = gap)]	\$-20
Life Cycle Indicator [life cycle expenditure / life cycle cost]	97%

Water and Sewer Asset Management Plan

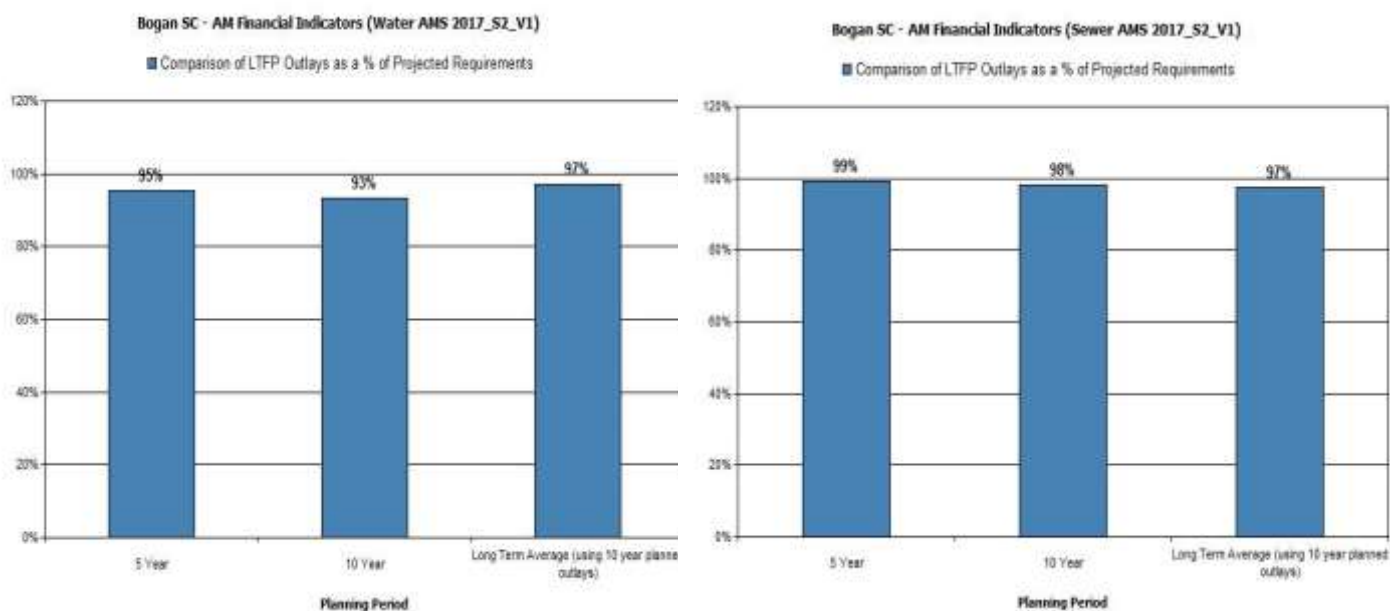
Medium Term - 10 year financial planning period	
10 yr Ops, Maint & Renewal Projected Expenditure	\$759
10 yr Ops, Maint & Renewal LTFP Budget Exp	\$745
10 year financing shortfall [10 yr proj exp - LTFP Budget exp]	\$-14
10 year financing indicator [LTFP Budget exp / 10 yr proj exp]	98%
Medium Term – 5 year financial planning period	
5 yr Ops, Maint & Renewal Projected Expenditure	\$823
5 yr Ops, Maint & Renewal LTFP Budget Exp	\$815
5 year financing shortfall [5 yr proj exp - LTFP Budget exp]	\$-7
5 year financing indicator [LTFP Budget exp / 5 yr proj exp]	99%

Source: NAMS PLUS 3

Asset management financial indicators

Figure 11.2 shows the asset management financial indicators over the 10 year planning period and for the long term life cycle.

Figure 11.2: Asset Management Financial Indicators



Source: NAMS PLUS 3

Modelling of Scenarios

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

For this Asset Management Plan, two different scenarios were modelled using the NAMS Plus online asset management tools.

