ASSET MANAGEMENT PLAN

Manganese removal plant, July 2015

Version 2.0
Adopted February 2016
<table>
<thead>
<tr>
<th>Rev No</th>
<th>Date</th>
<th>Revision Details</th>
<th>Author</th>
<th>Reviewer</th>
<th>Approver</th>
</tr>
</thead>
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<td>1.0</td>
<td>Jan 2009</td>
<td>Creation of Draft Plan</td>
<td>GF</td>
<td>PB</td>
<td>DP</td>
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<td>8 Dec 2010</td>
<td>Adoption by Council</td>
<td>GF</td>
<td>PB</td>
<td>DP</td>
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<tr>
<td>2.0</td>
<td>February 2016</td>
<td>Full Revision</td>
<td>BDO</td>
<td>PB/RD</td>
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</table>

GF: Greg Fraser  Asset Engineer - 2010
BDO: Ben O’Regan  Asset Engineer 2010 -
PB: Peter Benson  Administration Engineer
RD: Russell Deans  Manager Water and Waste
DP: Doug Patterson  Director Engineering Services

Document ID: f:\assets\adopted asset management plans\water revised amp_2015_v2.docx
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ASSET MANAGEMENT PLAN – Filtered Water Reticulation Network  
February 2016, Ver.2.0
1. EXECUTIVE SUMMARY

What Council Provides
Council owns and maintains a filtered water reticulation network to ensure all users have access to water that is within regulatory guidelines at all times for drinking and other household and business uses. Further to this is the requirement to provide a network that is compliant for firefighting purposes.

The network\(^1\) consists of:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Replacement $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dams</td>
<td>104,603,017</td>
</tr>
<tr>
<td>River Weir</td>
<td>32,123,648</td>
</tr>
<tr>
<td>Filtration Plant</td>
<td>8,507,363</td>
</tr>
<tr>
<td>Buildings/ Structures</td>
<td>3,002,653</td>
</tr>
<tr>
<td>Pump Station</td>
<td>23,963,499</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>117,758,354</td>
</tr>
<tr>
<td>Pipes over 450km</td>
<td>23,963,499</td>
</tr>
<tr>
<td>Hydrants over 2900</td>
<td></td>
</tr>
<tr>
<td>Valves over 2950</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>290,185,699</td>
</tr>
</tbody>
</table>

* The value of these items is included in the value of the pipes they are fitted to.

What does it Cost?
There are two key indicators of cost to provide the Drinking Water Reticulation Network service.
- The life cycle cost being the average cost over the life cycle of the asset, and
- The total maintenance and capital renewal expenditure required to deliver existing service levels in the next 10 years covered by Council’s long term financial plan.

The life cycle cost to provide the Water reticulation network is estimated at $8.881m per annum. Council’s planned life cycle expenditure for year 1 of the asset management plan is $7.009m which gives a life cycle sustainability index of 0.79\(^3\).

The total maintenance expenditure budgeted to provide the Water Supply network in the next 10 years is estimated at $68.182m. This is an average of $6.818m per annum; giving a 10 year sustainability index of 0.77\(^3\).

Plans for the Future
Council plans to operate and maintain the Water Supply Network to achieve the following strategic objectives:
1. Ensure assets are maintained to a safe and functional standard as set out in this AM Plan
2. Ensure that future expansion of the Water Supply Network is planned to appropriately cater for growth predictions for the LGA
3. Maximise an asset’s economic life while minimising lifecycle expenditure
4. Maintain a high level of community satisfaction in the portfolio
5. Achieve compliance with the NSW Local Water Utility Best Practice Guidelines and other regulatory requirements.

Measuring our Performance
Quality
Water Supply Network assets will be maintained in a reasonably usable condition. Defects found or reported that are outside our service standard will be repaired. See the maintenance response service levels for details of defect prioritisation and response time.

Function
Our intent is that Water Supply Network assets are maintained in partnership with other levels of Government and stakeholders to ensure the uninterrupted supply of drinking water, community satisfaction is maintained and that safety is not compromised.

Safety
Reported defects are recorded on the Customer Request Maintenance System (CRMS) and sent to the appropriate manager for assessment. Repairs are carried out in accordance CRMS timeframes and available funding.

Water quality will be maintained within NSW DPI Water / Health Department Guidelines.

The Next Steps
The actions resulting from this asset management plan are:
- Work towards an advanced asset management plan for the Water Filtration Plant
- Undertake Condition assessments on the parts of the supply network where samples are available (eg mains repair locations)
- Improve the date of construction or replacement information held in the asset register
- Make use of available financial data to produce accurate input to future budgets

\(^1\) The detail of this plan only covers the piped reticulation network. A major component of the system is the Water Filtration Plant which due to its size and complexity is beyond the scope of this plan; and should be subject to a separate asset management plan. The filtration plant is included here for completeness of the valuation information.

\(^2\) See Section 6.1.1, Sustainability of service delivery

\(^3\) See Section 6.1.1, Sustainability of service delivery
2. INTRODUCTION

2.1 Background

This asset management plan is to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the desired levels of service.

The asset management plan is to be read with the following associated planning documents:

- Asset Management Policy 2013,
- Bathurst Regional Council Guidelines for Engineering Works 2011
- Bathurst Regional Council Bathurst Region Urban Strategy 2008
- Bathurst Regional Council Strategic Business Plan for Water Supply & Sewerage Services 2009/10 (DLM Environmental Consultants Pty Ltd 2010)
- NSW DPI Water Best Practice Management of Water Supply and Sewerage 2007 (NSW Government)

This asset management plan covers the following infrastructure assets:

<table>
<thead>
<tr>
<th>Feature Type</th>
<th>Measure</th>
<th>Replacement $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dams</td>
<td>2</td>
<td>104,603,017</td>
</tr>
<tr>
<td>River Weir</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Filtration Plant</td>
<td>1</td>
<td>32,123,648</td>
</tr>
<tr>
<td>Buildings/Structures</td>
<td>14</td>
<td>8,507,363</td>
</tr>
<tr>
<td>Pump Station</td>
<td>13</td>
<td>3,002,653</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>23</td>
<td>23,963,499</td>
</tr>
<tr>
<td>Pipes</td>
<td>449km</td>
<td>117,758,354</td>
</tr>
<tr>
<td>Flow Meters</td>
<td>8</td>
<td>*</td>
</tr>
<tr>
<td>Hydrants</td>
<td>over 2900</td>
<td>*</td>
</tr>
<tr>
<td>Valves</td>
<td>over 2950</td>
<td>*</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td><strong>290,185,699</strong></td>
</tr>
</tbody>
</table>

* The value of these items is included in the value of the pipes they are fitted to.

