Document Control

Asset Management Plan

PART D – Water & Drainage

<table>
<thead>
<tr>
<th>Version No.</th>
<th>Date</th>
<th>Comment</th>
<th>By</th>
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<tr>
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1.0 EXECUTIVE SUMMARY

1.1 Purpose of the Plan

The aim of the Water & Drainage Asset Management Plan is to provide a framework to describe and review existing management practices relating to Council’s water and drainage infrastructure, and to form the basis of an improvement program to meet progressively identified deficiencies.

This Asset Management Plan has been produced in accordance with IIMM and industry best practice. It is noted that there are shortcomings to the existing asset registers that impact on graphs and tables throughout the plan. To assist this, improvement actions are identified throughout the report and will guide improvements to the data over the next 24 months. The plan will then be updated accordingly.

The Asset Management Plan outlines the key elements involved in managing the assets and combines management, financial, engineering and technical practices to ensure that the level of service required by user groups is provided at the lowest long term cost to the community within the limits of any fiscal constraints that may be imposed by Council.

1.2 What does it cost?

Moorabool Shire’s water and drainage asset stock has been valued at a gross replacement cost of $51.95M with these assets comprising of;

- Stormwater drainage – pipes, pits & end-walls, small culverts, water quality devices
- Flood Control – Retention/Detention systems
- Water supply - bores, standpipes, pipelines & irrigation
- Water Storage – dams and tanks
- Water Treatment - Septic Tanks & Water Treatment Systems

Table 1: Asset Quantities and 2014 Replacement Cost

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Asset Category</th>
<th>Asset Component</th>
<th>Asset Quantity</th>
<th>2014 Replacement Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm water Drainage</td>
<td></td>
<td>Pipes</td>
<td>4,550 number / 166KM</td>
<td>$32,712,215</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pits and End-walls</td>
<td>5,271 number</td>
<td>$10,878,441</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minor Culverts</td>
<td>2,540 number</td>
<td>$6,773,483</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Quality Devices</td>
<td>7</td>
<td>$54,242</td>
</tr>
<tr>
<td>Water Supply</td>
<td></td>
<td>Stand Pipes</td>
<td>2 number</td>
<td>$1,157,965</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bores</td>
<td>5 number</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pipelines &amp; Irrigation</td>
<td>14 irrigation systems</td>
<td></td>
</tr>
<tr>
<td>Water Storage</td>
<td></td>
<td>Dams</td>
<td>2 number</td>
<td>$228,550</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large Capacity Tanks (100KL+)</td>
<td>9 number</td>
<td></td>
</tr>
<tr>
<td>Water Treatment</td>
<td></td>
<td>Septic Tanks &amp; Water Treatment Systems</td>
<td>3 number</td>
<td>$154,243</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$51,959,139</strong></td>
</tr>
</tbody>
</table>
Stormwater drainage assets (pipes, pits, small culverts and water quality devices) constitute 96% of the asset values in this group.

The following Table lists the currently listed water and drainage assets controlled by Council in its registers along with 2014 Replacement Values.

**Assets specifically excluded from this plan are:**
- Pipes under driveways which provide access to private property only where the drainage is not a continuation of the existing drainage network) are the responsibility of the land owner.
- Drainage infrastructure within a property and to the point of connection to the Council drainage system including the connection itself (the responsibility of the land owner).
- Pits and pipes that drain only VicRoads roads, as defined in the Operational Responsibility for Public Roads Code of Practice (the responsibility of VicRoads).
- Table drains (not capitalised).
- Kerb and channel (addressed in the Road Asset Management Plan).
- Hydrants or fire plugs (assets of the respective Water Authorities, even though Council is responsible for their testing and maintenance and the maintenance of associated markers).

Section 6.3 shows graphs of predicted renewal funding needs from financial modelling for pits and pipes in the stormwater drainage group at this stage which make up the bulk of this asset group. Specifically the modelling covers the Retreatment Intervention Condition Level (RICL) renewal funding requirements for the retention of selected asset components for the next 20 years.

This prediction of funding needs does not include any allowance for renewals or upgrading as a consequence of premature failures due to poor construction techniques or where pipes are under-capacity due to growth placing more demand on pipe capacity than allowed for in the original design.

The Average Annual RICL Renewal demand over 20 years is $96,000/annum although this is only $28,000 over the first 10-years. In addition to this there may be issues where renewals are required to address failures or hydraulic deficiencies in advance of the expected useful life.

*Appendix 1* shows the predicted capital funding requirements with RICL renewal predictions as taken from the condition based modelling outlined in Section 6.2.

*Appendix 2* shows the predicted maintenance funding requirements, with funding for pits and pipes based on current funding levels.

**1.3 Asset Management Improvements**

It is intended that the Asset Management Plan be updated periodically to reflect changes to management of Council’s Infrastructure assets. It is to be a ‘living’ document that should always reflect as closely as practicable actual practices used in managing the various assets. Only in this way will Council be best able to ascertain the long term financial needs for these assets.
During the process of developing the Water & Drainage Asset Management Plan a number of key issues arose that require addressing. These are listed in Section 7.1 which forms the Asset Management Improvement Plan.
2.0 INTRODUCTION

1.1 Scope and Purpose of the Plan

This Asset Management Plan (Part D) forms a component of a suite of Asset Management Plans and describes the current management arrangements for Moorabool Shire’s Water & Drainage Assets.

- **PART A** • General Information (associated with managing all asset groups)
- **PART B** • Transport AMP
- **PART C** • Buildings, Facilities and Structures AMP
- **PART D** • Water and Drainage AMP
- **PART E** • Recreation and Open Space AMP

This plan (Part D) describes the current management arrangements for Moorabool Shire’s Water & Drainage assets.

This plan is to be read in conjunction with the following associated planning documents:

- Moorabool Shire Council’s Asset Management Plan (PART A General Information)
- Moorabool Shire Council’s Asset Management Policy
- Moorabool Shire Council’s Asset Management Strategy
- Moorabool Shire Council’s Strategic Financial Plan

2.1 Background

The function of the urban stormwater drainage system is to protect people, property and public health by safely and efficiently collecting, transporting and disposing of stormwater runoff.

In providing a stormwater system to the Shire, the Council aims to:

- achieve defined community levels of service
- protect the health and safety of the Community
- minimise adverse effects on the environment
- comply with legal requirements
- achieve defined technical levels of service
- achieve defined standards of system management

Role of Local Government in Stormwater Management

Councils do not have any statutory responsibility for floodplain management. However, councils play a significant role in managing the stormwater drainage system. Each council is
responsible for land-use planning and for drainage infrastructure in smaller local catchments within the municipal area.

Under the Local Government Act 1989, councils are required “to ensure that resources are used efficiently and effectively and services are provided in accordance with Best Value Principles to best meet the needs of the local community”. Councils are also responsible for “providing and maintaining community infrastructure”.