1. Scenario 2 – Using the Asset Register to determine projected renewals from remaining useful life
2. Scenario 3 - Using planned renewals from Council's adopted Water Capital Works 30 year Plan

Bogan Shire Council's water assets are in a reasonable condition. The condition assessment which took place in late 2015 identified a few assets reaching end of life in the next ten years. As a result, the projected renewal expenditures identified by the Scenario 1 modelling outcomes are lean.

According to the Scenario 2 modelling, Council is overspending on asset renewal in the short term, with an unfunded major renewal of the water treatment plant is forecast for 2037. This result does not reflect the capital works planning undertaken by Council and is unrealistic.

It was therefore necessary to model Scenario 3 using the renewal expenditure itemised in the Water Capital Works 30 Year Plan. The items in the Water Capital Works 30 Year Plan have been included by staff based on their detailed knowledge of the asset portfolio and its renewal needs. It can be considered an indicator of the renewal spending actually required to replace assets in the short term as they approach end of life and before they fail.

The Scenario 3 modelling revealed that Council's proposed spending on asset renewals was appropriate and lead to balanced financial indicators, as shown in Figure 8 above. This outcome whilst appearing favourable, may not be reliable. In this situation, engineering judgement is required, because neither Scenario 1 or 2 are truly reflective of Council's asset planning needs.

12. Key Performance Measures

Development of Key Performance Measures (KPM's) based on condition have been developed by considering the statutory regulated quality of potable water and agreed customer service levels. The KPM's are to be reviewed to align with the Technical LOS and the Strategies identified in the CSP that support the outcomes identified in Levels of Service section of this document.

Table 12.1 Performance Measures

Key Performance Measure	Level of Service	Target	Current
Incidence of unplanned interruptions	Water to be available to customers when required with minimal planned and no unplanned interruptions	<10	35 incidents of unplanned interruptions to water in 2015/16
Adequate water pressure	Water pressure is sufficient to meet customers' needs	Average operating pressure of 19m across the network, checked regularly to ensure compliance	No consistent methodology for checking pressure
Compliance with "Australian Drinking Water Guidelines 2004" issued by the National Health and Medical Research Council (NHMRC) and ARMCANZ	Water is suitable for drinking	100% compliance	In 2015/16, 100% of samples achieved microbiological compliance. For chemical compliance 100% of samples achieved compliance for fluoride, while other elements were fully compliant

13. Plan Improvements

The Asset Improvement Plan is intended to provide improvements in the knowledge of our assets and their management. This plan will ensure that acceptable progress is made on improving asset management processes and procedures and that progress can be verified and quantified.

In addition to the Asset Management Strategy improvements, the following improvements of Water and Sewer assets are managed and planned for the next 10 years

Projected Capital Renewal Works Program - Water AMS 2017_S2_V1

(\$000)

Year	Item	Description	Estimate
2017		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Stage 1 2016/17 - Switchboard & SCADA to Water Treatment Plant	\$850
	4	New flouridation Plant (100% grant)	145
	5	Pumps & Others	\$84
		Stage 1a - 700 ML Storage 1a (32%) to Nyngan	\$2043
2017		Total	\$1,841

2018		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Stage 1 2016/17 - Switchboard & SCADA to Water Treatment Plant	\$50
	4	Stage 2 2017/18 - Automation of valves (75% renewal)	\$300
	5	New Liquid Alum system	\$100
	6	Replacement Hypochloride system	\$100
	7	Sludge rake replacement	\$100
	8	Pumps and Others	\$20
	9	Stage 1a - 700 ML Storage 1a (32%) to Nyngan	\$7869
2018		Total	\$3,336

(\$000)

Year	Item	Description	Estimate
2019		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Stage 2 2017/18 - Automation of valves (75% renewal)	\$100
	4	New Liquid Alum system	\$75
	5	Replacement Hypochloride system	\$100
	6	Sludge rake replacement	\$100
	7	Treated Water Pump and Other pumps	\$170
2019		Total	\$815
2020		Network Renewals	Estimate
	1	Mains	\$80
	2	APC Channel	\$180
	3	Filter Optimisation (anticipated grant) a Village pumps & Others	\$230
2020		Total	\$490

