# RATONGA WAI PARU - WASTEWATER
# Asset Management Plan

## MASTERTON DISTRICT COUNCIL 2021 - 2031

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MASTERTON DISTRICT COUNCIL
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# DOCUMENT CONTROL



Masterton District Council

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| QUALITY INFORMATION | |
|---|---|
| Document | Asset Management Plan |
| Reference | **Version 1 Draft** |
| Date | Feb 2021 |
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| Peer reviewed by | Resolve Feb 2021 |
| Document Approved | David Hopman 25 March 2021 |
| Adopted by Council | 30 June 2021 |

| REVISION HISTORY | | | |
|---|---|---|---|
| Revision | Revision Date | Details | Authorised |
| 5 | 04/10/2011 | Total plan review | T Pritchard |
| 8 | 27/03/2015 | Total plan review | T Pritchard |
| 11 | 30/06/2018 | Total plan review for LTP | D Mawson |
| 12 | 25/03/2021 | Total plan review for Audit | D Mawson |
| 13 | 30 /06/2021 | Plan adopted with LTP | D Mawson |

# EXECUTIVE SUMMARY

## Summary

This Wastewater Asset Management Plan covers the wastewater assets that Masterton District Council currently owns and operates.

The Council provides a reticulated network to collect and then dispose of wastewater from residential, commercial and industrial properties in the Masterton urban area including the Waingawa industrial area, at Riversdale, Castlepoint and Tinui.

This asset management plan should be read in conjunction with the Long-Term Plan (LTP 2021-31) which is the Districts overall plan for the next ten years to promote the social, economic, environmental and cultural well-being of the community now and in the future.

The plan contributes towards achieving the Masterton District Councils stated community outcomes of being an easy place to move around, achieving a strong sustainable economy, having an active, involved & caring community. Making us a sustainable, healthy natural environment, and also creating a knowledgeable resilient community. Strategic and tactical asset management also plays a role in improving social and environmental outcomes for Masterton.

The Council owned wastewater supplies comprise of approximately 196.8 km of reticulation pipes, 2133 manholes, 13 pump stations and 4 treatment plants. The wastewater treatment plant facilities are at Homebush, Castlepoint, Tinui, & Riversdale. Rates are levied for wastewater connections in Masterton (9,218), Tinui (20), Castlepoint (197), and at Riversdale (363).

The disposal of wastewater is funded through targeted location and usage rates per property. The total optimised replacement cost of water assets inclusive of reticulation & treatment as at 30 June 2020 was $155,506,954. With an optimised depreciated replacement cost of $97,527,146.

Possible new wastewater assets are also funded from private developments.

There are risks associated with the collection & treatment of wastewater and the associated wastewater assets, and the main risk identified that may pose a threat to the Councils water assets is possible climate changes which could affect the land disposal operation and volumes entering the wastewater network. Possible solutions through inflow and infiltration management would include identifying discharges to the network that contribute to unnecessary overloading of the assets.

Council believes it presently has sufficient capacity within its wastewater infrastructure to continue to treat the current levels of wastewater at Riversdale Homebush Tinui & Castlepoint and absorb possible expansions in its water network.

Although the capacity of Masterton's reticulation network is adequate to meet current and forecast demand for wastewater treatment, a lot of the networks age and condition varies considerably. Some pipes were laid in the early 1900's and they are still in use it has been planned that these are prioritised in the 30-year renewal programme. The progressive renewal of piped reticulation in the 30-year plan is estimated at $1 million per year. A 30-year wastewater treatment strategy has also been adopted by the council with the vision that 'Wastewater is managed in an environmentally and fiscally sound way for our community." Projects arising from implementing this strategy are estimated at $40m capital programme over the next 10 years and 141m over 30 years.

# INTRODUCTION

## Background

The purpose of this Wastewater Asset Management Plan ("the Plan") is to provide Masterton District Council ("Council") with a tool to assist with the management of its Wastewater assets ("the assets"). This tool combine's management, financial, engineering and technical practices and is intended to:

- Ensure that an agreed level of service is provided to defined standards at optimum cost.
- Be sustainable in the long term.
- Comply with regulatory requirements.
- Help Council to achieve the outcomes the community has defined.

This Plan, prepared in 2020/21, supersedes Councils "Wastewater Asset Management Plan 2018".

## Scope of plan

Council owns, operates and maintains systems to collect and dispose of wastewater from properties in the Masterton urban area and the Riversdale, Castlepoint and Tinui settlements. Wastewater assets include pipes, manholes, pump stations and wastewater treatment plants (WWTP).

This Plan was developed to provide Council with a long-term view of:

- Where its water assets (those Council owns) are currently at
- What issues are likely to impact on these assets in the future?
- What level of service should be provided to the community in the future at a cost that can be afforded?

All of the figures in this plan are expressed in New Zealand dollar values as at 30 June 2020 and unless noted otherwise, are in GST exclusive terms.

## Links to other Management Documents

Long Term Plan 2021 - 2031

Infrastructure Strategy 2021 – 2051

## Asset management drivers (Wastewater)

Council's role in advocating on behalf of the region's wastewater users, ratepayers and residents is a key driver of the asset management process. It enables sound arguments to be put to the appropriate bodies to ensure equitable access to, and funding for, the wastewater networks. Asset management plans clearly define the communities, Council objectives and how these can be successfully delivered within any environmental constraints that are identified in the asset management plans.

## Goals and objectives of asset ownership

Council has adopted a funder-provider role delivering wastewater services using a combination of in-house and contracted labour. Council attaches a high priority to the role that it plays in the provision of these services.

Councils overall objectives for the service are:

- To protect the health and safety of the community
- To provide and maintain efficient and environmentally safe systems for the collection and transfer of wastewater.
- To ensure the sewage treatment and disposal system is environmentally safe and appropriate to the needs of domestic and industrial users.

- To comply with central government legislative requirements and waste strategy as appropriate.

The reasons why council is involved in this activity are:

- The effective management of wastewater is necessary in order to protect public health and the environment.
- The health act 1956 requires every territorial authority to improve, promote and protect public health within its district and to provide 'sanitary works'. Sanitary works include drainage works, wastewater works and works for the disposal of sewage.
- Part 29 of the local government act 2002 empowers council to provide, cleanse, repair and maintain all drainage works necessary for the efficient drainage of the district and to treat and deal with sewage by physical, chemical or biological means.
- The rating powers act 1988 empowers council to levy a separate rate or uniform annual charge on properties connected or able to be connected directly or indirectly to a public sewer or drain.
- The building code specifies that suitable appliances for the disposal of refuse water in a sanitary manner (by inference this includes the means of collection) are made available for the inmates of a dwelling.

The following summarises the various tools and practices council uses to manage the assets.

## Asset management systems

- Council's services contract requires ongoing administration and monitoring of the works. This is to ensure the work is being carried out to Council's satisfaction and in a cost-effective manner.
- This contract has allowed for increased reporting on the information held on the asset. Further work is also anticipated in terms of physical inspection of the service.
- The WWTP staff have developed an emergency response plan for the plant operation principally after a major earthquake.
- Council has installed an asset Management system called "Assetic' which is a central strategic register and asset management system for all asset classes. It includes in-built reporting, works tracking and life-cycle costing. It is integrated with 'Assetic Predictor' for a complete Strategic Asset Management planning and operational system capable of holding all water asset information.
- Council has also developed an Engineering Lifelines plan, which identifies vulnerable components of the Wastewater assets and ways of mitigating the degree of disruption likely to be incurred in a civil emergency. Mitigating work identified in the plan will be progressively implemented and the plan itself will be reviewed over the next 3 years.

## Standards and guidelines

- In operating and maintaining its wastewater and stormwater assets, Council currently use the following standards and guidelines on a regular basis as appropriate:
- Water NZ; New Zealand Pipe Inspection Manual 3rd Edition.
- Standards New Zealand (2013) NZS3910: 2013 Conditions of Contract for Building and Civil Engineering Construction.
- Standards New Zealand (2004) NZS4404: 2010 Land Development and Subdivision Engineering.

## Summary of asset management practice

The table below compares our current practice with appropriate and best asset management practice. (Based on International Infrastructure Management Manual - IIMM guidelines)

| Wastewater Asset Management Processes | | | |
|---|---|---|---|
| Asset Management Activity | Current practice | Appropriate | Best practice |
| 1. Level of service | Review LOS & consult with community at least every 3 years | √ | |
| 2. Knowledge of assets | Asset management system containing all assets maintained. Supplemented by contractor/specialist reports on serviceability & condition. | √ | |
| 3. Risk management | Strategic risk assessment at least every 6 years. Operational risk assessment at least every 3 years. Emergency response plans have been developed. | √ | |
| 4. Condition assessment | Largely based on contractor's service records & Council records e.g. Resource consents. Specialist studies/reports supplement these records to build knowledge | √ | |
| 5. Accounting / Economics | NCS accounting system. Accrual based system. | √ | |
| 6. Operations | Service contractors are monitor & report on any operational issues. Operated to appropriate & NZ standards. | | √ |
| 7. Maintenance | Service contractors monitor the system and undertake/report on any maintenance work required & NZ standards. | | √ |
| 8. Performance monitoring | Reported annually as part of the Annual Report process. | | √ |
| 9. Optimised lifecycle strategy | Reported annually as part of the Annual Report process. | √ | |
| 10. Design Project/Management | Performance assessment used to prioritise lifecycle strategy. | | √ |
| 11. Asset utilisation /Demand modelling | Expertise is contracted as required. Assetic Asset Management modelling | √ | |
| 12. Quality Assurance /Continuous improvement | Demand forecasting reliant on historic usage records, staff knowledge and census data. | | √ |

## Summary of Assets

The Masterton District Wastewater systems is summarised in the table below;

| Summary of Total Masterton Urban and Rural Wastewater Assets | | | | |
|---|---|---|---|---|
| Location | Asset description | Unit | Quantity | Notes |
| Masterton Urban Area | Pipes | Km | 176.6 | Approximately 50-840mm dia. |
| | Pump Stations | No. | 3 | Incl. Colombo Rd siphon |
| | Manholes | No. | 2,207 | Including pump stations |
| | Treatment | No. | 1 | Waste stabilisation ponds, field irrigation disposal |
| Riversdale Beach | Pipes | Km | 13.5 | Approximately 50-225mm dia. |
| | Pump Stations | No. | 7 | |
| | Manholes | No. | 114 | Including pump stations, but excl valves, air valves & cleaning eyes. |
| | Treatment | No. | 3 | Waste stabilisation ponds, field irrigation disposal |
| Castlepoint | Pipes | Km | 6.7 | Approximately 50 & 150mm dia. |
| | Pump Stations | No. | 2 | |
| | Manholes | No. | 81 | |
| | Treatment | No. | 1 | Waste stabilisation ponds, 3 wetland cells. |
| Tinui | Pipes | Km | 1.3 | Approximately 100 & 150mm dia. |
| | Pump Stations | No. | 1 | |
| | Manholes | No. | 16 | |
| | Treatment | No. | 1 | Waste stabilisation ponds |

## Asset plan sophistication target level

The level of sophistication refers to the degree to which core and advanced criteria for asset management planning have been achieved. Criteria for core and advanced asset management planning are set out in the *International Infrastructure Management Manual*. (IIMM)

This plan sets out to achieve the minimum level of sophistication where corporate expectations are expressed informally and simply.