Under the Emergency Management Act 1986, councils must prepare a municipal emergency management plan and appoint a municipal emergency resource officer. Responsibility for the immediate response to a flooding emergency rests with the Victorian State Emergency Service, but councils coordinate recovery activities such as the clean-up of debris. When a more widespread “municipal emergency” is declared, the council municipal emergency resource officer, MERO, coordinates the immediate response.

Figure 1: Drainage Infrastructure within Ballan
Figure 2: Drainage Infrastructure within Bacchus Marsh
**Melbourne Water**

Melbourne Water is the regional drainage authority for the metropolitan area and is responsible for maintaining the major drainage system in stormwater catchments that cover an area exceeding 60 hectares. Melbourne Water is responsible for larger underground pipes, generally above a diameter of 1200 mm, and open channels, creeks and rivers. Its area extends to the Yarra Ranges in the east, the Mornington Peninsula and Western Port in the south, Yan Yean in the north and Werribee catchment to the west.

Moorabool Shire is within the Werribee Catchment. Melbourne Water cares for the following major waterways:

- Werribee River
- Korkuperrimul Creek
- Coimadai Creek
- Myrniong Creek
- Lerderderg River
- Parwan Creek

Melbourne Water manages local water and sewerage infrastructure as well as provide healthy waterways and flood protection.
2.1 Key Stakeholders

Stakeholders identified in this plan are the stakeholders that will be consulted when it comes to the time that the Shire will be seeking input in relation to determination of Community Level of Service.

Table 2: Key Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Role or Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Stakeholders</strong></td>
<td></td>
</tr>
<tr>
<td>Elected Council</td>
<td>Custodian of the asset, with Councillors representing the residents and setting strategic direction as per the Corporate &amp; Operational Plans.</td>
</tr>
<tr>
<td>Executive &amp; Operational Management Teams</td>
<td>To ensure that Asset Management policy and strategy is being implemented as adopted, and to ensure that long-term financial needs to sustain the assets for the services they deliver are advised to council for its strategic &amp; financial planning processes.</td>
</tr>
<tr>
<td>Managers of the water &amp; drainage and drainage easement/reserve assets</td>
<td>As the designated Strategic Custodian of property assets, responsible for the overall management of the assets from planning, design, maintenance, capital works and monitoring and updating the plan and ensuring its outcomes are realised to achieve the levels of service being required from utilisation of the assets;</td>
</tr>
<tr>
<td>Maintenance personnel (Internal)</td>
<td>To ensure provision of the required/agreed level of maintenance services for asset components;</td>
</tr>
<tr>
<td>Asset Management Group</td>
<td>To ensure AM planning meets requirements that optimise useful asset life and service provision.</td>
</tr>
<tr>
<td>Financial managers</td>
<td>To ensure that adequate financial information is provided to Council and to the relevant asset managers to facilitate sound management of the assets.</td>
</tr>
<tr>
<td>Information technology managers</td>
<td>To ensure that the relevant IT systems are functioning and that any data within the systems is secure and its integrity is not compromised.</td>
</tr>
<tr>
<td>Risk managers</td>
<td>To ensure that risk management practices are conducted as per Council policy and assist operations managers with advice on risk issues.</td>
</tr>
<tr>
<td>Internal auditors</td>
<td>To ensure that appropriate policy practices are carried out and to advise and assist on improvements.</td>
</tr>
<tr>
<td><strong>External Stakeholders</strong></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>Residents &amp; businesses using and adjoining the systems and who are impacted by them – eg overflows, causing environmental or safety hazards.</td>
</tr>
<tr>
<td>Maintenance personnel (External)</td>
<td>To ensure provision of the required/agreed level of maintenance services for asset components;</td>
</tr>
<tr>
<td>Catchment Management Authority</td>
<td>Responsible for management of water catchments</td>
</tr>
<tr>
<td>State &amp; Federal Government Departments</td>
<td>Periodic provision of advice, instruction and support funding to assist with management of the drainage network.</td>
</tr>
<tr>
<td>Council’s Insurer.</td>
<td>Insurance and risk management issues.</td>
</tr>
</tbody>
</table>
### 2.2 Legislation

Table 3: Legislation Relevant to Management of Water & Drainage Systems includes

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Government Act 1989</strong></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.</td>
</tr>
<tr>
<td><strong>Road Management Act 2004</strong></td>
<td>Relates to management of the drainage system where it lies within the Public Road Reserve.</td>
</tr>
<tr>
<td><strong>Water Act 1989</strong></td>
<td>Applies to the management of the use of water resources including conservation, protection and quality of discharges into waterways.</td>
</tr>
<tr>
<td><strong>Subdivision Act 1988 &amp; Subdivision Regulations (Procedures) 1989</strong></td>
<td>Applies to works for drainage to connect the subdivision to the system serving properties outside it.</td>
</tr>
<tr>
<td><strong>Building Act 1993, Building Regulations 2006 &amp; Plumbing Regulations 2008</strong></td>
<td>Provides for regulation of plumbing work and plumbing standards as it impacts discharge of water into the stormwater drainage system from private buildings.</td>
</tr>
<tr>
<td><strong>ResCode</strong></td>
<td>In relation to stormwater management, ResCode applies to the construction of new residential subdivisions to ensure environmentally sustainable residential development. This includes stormwater discharges from subdivisions development</td>
</tr>
<tr>
<td><strong>Environment Protection Act 1970</strong></td>
<td>Relates discharge, emission or deposit of any substance that may pollute any segment or element of the environment – in this instance, by its introduction into discharge waters of the stormwater drainage system</td>
</tr>
<tr>
<td><strong>State Environment Protection Policy, Waters of Victoria</strong></td>
<td>Sets the framework for government agencies, businesses and the community to work together, to protect and rehabilitate Victoria’s surface water environments.</td>
</tr>
<tr>
<td><strong>Catchment and Land Protection Act 1994</strong></td>
<td>Sets the framework for the integrated management and protection of catchments. It establishes the catchment management authorities.</td>
</tr>
<tr>
<td><strong>Emergency Management Act 1986</strong></td>
<td>Requires a council to have a Municipal Emergency Management Plan to address local emergency risks. This may include hazards arising from storm flows in the drainage system and associated infrastructure.</td>
</tr>
<tr>
<td><strong>Health &amp; Wellbeing Act 2008</strong></td>
<td>Allows the issue of a prohibition notice for the conducting of an activity that may damage public health - in this instance being illegal discharges into the stormwater drainage system</td>
</tr>
<tr>
<td><strong>Occupational Health and Safety Act 1985</strong></td>
<td>Applicable to working on stormwater infrastructure</td>
</tr>
<tr>
<td><strong>Melbourne Water Standards</strong></td>
<td>Used in conjunction with Council’s Standards to determine standards for road construction and maintenance for stormwater drainage systems.</td>
</tr>
<tr>
<td><strong>Water Services Association of Australia relevant Standards</strong></td>
<td>WSAA publishes water industry standards for items used in water supply and sewerage network infrastructure and associated systems.</td>
</tr>
<tr>
<td><strong>All other relevant Australian Standards</strong></td>
<td>AS/NZ Standards such as Risk Management Standard.</td>
</tr>
<tr>
<td><strong>Council Planning Scheme</strong></td>
<td>Planning matters as they relate to water &amp; drainage systems.</td>
</tr>
<tr>
<td><strong>All other relevant State and federal Acts and Regulations</strong></td>
<td>Where applicable, including Disability Discrimination Act (1992) including the Disability Standards for Accessible Public Transport (2002)</td>
</tr>
<tr>
<td><strong>All Local Laws and relevant policies of the Organisation</strong></td>
<td>Construction standards, Maintenance contracts, etc.</td>
</tr>
</tbody>
</table>
3.0 ASSET FUNCTION & LEVELS OF SERVICE