Water and Sewer Asset Management Plan

(\$000)

Year	Item	Description	Estimate
2021		Network Renewals	
	1	Mains	\$80
	2	APC Channel	\$180
	3	Filter Optimisation (anticipated grant) a Village pumps & Others & Others	\$30
2021		Total	\$290

2022		Network Renewals	
	1	Mains	\$50
	2	APC Channel	\$180
	3	Pumps & Others	\$30
2022		Total	\$260

(\$000)

Year	Item	Description	Estimate
2023		Network Renewals	
	1	Mains	\$40
	2	APC Channel	\$150
	3	Pumps & Others	\$30
2023		Total	\$220

2024		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$135
	3	Pumps & Others	\$30
2024		Total	\$190

(\$000)

Year	Item	Description	Estimate
2025		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$130
	3	Pumps & Others	\$30
2025		Total	\$185

2026		Network Renewals	
	1	Mains	\$25
	2	APC Channel	\$130
	3	Pumps & Others	\$130
2026		Total	\$285

Water and Sewer Asset Management Plan

Pipe replacement program in next 10 years

Material	Construction Year	From Node	To Node	Description	Quantity	Size	Units	CRC in2016
AC	1940	J14	J15	Bogan Street Hoskin St Dalton St	310	100	mm	\$63,275
AC	1966	J8	J252	Bogan Street Bogan st Lerkin oval	80	100	mm	\$67,493
AC	1900	J33	J34	Bogan Lane Dandaloo St Derrybong St	220	100	mm	\$66,790
AC	1940	J66	J67	Cannonba Lane Mudal St Moonagee St	220	100	mm	\$21,527
AC	1940	J51	J52	Cannonba Street Derrybong St Hoskin St	250	100	mm	\$84,366
AC	1940	J59	J58	Cannonba Street Derrybong St Hoskin St	230	100	mm	\$57,650
AC	1940	J62	J64	Cannonba Street Terrangiaon St Mudal St	220	100	mm	\$38,183
AC	1940	J63	J65	Cannonba Street Terrangiaon St Mudal St	220	100	mm	\$133,017
AC	1940	J68	J76	Cathundril Street Dandaloo St Terangion St	475	100	mm	\$22,498
AC	1940	J69	J70	Cathundril Street Dandaloo St Derrybong St	240	100	mm	\$28,825
AC	1940	J77	J78	Cathundril Street Terrangiaon St Mudal St	290	150	mm	\$226,437
AC	1940	J151	J153	Cobar Street Mudal St Nyngan St	520	100	mm	\$46,401
AC	1940	J9	J69	Dandaloo Street Bogan St Cathundril St	475	100	mm	\$84,017
AC	1940	J140	J169	Dandaloo Street Cobar St Pangee St	110	150	mm	\$23,402
AC	1940	J81	J226	Derrybong Street Oxlay St Minore St	1230	150	mm	\$3,515
AC	1940	J95	J207	Derrybong Street Nymagee St Hoskin St	115	100	mm	\$54,838
AC	1940	J58	J74	Hoskins Street Cannonba St Cathundril St	114	100	mm	\$18,279
AC	1940	J152	J220	Mudal Street Cobar St Nymagee St	375	150	mm	\$50,205
AC	1940	J191	J202	Nymagee Street J191 Moonagee St	800	150	mm	\$34,449
AC	1940	J159	J160	Pangee Lane Tabratong St Dandaloo St	245	150	mm	\$46,401
AC	1940	J161	J162	Pangee Lane Derrybong St Hoskin St	245	100	mm	\$75,929
AC	1940	J190	J220	Tabratong Street Nymagee St Wambiana St	140	150	mm	\$13,358
CI	1900	J88	J253	Tottenham Road Oxlay St J253	285	150	mm	\$41,097
AC	1940	J220	J215	Wambiana Street Tabratong St Derrybong St	465	100	mm	\$45,500
AC	1940	J205	J206	Wambiana Street Tabratong St Derrybong St	470	100	mm	\$45,990
CI	1900	J44	J45	Warren Street J44 Mudal St	60	75	mm	\$4,944