# LEVELS OF SERVICE

## Introduction

This Wastewater Asset Activity Plan intends to match the level of service the asset provides with the expectations of customers given financial, technical and legislative constraints.

Asset activity plans can be readily aligned with strategic financial planning. Formalised asset management systems and practices provide the Council with key benefits, such as:

- Improved understanding of service level options and requirements.
- Minimum life cycle (long term) costs for an agreed level of service.
- Better understanding and forecasting of asset related management options and costs.
- Managed risk of asset failure.
- Improved decision making based on costs and benefits of alternatives.
- Clear justification for forward works programmes and funding requirements.
- Improved accountability over the use of public resources.
- Improved customer satisfaction and organisation image.

Pursuing formal asset management planning enables council, as owners of a comprehensive range of assets, to demonstrate to their customers and other stakeholders that services are being delivered in the most effective manner.

The purpose of this Asset Activity Plan is to report on the current service levels for each asset stream and how council operates these on the community's behalf. Options to vary the level of service are also reported, resulting in the presentation of a series of possible options for future maintenance or improvement.

## Customers and stakeholders

Council's Property and Community Facilities customers include, ratepayers, residents, local industries, businesses and our community.

Council's service stakeholders encompass Ministry of Health, local Iwi including Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa, Wairarapa District Health Board, Greater Wellington Regional Council, contractors, subdivision developers, ratepayer associations and other territorial authorities.

## Annual residents survey

### 2020 resident survey Wastewater

The most recent survey was done in 2020 (Keyresearch May 2020). Current performance based on recent survey results and compared to national and peer group averages is assessed as being adequate for the level of service desired by the community.

### Introduction

The Masterton District Council has a requirement to measure how satisfied residents are with the resources, facilities and services provided by Council, and to prioritise improvement opportunities that will be valued by the community

### Research objectives

To provide a robust measure of satisfaction with Council's performance in relation to service delivery

To determine performance drivers and assist Council to identify the best opportunities to further improve satisfaction, including satisfaction amongst defined groups within the district

To assess changes in satisfaction over time and measure progress towards the long-term objectives

**Methodology**

A statistically robust survey conducted online and via postal survey with a sample of n=579 residents across the Masterton District area

Post data collection the sample has been weighted so it is aligned with known population distributions for the Masterton District Council area, as per the Census 2018 results, based on age, gender and ethnicity

A total of 3,000 invitations were posted. At an aggregate level the sample has an expected 95% confidence interval (margin of error) of +/ 4.1%.

Data collection took place between 16 April and 24 May 2020

**Notes**

Due to rounding, percentages may add to just over or under (+/ 1%) totals

## Historical residential surveys

Council conducts a resident's survey and meets with focus groups to gain feedback on community perceptions of Council every year. The National Research Bureau (NRB) has carried out 'Communitrak' surveys for Council every year since 1993. This is a means of measuring Council's effectiveness in representing the wishes and viewpoints of our residents. It provides a comparison for Council on major issues, and on our performance relative to the performance of our peer group. It also compares Council to other Local Authorities throughout New Zealand and to previous Communitrak results, where applicable.

The following table shows the high-level results of the 2020 survey and the historical Communitrak Surveys rating the level of service for Wastewater.

**Results of Masterton's Communitrak Survey for Wastewater (Urban Ward Residents Only)**

| SURVEY YEAR | VERY SATISFIED % | SATISFIED % | NEUTRAL % | *DISSATISFIED % | VERY DISSATISFIED % |
|---|---|---|---|---|---|
| 2020 | 21 | 42 | 22 | 11 | 4 |
| **SURVEY YEAR** | **VERY SATISFIED %** | **FAIRLY SATISFIED %** | **NOT VERY SATISFIED %** | **VERY DISSATISFIED %** | **DON'T KNOW** |
| 2018 | 28 | 63 | 4 | 3 | 2 |
| 2017 | 29 | 62 | 4 | 2 | 3 |
| 2016 | 29 | 66 | 2 | 1 | 2 |
| 2015 | 26 | 70 | 2 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| 2014 | 19 | 74 | 4 | 1 | 2 |
| 2012 | 55 | 38 | 4 | 0 | 3 |
| 2011 | 39 | 52 | 6 | 0 | 3 |
| 2010 | 38 | 50 | 9 | 0 | 3 |
| 2019 | 43 | 41 | 15 | 0 | 1 |
| Peer-group (size) | 37 | 46 | 16 | 0 | 1 |
| National average | 18 | 41 | 27 | 0 | 14 |

*Different survey provider for 2020 and different satisfaction scale.

*Readings prior to 2014 had a different satisfaction scale. No survey in 2013 or 2019

## Consultation on special or future projects

Consultation with key stakeholder groups is undertaken when developing Wastewater strategy and project options. Formal public consultation is undertaken for capital project prior to implementation.

## Community outcomes consultation

Property and Community Facilities assets and services contribute to the community outcomes outlined in the table below. These will be reviewed every six years.

| Community Outcomes | |
|---|---|
| Community Outcome | How Roading Assets contribute |
| A thriving and resilient economy | • Supporting programmes and projects that promote Masterton as a great place to visit.<br>• Encouraging and facilitating events.<br>• Pursuing affordability as a key objective. |
| An engaged and empowered community | • Supporting and promoting strong capable community and sports groups, and their volunteers.<br>• Supporting a vibrant arts and culture community.<br>• Supporting an equitable society.<br>• Encouraging people to be active. |

## Legislative and other requirements

Statutory requirements set the framework for the minimum standards of service, which the water assets have to meet, and are generally non-negotiable. The key legislation and policies relating to the management of the assets are listed below.

### Relevant legislation affecting this asset

- Health Act 1956
- Resource Management Act 1991
- Health & Safety in Employment Act 2015
- The Climate Change Response Act 2002 and Zero Carbon amendment Act 2019
- The Civil Defence Emergency Management Act 2002 (Lifelines and amendment Act 2016)
- The Local Government (Rating) Act 2002
- Public Bodies Contracts Act 1959
- Public Works Act 1981
- NZS4404: 2010 land development and subdivision engineering the building code

### Council policies affecting this asset

- Rating and Financial Policies

### Regional council policies and plans affecting this asset

- Regional Policy Statement for the Wellington Region
- Regional Plan for Discharge to Land for the Wellington Region
- Regional Fresh Water Plan
- Regional Air Quality Management Plan
- Regional Soil Plan

### Council strategic planning and other documents affecting this asset

- Long Term Plan (LTP) 2021 – 2031
- Infrastructure Strategy 2021 - 2051

### Other planning and other reference documents

- Wairarapa Combined District Plan

### Other organisations and bodies that council intends to work with relating to this asset

- Central Government
- Greater Wellington Regional Council
- Masterton District Council
- Carterton District Council
- Rangitāne o Wairarapa
- Ngāti Kahungunu ki Wairarapa
- The Department of Conservation
- Wairarapa District Health Board including Wairarapa Public Health
- Regional Public Health

### Bylaws affecting this asset

Masterton District Council Consolidated Bylaws 2019

- Part 8 Wastewater Drainage
- Part 9 Trade Waste

## Levels of service and performance measures

**Current levels of service, performance measures & targets**

Council developed the current wastewater asset levels of service, performance measures and targets shown in the following table:

- Industry standards
- Customer research and expectations
- Legislative and other requirements
- Strategic and corporate goals

Levels of service were reviewed by consultation with the community in 2014, 2015, 2017 & 2019, the following table has been adopted by Council through the LTP process (2021-2031).

**Levels of Service, Performance Measures & Targets for Wastewater (2021)**

| Why Measure This? | Measure | Baseline 2018 (actual) | Performance Targets | | | |
|---|---|---|---|---|---|---|
| | | | 2021/22 | 2022/23 | 2023/24 | Years 4-10 |
| Provide efficient and effective wastewater systems for the collection, transfer, and disposal of wastewater | Customer satisfaction with urban wastewater services | 85% satisfaction | Maintain or improve satisfaction level over an average of the last three surveys | Maintain or improve satisfaction level over an average of the last three surveys | Maintain or improve satisfaction level over an average of the last three surveys | Maintain or improve satisfaction level over an average of the last three surveys |
| | *Mandatory Measures*: The total number of complaints received by the local authority about any of the following: | | | | | |
| | • Sewage odour<br>• Sewerage system faults<br>• Sewerage system blockages<br>• The territorial authority's response to issues with its sewerage system, | 5.44/1000 requests were received | Less than or equal to 8/1000 requests received | Less than or equal to 8/1000 requests received | Less than or equal to 8/1000 requests received | Less than or equal to 8/1000 requests received |

| Measure | Baseline | Performance Targets | | | |
|---|---|---|---|---|---|
| | | 2021/22 | 2022/23 | 2023/24 | Years 4-10 |
| *Mandatory Measure*: Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured: | | | | | |
| The local authority's response to any of these issues | 100% | 100% | 100% | 100% | 100% |
| **Attendance time:** from the time that the territorial authority receives notification to the time that service personnel receives notification to the time that service personnel | 100% of incidents responded to within 6 hours | ≤ 6 hours | ≤ 6 hours | ≤ 6 hours | ≤ 6 hours |
| Measure | Baseline | Performance Targets | | | |
| | | 2021/22 | 2022/23 | 2023/24 | Years 4-10 |
| **Resolution time:** From the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault. | Connection to system restored within 12 hours | ≤ 12 hours<br>100% | ≤ 12 hours<br>100% | ≤ 12 hours<br>100% | ≤ 12 hours<br>100% |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Alternative system provided where loss of service exceeds 24 hours | No alternative systems were required. | 100% of occasions | 100% of occasions | 100% of occasions | 100% of occasions |
| Provide wastewater disposal that is acceptable, safe and has minimal environmental impact | *Mandatory Measure:*<br>Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of: | | | | | |
| | *Mandatory Measure:*<br>• abatement notices,<br>• infringement notices,<br>• enforcement orders,<br>• convictions,<br>received by the territorial authority in relation to those resource consents. | No consent breaches that resulted in notices, orders or convictions | No consent breaches | No consent breaches | No consent breaches | No consent breaches |
| | *Mandatory Measure:*<br>The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1,000 sewerage connections to that sewerage system. | Measure<br>2 per 1,000 | ≤ 2/1000 | ≤ 2/1000 | ≤ 2/1000 | ≤ 2/1000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Percentage of time that treated effluent is not discharged to the river. | Winter: 49%<br><br>Summer: 72% | >50%<br><br>>75% | >50%<br><br>>75% | >50%<br><br>>75% | >50%<br><br>>75% |
| **Deliver trade waste inspection, monitoring and enforcement services to protect community health and safety** | All registered premises comply with trade waste disposal requirements as evidenced by annual inspection and followed up with further visits for enforcement if necessary | 121 trade waste inspections covering 87% of trade waste premises | 100% of known premises | 100% of known premises | 100% of known premises | 100% of known premises |