Key stakeholders in the preparation and implementation of this asset management plan are:

<table>
<thead>
<tr>
<th>Councillors</th>
<th>Formulate policy for the allocation of resources to maximise benefit to the community whilst minimising the Council’s exposure to risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Council</td>
<td>To manage the implementation of policy in a timely and cost effective manner. To ensure resources are effectively utilised</td>
</tr>
<tr>
<td>General Public</td>
<td>End users of the water product</td>
</tr>
<tr>
<td>Local Businesses and Industry</td>
<td>Many require water products for the operation of their business</td>
</tr>
<tr>
<td>Health care facilities</td>
<td>A clean and reliable water supply is essential to hospitals, clinics and home dialysis patients</td>
</tr>
</tbody>
</table>
2.2 **Goals and Objectives of Asset Management**

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

Council’s goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Taking a life cycle approach,
- Developing cost-effective management strategies for the long term,
- Providing a defined level of service and monitoring performance,
- Understanding and meeting the demands of growth through demand management and infrastructure investment,
- Managing risks associated with asset failures,
- Sustainable use of physical resources,
- Continuous improvement in asset management practices.⁴

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

Council’s vision:
From the Community Strategic Plan:
“A vibrant regional centre that enjoys a rural lifestyle, the Bathurst Region achieves health and well-being through strengthening economic opportunities, planning for sustainable growth, protecting and enhancing our assets, and encouraging a supportive and inclusive community. A Regional full of community spirit and shared prosperity.”

The Directions to achieve this vision come from the Community Strategic Plan and are detailed as the objectives within the CSP:

- Economic Prosperity
- Environmental Sustainability
- Liveable Communities
- Sound Leadership

Council’s mission
“The equitable development and maintenance of services provided for the general health and well-being of the citizens of the Bathurst Region and the adjustment of these services to meet changing needs.”

This plan sits within the plan cycle described by the Integrated Planning and Reporting framework (IP&R)⁵ as part of Council's Resourcing Strategy:

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⁴ IIMM 2006 Sec 1.1.3, p 1.3
Relevant Council Objectives and Directions identified in BRC Annual Report 2014-2015 and how these are addressed by Council’s implementation of this Asset Management Plan are:

Objective 6: To support infrastructure development necessary to enhance Bathurst’s lifestyle and industry development.
Objective 8: To promote sustainable and energy efficient growth.
Objective 12: To protect and enhance water quality and riparian ecology
Objective 15: To secure a sustainable water supply and raise awareness on water issues.
Objective 22: To improve community safety.
Objective 28: To plan for the growth of the region and the protection of the region’s environmental, economic, social and cultural assets.
Objective 29: To guide the construction and provision of new infrastructure/facilities and services and the management and upgrading of existing assets and service levels.
Objective 31: To maintain local public ownership of water and sewer assets.
Table 2.2. Council Goals and how these are addressed in this Plan

| Operate, maintain, repair and upgrade Water Filtration Plant. | Meet the Australian Drinking Water Standards 99% of the time. | Water Filtration Plant operations are ongoing, with maintenance and repairs conducted as required. The telemetry upgrade project is complete. Training has been carried out and maintenance period has commenced. |
| Provide compliance reports to NSW Health as required. | Samples taken, testing completed and reports provided. 208 per year. | |
| Operate, maintain, repair and upgrade water distribution system. | Water distribution system operations are ongoing, with monitoring, maintenance and repairs conducted as required. | |
| Respond effectively to discoloured water complaints within four hours. | Complaints regarding discoloured water are actioned within the required timeframe. Discoloured water calls for financial year 2014/2015 is 534. | |

2.3 Plan Framework

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

A road map for preparing an asset management plan is shown on the next page.

2.4 Core and Advanced Asset Management

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

Future revisions of this asset management plan will hope to incorporate a review of the benefits of an ‘advanced’ plan offset the investment in systems and processes to provide better value for Council6.

The criticality and complex nature of the Water Filtration Plant warrants development of a separate Asset Management Plan at least at the Core level.

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6 [See pp 14 NAMS PLUS3 Guidelines]: “Seeking advanced practice in all areas may not be the best solution for all organisations. It will depend on the scale and type of assets the organisation manages and the business context. Significant investment in systems, data and process is required to achieve advanced asset management.”
Road Map for preparing an Asset Management Plan
Source: IIMM Fig 1.5.1, p 1.11

CORPORATE PLANNING
Confirm strategic objectives and establish AM policies, strategies & goals.
Define responsibilities & ownership.
Decide core or advanced AM Pan.
Gain organisation commitment.

REVIEW/COLLATE ASSET INFORMATION
Existing information sources
Identify & describe assets.
Data collection
Condition assessments
Performance monitoring
Valuation Data

DEFINE SCOPE & STRUCTURE OF PLAN

IS THE PLAN AFFORDABLE?

CORPORATE PLANNING

AM PLAN REVIEW AND AUDIT

INFORMATION MANAGEMENT, and DATA IMPROVEMENT

IMPLEMENT IMPROVEMENT STRATEGY

LIFECYCLE MANAGEMENT STRATEGIES
Develop lifecycle strategies
Describe service delivery strategy
Risk management strategies
Demand forecasting and management
Optimised decision making (renewals, new works, disposals)
Optimise maintenance strategies

FINANCIAL FORECASTS
Lifecycle analysis
Financial forecast summary
Valuation Depreciation
Funding

IMPROVEMENT PLAN
Assess current/desired practices
Develop improvement plan

ANNUAL PLAN / BUSINESS PLAN

ITERATION
Reconsider service statements
Options for funding
Consult with Council
Consult with Community
3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

The 2012 Bathurst Regional Council Community Survey was conducted between 15 November 2012 and 1 February 2013. The survey aimed to gauge resident satisfaction with a range of Council provided services and facilities and to determine the importance of a variety of local issues. A total of 269 surveys were completed.

Respondents were asked to nominate their top five priorities from a list of fourteen options.
Also, respondents were provided with a list of the key infrastructure projects identified in the Bathurst 2036 Community Strategic Plan and were asked to nominate on a scale of 1 to 10, with 10 being the highest level of importance, how important each project was to them. The results are shown.

As can been seen below in Fig 3.1, respondents indicated that Water Networks were the 9th most important project area.

**Fig 3.1. Average level of importance of key infrastructure projects**

- **New/upgraded community buildings**: 7.3
- **Environmental restoration & sustainability**: 7.3
- **New footpath and cycle ways**: 7.2
- **Emergency Services Building**: 6.8
- **Upgrade of sewer networks**: 6.6
- **CBD car parking**: 6.6
- **Major playground provision/upgrade**: 6.6
- **New/Extended Library/Art Gallery complex**: 6.6
- **Water networks**: 6.5
- **Aust Centre for Science & Emerging...**: 6.4
- **Community Arts Centre**: 6.2
- **Museums development/expansion**: 6.2
- **Sporting facilities**: 6.1
- **Ring Road**: 6.0
- **Aerodrome upgrade**: 5.9
- **Archives collection storage facility**: 5.6
- **New Music Conservatorium building**: 5.3
- **Council Administration Building**: 5.2
- **Mount Panorama infrastructure**: 4.8

This asset management plan does not recommend performing wide spread public consultation on the management of the Council’s water supply network.
Council’s customer request system (CRMS) provides feedback on issues that customers are experiencing in their use of the water supply. The complaints cover aspects of the water supply associated primarily with the reticulation system.