3.1 Function of System Assets

Table 4: Asset Function

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm water Drainage</td>
<td>The function of urban drainage is to:</td>
</tr>
<tr>
<td></td>
<td>• To provide a drainage system that will collect and convey storm water from a catchment to its receiving waters with minimal nuisance, danger or damage and at a financial and environmental cost that is acceptable to the community as a whole.</td>
</tr>
<tr>
<td></td>
<td>• To limit flooding of public and private property, both within the catchment.</td>
</tr>
<tr>
<td>Flood Control</td>
<td>The function of flood control is temporarily to store overland water flows so that they can be released in a controlled manner which limits downstream flooding or erosion.</td>
</tr>
<tr>
<td>Water Storage &amp; Water Supply</td>
<td>The function of Council’s water assets are:</td>
</tr>
<tr>
<td></td>
<td>• To provide, in drought conditions, an emergency water supply network for residential or stock use to rural landholders, within a minimum travel distance of 20KM;</td>
</tr>
<tr>
<td></td>
<td>• To provide, in drought conditions, an emergency water supply network to protect heritage trees and to maintain significant sporting facilities in safe operating condition;</td>
</tr>
<tr>
<td></td>
<td>• To provide an emergency water supply network to support CFA activities in the event of bushfires.</td>
</tr>
<tr>
<td>Water Treatment</td>
<td>The function of Council’s Water Treatment systems is to provide environmentally safe sewage treatment for toilets and other Water Treatment associated Council buildings in non-sewered areas.</td>
</tr>
</tbody>
</table>

3.2 Levels of Service

Background to Levels of Service is outlined in AMP Part ‘A’ – General Information.

The development of performance measures and targets for the drainage asset service criteria is required, and must consider not only community/customer expectations; strategic goals; and legislative requirements, but technical standards and Council’s ability to allocate sufficient resources to meet measures and targets.

A fundamental performance measure relates to the capability of the drainage system to cope with medium size storms (for example, storms with a 20 year recurrence interval, or a 5% probability in any given year).

To determine the levels of service a clear understanding of the community’s needs, expectations and preferences is required as well as an understanding of what is currently being provided from an historic perspective along with a breakdown of costs into key components rather than just an overall cost of service delivery.
In the past there has been no separate direct community consultation with respect to the water & drainage networks. They are however inherently part of Council’s service delivery and as such contribute to the community’s overall satisfaction with Council.

As at June 2014, there is insufficient knowledge available of the current levels of service by way of asset condition and also local flooding issues. However one of the objectives of this asset management plan is to achieve a greater level of understanding of the asset.
4.0 FUTURE DEMAND

4.1 Factors Driving Demand for Water & Drainage Assets

Residential Development

The Asset Management Plan Part A (General Information) details the urban development and population growth assumptions that underlie the demand projections for the water and drainage assets. The following Table presents the projected residential dwelling development expected over the 20 years from 2012 which will include underground drainage. All capital assets associated with subdivision development are assumed to be fully funded by the developers.

Table 5: Indicative Urban Residential Dwelling Development - 2012 - 2036

<table>
<thead>
<tr>
<th>Locality</th>
<th>Development (New Residential Dwellings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darley (Final stages of existing sub-divisions &amp; infill)</td>
<td>870</td>
</tr>
<tr>
<td>Bacchus Marsh (Infill in Graham &amp; Taverner Streets area)</td>
<td>900</td>
</tr>
<tr>
<td>West Maddingley (McCormacks Road area)</td>
<td>1600</td>
</tr>
<tr>
<td>Underbank</td>
<td>1200</td>
</tr>
<tr>
<td>Other infill (including Bences Road)</td>
<td>500</td>
</tr>
<tr>
<td><strong>Sub Total: Bacchus Marsh</strong></td>
<td><strong>5070</strong></td>
</tr>
<tr>
<td>Ballan</td>
<td>856</td>
</tr>
<tr>
<td>Gordon</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL: Moorabool Urban Subdivision Development</strong></td>
<td><strong>6076</strong></td>
</tr>
</tbody>
</table>

Environmental concerns and water quality of rivers and streams

In 2002 Moorabool Shire developed a Storm Water Management Plan (SWMP) to guide Council in improving the environmental management of storm water throughout the municipality. This plan identified the need for new water quality infrastructure. Council in collaboration with Melbourne Water has commenced the development of a Waterway and Stormwater Management Plan for Ballan and Bacchus Marsh that will ultimately supersede the Stormwater Management Plan.

Environmental concerns regarding decommissioned bores

At least 7 bores formerly operated by Moorabool Shire, or its predecessors, have been abandoned but Council has no record that they were formally decommissioned. Under the Environment protection Act 2007 such bores are required to be decommissioned to ensure that contamination of aquifers does not occur.

Environmental Issues/Climate Change

The management of storm water drainage places an ever-increasing focus on environmental issues and sustainability. Water Sensitive Urban Design (WSUD) offers an alternative to the traditional conveyance approach to stormwater management, minimising the extent of impervious surfaces and mitigating changes to the natural water balance, through on-site reuse of water as well as through temporary storage.
A report “Infrastructure and Climate Change Risk Assessment for Victoria” was prepared by the CSIRO for the Victorian Government in 2007. The report raises issues relating to infrastructure that may well be at risk due to climate change.

From a council infrastructure perspective, where alterations, upgrading, renewal or replacement of elements of structures and even new roads, pathways, bridges and drainage structures are proposed, a preliminary risk assessment needs to be undertaken as to the potential impact of climate change.

**Strategic Studies**

A number of strategic studies are underway or have been completed to review flood impacts and stormwater quality, including the following;

- Assessment of artificial Wetland Locations for Bacchus Marsh Township (Jan, 2004)
- Bacchus Marsh Flood Risk Study (May, 2006)
- Moorabool Shire Council Storm Water Management Plan (Jan, 2002)
- Melbourne Water Reports
- Development Service Schemes (Drainage Schemes)
  - Cairns Drive, Darley
  - Masons Lane, Bacchus Marsh
  - Ballan North West (DRAFT)
  - Ballan South West (DRAFT)
  - Gillespies Lane, Ballan (DRAFT)
- Drainage Strategies
  - Griffith Street, Maddingley
  - Gosling Street, Ballan (DRAFT)
- Flood Management Plans
- Gordon Infrastructure Study

The outcome of these studies will form the basis of the new and upgrade program.