## How Wastewater levels of service contribute to our community outcomes

| Community Outcomes | | | | | |
|---|---|---|---|---|---|
| Levels of Service | A strong resilient economy | A sustainable, healthy environment | An active, involved and caring community | A knowledgeable community | An easy place to move around |
| Provide an efficient and effective Wastewater system | √ | √ | √ | | |
| This level of service aims to ensure the needs of local communities are met regarding the treatment and supply of domestic and industrial water requirements. This contributes to both the public health of the community and the community's capacity for growth and economic development, now and in the future. | | | | | |
| Provide Wastewater services in a manner that is acceptable, safe and has minimal environmental impact | √ | √ | √ | | |
| This level of service aims to ensure that services are provided in a way that is equitable and culturally acceptable, whilst maximising public health opportunities and minimising environmental impact. | | | | | |

## Past performance measures

The following table shows the performance measures for the Wastewater activities, and whether Council has achieved them. This information was obtained from the Annual Reports for each year. Note it gives a reasonably simplistic view of Councils performance and the reader is referred to the Annual Reports for further details.

| Past Masterton District Water Supply Performance Trends | | | | | | | |
|---|---|---|---|---|---|---|---|
| Performance Measure | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 |
| Customer satisfaction with wastewater services<br>Maintain satisfaction level and within 10% of peer group average | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved |
| Proportion of urgent wastewater service requests responded to within 6 hours of notification (94%) | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved |
| Renewal of disposal on connected properties within 12 hours<br>More than 95% of incidents | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved |
| Alternative system provided where loss of service exceeds 24 hours<br>100% of occasions | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved |
| Wastewater assets managed to the level specified and agreed in the AMP<br>Work projects scheduled for each year are completed | Note 1 | Achieved | Note 1 | Note 1 | Note 1 | Partly achieved | Partly achieved |
| Complete a six yearly sanitary services assessment of wastewater service provision in the district.<br>Wastewater services assessed every 3 years | Note 1 | Note 1 | Achieved | Note 1 | Note 1 | Achieved | Note 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compliance with resource consents (100%) | Partly achieved | Partly achieved | Partly achieved | Partly achieved | Achieved | Achieved | Achieved |
| Proportion of network failures that had environmental effects Less than 1% | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved | Achieved |

*Note 1 – Performance measure not used for this year

## Desired levels of service

In 2020 council reviewed the level of service that it offers to the community. Past level of service changes and consultation, along with information gathered from surveys, meetings, trends, Annual Plan submissions and a range of other sources was used to help Council review service delivery.

By further improving the effectiveness and efficiency of its systems Council could improve service delivery.

Undertaking a review of wastewater services (the Sanitary Assessment) identifies ways in which Council can further enhance the effectiveness and efficiency of wastewater systems. Through such reviews specific work and/or projects could be identified and assessed for affordability versus potential benefits.

| Options for potential enhancements and or improvements to Levels of Service | | | | |
|---|---|---|---|---|
| Option to improve level of service | Justification | Benefit | Cost | Suggested action |
| Sewer Reticulation Renewals:<br>Private Laterals (Urban) | To help to address inflow and infiltration issues experienced in some areas and ensure current levels of service are at least maintained. (Trunk to Boundary) | Potential to improve service e.g. reduced risk of failures | $500,000 | External funded provided to support option |
| Sewer mining for Urban parks | To use water currently going to treatment plant | Water available during period of low or no rainfall | $250,000 | Explore options |
| Review of wastewater assets and implementation of potential enhancements identified as a result of this. | Customer feedback | Potential to improve service e.g. reduced risk of failures | The cost of improvements will be determined as specific projects are identified. | Infiltration investigation through methods such as CCTV are an ongoing project as a part of maintenance; |
| | Opportunity to add value and enhance service | Ensure targeted and efficient use of limited financial resources | The cost of improvements will be determined | Ongoing review of operations |
| | Review targets against peer groups | Targets & outcomes.<br>Enhanced procurement policy. New technology | The cost of improvements will be determined | Ongoing review of operations |

## Financial summary

Current costs

In 2020/21 Urban Wastewater Services, delivered at current levels of service produced: Source Annual Plan 2020/21.

- Operating costs of $6,376,526
- Rates funding of this was $6,533,8166

In 2019/20 Rural Wastewater Services, delivered at current levels of service produced.

- Operating costs of $622,901
- Rates funding of this was $335,295

The individual rural schemes operating costs without depreciation or income were,

- Castlepoint wastewater scheme $85,820
- Riversdale wastewater scheme $202,927
- Tinui wastewater scheme $14,654

To maintain these current levels of service, maintenance and renewal work will need to be undertaken, as detailed in this AMP. For more information re specific projects identified, please refer to sections: 4 Future Growth and Demand; 5 Risk Management and 6 Life Cycle Management Plans.

## Cost of enhancing current levels of services

The key actions and issues identified in this section requiring attention and/or intervention, and the costs associated with the proposed work, are outlined in the following table.

It should be noted that the level of services provided through the upgrading of assets is subject to the availability of capital contributions for that service.

| Work and cost required to enhance current level of service | | | | |
|---|---|---|---|---|
| Action/Work | Driver | Estimated cost | Scheduling | How this is funded |
| Sewer Reticulation Renewals:<br>Private laterals (Urban) | To help to address inflow and infiltration issues experienced in some areas and ensure current levels of service are at least maintained. (Trunk to Boundary) Potential to improve service e.g. reduced risk of failures | $500,000 | 2021-22 | External funded provided to support option |
| Renewal Programme | Potential to enhance current LOS and a reduce risk of failures | Within current budgets | Ongoing | Through existing Operational & Capital Expenditures |
| Town centre revamp project | Enhance customer experience | $550,000 over 10 years | 2021 – 2031 | Included in renewal budgets |
| Targeted programme:<br>Opportunity to add value and enhance service | Ensure targeted and efficient use of limited financial resources | Within current budgets | Ongoing | Through existing Operational & Capital Expenditures |

# FUTURE GROWTH AND DEMAND

## Introduction

The objective of asset management is to create, operate, maintain, rehabilitate and replace assets at the required level of service for present and future customers in a cost effective and sustainable manner. This Plan must therefore forecast the needs and demands of the community now and in the future, and outline strategies to develop the assets to meet current and future needs.

Council has considered the following factors for Wastewater in addition to those described in our LTP assumptions to predict future demands:

- Waste volume and waste mix
- Tourism
- Land use
- Changing legislative requirements
- Commercial influences such as industrial expansion at Waingawa may increase demand for services or result in demand for different types of services.

Greater emphasis on sustainability issues and demand for Council to provide leadership with policies that reflect stronger sustainability objectives, along with increasing pressure to enhance the preservation of water and the viability of our waterways, is anticipated. Council's aim is to reduce discharge to the Ruamahanga River over the next 30 years.

## Population effect

With a forecast 1% growth per annum in population, Council does not expect the demand on wastewater to change significantly. This is dependent on reduction in Inflow / Infiltration and water demand (as detailed in the Water supply AMP). The household distribution and urban/rural split should continue to be monitored. If the rural population does continue to increase on the outskirts of the urban area, this growth could be accommodated by expanding existing urban facilities.

If the risk of the urban growth forecast being low, then this is mitigated by the additional capacity in the current wastewater treatment plant has incorporated into its design. If the risk of the urban growth forecast being high, then this would impact on the ability to fund depreciation. Both risks are management by 3 yearly demographic review undertaken through the LTP review process.

## Waste volume and mix

The wastewater stream in Masterton comprises two components: domestic waste and trade waste.

Trade waste is any liquid, with or without matter in suspension or solution therein, that is or may be discharged into the wastewater system from batch discharge, or trade premises, in the course of any trade or industrial process or operation, or in the course of any activity or operation of a like nature and can include personal ablutions but does not include stormwater.

Additional flows and loads are expected from the Waingawa industrial area, which is in the Carterton district. Some businesses in Waingawa already dispose of their domestic wastes to Masterton's sewer. With potential to expand the industrial area, this has the possibility to increase

The most recent study of wastewater in Masterton indicates that it is typical for a New Zealand town. The trade waste component was determined to be 28% of the total BOD load. Typical trade waste to New Zealand plants contributes over a third of the domestic BOD load (Hauber, 1995).

| Influent flows to ponds | | | |
|---|---|---|---|
| | 2017/18 | 2018/19 | 2019/20 |
| Flows | $M^3$/day | $M^3$/day | $M^3$/day |
| Dry weather (summertime minimums) | 9,500 | 9,300 | 7,916 |
| Peak wet weather | 42,000 (July 2017 storm event) | 32,700 | 27,800 |
| Average | 14,800 | 14,300 | 13,000 |

Whilst domestic waste flows are not projected to increase over the next five years, trade waste flows are expected to increase. Due to industrial development and expansion at Waingawa, trade waste flows and loads from there are expected to increase. The main trunk sewer from the south end of the Masterton urban area was installed with enough capacity to serve a potential industrial area immediately south of the Waingawa River, so capacity exists to cope with this increase.

| 2020 and estimated 2030 MWTP flows and loads | | | | |
|---|---|---|---|---|
| 2017-20 AVE | Av. Flow ($m^3$/d) | Peak flow (litres/sec) | Bod (kg/d) | Ss (kg/d) |
| Domestic | 13,363 | 615 | 1,171 | 1,361 |
| Trade | 670 | 8 | 516 | 292 |
| Total | 14,033 | 623 | 1,687 | 1,653 |
| 2030 | Av. Flow ($m^3$/d) | Peak flow (litres/sec) | Bod (kg/d) | Ss (kg/d) |
| Domestic | 14,830 | 692 | 1,316 | 1,530 |
| Trade | 1,221 | 16 | 687 | 409 |
| Total | 16,051 | 708 | 2,003 | 1,939 |

## Commercial influences

The effects of industrial or commercial users on wastewater services in Masterton were analysed. The key impact of commercial use on wastewater services is likely to come from industrial activity in the Waingawa area, and particularly industry related to forestry activity.