**Fig 3.1.1 Customer Requests related to Water Network**

![Graph showing CRMS Requests by year from 2005 to 2015](image)

Figure 3.1.1 shows a relatively static trend in the number average number of complaints registered in Council’s Customer Request Management System (CRMS) per month from 2011 to 2015 with 2015 the lowest in the last five years.
3.2 Legislative Requirements

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

Table 3.2. Legislative Requirements

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Government Act 1993</td>
<td>Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery. Details Council’s role as custodian and trustee of public assets, and its associated responsibility to effectively account for and manage these assets.</td>
</tr>
<tr>
<td>Civil Liabilities Act 2002</td>
<td>Sets out the provisions that give protection from civil liability and the responsibilities of Council and public alike.</td>
</tr>
<tr>
<td>Environmental Planning and Assessment Act 1979</td>
<td>The proper management, development and conservation of natural resources, including agricultural land, natural areas, forests, minerals, water, the city, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.</td>
</tr>
<tr>
<td>Protection of the Environment Operations Act 1997</td>
<td>To protect, restore and enhance the quality of the environment having regard to the need to maintain ecologically sustainable development.</td>
</tr>
<tr>
<td>Water Management Act 2000</td>
<td>Legislates the sustainable and integrated management of water sources for NSW.</td>
</tr>
<tr>
<td>Public Health Act 1991 – Part 2B</td>
<td>Dictates the provision of safe drinking water.</td>
</tr>
<tr>
<td>Australian Drinking Water Guidelines 2004</td>
<td>Provides a minimum standard in many areas including formed Building design, signage, provision of hand rails, etc.</td>
</tr>
<tr>
<td>BRC Drought Contingency and Water Supply Emergency Management Plan</td>
<td>Outlines Council’s response to continued drought conditions and a drop in water supply to critical levels.</td>
</tr>
<tr>
<td>BRC Strategic Business Plan for Water Supply &amp; Sewerage Services 2009/10</td>
<td>Sets Council’s performance measurement criteria and the levels of service to the customer</td>
</tr>
<tr>
<td>Work Health &amp; Safety Act 2011</td>
<td>To secure and promote the health, safety and welfare of people at work.</td>
</tr>
</tbody>
</table>

3.3 Current Levels of Service

Council has defined service levels in two terms.

Community Levels of Service relate to how the community receives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance.

Supporting the community service levels are operational or technical measures of performance developed to ensure that the minimum community levels of service are met. These technical measures relate to service criteria such as:

Service Criteria | Technical measures may relate to
--- | ---
Quality | The cleanliness of the water supply – especially the presence /absence of manganese in the water supply
Quantity | Period or periods of time for which water supply pressure is not sufficient
Availability | Period or periods of time for which water supply or sufficient water supply is not available.
Safety | The levels of pathogenic organisms in the water supply

A general level of service statement covering target service levels provides a starting point for the development of specific service levels.
General Level of Service Statement for water reticulation network:

The water reticulation network will be maintained to a level that allows the reliable, safe delivery of water supply to those connected to the network in line with appropriate guidelines. This includes (but is not limited to) the management of:

- occupational health and safety issues,
- issues of general public safety and public liability,
- defects affecting short and long term structural integrity of the network,
- defects affecting the availability of supply to users.

Council’s current service levels are detailed in Table 3.3.

Table 3.3. Current Service Levels

<table>
<thead>
<tr>
<th>Key Performance Measure</th>
<th>Level of Service</th>
<th>Performance Measure Process</th>
<th>Performance Target</th>
<th>Current Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMUNITY LEVELS OF SERVICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Water supplied is clean</td>
<td>Number of complaints relating to water quality</td>
<td>&lt;300 pa</td>
<td>255 (2015)</td>
</tr>
<tr>
<td>Quality</td>
<td>Water is available</td>
<td>Period of time where the water service is unavailable</td>
<td>&lt;1 day per year to any one residence due to line maintenance</td>
<td>Unknown*</td>
</tr>
<tr>
<td>Quality</td>
<td>Customers receive 24 hours’ notice for planned service disruptions</td>
<td>Number of complaints relating to planned service interruptions</td>
<td>10 per interruption event</td>
<td>Unknown*</td>
</tr>
<tr>
<td>Safety</td>
<td>Bathurst water supply has sufficient volume for unrestricted supply</td>
<td>Level of water restrictions in effect</td>
<td>&lt; No restrictions in place</td>
<td>Level 1 restrictions in place for part of 2008, none since.</td>
</tr>
<tr>
<td>Quality</td>
<td>Water supply is fit to drink</td>
<td>Reported cases of water-borne illness</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Quality</td>
<td>Water supply is fit for washing purposes</td>
<td>Reported cases of reactions to water.</td>
<td>0</td>
<td>0 (2015)</td>
</tr>
<tr>
<td><strong>TECHNICAL LEVELS OF SERVICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Compliance with the Australian Drinking Water Guidelines</td>
<td>Independent testing of water</td>
<td>99% compliance with the guidelines</td>
<td>Unknown*</td>
</tr>
<tr>
<td>Quality</td>
<td>Reduction in manganese concentrations to below colouration levels</td>
<td>Testing of filtered water for manganese concentrations</td>
<td>&lt;0.01 mg/L</td>
<td>Typically &lt;0.1mg/L</td>
</tr>
<tr>
<td>Quantity</td>
<td>Filtered water supply pressure is sufficient for peak demands</td>
<td>Measurement of mains pressure</td>
<td>Pressure between 15m and 90m head of water whilst supplying 6l/min</td>
<td>Unknown*</td>
</tr>
<tr>
<td>TECHNICAL LEVELS OF SERVICE</td>
<td>Filtered water supply flow is sufficient for peak demands</td>
<td>Average peak flow to households</td>
<td>Peak instantaneous demand of 4kL/ET/day</td>
<td>Unknown*</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------</td>
<td>-------------------------------</td>
<td>----------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Availability</td>
<td>Length of time water restrictions are imposed</td>
<td>Time restrictions are in place</td>
<td>Restrictions in place &gt;5% of the time</td>
<td>Enforced restrictions have not been implemented in the past 8 years. t.</td>
</tr>
<tr>
<td>Safety</td>
<td>Water supply is clean</td>
<td>Compliance with the 2004 drinking water guidelines</td>
<td>100% compliance with the drinking water guidelines</td>
<td>Unknown*</td>
</tr>
</tbody>
</table>

* - Current performance measurement criteria listed as unknown are included as they are service level indicators in the Strategic Business Plan for Water and Sewerage, 1995. Although currently unknown, improved data collection will allow reporting on these criteria in the future.
4. FUTURE DEMAND

4.1 Demand Drivers

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

A hydraulic model of the water network has been constructed and calibrated to identify areas in the reticulation network where future development may place pressure demands on the existing system.

Demand factors influencing water supply management include population increase, the increasing use of irrigation of gardens and lawns in private dwellings, the increasing popularity of swimming pools in private dwellings and the increase in water saving initiatives such as water tank installation.

4.2 Demand Forecast

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

The major factor affecting demand on the Council’s infrastructure is population growth.