### 4.2 Legislative Change

Legislative change can significantly affect Council’s ability to meet minimum levels of service, and may require improvements to infrastructure assets. Future tightening of stormwater discharge standards may affect stormwater disposal options.

There is an increased concern regarding the quality of stormwater discharges and the contaminants typical from urban run-off (e.g. oil, lead, fertiliser, rubbish, etc). There is a need to focus on ways to cost effectively improve stormwater quality for the overall good of the environment.

### 4.3 Technological Change

New technology may well see the introduction of techniques and materials that bring about changes to management of stormwater assets. Technological advances applicable to the life cycle management of drainage assets are being made in the following areas:
- **In-situ relining of pipes** as an alternative to replacement. Industry experience indicates that the life of a well-constructed, reinforced concrete drain is likely to be in excess of the currently adopted 100 years and that future rehabilitation strategies will extend this even further.

- **‘Trenchless’ technology** with which repairs and rehabilitation are undertaken without the traditional open trench excavation of pipelines. This technique offers savings and can decrease disruption to traffic and property owners, and

- **Treatment system** – new technologies for the removal of pollutants from stormwater are being advanced and becoming more affordable.

New technology may well see the introduction of techniques and materials that bring about changes to management of stormwater assets.

**Water Sensitive Urban Design (WSUD)** offers an alternative to the traditional conveyance approach to stormwater management, minimising the extent of impervious surfaces and mitigating changes to the natural water balance, through on-site reuse of water as well as through temporary storage.

The key principles of WSUD, as stated in Urban Stormwater - Best Practice Environmental Management Guidelines, are to:

- Protect natural systems;
- Integrate stormwater treatment into the landscape;
- Protect water quality;
- Reduce run-off and peak flows; and
- Add value while minimising development costs.
4.4 Demand Forecast Summary

Moorabool Shire is a popular tree change destination, growing as fast as any other local government area in inland regional Victoria. The official population of Moorabool Shire in 2014 is 31,000. This is estimated to grow to 32,700 by the end of 2016.

![Forecast Population Graph](image)

Source: MSC Council Plan 2013-17

More than half the population lives in Bacchus Marsh and surrounds (approximately 19,032). The Shire’s second largest population can be found in and around Ballan (6534). The remaining population is distributed throughout the large number of small towns, hamlets and farming areas within the Shire. The majority of people who relocate to Moorabool Shire are young families seeking a semi-rural lifestyle. Moorabool’s demographic reflects this trend.

Factors influencing growth or decline of asset demand, and their impact on services, are listed in the following Table.

Table 6: Factors Affecting Asset Demand

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Factor Influencing Demand</th>
<th>Impact on the service, cost, timing</th>
<th>Demand Management Plan: Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage</td>
<td>Climate change</td>
<td>Climate change is expected to cause more severe rainfall events that will place additional stress on the drainage networks. Council will need to be aware of any deficiencies that become evident and respond in an appropriate manner.</td>
<td>When pipe data is available, model network to identify deficiencies and prioritise upgrades</td>
</tr>
<tr>
<td></td>
<td>New developments</td>
<td>Increased loading on downstream existing assets.</td>
<td>Include retention requirements in new subdivisions</td>
</tr>
<tr>
<td></td>
<td>Changing community expectation</td>
<td>Possible growth in demand to improve level of service with changing community attitudes.</td>
<td>Monitor.</td>
</tr>
</tbody>
</table>
Climate change is expected to cause more severe rainfall events. It may be more economic to provide flood mitigation structures rather than increase the capacity of the drainage system. Include retention requirements in new subdivisions.

Climate change is expected to cause more severe and more frequent drought events leading to increased demand for emergency water. Extend user control and user pays.

Climate change is expected to cause more severe and more frequent drought events leading to increased demand for emergency water. Extend use control & user pays.

- **Flood Control**: Include retention requirements in new subdivisions.
- **Water Storage**: Extend user control and user pays.
- **Water Supply**: Extend use control & user pays.
- **Water Treatment**: Monitor.

### Table 7: Storm water Drainage Demand Analysis Assumptions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pits (side entry &amp; junction pits) per property</td>
<td>0.85 pits/property</td>
</tr>
<tr>
<td>Length of storm water drainage pipe per property</td>
<td>25 metre/property</td>
</tr>
</tbody>
</table>

### New & Upgrade Water & Drainage Asset Demand Forecast

Demand analysis for new drainage assets from subdivisions or retrofitting are based on the following data from recent subdivisions in Bacchus Marsh with greater than 100 properties.

### New & Upgrade Water Quality Devices Forecast

In 2002 Moorabool Shire developed a Stormwater Management Plan (SWMP) to guide Council in improving the environmental management of storm water throughout the municipality. This plan identified the need for new water quality infrastructure.

Dramatically changed population forecasts, changes to water quality engineering measures and revisions to water quality standards has seen the review of this document warranted. The development of a Waterway and Stormwater Management Plan for Ballan and Bacchus Marsh is currently underway and includes a review of the 2002 Stormwater Management Plan. Upon finalisation of the plan, this Asset Management Plan will be updated with recommendations for new water quality infrastructure.

### New & Upgrade Flood Control Devices Forecast


A joint Melbourne Water Moorabool Shire project has just been initiated to develop a Shire-wide Flood Management Plan. Results from this study will be reflected in future upgrades to this Asset Management Plan.
New & Upgrade Water Storage and Supply Assets

During the 1980’s drought, in 1982/3, the State Government funded a number of bores and standpipes across the Shire. This emergency supply network was based on achieving a distribution of bores so that landholders did not have to travel more than 20 km to supply points. These bores have now either reached the end of their service life and been abandoned or replaced, or are close to the end of their service life.

During the most recent drought, Council received State and Federal Government funding, to which Council contributed, to provide emergency water supply and storage assets. These assets included water storage tanks in fire critical zones to supplement CFA emergency water supplies and large water storage tanks at major sporting ovals to maintain turf in a safe condition.

Current strategic planning for sporting reserves will identify future demand for emergency water sources and associated piping and irrigation.

New & Upgrade Water Treatment Management Assets

Historically, only properties in Bacchus Marsh and Ballan had access to underground sewers. Properties in the townships and rural residential and rural areas had septic tanks or (more recently) aerated waste treatment systems (AWTS).

There are currently six Council owned or managed Toilets in the Shire with septic tanks or AWTS and a further 9 public buildings with septic tanks or AWTS.