## Forestry

Timber due to be harvested in the District, if processed locally, could increase the discharge of pre-treated wastewater to Council's wastewater system in the future. Capacity exists to accommodate any increased discharge at this point in time

The current economic environment may impact on these projections. This situation should be monitored and as more information comes to light, it is recommended that these estimates be updated.

| Current and Future Trade Waste Flows & Loads from 2020 to 2030 | | | |
|---|---|---|---|
| 2020 | Av. Flow ($m^3$/d) | Bod (kg/d) | SS (kg/d) |
| Timber processors | 0 | 0 | 0 |
| Trade | 670 | 516 | 292 |
| Total | 670 | 516 | 292 |
| 2030 | Av. Flow ($m^3$/d) | Bod (kg/d) | SS (kg/d) |
| Timber processors | 8329 | 23 | 20 |
| Trade | 892 | 687 | 409 |
| Total | 1221 | 710 | 429 |

## Climate change

Climate change is expected to influence the wastewater service, from both an acquisition and disposal perspective.

The east of New Zealand is predicted to become warmer and drier with an increased potential for extreme weather events.

Council's ongoing source detection and I & I reduction and education efforts may mitigate some potential effects. Climate changes could influence the wastewater disposal system however developments and potential impacts will be monitored.

Further monitoring and analysis work are recommended to gain a better understanding of how climate change may impact on the wastewater services in the Masterton District.

See risk section and LTP for climate change assumptions

## Carbon emissions

With council ongoing I&I reduction mainly through the pipe renewal programme with have reduced the energy consumption required to operate the Homebush WWTP thus lowering carbon emissions

### Demand for Improvement in the Service Level

The impact of demand drivers on future wastewater facilities and services are summarised in the following table.

| Expected Impacts of Demand Changes for Wastewater Services | | |
|---|---|---|
| Demand Driver | Future Impact | Future Demand (for the next 10 years) |
| Population | Low/Med | Negligible |
| Waste Volume/ Mix | Low | Negligible |
| Commercial Influences | Low/moderate | Unknown |
| Climate changes | Low/moderate | Negligible |
| Demand for improvement in level of service | Low/moderate | Outcomes from strategic review, public consultation and annual plan submissions, resource consents to be considered |
| Changes in customer expectations | Low/moderate | Outcomes from public consultation |

## Cost of responding to growth and demand changes

As noted, no specific work has been identified at this time. The key actions and issues identified in this section that may require attention and/or intervention, and the costs associated with the proposed work, are outlined in the following table.

| WASTEWATER WORK REQUIRED TO MEET GROWTH & DEMAND | | |
|---|---|---|
| Demand driver | Work/action required | Estimated cost & How this will be funded |
| Climate change | It is possible that climate change impacts will require future work to mitigate and/or adapt. At this stage the extent and impact of climate change is unknown. | Potential project costs are unknown, investigate work will be covered by existing budgets.<br>Infiltration & inflow of water into the WW pipe network |
| Carbon Emissions | Wastewater treatment plant emissions are significant to MDC carbon footprint.<br>Further is required to measure carbon output and to investigate mitigation options | Investigation work are from existing budgets. Any identified work required for mitigating carbon output need to be confirmed. |
| Review of wastewater services & sanitary services assessment | Specific work and/or projects may be identified as part of ongoing reviews. | Potential projects and cost unknown at this stage |

## Conclusion

A 3.5% increase in average wastewater flows is expected in the Masterton urban area over the 10 years, mainly due to forecast increases in trade waste. Increases in Biochemical Oxygen Demand (BOD) and suspended solids (SS) of 10.6% and 7.5% respectively, are also expected. The population in Masterton urban area is expected to grow by 1% per year, so reduction in Inflow / infiltration and water demand projects means domestic wastewater is not predicted to increase.

These figures are estimates only and it is recommended projections be updated whenever more information becomes available.

Further research is recommended to assess:

- Expected growth or otherwise in commercial sectors.
- Council will develop strategies for the various possible projections as to the likely risks of climate changes.
- Population projections for Castlepoint, Riversdale Beach and Tinui

# RISK MANAGEMENT

## Introduction

Risk management is the term applied to a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organizations to minimize losses and maximize opportunities. Risk management is as much about identifying opportunities as avoiding or mitigating losses.

Part A summarises risk relevant to all asset streams but there are risk management issues particular to the water supply, and these are identified below.

## Risk management process

The process followed for this Plan was:

**Strategic level risk assessment:**

- Initiation of Risk Management Project in November 2005 to support Councils asset management planning processes and the LTP
- Introduction of Council staff to concepts of risk management via training workshops
- Preparation of draft risk assessments by Council asset managers for their respective areas of responsibility, which were then reviewed by Waugh Consultants Ltd
- Production of a report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2006)
- Identification of issues to be followed up
- Review of Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2006) in conjunction with asset managers and production of a revised report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2011)
- Risk Management Update (Waugh Consultants, 2014)
- The impact of the Waugh Update (2011 & 2014) was reviewed at a strategic level in conjunction with the risk assessments carried out by Council staff. The risk management analysis is now consistently incorporated into all respective asset management plans
- 2017 Council risk review undertaken following the Waugh Risk management assessments.
- Production of a report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2020)

## Natural resources plan

Greater Wellington Regional Council has released their Natural Resources Plan (to replace the existing Regional Plan) and are currently dealing with the appeals via the Environment Court. This document will need to be further modified to bring in rules specific to water use and allocation, and the Regional Council is proposing to do this though the Whaitua Process. The Natural Resources Plan sets targets and rules for all activities in the Wellington region that have the potential to affect the natural environment, biodiversity and landscape values. In particular, the water use provisions have the potential to significantly impact on Council's infrastructure requirements, especially on the potable water and wastewater treatment plants, and the stormwater network. In preparing the asset management plans and infrastructure strategy we have allowed for

what we believe to be the most likely requirements when the Natural Resources Plan is in place. However, the plan remains in its appeals phase with the rules and standards subject to change.

### Operational level risk assessment:

Some of the inherent seismic vulnerabilities of water and wastewater systems include.

- Many critical facilities, such as reservoirs, pump stations, and treatment plants, were designed and constructed before the adoption of seismic design standards that reflect the current state of knowledge of regional seismicity.
- Pipeline networks include extensive use of non-ductile (inflexible) materials, such as concrete and cast-iron pipe, which tend to fail during strong ground motion. Pipelines are especially vulnerable to failure from permanent ground deformation (resulting from liquefaction) because the deformation causes push-on pipe joints to separate.
- Wastewater system failure and overflows potentially increasing public health and environmental risks

### Summary of trends in risk assessment

The Waugh Update (2020) showed that there were a number of risk themes that were common to many activities. These themes are outlined in the Waugh Report and are identified for Councils consideration, rather than as a list of individual risk issues against each activity. Themes included:

- CAPEX Programme Management and future funding
- Unforeseen Natural Events/Pandemic's
- Health & Safety
- Legislative Compliance
- Policy & Process Development
- Asset Renewals, Operations & Maintenance
- Staff Resourcing & Training

### Critical Wastewater Assets

Council has identified the critical Wastewater assets as being.

- The Colombo Road siphon
- Homebush Wastewater treatment facility
- Castlepoint Wastewater treatment plant
- Riversdale Wastewater treatment plant
- The Wastewater trunk mains network
- Pump stations

### Risk analysis

The risks specific to this asset plan were identified and assessed based on existing conditions. See following risk tables the higher the risk scores the higher the risk potential.

**Risk review 2020**

The 2020 risk management review process included:

A review of the MDC Risk Management Policy and Corporate Risk framework

Risk review workshops with Council's Infrastructure managers

Review of and alignment of risk register format with the Corporate Risk Register

Update of the risk registers.

### Risk review objectives

The objectives of the 2020 Risk Management Review process include:

- Update the MDC risk assessments and mitigation measures reflecting latest MDC risk management policy and practice.
- Detailed risk registers that record latent (untreated) risk scores, current practise risk scores and residual risk (when identified improvement s have been implemented).
- Support the 2021-31 LTP financial programme development where risk is a driver for capital or operational funding

### Staff Workshops

The 2020 risk review process and results presented in this report are based on the opinions and perspectives of asset management on operational MDC staff. Risk assessments based on opinion are particularly useful in extracting perceived issues/problems relating to an activity, and in provoking discussion as to why one issue has a higher risk than another. Much of the value of this type of risk assessment exercise is gained when it is completed by groups of staff, as it tends to lead to questioning of assumptions surrounding the activity that may no longer be valid. The results presented should be challenged and reviewed as necessary within the wider corporate context and whenever additional asset information is obtained.

Qualitative asset condition and performance information is an important indicator of physical asset risk. Whilst specific asset condition has not been investigated in detail as part of work, asset condition and performance issues have been identified in the risk registers.

### Risk Register Update

### Improvements

The updated risk registers have been further developed to include likelihood and consequence scorning for the following , three stages of risk exposure:

- Un-treated risk,
- Current or existing [E] risk rating, recognising existing processes that manage or mitigate the risk,
- Residual risk or proposed [P] risk rating, a proposed process that if implemented will manage or mitigate the risk to its lowest level.

Current risks with a score of 12 or higher, have been included in the improvement plans. The residual risk actions help to define the improvement actions.