<table>
<thead>
<tr>
<th>Demand drivers</th>
<th>Present position (2011 census)</th>
<th>Projection</th>
<th>Impact on services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>38,519</td>
<td>51,482 (2031, CSP)</td>
<td>Increased population and area of development will lead to increasing demand on existing reticulation network infrastructure and demand for new infrastructure.</td>
</tr>
<tr>
<td>Demographic (% population over 65)</td>
<td>13.9%</td>
<td>17.5% (2031 forecast)</td>
<td>An aging population will lead to a change in ratepayers who qualify for concessions and therefore pay less for their connection and consumption</td>
</tr>
<tr>
<td>BASIX/Other Regulation Requirements</td>
<td>All new houses and renovations of houses over $50,000 are required to meet BASIX requirements</td>
<td>Future Regulations may impose stricter controls</td>
<td>Individual households will be required to meet water efficiency criteria, including installation of water tanks and meet additional criteria reducing the per capita demand on the network</td>
</tr>
<tr>
<td>Technological changes</td>
<td>Water efficient appliances are widely accepted as the norm</td>
<td>Increasingly efficient appliances</td>
<td>Reduced demand on network per connection.</td>
</tr>
<tr>
<td>Technological changes</td>
<td>Water efficient irrigation systems being installed</td>
<td>Landscaping plant selection, along with other water sensitive design criteria reducing network demand</td>
<td>Reduced demand on network per connection.</td>
</tr>
<tr>
<td>Growing awareness of environmental factors</td>
<td>Grey water re-use:</td>
<td>Increasing use of recycled water in domestic and commercial situations</td>
<td>Usage shifting from potable supply to locally recycled supply reducing demand on network.</td>
</tr>
</tbody>
</table>
4.3 Demand Management Plan

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

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

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

Table 4.3. Demand Management Plan Summary

<table>
<thead>
<tr>
<th>Service Activity</th>
<th>Demand Management Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic water use</td>
<td>Council initiatives to replace older style shower heads with 9L/minute units and to encourage the installation of other water efficient appliances.</td>
</tr>
<tr>
<td>Domestic water use</td>
<td>Unit pricing for water is increasing in line with the NSW state government recommendations to apply a more prohibitive user pays system. At least 75% of residential revenue generated through usage charges</td>
</tr>
<tr>
<td>Rain water collection</td>
<td>Subsidy system for the installation of rain water collection tanks. BASIX requirements dictate the installation of water tanks in new residential developments.</td>
</tr>
<tr>
<td>Outdoor domestic use</td>
<td>A system of watering termed the ‘Odds and Evens System’ limits the watering of domestic gardens on the water supply to watering on every second day.</td>
</tr>
</tbody>
</table>

---

8 IPWEA, 2011, IIMM, Table 3.4.1, p 358.
4.4 New Assets from Growth

The new assets required to meet growth will be acquired from land developments and constructed by Council. The new asset values are summarised in Fig 1. The assets covered in Fig 1. are the reticulation pipe lengths only. New valves, hydrants and fittings are required proportionally to the new length of network added. Other assets such as pump stations and reservoirs will be installed as necessary and are not considered.

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

Figure 4.4 outlines new network additions for the past 10 financial years. The total length of the assets added in this period is not necessarily typical for any 10 year period, but shows a reasonably steady trend.

Fig 4.4. New Assets from Growth past 10 financial years (by length)
5. LIFECYCLE MANAGEMENT PLAN

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

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this asset management plan are shown below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dams</td>
<td>2</td>
</tr>
<tr>
<td>River Weir</td>
<td>1</td>
</tr>
<tr>
<td>Filtration Plant</td>
<td>1</td>
</tr>
<tr>
<td>Buildings/ Structures</td>
<td>14</td>
</tr>
<tr>
<td>Pump Station</td>
<td>13</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>23</td>
</tr>
<tr>
<td>Pipes</td>
<td>450km</td>
</tr>
<tr>
<td>Flow Meters</td>
<td>8</td>
</tr>
<tr>
<td>Hydrants</td>
<td>over 2900</td>
</tr>
<tr>
<td>Valves</td>
<td>over 2950</td>
</tr>
</tbody>
</table>

The pipe network can be further broken down as:

<table>
<thead>
<tr>
<th>Material</th>
<th>Raw water reticulation (m)</th>
<th>Potable Reticulation (m)</th>
<th>Potable Trunk Main (m)</th>
<th>Grand Total (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos cement</td>
<td>8,777</td>
<td>126,678</td>
<td>35,594</td>
<td>171,050</td>
</tr>
<tr>
<td>Cast iron</td>
<td>14,405</td>
<td>34,753</td>
<td>5,369</td>
<td>54,527</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>4,879</td>
<td>149,423</td>
<td>31,033</td>
<td>185,335</td>
</tr>
<tr>
<td>Plastic</td>
<td>21,267</td>
<td>17,383</td>
<td></td>
<td>38,650</td>
</tr>
<tr>
<td>Steel</td>
<td>50</td>
<td>281</td>
<td>330</td>
<td></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>49,378</strong></td>
<td><strong>328,237</strong></td>
<td><strong>72,277</strong></td>
<td><strong>449,892</strong></td>
</tr>
</tbody>
</table>

There are a number of service issues with the water supply system in its current state.

**System age and reliability**

The network of water reticulation pipes dates back to 1886 when Bathurst became the first NSW inland town to commission a water supply system. There are areas within town that are still serviced by the original lead jointed cast iron pipes.

The current network is a mixture of old cast iron and asbestos cement pipes and more modern ductile iron (often lined with concrete) and new plastic type pipes. As breakages occur in the network’s older pipes they are replaced with modern equivalents.

New pipes laid for new subdivisions and developments will be of cement lined ductile iron or uPVC pipe as per the Engineering guidelines. Council has no reliable way of predicting breakages in the network, however the Council’s Water section map main breakages to identify areas of compromised pipe network.
Discoloured water

The Bathurst Water Filtration Plant has a capacity of 60 ML/day and draws its raw water from the Macquarie River, which is fed from Chifley Dam via the Campbell River and the Fish River. The soil in the catchments above the Bathurst Water Filtration Plant is naturally rich in manganese.

Manganese exists naturally in some soils and enters into ground water or is washed down to surface water reservoirs. If not oxidised, manganese (II) ions will escape through water treatment processes into the supply system. Once in the system, the ion is gradually oxidised to insoluble manganic dioxide. Ground water in the Bathurst region is naturally high in dissolved manganese. Some ground water inevitably ends up in the raw water supply to the water filtration plant.

During times of lower water usage the manganese is deposited on pipe walls in a biofilm. Disturbances to flow from higher usage (eg warm weather periods in summer) or a main break cause the deposited manganese to be washed off the pipe wall. This results in discoloured water that can range from weak tea coloured to strong coffee coloured.

The basic filtration process at the Bathurst Water Filtration Plant comprises pre-dosing of potassium permanganate, powdered activated carbon (if required to manage taste and odour issues), soda ash, alum and polymer to the raw water, chemical coagulation, flocculation, sedimentation, gravity sand filtration, chlorination disinfection, post soda ash dosing for pH control and fluoridation for dental health.