Water and Sewer Asset Management Plan

Projected Capital Renewal Works Program - Sewer AMS 2017_S2_V1

(\$000)

Year	Item	Description	Estimate
2017		Network Renewals	
	1	Sewer Main Renewal	\$30
	2	Pump stations	\$80
	3	STP Improvement	\$117
2017		Total	\$227

2018		Network Renewals	
	1	Pump stations	\$25
	2	STP Improvement	\$350
2018		Total	\$375

(\$000)

Year	Item	Description	Estimate
2019		Network Renewals	
	1	STP Improvement	\$250
2019		Total	\$250

2020		Network Renewals	Estimate
	1	Pump stations	\$25
	2	SCADA System	\$100
2020		Total	\$125

(\$000)

Year	Item	Description	Estimate
2021		Network Renewals	
	1	Sewer Main Renewal	
	2	Pump stations	
	3	SCADA System	
	4	STP Improvement	
2021		Total	\$0

2022		Network Renewals	
	1	Sewer Main Renewal	\$200
	2	Pump stations	\$25
2022		Total	\$225

(\$000)

Year	Item	Description	Estimate
2023		Network Renewals	
	1	Sewer Main Renewal	
	2	Pump stations	
	3	SCADA System	
	4	STP Improvement	
2023		Total	\$0

Water and Sewer Asset Management Plan

2024		Network Renewals	
	1	Pump stations	\$25
2024		Total	\$25

(\$000)

Year	Item	Description	Estimate
2025		Network Renewals	
	1	Sewer Main Renewal	
	2	Pump stations	
	3	SCADA System	
	4	STP Improvement	
2025		Total	\$0

2026		Network Renewals	
	1	Pump stations	\$25
2026		Total	\$25

14. Risk Management Plan

Council is committed to assessing risks associated with hazards and mitigating assessed risks where practicable.

Delivering services through infrastructure is broad, complex and involves significant capital outlays. Managing risks is a key element in the management of infrastructure assets, particularly in the balance of desired/required levels of service and available funding. Capital projects could lead to significant financial losses unless they are managed carefully. Such projects often involve unbalanced cash flows, when large initial investments are necessary before any returns are obtained.

For assets with potentially long lives, risks associated with changing economic conditions, varying levels of demand for services, new competition and maintenance and disposal requirements needs to be analysed and managed to ensure the investment is worthwhile. These impact of these risks should be tested through the financial planning process.

Size is not the only consideration. Projects or programs, which are inherently complex will also benefit from particular attention to Risk Management. This might occur when there are important economic or financial aspects, sensitive environmental or safety issues, or complex regulatory and licensing requirements.

Risk Management will be considered in the development of individual Asset Management Plans. Systematic management of risk is a large task requiring a continuous improvement approach. Most service areas are managing operational risk and our challenge is to manage all risks through a consistent framework of infrastructure asset management plans and risk management plans. From this Plan the following key Risks have been identified:

Table 14.1 Critical Risks and Treatment Plans

Asset at Risk	What can Happen	Risk Treatment Plan
Chlorination plant failure	Death or serious injury	Council has plans to issue a boil water alert in conjunction with NSW Health should this occur
Water treatment works failure	Death or serious injury	Council has plans to impose water restrictions should this occur
Contamination of the water supply distribution system	Death or serious injury	Council has plans to issue boil water alerts and undertake flushing
Reservoir contamination	Death or serious injury	Council has plans to drain the contaminated reservoir and refill them
Major power failure	Loss of production	Council has plans to impose water restrictions should this occur

Service or Asset at Risk	What can happen?	Possible cause	Risk rating	Risk treatment plan	Associated Cost
Water Channel	Restricted flow	Damage by stock ,general usage, siphon losses, evaporation and vegetation build up	High	1. Increase the budget on Channel maintenance 2. Drought management plan (water restriction) 3.Convert into a pipe line	\$180,000 maintenance cost and Staff time. \$76M pipeline
Water Treatment Works	Mal functioning of Liquid alum and Hypo chloride systems	Existing systems are not compliance with industrial standards	High	Replacement of existing Hypo and liquid alum systems.	\$ 375,000 and staff time