The connection of Council owned public toilets in Gordon to the new underground sewerage system is complete.
4.5 Demand Management Strategy

The strategy to manage demands on the urban storm water drainage system will involve a combination of the following actions:

- Ensure drainage asset data exists which permits accurate modelling of forecast storm water flows
- Ensure that applications for new subdivision developments are required to adequately cater for storm water discharges in terms of quality and quantity.
- Assess shortcomings of the existing system, in quality and quantity, and develop remedial works proposals;
- Use of Water Sensitive Urban Design aspects to be encouraged in new developments to incorporate runoff within a property, minimising external property discharges.

The strategy to manage demands on emergency water supply and storage primarily requires either or both the regulation of use and the introduction of user pays systems.

Two options are available for regulating use:

- Installation of locks on standpipes with keys held by authorised users (e.g., CFA) or available on request (subject to guidelines) from Council officers.
- Computerised swipe card control (such as exists in Ballan and Maddingley) coupled with either volumetric limits or user pays (as at Ballan and Maddingley).

Currently, storage tanks exist at Dales Creek, Greendale, Balliang and Barkstead which are reserved for CFA use only and the CFA hold keys to unlock the tanks. Similarly, usage of water from tanks at the various recreation reserves (Maddingley Park, Masons Lane, Darley, and Dunnstown) is controlled by the respective Committees of Management.

Council has a number of public water standpipes that are uncontrolled – that is, the water is free for the taking. During the recent drought there were frequent complaints from local residents regarding excessive usage by ‘external’ users, including residents from Melton, Bacchus Marsh and Ballarat as well as commercial users (including construction companies and agricultural spraying firms). Outside of drought periods, observations by Council staff suggest significant daily use of some of these emergency water sites by commercial users. The only effective way to ensure the water from these sources will be available to the local residents for whom it is intended is the introduction of computerised swipe card control with user payment based on volume used.
5.0 LIFECYCLE MANAGEMENT PLAN

5.1 Background Data

This section of the plan describes the funding strategies for the long term management of this asset class.

Physical Parameters

The purpose of the stormwater drainage system is to protect people, property and public health by safely and efficiently collecting, transporting and disposing of stormwater runoff. Stormwater is discharged directly into the Shire’s waterways.

Table 8: Summary of Drainage Assets

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Asset Component</th>
<th>Asset Number</th>
<th>Asset Length (kms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm water Drainage</td>
<td>Pipes</td>
<td>4,550</td>
<td>166</td>
</tr>
<tr>
<td></td>
<td>Pits and End-walls</td>
<td>5,271</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Small Culverts</td>
<td>2,540</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>Water Quality Devices (gross pollutant traps)</td>
<td>7</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Supply</td>
<td>Stand Pipes</td>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Bores</td>
<td>5</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Pipelines &amp; Irrigation</td>
<td>14</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Treatment</td>
<td>Septic Tanks &amp; Water Treatment Systems</td>
<td>3</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Asset Condition

Council applies a five point rating to characterise asset condition, as illustrated in the Table below.

Table 9: Asset Condition Rating Scale

<table>
<thead>
<tr>
<th>Rating</th>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Good</td>
<td>Asset in excellent condition with only superficial deterioration present.</td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>Some deterioration evident. Serviceability may be impaired slightly.</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>Obvious condition deterioration. Asset serviceability is now affected and maintenance costs are rising.</td>
</tr>
<tr>
<td>4</td>
<td>Poor</td>
<td>Serviceability is heavily affected by asset deterioration. Maintenance cost is very high and the asset is at a point where it requires major reconstruction or refurbishment</td>
</tr>
<tr>
<td>5</td>
<td>Very Poor</td>
<td>Asset deteriorated to a dangerous condition and requires major reconstruction or refurbishment</td>
</tr>
</tbody>
</table>
The age profile distribution of Council’s Water & Drainage Assets is shown below;

**Figure 3: Age Profile Graph for Storm Water Assets**

![Age Profile Graph for Storm Water Assets]

**Useful Service Lives of Water & Drainage Asset Components**

Council reviewed the service lives of all asset components in 2012 and included this in its Policy and Procedures on Asset Valuation. The review took into account current “best practice”, estimates from engineering research organisations, state government agencies, the Australian Taxation Office and other sources. It also took into account the range of values used by comparable rural Councils in Victoria and specific factors experienced in Moorabool. These service lives were presented to Council’s audit committee in 2012. These considerations are summarised in the following Table.

**Table 10: Asset Useful Lives (consistent with Valuation and Revaluation policy)**

<table>
<thead>
<tr>
<th>Asset Group</th>
<th>Asset Category</th>
<th>Asset Component</th>
<th>Useful Life (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water &amp; Drainage</td>
<td>Storm water Drainage</td>
<td>Pipes</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pits and End-walls</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Small Culverts</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Quality Devices</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Flood Control</td>
<td>Retention/detention Systems</td>
<td>25</td>
</tr>
<tr>
<td>Water Supply</td>
<td></td>
<td>Stand Pipes</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bores</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pipelines &amp; Irrigation</td>
<td>50</td>
</tr>
<tr>
<td>Water Storage</td>
<td></td>
<td>Dams</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large Capacity Tanks</td>
<td>20</td>
</tr>
<tr>
<td>Water Treatment</td>
<td></td>
<td>Septic Tanks</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Treatment Systems</td>
<td>20</td>
</tr>
</tbody>
</table>

Moorabool Shire has not developed customised condition rating guidelines for water and drainage assets.
**Risk Identification**

Council’s Risk Management Framework, as it applies to asset management, is discussed in detail in Asset Management Plan - Part A General Information.

It is emphasised that this Plan addresses only the *strategic risks* relevant to the water and drainage assets group. Operational risks relating to particular pipes, pits, water storage, water supply or treatment assets are, or will be, addressed in the respective Operational and Maintenance Management Plans.

Operational risks are, or will be, identified through network modelling, flood modelling, reviews of individual high risk assets, for example individual Council owned dams, and through ad hoc safety audits as a result of incidents or concerns raised by residents.

Risks associated with flooding of the Lerderderg and/or Werribee Rivers are addressed in Bacchus Marsh Flood Risk Study 2006 and Moorabool Shire Flood Emergency Plan 2011.


This Plan provides a high level risk review of the water and drainage infrastructure to identify strategic outcomes with the view to establishing mitigation strategies. The strategic risks associated with the Water Assets Group and the associated controls proposed are listed in the Infrastructure Risk Register.

**System Capacity & Performance**

Asset performance relates to the ability of the asset to perform over time to meet its intended purpose. This involves its ability to meet hydraulic capacity demands placed on it (the ability to carry storm flows) as well as remaining structurally sound as the assets age and also may be subjected to greater external loads than originally intended.

Structural performance can be impacted for instance where pipes laid at relatively shallow depth under roads and/or bedded on poor material are now facing far greater impact loads from traffic than when they were laid.

Moorabool does have performance and capacity issues that need to be addressed in forthcoming works programs.