### Risk Methodology & Scores

Risk Stages

As mentioned, the risk registers have 3 risk scores 1 for each stage i.e. untreated, current practice and residual risk

Risk Scoring Process

**Step 1:**

Every risk is scored by assessing and allocating a score for both the likelihood and consequence of each score the scoring is based on the following tables:

| LIKELIHOOD TABLE AND SCORES | |
|---|---|
| Likelihood | Score |
| Rare | 1 |

| | |
|---|---|
| Unlikely | 2 |
| Moderate | 3 |
| Likely | 4 |
| Almost certain | 5 |

| CONSEQUENCE TABLE AND SCORES | |
|---|---|
| Likelihood | Score |
| Insignificant | 1 |
| Minor | 2 |
| Moderate | 3 |
| Major | 4 |
| Catastrophic | 5 |

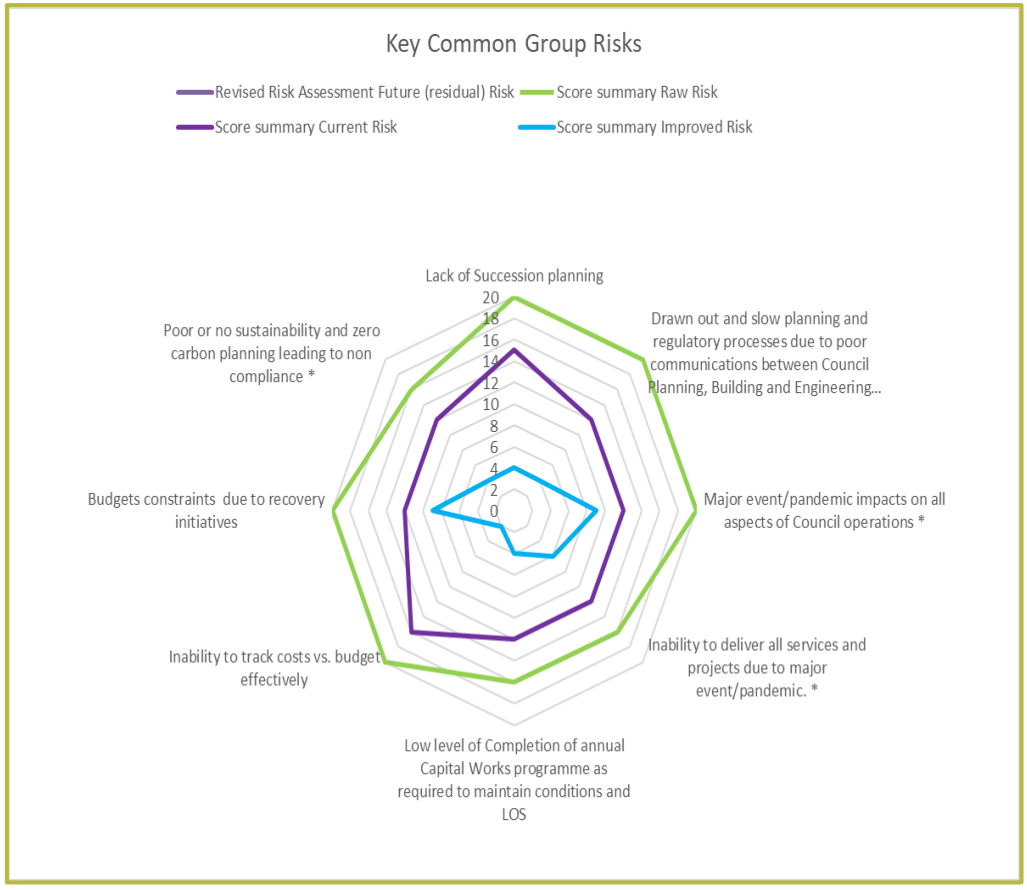
**Step 2:**

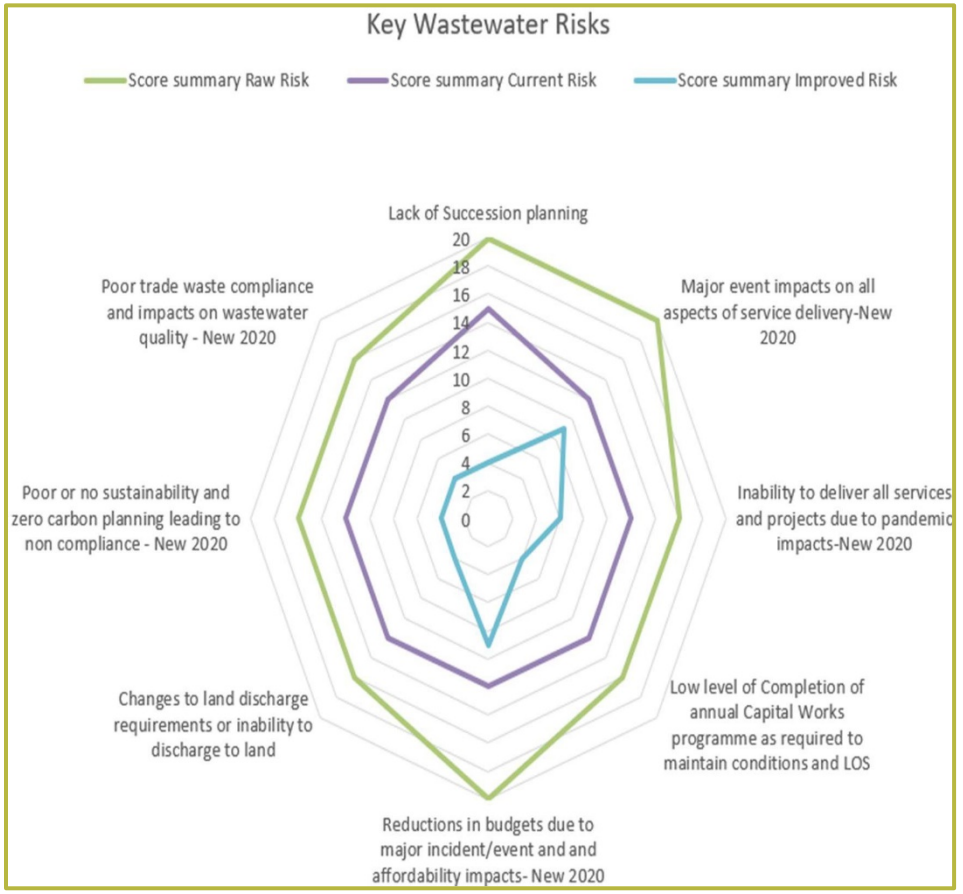
The risk score is calculated by multiplying the 'likelihood' score by the 'consequence' score

**Likelihood score x consequence score = Risk score**

This scoring process is repeated for each of the 3 risk stages.

The table below details the Risk Rating categories and potential implications for the following areas legislation, Community expectation financial and environmental.



| RISK RATING CATEGORIES | | | | | |
|---|---|---|---|---|---|
| Risk Rating | Risk Scores | Legislation | Community Expectation | Financial | Environment |
| Critical (4) | > 19 | Commissioners Appointed | Expectations not obtainable | Detrimental effects > $0.5m | Widespread long-term effect |
| High (3) | 12 to 19 | Adverse Audit Opinion or Disclaimer | Expectations not obtainable medium term | Detrimental effects > $50k | Long term effect |
| Moderate (2) | 5 to 11 | Qualified Opinion; Warning over non-compliance. | Expectations not obtainable in short term | Detrimental effects between $10k - $50k | Short term reversible effect |
| Low (1) | 3 to 4 | Minor non-compliance | Faults within agreed LoS | Detrimental effects <$10k | Reversible and contained effect. |
| Insignificant (0) | 2 or lower | Compliance | Expectations reached | No effect | No effect |

### Risk review outcomes

This section of the report provides an overview of the critical and high risks per activity, with the detailed risk registers attached as appendices.

### Assets and Operations Group Risks

A number of Assets and Operations Group risks common to all the activities were identified. These risks have been grouped together as common group risks in this section of the report. Doing this reduces duplication of these risks in each individual activity risk register, streamlining the management and reporting of these risks.

Some of these common Group risks have different responses and mitigations measures in the different activities. Where this is the case the risks are included in the activity specific risk registers.

### Key Risks & Group improvement items

The tables below summary the Assets and Operations Group key risks, highlighting the raw risk , current risk and potential improved risk scores if improvement actions are implemented:

The table below also summarises the improvement actions that if implemented reduces the individual risk scores:

## WASTEWATER IMPROVEMENT ITEMS

| Risk Description | Score summary | | | Improvement Items |
|---|---|---|---|---|
| | Raw Risk | Current Risk | Improved Risk | |
| Lack of Succession planning | 20 | 15 | 4 | [P] Develop robust succession plans for key positions. Develop staff recruitment/retention strategies |
| New-pandemic impacts on all aspects of service delivery | 20 | 12 | 9 | [P] Ongoing pandemic response planning and reviews |
| New-Inability to deliver all services and projects due to pandemic impacts | 16 | 12 | 6 | [P] monitoring impacts and revision responses and budgets |
| Low level of Completion of annual Capital Works programme as required to maintain | 16 | 12 | 4 | [P] Obtain executive agreement so that desire to employ locally is balanced against need to attract resource from outside of MDC to deliver on time. |

## WASTEWATER IMPROVEMENT ITEMS

| Risk Description | Score summary | | | Improvement Items |
|---|---|---|---|---|
| | Raw Risk | Current Risk | Improved Risk | |
| conditions and LOS | | | | [P] Capital delivery process & Procurement planning review and improvement |
| New-Reductions in budgets due to pandemic and affordability impacts | 20 | 12 | 9 | [P] monitoring impacts and revision responses and budgets |
| Changes to land discharge requirements or inability to discharge to land | 16 | 12 | 4 | [P] Review /plan/ monitor trends for future consenting options for 2034 reconsenting |
| New-Poor or no sustainability and zero carbon planning leading to non-compliance | 16 | 12 | 4 | [P] Develop activity plans and actions based on Council objectives and policy |
| New-Poor trade waste compliance and impacts on | 16 | 16 | 4 | [P] Periodic Survey and TW monitoring |

| WASTEWATER IMPROVEMENT ITEMS | | | | |
|---|---|---|---|---|
| Risk Description | Score summary | | | |
| | Raw Risk | Current Risk | Improved Risk | Improvement Items |
| wastewater quality | | | | [P] Review TW conditions<br>[P] TW bylaw enforcement |

## Work Options identified to mitigate Risk

| Options for potential future work to mitigate identified risks | | | |
|---|---|---|---|
| Justification | Action/Work | Benefit | Estimated cost |
| Health & Safety Improvements | Emergency Wastewater Storage tanks | To storge wastewater during times when the network is not able to manage capacity (Usually in heavy rain events) | $2,000,000 |
| Health & safety improvements | Compliance with health and safety requirements. Risk mitigation. Update Wastewater Safety Plan & Review response plan | To review current and future Wastewater safety plan and make improvements | $20,000 p/a |
| Public Health Assessments and Strategic Reviews | • The review and updating of the WWSP is a legal requirement and must be completed<br>• Legislation also requires a Sanitary Services Review every 6 years. | To review current and future Wastewater safety plan and make improvements | • $30,000<br>• $10,000 |
| Wastewater system failures and/or overflows may present public health and environmental risks | Upgrading, maintenance and operational work | to minimise the risk of system failures and/or overflows. | Within existing renewal and operational budgets |

### Cost of mitigating identified risks

The key risks identified in this section that requires attention and/or intervention, and the costs associated with proposed work, are outlined in

The following table.