Water and Sewer Asset Management Plan

Water Treatment Works	Aging of Water treatment and un alarmed operational system could lead for unplanned interruption and producing of poor quality water	Aged and out dated	High	Replacement of Switchboard Installation of clear SCADA system Automation of valves Sludge rake replacement Filter Optimisation (anticipated grant)	\$900,000 and staff time \$400,000 \$200,000 \$250,000
Water Pump Stations	Localized power failure, spare pump is inadequate in peak period.	To be upgraded	High	Upgrading of Treated Water Spare Pump Upgrading of Raw Water Spare Pump	\$200,000 \$150,000
Water Mains	Distribution /Supply main failure	Pipe age	High	Replacement program	\$565,000 and staff time over 10 years
Sewer Pump Stations	Localized pump failure	Pump age	High	1.Implementation of maintenance and replacement program	\$125,000 cost and Staff time
Sewer Mains	Minor main failure Tree root ingress	Solid deposition	High	Sewer main inspection and relining program.	\$ 200,000 and staff time
Sewer Treatment Plant	Functional failure due to high concentration of suspended solids.	Deposition of sediments.	High	De slugging	\$300,000

One of the outcomes of this assessment is the determination of **Critical Assets** Critical assets are specific assets which have a high consequence of failure but not necessarily a high likelihood of failure by identifying critical assets and critical failure modes, Council can appropriately target and refine inspection regimes, maintenance plans and capital expenditure plans.

Operations and maintenances activities may also be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc.

The identification of critical pipe assets is identified in table 5,1, reservoirs where there is a potential for failure to risk public safety or property have also been identified as critical, as has the Water Treatment Plant. Table 14.2 identifies the critical assets for the water network.

Table 14.2 Critical Assets

Water

Critical Assets	Critical Failure Mode	Treatment Plan
Water Treatment Plant	Civil, electrical or chemical failure	Scheduled maintenance and regular inspection regime to ensure that it is functioning as required
Raw and Treated Water Pumping stations	Failure of Raw and Treated Water Pumping	Scheduled maintenance and regular inspection regime to ensure that it is functioning as required
Reservoirs	Failure due to structural deterioration or contamination of water storage	Scheduled structural inspections and maintenance of vermin proofing including internal cleaning of the reservoirs.

Sewer

Critical Assets	Critical Failure Mode	Treatment Plan
Sewerage Pump Stations	Failure of Sewer pumping	Scheduled maintenance and regular inspection regime to ensure that it is functioning as required
Sewerage Treatment Works	Over flowing and functional failure	Scheduled maintenance and regular inspection regime to ensure that it is functioning as required De slugging