Due to the site constraints of the current plant, the manganese oxidation process via dosing of potassium permanganate (first trialled in 2001) has not been entirely successful due to the lack of sufficient reaction time and the absence of a high pH environment for the potassium permanganate to react. There is also an inherent problem associated with the use of potassium permanganate. As the manganese content in the raw water varies, the plant operator has to manually adjust the potassium permanganate dose rate correspondingly. During any underdosing periods, manganese remaining in the water would have been transferred to the reticulation network. Any overdosing incidents would result in the supply of ‘pink water’ to consumers. Pre-dosing the raw water with another chemical such as chlorine to oxidise the manganese is not suitable due to the likely formation of chlorination by-products, known as trihalomethanes, which are known to be carcinogenic when present in high levels in water for human consumption.

Council commissioned a report into further treatment options for manganese and iron removal in May 2009.

At the Bathurst Water Filtration Plant, Bathurst Regional Council and NSW Public Works trialled an innovative method to oxidise the manganese by chlorination of the settled water. The trial sought to capture the insoluble manganese oxides formed and deposited on the filter sand surface media and then be removed by filter backwashing. The chlorination by-product generated from this process will be minimal as most of the natural organic matters in the raw water would have been removed from the water by alum coagulation and settled in the sedimentation tanks. The trial was undertaken in two stages.

For Stage 1, Bathurst Regional Council hired two 100 mm diameter perspex filter columns and the associated chemical dosing equipment to conduct a trial on equipment replicating the function of the Water Filtration Plant between September 2011 and December 2011.

Following the success of the Stage 1 Trial, Bathurst Regional Council decided to conduct the confirmative Stage 2 Trial with one of the existing 14 full size open gravity filters as a test filter and another as a control filter. The 11 weeks trial took place between March 2012 and May 2012.

Following the success of this trial, a major retrofitting of the Plant was undertaken during 2015 to include new dosing technology and associated infrastructure and this was successfully commissioned in October 2015.

Further work to rid the residual manganese deposits from the reticulation network is ongoing. In early 2016 by a systematic program of reservoir cleaning, mains flushing and ‘ice pigging’ where an ice slush is forced along selected pipelines, captured (along with the disturbed material from the pipeline) and removed was undertaken. This will be undertaken again in the future as it has proven successful in minimising the number of customer enquiries regarding discoloured water.
NOTE

- There is no definitive register of the age of assets owned by Council. The data contained in figure 5.1.1 is a combination of actual dates where known and estimations where exact construction dates are unknown.
- Approximately 60% of the network age has been estimated by using the date of registration of deposited plans.

This analysis is beyond the scope of this AM Plan at a ‘Core’ level and current levels of resourcing would not allow development to an “Advanced” AM Plan level of detail.

### 5.1.2 Asset capacity and performance

Council’s services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

#### Table 5.1.2. Known Service Performance Deficiencies

<table>
<thead>
<tr>
<th>Location</th>
<th>Service Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas above 708.00mAHD</td>
<td>The current reticulation supply cannot adequately supply water to customers above the 708.00m contour in Kelso.</td>
</tr>
</tbody>
</table>
5.1.3 Asset condition

The condition profile of the sub-surface parts of the sewer network is difficult to ascertain. In lieu of condition information the age of the pipe network (see table below) will be used to estimate the condition.

*Fig 5.1.3. Asset Condition Profile*

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Life left (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100-90</td>
</tr>
<tr>
<td>2</td>
<td>80-70</td>
</tr>
<tr>
<td>3</td>
<td>60-40</td>
</tr>
<tr>
<td>4</td>
<td>30-10</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Condition rating will be measured using a 1 – 5 rating system as broadly outlined below. This will be on the overall condition of the item and not of any individual components.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description of Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excellent condition: Sound condition, well maintained, no defects.</td>
</tr>
<tr>
<td>2</td>
<td>Good: Minor deterioration.</td>
</tr>
<tr>
<td>3</td>
<td>Fair: Functionally sound, deterioration beginning to impact on asset integrity.</td>
</tr>
<tr>
<td>4</td>
<td>Poor: Significant defects, marked deterioration.</td>
</tr>
<tr>
<td>5</td>
<td>Bad: Near failure.</td>
</tr>
</tbody>
</table>

The condition ratings and data used above are the same used in Council’s Special Schedule 7 in the Annual Financial Statements. Any report is only as good as the data that feeds it and there is a need to improve the flow of information from work crews to the asset system to allow updating some of the age data for Pump Stations and the Filtration Plant.
### 5.1.4 Asset valuations

The value of assets as at 30 June 2015 covered by this asset management plan is summarised below.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Replacement Value</th>
<th>Depreciated Replacement Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam</td>
<td>104,603,017.85</td>
<td>66,856,248.07</td>
</tr>
<tr>
<td>Pipes</td>
<td>117,846,391.61</td>
<td>61,168,413.34</td>
</tr>
<tr>
<td>Pump Station</td>
<td>3,002,653.27</td>
<td>789,566.93</td>
</tr>
<tr>
<td>Reservoirs</td>
<td>23,963,499.04</td>
<td>12,225,689.18</td>
</tr>
<tr>
<td>Treatment</td>
<td>32,123,648.75</td>
<td>11,206,331.57</td>
</tr>
<tr>
<td>Valves</td>
<td>179,866.22</td>
<td>175,119.46</td>
</tr>
<tr>
<td>Water Meter</td>
<td>47,296.70</td>
<td>40,973.70</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>281,766,373.44</strong></td>
<td><strong>152,462,342.25</strong></td>
</tr>
</tbody>
</table>

Annual Depreciation Expense: $3.483\,\text{m}^9
5.2 Risk Management Plan

An assessment of risks associated with service delivery from infrastructure assets has identified critical risks to Council. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

Critical risks, being those assessed as ‘Very High’ - requiring immediate corrective action and ‘High’ – requiring prioritised corrective action identified in the infrastructure risk management plan are summarised in Table 5.2.

Table 5.2. Critical Risks and Treatment Plans

<table>
<thead>
<tr>
<th>Asset Risk</th>
<th>What can Happen</th>
<th>Risk Rating</th>
<th>Risk Treatment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main break</td>
<td>Aging infrastructure is susceptible to pressure fluctuations. Breakages can</td>
<td>VERY HIGH</td>
<td>Council maintains a 24 hour water maintenance crew to minimise the time required</td>
</tr>
<tr>
<td></td>
<td>cause interruption to critical supply</td>
<td></td>
<td>to fix critical water network problems</td>
</tr>
<tr>
<td>Main break</td>
<td>Damaged caused by nearby excavations can cause interruption to critical supply</td>
<td>VERY HIGH</td>
<td>Where possible excavation works are only performed with prior clearance from the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Council. Major excavation works will be carried out with guidance of a Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>officer.</td>
</tr>
<tr>
<td>Low hydrant</td>
<td>At certain times throughout the day the minimum required hydrant pressure</td>
<td>HIGH</td>
<td>Council has commissioned a comprehensive study to identify areas within the water</td>
</tr>
<tr>
<td>pressure</td>
<td>may not be available in certain areas</td>
<td></td>
<td>supply network that may not be apply to supply minimum hydrant pressures.</td>
</tr>
<tr>
<td>Very low</td>
<td>Sediment, particularly manganese dioxide can become suspended due to</td>
<td>VERY HIGH</td>
<td>Council maintains a 24 hour water maintenance crew to minimise the time required</td>
</tr>
<tr>
<td>quality water</td>
<td>turbulence and can reduce quality to a level that is not safe for consumption</td>
<td></td>
<td>to fix critical water network problems. Clean water can be delivered in the form of</td>
</tr>
<tr>
<td>supply</td>
<td></td>
<td></td>
<td>20l plastic containers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.3 **Routine Maintenance Plan**

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

5.3.1 **Maintenance plan**

Maintenance includes reactive, planned and cyclic maintenance work activities.