**Asset Condition Monitoring**

Historically council has had very limited knowledge of the condition of the water and drainage assets. In 2011 Council established an ongoing rolling program of asset condition surveys and in 2012, Council adopted a policy that the condition of all asset groups would be surveyed on at least a 3 year rolling basis.
5.2 Operational and Maintenance Plan

Water & Drainage Asset Operations and Maintenance Plan

Council currently does not have an operations and maintenance plan for water and drainage assets. The development of such a plan is envisaged over the coming 3 years. When completed it will address:

- Definition of Inspection Types (Programmed and reactive)
- Minimum Programmed Inspection frequency by asset hierarchy
- Intervention levels and maintenance prioritisation by asset hierarchy
- Response times

Council does not currently undertake programmed defect inspections of water and drainage assets. Reactive inspections occur consequent on customer requests. This will be addressed when the Operations and Maintenance Plans are developed.

Council currently does not have procedures regarding prioritisation of water and drainage maintenance work or response times. This will be addressed when the Operations and Maintenance Management Plans are developed.

Basis for Future Maintenance Costs

At present, most of the maintenance costs for flood control, water supply or water storage assets are not distinguished in the chart of account from the facility they are associated with.
5.3 Renewal/Replacement Plan

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

Renewal Demand and Renewal Gap

Detailed modelling of the components of water and drainage renewal for Moorabool Shire suggest that an average figure of $96,000 per year would normally be required for renewal to maintain asset services.

Annual renewal expenditure on Council water and drainage assets is typically $50,000 per year. Hence a significant accumulated backlog is to be expected.

Once condition assessments have been completed it will be possible to establish with a greater degree of accuracy what the future funding predictions will be. Current modelling provides an indication only of renewal demands based on the averages incurred in similar councils to Moorabool.

Renewal Priority Ranking

Council’s Capital Works Evaluation Guidelines provides a prioritisation matrix for the Stormwater Asset category. All renewal projects identified on the long term capital improvement program are prioritised in accordance with this adopted document.

In a mature asset management framework, long-term renewal budget predictions are based on a schedule of treatment options linked to condition assessments and desired levels of service. This asset group is still some way off this. Treatment options are currently determined by preplanning studies undertaken.
5.4 Asset Creation & 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.

New and Upgrade Proposals

Provision of new or upgraded works fall into the following categories depending upon the extent and type of works:

- Council funded, or
- Developer funded as part of subdivisional development, or
- Contribution to the cost by either the developer and/or Council.

As Council acquires new assets through the subdivision development process it is important that the consequential costs are established and allowed for in future budgets. It is not reasonable to expect these costs to be absorbed into existing budgets without an increase in funding allocation. To not provide additional funding is to effectively reduce the current levels of service to some or all of the rest of the municipal area.

New and Upgrade Priority Ranking

New and upgrade proposals are evaluated against defined criteria within budget parameters for projects broadly set by the long term financial plan.

Council’s Capital Works Evaluation Guidelines provides a prioritisation matrix for projects identified on the New and Upgrade long term capital improvement program. All projects identified on the long term capital improvement program are prioritised in accordance with this adopted document.

Future New and Upgrade Costs and Programs Identified in this Plan

Projects identified on the New and Upgrade long term capital improvement program are largely developed from strategic studies. Previous strategic studies require review to ensure identified projects are included on the long term capital improvement program. Following this, this Asset Management Plan will be updated to reflect infrastructure requirements.

5.5 Disposal Plan

Disposal is any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. As with acquisition decisions, asset disposals should be undertaken within an integrated planning framework that takes account of Council policy and priorities, service delivery needs, financial and budgetary constraints and the Council’s overall resource allocation objectives.

Assets may become surplus to requirements for a variety of reasons, including:

- Under-utilisation, for example due to demographic changes;
- Obsolescence due to changed community attitudes or technological change;
- Failure to meet changed legal, technical or safety requirements;
- Excessive increases in operating or maintenance costs;
- Service provided by more economical means.

It is not envisaged that water and drainage assets included in this Plan will be considered for decommissioning in the foreseeable future.
6.0 STRATEGIC FINANCIAL MANAGEMENT

6.1 Current Financial Position

Operating & Maintenance Expenditure

These are costs that include all actions that need to be done to assure assets deliver the standard of service that is required (which keeps the water and drainage systems operational, but does not affect the life of the asset). It does not include rehabilitation or renewal as these are capital.

At present, most of the maintenance and operations costs for flood control, water supply or water storage assets are not distinguished in the chart of accounts from the facility they are associated with.

For Financial modelling purposes, the annual average expenditure for maintenance for 2013/14 has been listed as $80,000 for pits and $80,000 for pipes.

Capital Expenditure

Capital expenditure covers renewals, upgrades and new assets. It is expenditure that increases the value of an asset. Council’s Capital Improvement Program includes two components;

- **Renewal Program**
  
  Applies to projects that rehabilitate or replace existing drainage and associated infrastructure to meet its original performance capability.

- **New and Upgrade Program**
  
  Applies to projects that increase the capacity of existing assets beyond their original design capacity or service potential.

In the situation of replacing pipes where there is a hydraulic under-capacity of segments of the existing network, the pipe met the original capacity requirement when first constructed but subsequent urban growth has resulted in an inability to meet demand. Some of the upgrade cost is therefore renewal as it is replacing the existing level of service, albeit under-capacity and the balance is new work as it is providing a higher level of service to meet current and future demands.

For Financial modelling purposes, the expenditure for renewals for 2013/14 is listed as $50,000 and only for pits.
6.2 Financial Modelling

Financial modelling enables predictions for future funding requirements to be made based on available data and recent trends in asset life expectancies, condition, replacement costs, etc. Modelling outcome is very much dependent upon the accuracy of the input data and how assets are grouped for modelling. It is not a precise process but does provide a degree of certainty in the outcomes.

Moorabool Shire Council, along with a number of other councils in Victoria, under the guidance of the MAV STEP Program has utilised the Moloney Financial Modelling system to establish the order of magnitude of renewal needs of its infrastructure assets.

The Moloney Modelling process compares the current renewal expenditure, the asset valuation and quantity, the existing condition of assets and the level at which the asset will be renewed (intervention level) in order to determine the required expenditure to meet the renewal targets. Both existing condition and intervention levels are based on a Moloney 0-10 asset condition rating.

In the Moloney Renewal Model, the intervention point is known as the **Retreatment Intervention Condition Level (RICL)**. The RICL is the point at which the asset component has deteriorated to such a condition that it is economically prudent to initiate restoration works to bring the condition of that component back to new.

The following initial RICL’s have been used for the various components for the purposes of financial modelling within this Plan. In the case of the stormwater drainage system, only pipes and pits have been modelled.