**Work and cost required to mitigate identified risks**

| Action/Work | Driver for Action | Estimated cost | Scheduling | How this is funded |
|---|---|---|---|---|
| Health & Safety Improvements | Compliance with health and safety requirements. Risk mitigation. Update Water Safety Plan & Review response plan | $20,000 p/a | Masterton – 2022<br>Tinui - 2025 | Rates – O&M |
| Public Health Assessments and Strategic Reviews | The review and updating of the WSP is a legal requirement and must be completed. | $30,000 | 2023<br>2026<br>2029 | Rates – O&M |
| | Legislation also requires a Sanitary Services Review every 6 years. | $10,000 | 2024/25 & 2030/31 | Rates – O&M |
| | Specific work and/or projects to reduce risk factors may be identified as part of these assessments/ reviews. | | | |
| Wastewater system failures and/or overflows may present public health and environmental risks | Upgrading, maintenance and operational work to minimise the risk of system failures and/or overflows. | Within wastewater renewal costs | Ongoing | Within existing budgets |

## Climate change and stormwater protection

Climate change will increase the risks from natural hazard events that already occur within the district, particularly as a result of:

- sea level rise, exacerbating the effects of coastal erosion and inundation and of river flooding in low lying areas, especially during storm surge;
- increased frequency and intensity of storm events, adding to the risk from floods, landslides, severe wind, storm surge, coastal erosion and inundation; and
- increased frequency of drought, placing pressure on water resources and increasing the wildfire risk.

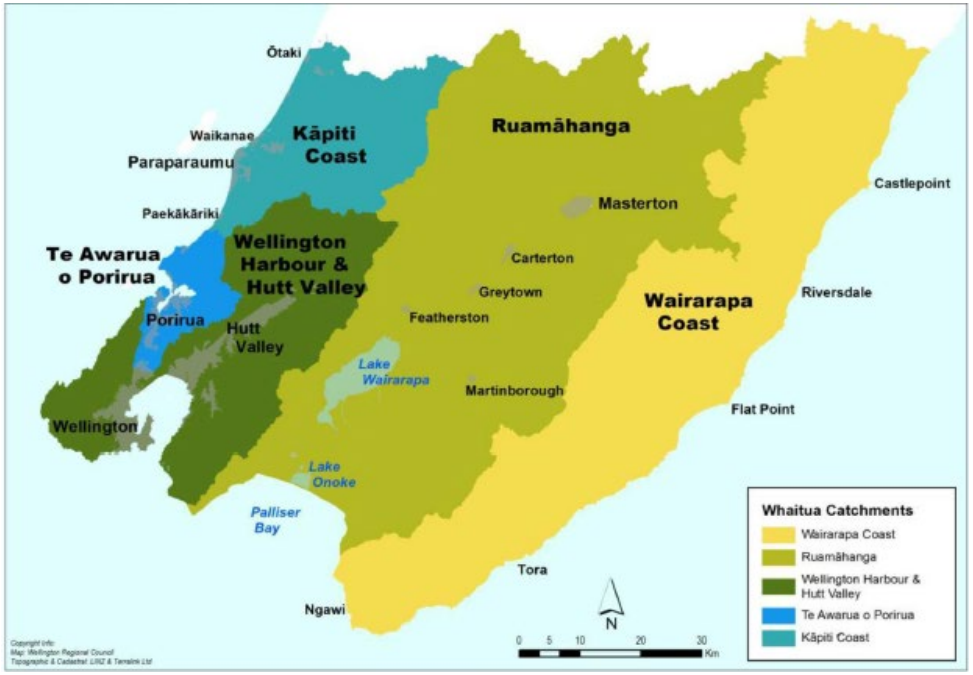
More frequent droughts may also affect the security of water supply. Currently we rely on adequate water flows from the Waingawa River and have no stored water for a prolonged drought.

Our overall approach in response to these effects is to manage through mitigation of causes and adaptation to effects. Policies and responses will need to be robust to a range of possible futures, rather than relying on a single 'forecast'.

Climate change is projected to have the impacts shown in the table below on the Masterton district coast. These are expressed as a range, as there are several scenarios considered when making projections.

We have based our planning on the NIWA modelled regional climate change projections (known as the Whaitua tables). The scenarios are expressed as a range, from higher emissions to lower emissions for a number of climate related parameters.

Council is preparing a Climate Change mitigation strategy during 2021/22. Projects from investigations as this strategy to being developed may change current and forecast project, work and maintenance programmes




*Notes*

*https://www.gw.govt.nz/assets/Uploads/WhaituaClimateChangeprojectionsMarch2020.pdf*

*Rcp4.5 mid-range scenarios where greenhouse gas concentrations stabilise by 2100*

*Rcp8.5 is a high concentration scenario where the ghg emissions continuing very high. In the light of new technologies and improvements it remains a valid way to test the sensitivity of the climate variable*

| Climate Change Wairarapa | | | |
|---|---|---|---|
| By 2040, seasonally the region could expect*: | | | Impacts |
| Ruamahanga | • 0.7°C to 1°C temperature rise<br>• Up to 30 Increased hot days over 25°C | • Between 5 % less rain, to 5 % more rainfall<br>• 0.12 to 0.24 metres above present | • Increased human heat stress and mental health issues, rurally and in urban centres<br>• Increased temperatures in urban centres due to human activities, large areas of concrete, buildings and vehicles<br>• Increased risks of pests (such as wasps, rodents and fruit flies) and diseases (including risks to human health) and biodiversity losses<br>• Increased air pollution and seasonal allergies<br>• Higher demand for drinking water at times when water is likely to be scarcer<br>• Stress on ecosystems and associated impacts on health and economy<br>• Range and habitat of native plants and animals will change-extinction of some species<br>• Higher temperatures may allow for different crops to be grown.<br>• Timing of seasonal activities such as flowering, breeding and migration will change.<br>• •Several fold increase in urban and rural wildfire risk – a particular concern for water supply | • Increased prevalence of drought delivering urban and rural water shortages, and increased pressure on water infrastructure, including water storage<br>• Saltwater intrusion on groundwater<br>• Decreased water quality and increased levels of toxic algae which impacts biodiversity, recreation and drinking water sources<br>• Increased flooding, slips and landslides affecting land, houses, roads and other assets, public transport and rural productivity<br>• Flood protection infrastructure Levels of Service reduced overtime<br>• Impacted rural community due to reduced agricultural production<br>• Reduced soil fertility<br>• Regional parks negatively affected by both drought and flooding<br>• Higher stress on indigenous ecosystems, plants and animals, especially with drought<br>• Reduced workplace productivity |
| Wairarapa Coast | • 0.5°C to 1°C temperature rise<br>• Up to 30 Increased hot days over 25°C | • Between 0 % less rain, to 5 % more rainfall<br>• 0.12 to 0.24 metres above present | | |
| By 2090, seasonally the region could expect*: | | | | |
| Ruamahanga | • 1.2°C to 3°C temperature rise<br>• Up to 80 Increased hot days over 25°C | • Between 0 % less rain, to 10 % more rainfall<br>• 0.68 to 1.75 metres above present | | |
| Wairarapa Coast | • 1°C to 3°C temperature rise<br>• Up to 60 Increased hot days over 25°C | • Between 10 % less rain, to 5 % more rainfall<br>• 0.68 to 1.75 metres above present | | |

– **Source: MFE , GWRC and NIWA climate change summaries. Updated 2020*Projected changes are relative to 1995 levels. The numbers provided are mid-range estimates of what the change is projected to be and should not be taken as definitive values.**

## Increased flood risk

As well as the main township of Masterton, our district has other smaller communities such as Castlepoint, Taueru, Tinui, Mauriceville and Riversdale. Two of these communities are situated along its coastal edge. The urban developments are subject to flooding from the many streams and rivers which drop fast out of the ranges and then slow down and spread out on the plain on their way to the sea.

In high rainfall events, the volume and rate of flow of the water coming down the waterways rises quickly and residual ponding, once the waterway levels have dropped, can be significant.

The climate change projections suggest that very heavy rainfall events are likely to become more frequent, especially in the Tararua ranges during north-westerly storms and the Wairarapa during southerly storms. This will present very significant challenges in how we manage our assets.

Stormwater eventually finds its way to the sea. The level of the sea at the time the stormwater is flowing down the rivers influences how fast and how much of the stormwater can drain away. If the sea level is high enough, it can prevent the water flowing away out to sea causing it to back up and overflow inland. The rise in base sea level is caused in part by rising ocean temperatures – heated water expands.

In addition to this effect, rising ocean temperatures mean that storms generated at sea will contain more energy, for example be more intense. This in turn means that storm surges and wave heights will be higher. All these factors combine to significantly increase the risk of inland flooding on the district's coastal plains.

GWRC has recently collated data gathered from 20 years' research and new data using aerial photos, electronic flood mapping tools and a range of analytical techniques to identify hundreds of Masterton properties as being at potential increased risk of flooding.

We are working with GWRC to confirm predictions for flood events. The overriding issue is to ensure timely protection measures are in place against a 1 in 100-year flood to preserve our community and our economy. Until levels are confirmed, and any mitigation required is in place, there may be implications for any proposed developments in the town centre, the library project and the town's overall economic development.

## Earthquake resilience risks

Parts of Masterton are built on old flood plains that could be subject to liquefaction in a major earthquake. Part of MDC's bridge and reticulation renewals programme involves using different construction methods and materials to provide greater earthquake resilience in pipelines.

We do not consider that this risk is so great that the renewals programme should be brought forward. Instead, we will address resilience at the time pipes and bridges are replaced.

## Three Waters Reform

The Three Waters Reform is a process that central government is leading to consider the future of the three water services councils currently deliver – drinking water supply, wastewater and stormwater - and who is best placed to provide these in future.

The Council has signed a Memorandum of Understanding (MoU) with central government agreeing to take part in exploring options for the future. The work we are doing with central government is to identify approaches that could benefit the future delivery of these services.