**Reactive maintenance** is unplanned repair work carried out in response to service requests and management/supervisory directions. Reactive water supply network maintenance consists primarily of:

- Repair to water main breaks
- Flushing of mains to reduce manganese sediments
- Repairs to water meters
- Any emergency repairs to infrastructure other than the pipe network.

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

- Regular inspection and servicing of water supply pumps
- Regular inspection and maintenance of hydrants

**Cyclic maintenance** is repetitive maintenance performed without specific programming. This can include:

- Painting of some buildings
- Painting of the water reservoirs
- Cleaning of pump stations
- Maintenance of emergency equipment

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

5.3.2 **Standards and specifications**

Maintenance will be carried out in accordance with the following Standards and Specification:

- Building Codes of Australia where appropriate and to the satisfaction of the Council’s Building Maintenance Supervisor in areas not covered by the building codes
- NSW Code of Practice for Plumbing and Drainage 3rd Edition 2006
- Bathurst Regional Council 2011 *Guidelines for engineering works*, Bathurst Regional Council

5.3.3 **Summary of future maintenance expenditures**

The average minimum expenditure on maintenance required will be current expenditure plus inflation variations. However with additional assets to maintain added over time this will not be sufficient.

Future maintenance expenditure is forecast to trend in line with the value of the current asset stock as shown in Fig 6. Note that all costs are shown in current 2016 dollar values.
5.3.4 Summary of future maintenance expenditures

Future maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Fig 5.3.4.

**Fig 5.3.4 Planned Maintenance Expenditure**

Deferred maintenance, i.e. works that are identified for maintenance and unable to be funded are to be included in the risk assessment process in the infrastructure risk management plan.
5.4 Renewal/Replacement Plan

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. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

5.4.1 Renewal plan

Council does not currently have a long term renewal plan for water reticulation assets. To improve the decision making process and develop a comprehensive renewal program, more thorough data capture is required.

There is no specific long term plan or budgetary allocation for periodic renewal or replacement of assets. Rather, assets requiring renewal or replacement are identified during the compilation of the following year’s management plan.

Candidate proposals are inspected to verify accuracy of 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.

Table 5.4.1 outlines a basic scoring system that may be used in future to prioritise renewal candidate proposals.

Table 5.4.1 Renewal Priority Ranking Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition of asset</td>
<td>40%</td>
</tr>
<tr>
<td>Purpose of asset</td>
<td>20%</td>
</tr>
<tr>
<td>Population serviced by asset</td>
<td>20%</td>
</tr>
<tr>
<td>Projected capital cost</td>
<td>10%</td>
</tr>
<tr>
<td>Proximity to similar assets</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 replacement cost.

5.4.2 Renewal standards

- NSW Code of Practice for Plumbing and Drainage 3rd Edition 2006
- Bathurst Regional Council 2011 Guidelines for engineering works, Bathurst Regional Council
5.4.3 Summary of future renewal expenditure

Fig 5.4.3. Projected Capital Renewal Expenditure

![Projected Capital Renewal Expenditure graph]

* Unrenewed items are still listed in the Asset Register and being past their ‘due for renewal’ date, sometimes referred to as Backlog.

5.5 Creation/Acquisition/Upgrade Plan

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

New water supply network assets are broadly added to the asset register in direct proportion to population growth, though often just ahead of the growth ‘curve’. This is due to the infrastructure needing to be in place for a new development area before new housing and other infrastructure is built.

Growth areas have been identified around Eglinton, Laffing Waters/Trinity Heights/Marsden Lane (subject to completion of a new reservoir to service above 708m AHD contour) and Wentworth Drive area.

5.5.1 Selection criteria

New water reticulation assets are constructed as new growth dictates. Reticulation system assets include pipes, valves, hydrants, meters and pump stations where required. When a required upgrade has been identified usual practice is to duplicate the service rather than replacing it. Upgrades to the water system are, therefore generally regarded as new assets.

Compliance with agreed levels of service will dictate much of the upgrade work required to the filtered reticulation network.

5.5.2 Standards and specifications

New work is carried out in accordance with the Bathurst Regional Council’s engineering guidelines and appropriate Australian Standards.
5.6 Disposal Plan

There are no current plans for asset disposal from the water supply network portfolio.

Council will dispose of an asset when it becomes uneconomical to maintain or replace. If pipes are left in the ground they are usually sealed at the connections and abandoned.
6. **FINANCIAL SUMMARY**

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

6.1 **Financial Statements and Projections**

The financial projections are shown in Fig 6.1 for planned operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets).

![Fig 6.1. Planned Operating and Capital Expenditure](image)

6.1.1 **Sustainability of service delivery**

There are two key indicators for financial sustainability that have been considered in the analysis of the services provided by this asset category, these being long term life cycle costs and medium term costs over the 10 year financial planning period.

**Long term - Life Cycle Cost**

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the longest asset life. Life cycle costs include maintenance and asset consumption (depreciation expense). The annual average life cycle cost for the services covered in this asset management plan is $8.881 million p.a.

Life cycle costs can be compared to life cycle expenditure to give an indicator of sustainability in service provision. Life cycle expenditure includes maintenance plus capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure at the start of the plan is $7.009 million.

A gap between life cycle costs and life cycle expenditure gives an indication as to whether present consumers are paying their share of the assets they are consuming each year. The purpose of this water...
The reticulation network asset management plan is to identify levels of service that the community needs and can afford and develop the necessary long term financial plans to provide the service in a sustainable manner.

**Medium term – 10 year financial planning period**

This asset management plan identifies the estimated maintenance and capital expenditures required to provide an agreed level of service to the community over a 10 year period for input into a 10 year financial plan and funding plan to provide the service in a sustainable manner.

This may be compared to existing or planned expenditures in the 10 year period to identify any gap. In a core asset management plan, a gap is generally due to increasing asset renewals.

Fig 6.1.1 shows the projected asset renewals in the 10 year planning period from the asset register. The projected asset renewals are compared to planned renewal expenditure in the capital works program and capital renewal expenditure in year 1 of the planning period as shown in Fig 6.1.1.

**Fig 6.1.1. Projected and Planned Renewals and Current Renewal Expenditure**

![Projected and Planned Renewals Graph](image)

Providing services in a sustainable manner will require matching of projected asset renewals to meet agreed service levels with planned capital works programs and available revenue.

A gap between projected asset renewals, planned asset renewals and funding indicates that further work is required to manage required service levels and funding to eliminate any funding gap.