The following assumptions have been made for the modelling:

**Pipes**
- Condition – Good
- Intervention level – 9 (most Councils set it at this level as they do not replace until nearly failed).
- Expected life – 100 years

**Pits**
- Condition – Good
- Intervention level – 10 (most Councils set it at this level as they do not replace until failed).
- Expected life – 100 years

6.3 Predicted Capital Expenditure

The Renewal Liability Gap illustrated by the Moloney Modelling provides Council with an understanding of the difference between what Council is currently spending to renew its drainage system assets and what it needs to be spending.

The renewal gap is estimated over a period of 20 years by modelling the deterioration of asset condition over the life of the asset. Knowing the current condition of the pipes and pits and their expected lives, an estimate can be made of where these two asset components sit within their lifecycles and consequently a determination can be made in relation to their remaining life.
Modelling only covers the pipes and pits for the stormwater drainage group at this stage. The Figure below demonstrates the Retreatment Intervention Condition Level (RICL) renewal funding requirements for the retention of selected asset components for the next 20 years.

This prediction of funding needs does not include any allowance for renewals or upgrading as a consequence of premature failures due to poor construction techniques or where pipes are under-capacity due to growth placing more demand on pipe capacity than allowed for in the original design.

The Average Annual RICL Renewal demand over 20 years is $96,000/annum although this is only $28,000 over the first 10-years. In addition to this there may be issues where renewals are required to address failures or hydraulic deficiencies in advance of the expected useful life.

**Figure 4: Predicted Renewal Split by Major Component of the Stormwater Group**

The following Figure shows the deterioration as a percentage of the asset base above intervention level if funding stays at the current level. The red line shows the percentage of asset stock that will be below the intervention level as a consequence of the funding shortfall.

Although current funding levels are shown as being in excess of the modelled RICL Renewal prediction, analysis is required to separate current expenditures into RICL Renewals, renewals arising from premature failures due to construction issues, and renewals and upgrades associated with addressing hydraulic inadequacies of the existing piped system.
6.4 Funding Capacity

The capacity of Council to fund the Drainage assets into the future has not yet been specifically considered in this AM Plan. It is dependent upon the knowledge of funding requirements of a number of other aspects such as ongoing costs of delivery of various council services and also the infrastructure assets that are used to deliver those services. The issue will be developed in future plans.

The Long Term Financial Plan (LTFP) is the key ten-year financial planning document of Council that is governed by a series of financial strategies and accompanying performance indicators that Council considers and adopts. It establishes the financial framework upon which sound financial decisions are made.

Council has a legislative requirement to comply with the principles of sound financial management as detailed in section 136 of the Local Government Act 1989. A key component of sound financial management is the preparation of longer term financial strategies, plans and budgets.

6.5 Funding Strategy

Council, as part of reviewing its LTFP, revises its borrowing strategy, asset management, capital investment, discretionary and statutory reserves, capital works program, the range and level of services provided and the revenue raising strategy.

A number of strategic challenges remain ahead including renewing existing assets, continuing to provide an appropriate range and level of services to a growing and changing community, maintaining a sound financial position and addressing the need for capital expansion. The other key related issue is the risk and liability that both Council and the community face if Council does not invest in asset renewal at an adequate rate.
The LTFP establishes the strategic financial direction for Council to meet the funding and investment challenges that lie ahead in the next ten years. The LTFP is prepared in conjunction with the Council Plan to ensure the affordability of activities included in the Council Plan.

Each year Council will develop a Capital Works Budget for asset renewals, upgrades and new works and a Recurrent Budget allocation for maintenance & operations expenditure for its water & drainage network.

**Appendix 1** shows the predicted capital funding requirements with RICL renewal predictions as taken from the condition based modelling outlined in Section 6.2 above.

RICL designates the renewal work to be undertaken at the Retreatment Intervention Condition Level as established through the Moloney Financial Modelling process. However, the amount shown for RICL renewals is not definitive for all renewals as in fact some additional renewal work may be required to upgrade under-capacity drainage segments where the pipes may not have reached RICL but the under-capacity issue is the determinant of renewal. Another area where renewal may be required is for premature failures due to construction issues.

**Appendix 2** shows the predicted maintenance funding requirements, with funding for pits and pipes based on current funding levels. As stated in Section 6.1, currently most of the maintenance and operations costs for flood control, water supply or water storage assets are not distinguished in the chart of accounts from the facility with which they are associated. Completion of Appendix 2 will require analysis of this cost over time.

It is intended that expenditure projections will be in accordance with this Water & Drainage Asset Management Plan, policies named within, corporate goals, Council’s Asset Management System, government legislation and regulations, and the needs of the community within financial constraints.
6.6 Key Assumptions in Financial Forecasts

The following general assumptions should be made in preparing 10-year expenditure forecasts:

- System assets will remain in Council ownership throughout the planning period.
- All expenditure is stated in current dollar values with no allowance made for inflation or other escalations over this period.
- The condition and size of the network as stated at a specific date.
- Consequential impact on operations, maintenance and renewal financial projections of newly acquired assets is to be considered.
- Continued use of current construction techniques and materials.
- Renewal, maintenance and isolated failure replacement is generally “like for like”.
- Capitalisation threshold applied to minimum expenditure for maintenance within a single segment as per Council’s Asset Capitalisation Threshold Policy.
- Operational Administration overheads and other non-asset maintenance costs such as cleaning are not included in the modelling; these will require separate budget consideration via other accounts.
- Development contributions through subdivision and other approvals are captured and recognised.
- Depreciation is in accordance with Council Policy.

The following table summarises the confidence levels of information contained in this Asset Management Plan.

Table 11: Data Confidence Rating

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Inventory</th>
<th>Condition</th>
<th>Age</th>
<th>Performance</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Flood Control</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Water Storage</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Water Supply</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>Water Treatment</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>
### Table 12: Data Confidence Definitions

<table>
<thead>
<tr>
<th>Confidence Grade</th>
<th>General Description</th>
</tr>
</thead>
</table>
| A                | **Highly Reliable < 2% Uncertainty**  
Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment. |
| B                | **Reliable 2-10% Uncertainty**  
Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings’ for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation. |
| C                | **Reasonably Reliable 10 – 25 % Uncertainty**  
Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings’ for example the data is old or incomplete, some documentation is missing and reliance is placed on unconfirmed reports or significant extrapolation. |
| D                | **Uncertain 25 –50% Uncertainty**  
Data based on uncertain records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available. |
| E                | **Very Uncertain > 50% Uncertainty**  
Data based on unconfirmed verbal reports and/or cursory inspection and analysis. |
7.0 PLAN IMPROVEMENT AND MONITORING

7.1 Improvement Plan

The Asset Management Improvement Plan generated from this Asset Management Plan is shown in the table below;