Water and Sewer Asset Management Plan

15. Appendix A: Budgeted Expenditures Accommodated in LTFP

LTFP - Water Supply

Year	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Income											
Grants	\$155	\$2,650	\$132	\$132	\$383	\$133	\$113	\$103	\$100	\$101	\$94
Develop Contributions	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fees & Charges	\$1,769	\$1,817	\$1,865	\$1,915	\$1,967	\$2,019	\$2,073	\$2,129	\$2,186	\$2,245	\$2,305
Other Income	\$577	\$77	\$77	\$77	\$77	\$77	\$77	\$77	\$77	\$77	\$77
Total Income	\$2,500	\$4,543	\$2,074	\$2,124	\$2,426	\$2,229	\$2,263	\$2,309	\$2,363	\$2,422	\$2,476
Renewals											
Mains	\$80	\$80	\$80	\$80	\$80	\$50	\$40	\$25	\$25	\$25	\$25
APC Channel	\$180	\$180	\$180	\$180	\$180	\$180	\$150	\$135	\$130	\$130	\$120
Treatment Plant	\$995	\$575	\$350	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bore3	\$84	\$30	\$180	\$230	\$30	\$30	\$30	\$30	\$30	\$130	\$30
Renewal	\$1,339	\$865	\$790	\$490	\$290	\$260	\$220	\$190	\$185	\$285	\$175
Maintenance											
Mains	\$46	\$46	\$46	\$46	\$46	\$46	\$46	\$46	\$46	\$46	\$46
APC Channel	\$153	\$153	\$153	\$153	\$153	\$153	\$153	\$153	\$153	\$153	\$153
Treatment Plant	\$131	\$131	\$131	\$131	\$131	\$131	\$131	\$131	\$131	\$131	\$131
Pumps & Others	\$293	\$293	\$293	\$293	\$293	\$293	\$293	\$293	\$293	\$293	\$293
Total	\$623	\$623	\$623	\$623	\$623	\$623	\$623	\$623	\$623	\$623	\$623
Operations											
Mains	\$59	\$59	\$59	\$59	\$59	\$59	\$59	\$59	\$59	\$59	\$59
APC Channel	\$585	\$585	\$585	\$585	\$585	\$585	\$585	\$585	\$585	\$585	\$585
Treatment Plant	\$33	\$33	\$33	\$33	\$33	\$33	\$33	\$33	\$33	\$33	\$33
Pumps & Others	\$997	\$997	\$997	\$997	\$997	\$997	\$997	\$997	\$997	\$997	\$997
Total	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674	\$1,674
Upgrade / Expansion											
Storage	\$736	\$2,593	\$25	\$0	\$250	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$736	\$2,593	\$25	\$0	\$250	\$0	\$0	\$0	\$0	\$0	\$0
Total Expenditure	\$4,372	\$5,755	\$3,112	\$2,787	\$2,837	\$2,557	\$2,517	\$2,487	\$2,482	\$2,582	\$2,472
Rolling Backlog	\$0	\$0	\$0	\$0	\$0	\$30	\$70	\$125	\$180	\$235	\$290

Water and Sewer Asset Management Plan

LTFP- Sewer

Year	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Income											
Grants	\$9	\$9	\$9	\$9	\$9	\$9	\$9	\$9	\$9	\$9	\$9
Develop Contributions	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fees & Charges	\$626	\$626	\$626	\$626	\$626	\$626	\$626	\$626	\$626	\$626	\$626
Other Income	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79	\$79
Total Income	\$714	\$714	\$714	\$714	\$714	\$714	\$714	\$714	\$714	\$714	\$714
Renewals											
Sewer Main Renewal	\$30	\$0	\$0	\$0	\$0	\$200	\$0	\$0	\$0	\$0	\$200
Pumpstations	\$80	\$25	\$0	\$25	\$0	\$25	\$0	\$25	\$0	\$25	\$0
SCADA System	\$0	\$0	\$0	\$100	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STP Improvement	\$117	\$350	\$250	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Renewal	\$227	\$375	\$250	\$125	\$0	\$225	\$0	\$25	\$0	\$25	\$200
Maintenance											
Mains	\$67	\$210	\$210	\$210	\$210	\$210	\$210	\$210	\$210	\$210	\$210
Pumping Stations	\$16	\$16	\$16	\$16	\$17	\$17	\$17	\$17	\$17	\$17	\$17
Treatment	\$10	\$10	\$10	\$10	\$10	\$10	\$11	\$11	\$11	\$11	\$11
Others with management expenses	\$117	\$118	\$119	\$120	\$121	\$122	\$123	\$125	\$126	\$127	\$128
Total Maintenance	\$210	\$354	\$356	\$357	\$358	\$360	\$361	\$362	\$364	\$365	\$366
Operations											
Mains	\$118	\$118	\$118	\$118	\$118	\$118	\$118	\$118	\$118	\$118	\$118
Pumping Stations	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13
Treatment	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5
Others with management expenses	\$274	\$274	\$274	\$274	\$274	\$274	\$274	\$274	\$274	\$274	\$274
Total Operations	\$410	\$410	\$410	\$410	\$410	\$410	\$410	\$410	\$410	\$410	\$410
Upgrade / Expansion											
Pump Stations	\$102	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
Total Upgrade/Exp	\$102	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
Total Expenditure	\$949	\$1,189	\$1,066	\$942	\$818	\$1,045	\$821	\$847	\$824	\$850	\$1,026
Rolling Backlog	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