We expect to have more information on the proposal for Three Waters in May 2021. Once we know what central government is suggesting, we will assess what that means for our community and come back to the community before we decide whether to continue to participate in the reform process or opt out.

We expect to have to make that decision later in 2021. If we choose to participate, the proposal is likely to be implemented during the 2023/24 financial year.

Regardless of the outcome of the reform process, we know communities will need drinking water and wastewater services, whether they are delivered by the Council or another organisation.

The Three Waters activities are included in our financial strategy and the infrastructure strategy. These strategies, along with other supporting information like our forecasting assumptions and disclosures, give a complete and accurate set of information on the medium-term and long-term financial situation for these services.

More information on the Government's reform strategy and timeline is available at https://www.dia.govt.nz/Three-Waters-Reform-Programme

## Conclusion

Risks, at a strategic level, relevant to the wastewater assets were identified and assessed by both Council staff and Waugh Consultants Ltd.

Risks, at an operational level, relevant to the Wastewater assets have been identified as a result of this work, the 2014 PHRMP review, 2020 risk workshops, Leak Detection Studies and Condition Assessment. Operational risks identified through these projects have been assessed and incorporated into this Plan.

# LIFE CYCLE MANAGEMENT PLANS

## Introduction

Life cycle management plans were prepared for the asset groups of wastewater, and the wastewater treatment plants they include the Urban Masterton area and the rural areas of Tinui, Castlepoint, & Riversdale.

Each lifecycle management plan includes the following information:

- Asset description (including physical parameters, capacity/performance, condition, valuation, historical expenditure, critical assets, significant negative effects, resource consents, data confidence levels)
- Design standards
- Maintenance plan
- Renewal/replacement plan
- Asset creation plan
- Financial forecast
- Disposal plan

## Wastewater Introduction

This section covers the wastewater systems in the following areas Masterton, Riversdale, Castlepoint and Tinui that Council owns and maintains. This includes the infrastructure required to operate such as pipes, laterals, inspection points, manholes and pump stations on public or private property.

Council has made a strategic decision to maintain the current level of service, which meets required legislative and health and safety requirements associated with the activity.

## Asset description

**Masterton Urban**

**Pipes**

Masterton's wastewater system consists of approximately 196.8 km of mostly 50mm to 840 mm diameter pipes, with a predominate diameter of 150mm, as shown in the table below. The oldest pipes were laid around the early 1900s, with ages of the reticulation dating from then, up to the present day. The majority of the reticulation assets are gravity drained although there are two main reticulation pump stations, one at Waingawa Bridge for the industrial area south of the bridge, and the Chapel Street reserve station. These pumps assist with changes in topography and also as backup redundancy. There is also a siphon situated on Colombo Road.

The key features of the upgrade at the Homebush Treatment Plant of the new WWTP include:

- New oxidation ponds: two primary ponds operating in parallel and five maturation ponds operating in series
- New inlet works
- New influent pumping station
- Live storage (controlled by automated valves) of up to 275,000$m^3$ in the ponds for when irrigation or river discharge is not possible
- Pond effluent pumping station and distribution system
- Border-strip irrigation system covering a net area of 75 hectares on existing pasture plus development of an additional area of

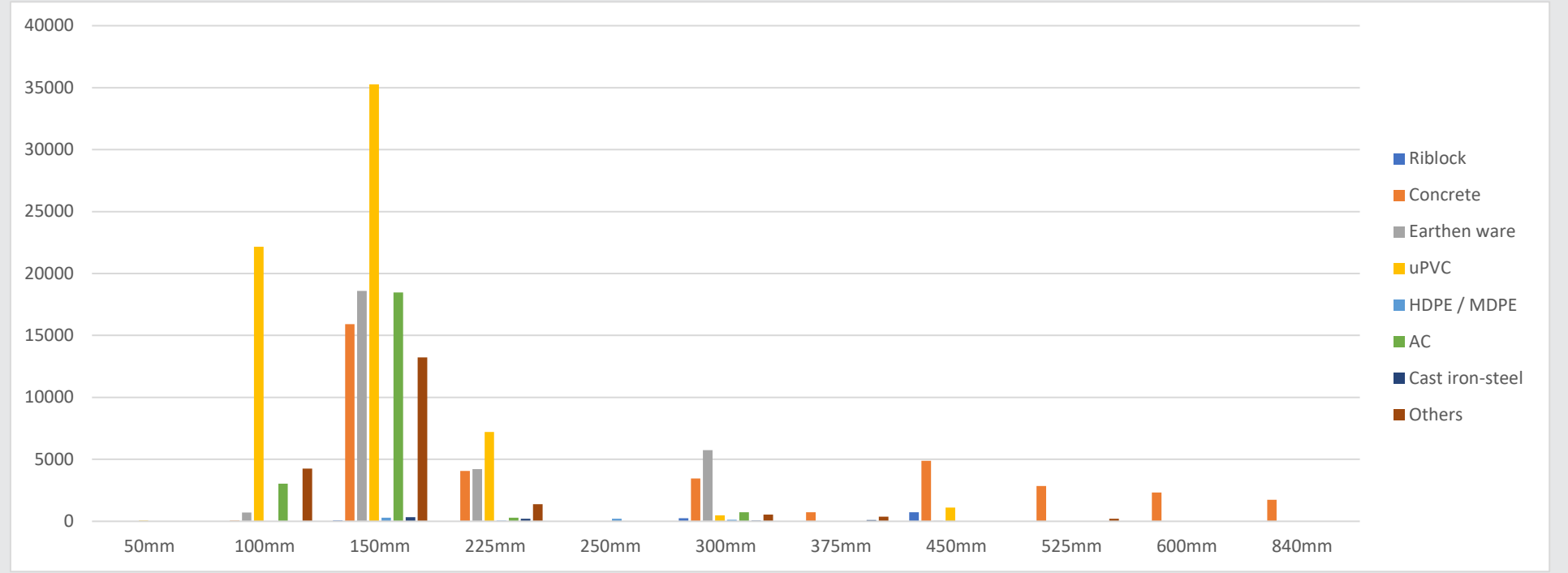
approximately 22 hectares for border-strip irrigation in the area of the existing treatment ponds

There are approximately 9,218 connections, mostly households but also including a small industrial contribution, serving an estimated population of 21,000 people.

**Masterton urban sewer pipes by diameter, length & material**

| Diameter | Riblock | Concrete | Earthen ware | PVC / uPVC | HDPE / MDPE | Asbestos concrete | Cast iron-steel | Other |
|---|---|---|---|---|---|---|---|---|
| Mm | M | M | M | M | M | M | M | M |
| 50 | | | | 57.84 | | | | |
| 100 | | 61.10 | 706.23 | 22,150.16 | | 3,040.00 | 8.08 | 4,250.54 |
| 150 | 92.00 | 15,919.70 | 18,605.01 | 35,257.67 | 285.07 | 18,469.93 | 326.38 | 13,221.78 |
| 225 | | 4,057.07 | 4,219.68 | 7,211.61 | 68.06 | 295.54 | 216.11 | 1,384.94 |
| 250 | | | | | 211.45 | | | |
| 300 | 255.00 | 3,460.81 | 5,753.45 | 478.00 | 119.84 | 727.00 | 68.24 | 540.61 |
| 375 | | 729.45 | | | | | 97.30 | 379.80 |
| 450 | 724.00 | 4,886.04 | 45.87 | 1,101.47 | | | 19.00 | 9.01 |
| 525 | | 2,852.46 | | | | | 25.00 | 207.31 |
| 600 | | 2,331.05 | | | | | | |
| 840 | | 1,739.74 | | | | | | |
| **TOTAL** | **1,071.00** | **36,037.42** | **29,329.19** | **66,256.75** | **684.42** | **22,532.47** | **760.11** | **19,948.68** |

## Masterton urban sewer pipes by diameter, length & material




There is a  proportion where the age of the pipes are an assumed age. Continuing work verifying pipe age is being undertaken. Also a small proportion of the pipe asset is over 100 years old and these pipes form a part of the current renewal programme.

Riversdale Beach

The Riversdale Beach scheme was commissioned with the first pond receiving effluent at the end of 2011. The system is a combination of gravity feed into 7 lift pumps to compensate for the relatively flat beach front topography. There are a small number of properties that require their own pumps to remove wastewater to the village's new reticulation network. One macerating pump set, and a main pump station set at the bottom end of the network move collected wastewater to the treatment & disposal site in the hills above.

| Riversdale sewer pipes by diameter & material | | | |
|---|---|---|---|
| Diameter | HDPE / MDPE | PVC / uPVC | Concrete |
| MM | M | M | M |
| 50 | 333.23 | | |
| 63 | 1419.16 | | |
| 75 | 496.15 | | |
| 80 | 543.31 | | |
| 90 | 1131.21 | | |
| 100 | | 2346.36 | |
| 125 | 104.00 | | |
| 150 | | 2672.43 | |
| 180 | 3023.14 | | |
| 225 | | 1390.92 | |
| 1600 | | | 52.16 |
| TOTAL | **7050.20** | **6409.71** | **52.16** |

All pump sets operate in paired sets with one pump acting as a 'duty pump' along with the other in 'stand by' pump mode.

Riversdale's wastewater system consists of approximately 13.5 km of mostly 50mm to 225 mm diameter pipes, with a section of 1600mm concrete pipe utilised as a retention reservoir at the bottom end of the network.

Effluent is pumped 2.8km to the treatment plant which consists of 3 treatment ponds lined with 2mm thick HDPE (high density poly – ethylene) liner and a spray irrigation scheme to pasture. The scheme has been constructed with capacity to cater for expected peak population influxes. There are approximately 350 homes connected to the system.