Table 13: Improvement Plan – Water & Drainage

<table>
<thead>
<tr>
<th>Improvement Action</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water &amp; Drainage Asset Register</strong></td>
<td>2014/15</td>
</tr>
<tr>
<td>▪ Undertake a thorough review of existing registers, and reconcile data to recent</td>
<td></td>
</tr>
<tr>
<td>drainage data collection survey results.</td>
<td></td>
</tr>
<tr>
<td>▪ Ensure that a single corporate database holds the Asset Registers which are to</td>
<td></td>
</tr>
<tr>
<td>be made available to all users. Eliminate duplicated data sets held within</td>
<td></td>
</tr>
<tr>
<td>operational units to ensure the corporate data set is not compromised and holds</td>
<td></td>
</tr>
<tr>
<td>the most up-to-date data records.</td>
<td></td>
</tr>
<tr>
<td><strong>Migration of data into Asset Management System (Assetic)</strong></td>
<td>2014/15</td>
</tr>
<tr>
<td>Finalise the asset registers and bring these into Assetic</td>
<td></td>
</tr>
<tr>
<td><strong>Water &amp; Drainage Operations and Maintenance Plan</strong></td>
<td>2015/16</td>
</tr>
<tr>
<td>To be developed and include;</td>
<td></td>
</tr>
<tr>
<td>▪ Levels of service</td>
<td></td>
</tr>
<tr>
<td>▪ how maintenance is to be managed, inspection regimes and intervention levels for</td>
<td></td>
</tr>
<tr>
<td>undertaking defect remedial measures and appropriate response times</td>
<td></td>
</tr>
<tr>
<td><strong>Long Term Capital Improvement Plan (Renewal)</strong></td>
<td>2014/15</td>
</tr>
<tr>
<td>Develop long term renewal Capital Improvement Program following completion of</td>
<td></td>
</tr>
<tr>
<td>data collection.</td>
<td></td>
</tr>
<tr>
<td><strong>Long Term Capital Improvement Plan (New)</strong></td>
<td>2014/15</td>
</tr>
<tr>
<td>Develop long term new and upgrade Capital Improvement Program. This program needs</td>
<td></td>
</tr>
<tr>
<td>to ensure all projects, identified through various strategic reports are included.</td>
<td></td>
</tr>
<tr>
<td><strong>Review of existing CCTV data</strong></td>
<td>2016/17</td>
</tr>
<tr>
<td>To be carried out on a criticality risk priority basis to establish current</td>
<td></td>
</tr>
<tr>
<td>structural condition rather than relying on an age basis for condition assessment.</td>
<td></td>
</tr>
<tr>
<td>Review past CCTV pipe surveys and pipe replacement projects to develop evidence</td>
<td></td>
</tr>
<tr>
<td>based estimates of pipe condition and remaining service life.</td>
<td></td>
</tr>
</tbody>
</table>


### 7.2 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.

This Plan will be reviewed on an annual basis and updated accordingly.
8.0 REFERENCES

The following documents have a direct relationship with this plan:

- Moorabool Council Plan
- Moorabool Storm Water Management Plan - 2002
- Bacchus Marsh Flood Risk Study 2006
- Moorabool Shire Flood Emergency Plan 2012
- Maddingly Drainage Condition Survey 2011
- Condition audits of bores in Moorabool, 2003 and 2011
- Moorabool Shire Council Domestic Wastewater Management Plan

In addition the following policy document issued jointly by Western Water, Southern Rural Water, Barwon Water and Central Highlands Water is relevant to this plan:

- Protecting Water Quality in the Moorabool Shire - Water Catchment Protection Policy

Key standards, manuals and guidelines include:

- International Infrastructure Management Manual Version 3.0 - 2006, IPWEA.
- Risk Management Standard, AS/NZS 4360:2004
- All relevant Australian Standards and Codes of Practice
- Moorabool Shire Council Standard Drawings
- Urban Stormwater Best Practice Environmental Management Guidelines, CSIRO 1999
- WSUD Engineering Procedures: Stormwater, Melbourne Water, June 2005
- WSAA Standards
## Appendix 1 – Indicative 10-Year Capital Funding Requirements

Note 1  The level of funding is indicative using Moloney Modelling and will be updated following the completion of condition assessment.

Note 2  The data below is based on existing asset registers. This information will be updated following the update of asset registers once condition assessment data has been collected.

Note 3  Modelling of New and Upgrade projects has not been included in this version of the Asset Management Plan. This information will be drawn from strategic documents including infrastructure studies.

<table>
<thead>
<tr>
<th>Asset Component</th>
<th>2013/14 Budget Funding</th>
<th>Indicative 10-Year Capital Funding Requirements – Water &amp; Drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14/15</td>
</tr>
<tr>
<td>RENEWALS - RICL TOTAL</td>
<td>$0</td>
<td>$2,974</td>
</tr>
<tr>
<td>RENEWALS - Under Capacity Works</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>RENEWAL – Premature Failures</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>RENEWALS TOTAL</td>
<td>$0</td>
<td>$2,974</td>
</tr>
<tr>
<td>UPGRADES - Under Capacity Works</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>UPGRADES - Other</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>UPGRADES TOTAL</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>NEW ASSETS</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>TOTAL CAPITAL WORKS</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

NB:  RICL designates the renewal work to be undertaken at the Retreatment Intervention Condition Level as established through the Moloney Financial Modelling process.

*TBD: To be determined.*
Appendix 2 – Indicative 10-Year Maintenance Funding Requirements

Note 1 The level of funding is indicative using Moloney Modelling and will be updated following the completion of data collection and condition assessment.

Table - 10-Year Indicative Maintenance Expenditure – Water & Drainage Asset

<table>
<thead>
<tr>
<th>Asset Component</th>
<th>14/15</th>
<th>15/16</th>
<th>16/17</th>
<th>17/18</th>
<th>18/19</th>
<th>19/20</th>
<th>20/21</th>
<th>21/22</th>
<th>22/23</th>
<th>23/24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pits &amp; Pipes</td>
<td>$178,144</td>
<td>$197,837</td>
<td>$218,976</td>
<td>$241,469</td>
<td>$265,226</td>
<td>$290,147</td>
<td>$316,121</td>
<td>$343,024</td>
<td>$370,724</td>
<td>$399,080</td>
</tr>
<tr>
<td>Open Drains</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Minor Culverts</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Water Quality Devices</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Standpipes</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Bores</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Pipelines &amp; Irrigation</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Septic Tanks &amp; AWTS</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>TOTAL MAINTENANCE WORKS</td>
<td>$178,144</td>
<td>$197,837</td>
<td>$218,976</td>
<td>$241,469</td>
<td>$265,226</td>
<td>$290,147</td>
<td>$316,121</td>
<td>$343,024</td>
<td>$370,724</td>
<td>$399,080</td>
</tr>
</tbody>
</table>

NB: The Table shows the predicted maintenance funding requirements, with funding for pits and pipes based on current funding levels. As stated in Section 6.1, currently most of the maintenance and operations costs for flood control, water supply or water storage assets are not distinguished in the chart of accounts from the facility with which they are associated. Completion of Appendix 2 will require analysis of this cost over time.