Council’s long term financial plan covers the first 10 years of the 20 year planning period. The total maintenance and capital renewal expenditure projected over the 10 years is **$68.182 million**. This is an average expenditure of **$6.618 million p.a.** Estimated maintenance and capital renewal expenditure in year 1 is **$7.009 million**. The 10 year sustainability index is **0.77**.

A sustainability index of 1.0 means sufficient expenditure is budgeted to meet life cycle costs. Less than 1.0 predicts a life cycle cost funding gap.
The above analysis has excluded the unrenewed value of just over $20 million and only includes renewals due from now on. If the unrenewed assets were included, the projection becomes:

![Projected and Planned Renewals](chart)

### 6.2 Funding Strategy

Ideally Council would maintain the water filtered reticulation network at condition 1 or 2. Subterranean pipe networks are difficult and expensive to inspect. Any information on the pipe condition gained through inspection will not necessarily be definitive. The balance between providing a reliable service and ensuring that the network is funded and maintained to a level that provides long term service is the responsibility of the Council’s water engineers. The input from the water customers is minimal.

The council funds all work to the water reticulation service through water tariffs applied to all urban residential and industrial lots connected to the reticulation system. The structure of rates payable is reviewed each year and published in the annual management plan. The fee structure for water services is moving toward a system with the major component being the usage charge and a smaller flat fee for the provision of the service, based on the size of the service.

The current levels of funding are proving adequate in the short and medium term. An increase in the funds available for asset renewal in the long term should be considered.

### 6.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council.

The depreciated replacement cost (current replacement cost less accumulated depreciation) will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets.
6.4 **Key Assumptions made in Financial Forecasts**

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

Key assumptions made in this asset management plan are:

- Useful life and value of assets are calculated using the *2014 Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets* published by the Urban Water branch of the NSW DPI Water in 2015 as a revision of the previous 2003 publication. Updates on rate changes are published annually to keep valuations current, with the update issued in 2015 used for the valuations in this Asset Management Plan.

- Annualised CPI of 3.33% for the 2016/17 and beyond. Given the unpredictability in overall economic performance actual CPI may be significantly different from this figure.

- Depreciation is calculated on a straight line method.

- Revaluation of entire portfolio is every 5 years as directed by NSW Office of Local Government, with major components such as Dams and Treatment Plants valued by the NSW Department of Public works and other network assets using Reference Rates Manual (see above).

- Accuracy of future financial forecasts may be improved in future revisions of this asset management plan by the following actions.
  - Development of condition based depreciation method that satisfies accounting standards
  - Collection of condition data through an asset survey (technology for which is just becoming available)
7. ASSET MANAGEMENT PRACTICES

7.1 Accounting/Financial Systems
Council currently uses Civica Authority as the primary Corporate System Administrator. IT manager

Relevant accounting standards are:
- AAS 27 "Financial Reporting by Local Governments"
- AASB 136 Impairment of Assets
- AASB 1021 Depreciation of Non-Current Assets
- AASB 1041 Accounting for the reduction of Non-Current Assets
- AAS 1015 Accounting for acquisition of assets

7.2 Asset Management Systems
Council uses CONFIRM asset management software. The current version in use by BRC is 15.10b.AM.6106.
CONFIRM team:
Team leader: Administration Engineer
Administrator: Asset Engineer
Data entry: 2 x Asset Technicians
Field inspections: Asset Inspector

CONFIRM consists of:
- A comprehensive asset register;
- Condition rating option for appropriate assets;
- Data Management, with reporting procedure to present inventory and assessment information;
- Asset Accounting, AAS27 reporting capability and life cycle costing
- MapInfo GIS system linked to CONFIRM.

As a result of this plan it is intended to improve the Asset management system by:
- Undertaking a condition survey of the portfolio,
- Linking of Confirm to Financial Software to gain more accurate costs of works.

7.3 Information Flow Requirements and Processes
The key information flows into this asset management plan are:
- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of various factors affecting future demand for services;
- Correlations between maintenance and renewal, including decay models;
- Data on new assets acquired by council.

The key information flows from this asset management plan are:
- The assumed Works Program and trends;
- The resulting budget, valuation and depreciation projections;
- The useful life analysis.

These will impact the Long Term Financial Plan, Strategic Business Plan, annual budget and departmental business plans and budgets. The current communication between financial and asset systems is limited to manually entering the relevant data.
8. CONCLUSION

The provision of water service is one of Council’s Principal Activities. Council provides a water filtered reticulation network to the urban area. This also includes the villages of Raglan, Eglinton and Perthville.

The water supply network currently consists of 449.9km of pipes, over 2,900 valves, 2950 hydrants, 13 pump stations, and 23 reservoirs.

The Bathurst water supply dates back to 1886. There are possibly some original pipes still in use in the network, making them at least 130 years old. Approximately 27.1% of the pipe network has been assessed as in poor or bad condition, based on the age of the pipes.

The current replacement cost is $281.766 million. The annual depreciation expense is $3.483 million p.a. Assets were last revalued in line with DLG requirements as at 30 June 2012, with a valuation increment each financial year since.

The current maintenance budget is approximately $5.528 million p.a.

The budget for maintenance and repair is currently forecast by adding an additional amount due to CPI on the previous year’s budget. As the reticulation assets age and the network expands to meet the growth in areas of Bathurst, the expenditure required to meet maintenance needs will increase at a rate higher than the extra for CPI. If the current level of maintenance is not increased in line with the increasing maintenance requirements of the filtered reticulation network more supply interruptions and a generally lower level of service could be reasonably expected.

Long term and medium term sustainability indices are 0.79 and 0.77. Both numbers indicate insufficient renewal funding.

The current renewal budget for 2015/16 is $1.48 million.

The water reticulation network assets have varied useful lives. The Reference Rates manual gives a useful life of water pipes of 80 years. In reality the individual assets within the pipe network have different life expectancies dependant on the material of their construction, the pressure in the pipe and the ground the pipe is laid in. Although the final assessment on capital renewal of building assets will be based on the criteria in 5.4.1, asset age is still the best indicator available to predict the future expenditure required to replace building assets that have deteriorated to a point where it is no longer serviceable.

The information contained within the asset management plan sets a benchmark for the water filtered reticulation network at the close of the 2015 calendar year. By continuing to collect information on the condition of the network and closely monitoring the expenditure on maintenance and renewal of the network the performance of the Council’s filtered water reticulation strategies can be measured, reported on and improved in the future.
9. PLAN IMPROVEMENT AND MONITORING

9.1 Performance Measures

The asset management improvement plan generated from this asset management plan is shown in Table 8.2.

Table 7.2: Improvement Plan

<table>
<thead>
<tr>
<th>Task No</th>
<th>Task</th>
<th>Responsibility</th>
<th>Resources Required</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review plan Annually</td>
<td>Asset Engineer</td>
<td></td>
<td>January 2017</td>
</tr>
<tr>
<td>2</td>
<td>Development of business case based Capital Program</td>
<td>BRC</td>
<td></td>
<td>June 2015</td>
</tr>
<tr>
<td>3</td>
<td>Development of advanced asset management plan for Water Filtration Plant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Develop methodology for condition assessment for water pipe network</td>
<td>BRC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- The degree to which the required cashflows identified in this asset management plan are incorporated into council’s long term financial plan and Strategic Management Plan;
- The degree to which 1-5 year detailed works programs, budgets, business plans and organisational structures take into account the ‘global’ works program trends provided by the asset management plan;

9.2 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services as a result of the budget decision process.

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

10. REFERENCES

Bathurst Regional Council, ‘Asset Management Policy’ 2013,
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AAAC</td>
<td>Average annual asset consumption</td>
</tr>
<tr>
<td>AMP</td>
<td>Asset management plan</td>
</tr>
<tr>
<td>ARI</td>
<td>Average recurrence interval</td>
</tr>
<tr>
<td>BOD</td>
<td>Biochemical (biological) oxygen demand</td>
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<tr>
<td>CRC</td>
<td>Current replacement cost</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
</tr>
<tr>
<td>CWMS</td>
<td>Community wastewater management systems</td>
</tr>
<tr>
<td>DA</td>
<td>Depreciable amount</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
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<tr>
<td>EF</td>
<td>Earthworks/formation</td>
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<tr>
<td>IRMP</td>
<td>Infrastructure risk management plan</td>
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<tr>
<td>LCC</td>
<td>Life Cycle cost</td>
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<tr>
<td>LCE</td>
<td>Life cycle expenditure</td>
</tr>
<tr>
<td>MMS</td>
<td>Maintenance management system</td>
</tr>
<tr>
<td>PCI</td>
<td>Pavement condition index</td>
</tr>
<tr>
<td>RV</td>
<td>Residual value</td>
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<tr>
<td>SS</td>
<td>Suspended solids</td>
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<tr>
<td>vph</td>
<td>Vehicles per hour</td>
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</tbody>
</table>
Annual service cost (ASC)
An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operating, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

Asset class
Grouping of assets of a similar nature and use in an entity's operations (AASB 166.37).

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

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

Assets
Future economic benefits controlled by the entity as a result of past transactions or other past events (AASB 166.12). Property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than 12 month.

Average annual asset consumption (AAAC)*
The amount of a local government's asset base consumed during a year. This may be calculated by dividing the Depreciable Amount (DA) by the Useful Life and totalled for each and every asset OR by dividing the Fair Value (Depreciated Replacement Cost) by the Remaining Life and totalled for each and every asset in an asset category or class.

Brownfield asset values**
Asset (re)valuation values based on the cost to replace the asset including demolition and restoration costs.

Capital expansion expenditure
Expenditure that extends an existing asset, at the same standard as is currently enjoyed by residents, to a new group of users. It is discretionary expenditure, which increases future operating, and maintenance costs, because it increases council’s asset base, but may be associated with additional revenue from the new user group, eg. extending a drainage or formed Building network, the provision of an oval or park in a new suburb for new residents.

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

Capital funding
Funding to pay for capital expenditure.

Capital grants
Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.
potential) allowing for any differences in the quantity and quality of output and in operating costs.

**Current replacement cost “As New” (CRC)**

The current cost of replacing the original service potential of an existing asset, with a similar modern equivalent asset, i.e. the total cost of replacing an existing asset with an as NEW or similar asset expressed in current dollar values.

**Cyclic Maintenance**

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

**Depreciable amount**

The cost of an asset, or other amount substituted for its cost, less its residual value (AASB 116.6)

**Depreciated replacement cost (DRC)**

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

**Depreciation / amortisation**

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

**Economic life**

See useful life definition.

**Expenditure**

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

**Fair value**

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

**Greenfield asset values**

Asset (re)valuation values based on the cost to initially acquire the asset.

**Heritage asset**

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

**Impairment Loss**

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

**Infrastructure assets**

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

**Investment property**

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

(a) use in the production or supply of goods or services or for administrative purposes; or
(b) sale in the ordinary course of business (AASB 140.5)

**Level of service**

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

**Life Cycle Cost**

The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises annual maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

**Life Cycle Expenditure**

The Life Cycle Expenditure (LCE) is the actual or planned annual maintenance and capital renewal expenditure incurred in providing the service in a particular year. Life Cycle Expenditure may be compared to Life Cycle Cost to give an initial indicator of life cycle sustainability.

**Loans / borrowings**

Loans result in funds being received which are then repaid over a period of time with interest (an additional cost). Their primary benefit is in ‘spreading the burden’ of capital expenditure over time. Although loans enable works to be completed sooner, they are only ultimately cost effective where the capital works funded (generally renewals) result in operating and maintenance cost savings, which are greater than the cost of the loan (interest and charges).

**Maintenance and renewal gap**

Difference between estimated budgets and projected expenditures for maintenance and renewal of assets, totalled over a defined time (e.g. 5, 10 and 15 years).

**Maintenance and renewal sustainability index**

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

**Maintenance expenditure**

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset’s useful life.

**Materiality**

An item is material is its omission or misstatement could influence the economic decisions of users taken on the basis of the financial report. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances.

**Modern equivalent asset**

A structure similar to an existing structure and having the equivalent productive capacity, which could be built using modern materials, techniques and design. Replacement cost is the basis used to estimate the cost of constructing a modern equivalent asset.

**Non-revenue generating investments**

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, e.g. parks and playgrounds, footpaths, formed buildings and bridges, libraries, etc.
Operating expenditure
Recurrent expenditure, which is continuously required excluding maintenance and depreciation, e.g. power, fuel, staff, plant equipment, on-costs and overheads.

Pavement management system
A systematic process for measuring and predicting the condition of formed Building pavements and wearing surfaces over time and recommending corrective actions.

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

PMS Score
A measure of condition of a formed Building segment determined from a Pavement Management System.

Reactive maintenance
Unplanned repair work that carried out in response to service requests and management/supervisory directions.

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

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

Recurrent funding
Funding to pay for recurrent expenditure.

Rehabilitation
See capital renewal expenditure definition above.

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

Renewal
See capital renewal expenditure definition above.

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

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

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

Service potential
The capacity to provide goods and services in accordance with the entity's objectives, whether those objectives are the generation of net cash inflows or the provision of goods and services of a particular volume and quantity to the beneficiaries thereof.

Service potential remaining*
A measure of the remaining life of assets expressed as a percentage of economic life. It is also a measure of the percentage of the asset's potential to provide services that are still available for use in providing services (DRC/DA).

Strategic Management Plan (SA) **
Documents Council objectives for a specified period (3-5 yrs), the principle activities to achieve the objectives, the means by which that will be carried out, estimated income and expenditure, measures to assess performance and how rating policy relates to the Council's objectives and activities.

Sub-component
Smaller individual parts that make up a component part.

Useful life
Either:
(a) the period over which an asset is expected to be available for use by an entity, or
(b) the number of production or similar units expected to be obtained from the asset by the entity.

Value in Use
The present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate new cash flows, where if deprived of the asset its future economic benefits would be replaced.

Source: DVC 2006, Glossary

Additional glossary items shown **

ASSET MANAGEMENT PLAN – Filtered Water Reticulation Network
February 2016, Ver.2.0
APPENDIX

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