### Castlepoint Beach

Castlepoint's wastewater consists of approximately 5.2 km of 50 to 150mm PVC pipes (gravity and rising mains), which were installed from

1994 onwards. There are currently 175 equivalent lots connected, serving an estimated population in peak holiday periods of 1,300 people.

| Castlepoint sewer pipes by diameter & material | |
|---|---|
| Diameter. | uPVC |
| mm | m |
| 63 | 247.71 |
| 80 | 1026.63 |
| 100 | 2399.61 |
| 150 | 3023.02 |
| Total | **6696.97** |

### Tinui Township

Tinui wastewater consists of approximately 1.3 km of pipes, including a main to the associated wetland. There are currently 20 equivalent properties connected, including the school, Tinui Hall and play centre, serving around 100 residents.

| Tinui sewer pipes by diameter & material | |
|---|---|
| Diameter | uPVC |
| mm | m |
| 100 | 69 |
| 150 | 1318 |
| Total | **1387** |

### Manholes

The number of sewer manholes in Masterton, Riversdale, Castlepoint and Tinui are summarised in the following table

| Manholes in Masterton, Riversdale, Castlepoint and Tinui | |
|---|---|
| Location | Number of manholes |
| Masterton | 2023 |
| Riversdale | 114 |
| Castlepoint | 81 |
| Tinui | 16 |
| Total | 2234 |

Pump stations

| Sewage pump stations in Masterton district | | | | |
|---|---|---|---|---|
| Location | Description | No. | make | Base life |
| Chapel St pump station | Pumps | 2 | Flygt | 20 |
| | Structure | 1 | | 80 |
| Second Street | Pumps | 2 | Flygt | 20 |
| | Structure | 1 | | 80 |
| Colombo Rd siphon | Vacuum | 2 | | 12.5 |
| | Structure | 1 | | 50 |
| Riversdale Beach | Pump | 6 | Mono | 20 |
| | Pump | 2 | Mono | 20 |
| | Pump | 2 | Mono | 20 |
| | Pump | 2 | Mono | 20 |
| | Pump | 2 | Mono | 20 |
| | Lift pumps | 10 | Various | 20 |
| | Structure | 7 | | 80 |
| Castlepoint pump station | Pump | 4 | Flygt | 20 |
| | Structure | 1 | | 80 |
| Tinui Township | Pump | 2 | Tsurumi | 20 |
| | Structure | 1 | | 80 |

## Wastewater Asset Capacity/Performance

### Pipes

The following table shows the estimated average dry weather flow (ADWF) and peak wet weather flow (PWWF) for Masterton, Riversdale, Castlepoint and Tinui.

| ADWF & PWWF for Masterton, Castlepoint & Tinui | | |
|---|---|---|
| Location | ADWF ($m^3$/day) | PWWF ($m^3$/day) |
| Masterton | 15,500 | 42,000 |
| Riversdale | 47 | 174 |
| Castlepoint | 32 | 90 |
| Tinui | 7 | 100 |

In July 2009 Masterton district council produced a sewerage inflow and infiltration 10-year reduction management plan.

Ongoing CCTV, private property sewer inspections and other investigations have assisted in identifying sewer inflow and infiltration sources. Council has been working towards rectifying these problems with 2019/20 being the ninth year of a substantial pipe and connection replacement programme.

The main trunk sewer from the south end of the Masterton urban area was installed with sufficient capacity to serve a potential industrial area immediately south of the Waingawa river. Development in this area will contribute to greater use of the main trunk sewer.

Masterton and Carterton district councils have negotiated an agreement to allow wastewater from south of the Waingawa river to discharge to the Masterton wastewater network. This agreement has a maximum discharge rate of 35 litres per second associated with the capacity of the line.

## Wastewater Pump Stations

The capacities and performance of the pump stations Council operates are as follows:

| Location | Description | Litres per second | Height |
|---|---|---|---|
| Chapel Street | Lift pump | 22 | 5.5m |
| Waingawa | Lift pump | 32 | 5m |
| Tinui | Lift pump | 1.5 | 8m |
| Castlepoint | Lift pump | 4 | 15m |
| Tuatahi Ave | Lift pump | 11 | 5m |
| Riversdale Beach reticulation pump set | Main macerating pumps (2) | 4.5 | 9.5m |
| | Cavity pumps (2) | 18 | 83m |
| | Lift pumps (2) | 31 | 2.2m |
| | Lift pumps (2) | 29 | 2.9m |
| | Lift pumps (2) | 24 | 4.2m |
| | Creek pumps (2) | 9.2 | 21.7m |
| | Surf Club pumps (2) | 2.6 | 12.3m |

## Wastewater Asset Condition

### Wastewater Pipes

The most common method of condition assessment of pipes in New Zealand is by closed circuit television (CCTV) inspection. The national guideline for CCTV is the NZ Pipe Inspection Manual 2019 (NZPIM).

The NZPIM grading system is based entirely on CCTV inspections. Both structural and service grades are calculated, and the grading system is as follows, 1 = Excellent, 2 = Good, 3 = Moderate, 4 = Poor, & 5 = Fail

The structural grading is based on the age of the pipe, maintenance records and defects and their severity that were recorded during CCTV inspection. Weighted scores are allocated to the various defects and severity ratings based on their influence on the structural integrity and serviceability of the pipeline. It is assumed pipes of structural grade 5 require renewal, repair, replacement or upgrading.

The service grading provides a guide to the future levels of maintenance required for the pipeline but does not indicate the type of maintenance required. Only those defects that can be remedied by non-structural maintenance works are included in the service grading. It is assumed pipes of service grade 5 require heavy cleaning and/or root cutting.

| Summary of sewer pipe grades for Masterton (all Inspections) | | | | |
|---|---|---|---|---|
| Grade | Structural M | % of inspected length (44km) | Service M | % of inspected length (44km) |
| 5 | 9,823 | 22 | 964 | 2 |
| 4 | 7,551 | 17 | 10,889 | 25 |
| 3 | 11,030 | 25 | 5,751 | 13 |
| 2 | 13,718 | 31 | 8,182 | 19 |
| 1 | 2,303 | 5 | 18,637 | 42 |
| TOTAL | **44,423** | **100** | **44,423** | **100** |

Ongoing CCTV surveys of pipes have been undertaken. The results of these surveys are continually being collated and form the basis for decision making for condition rating pipe grades. CCTV surveys will help to provide a reasonably consistent record of asset condition over time.

Grades will be shown on plans of the reticulation network to assist with planning maintenance and renewal work.

| Summary of sewer pipe grades for Masterton | | | | |
|---|---|---|---|---|
| Grade | Structural M | % of adjusted inspected length (31km) | Service M | % of adjusted inspected length (31km) |
| 5 | 6,477 | 21 | 394 | 1 |
| 4 | 5,231 | 17 | 2,186 | 7 |
| 3 | 7,586 | 24 | 4,867 | 16 |
| 2 | 10,608 | 34 | 7,613 | 25 |
| 1 | 1,452 | 5 | 16,294 | 53 |
| TOTAL | **31,354** | **100** | **31,354** | **100** |

**Castlepoint** wastewater system is relatively new, so has not been CCTV inspected to date. It is currently cleaned about twice a year so is expected to be in a reasonable condition. The system will continue to be monitored and CCTV inspection considered in the future.

**Tinui** wastewater CCTV inspection commenced in 2005/06 and the network has since been completely renewed from 2007 to 2011, with the network replaced from residential gully traps to the disposal field. This is now a newly built system; pipes are in as new condition.

**Riversdale Beach** construction of the wastewater system Beach commenced in 2009 and the first ponds received effluent by the end of 2011. Given this is a newly built system pipes are considered to be in an 'as new' condition.

**Wastewater Manholes**

**Masterton** manhole condition inspections were also carried out under contract 11-04/05 in the worst performing sub-catchments in 2005. Of interest was the amount of inflow & infiltration (II) entering the reticulation through manholes.

As the NZPIM grading system does not include manholes, an equivalent system was formulated. This system is considered to comply with the requirements of the International Infrastructure Management Manual (2020), ST1/SE1 = Excellent, ST2/SE2 = Good, ST3/SE3 = Moderate, ST4/SE4 = Poor, & ST5/SE5 = Fail

The following table summarises these inspections. Council Officers have since identified some inconsistencies in this data. It is therefore recommended that the data be verified and all remaining sewer manholes in Masterton be inspected and graded, consistent with the system used here. Manholes in Castlepoint need to be included in any assessment work.

**Summary of Sewer Manhole Grades for Masterton**

| Grade | Structural (st) no. | Service (se) no. |
|---|---|---|
| 5 | 45 | 56 |
| 4 | 62 | 6 |
| 3 | 57 | 25 |
| 2 | 56 | 208 |
| 1 | 324 | 250 |
| No grade | 1 | - |

## Asset Valuation

The Wastewater Reticulation asset components were valued as follows, as at 30th June 2020. Data was sourced from the WSP-OPUS valuation report 2020

**Valuation of Masterton urban sewer reticulation**

| Item | Optimised replacement cost ($) | Optimised depreciated replacement ($) | Annual depreciation ($) |
|---|---|---|---|
| Reticulation | 71,543,507 | 36,119,653 | 954,464 |
| Manholes & laterals | 28,141,398 | 14,903,578 | 341,649 |
| Pumping stations | 596,801 | 346,283 | 19,774 |

– Valuation as at 30 June 2020

Replacement cost is the cost of building anew the existing infrastructure using present day technology but maintaining the originally designed level of service. Maintaining the original level of service ensures that the existing asset with all its faults is valued, not the currently desirable alternative.

Values include actual purchase/construction price plus expenses incidental to their acquisition and all costs directly attributable to bringing the asset into working condition and location. These additional costs include:

- Professional fees of all types
- Delivery charges
- Costs of site preparation and installation
- Non-recoverable GST and other duties and taxes

The basic value of the assets reduces in accordance with the wear and tear and deterioration undergone over their lives. This reduced value is called the depreciated replacement value and has been calculated as the replacement cost proportioned by the ratio of remaining useful life to economic life on a straight-line basis. This method provides an accurate reflection of the service potential of the assets.

**MASTERTON WASTEWATER RETICULATION HISTORICAL EXPENDITURE**

| Year | Renewal expenditure ($) | Costs of maintenance ($) | Total expenditure (s) |
|---|---|---|---|
| 2009-10 | 2,297,280 | 539,915 | 2,837,195 |
| 2010-11 | 1,413,054 | 743,273 | 2,156,327 |
| 2011-12 | 2,263,740 | 782,636 | 3,046,376 |
| 2012-13 | 1,730,212 | 937,015 | 2,667,227 |
| 2013-14 | 1,394,897 | 1,056,878 | 2,451,775 |
| 2014-15 | 2,339,360 | 1,087,466 | 3,426,826 |
| 2015-16 | 2,252,514 | 1,135,338 | 3,387,852 |
| 2016-17 | 1,288,150 | 1,170,557 | 2,458,707 |
| 2017-18 | 974,108 | 1,159,510 | 2,133,618 |
| 2018-19 | 771,602 | 1,105,431 | 1,877,033 |
| 2019-20 | 1,127,507 | 1,164,827 | 2,292,334 |

## Historical Expenditures

Refer to Council's financial records for historical information on the operating and maintenance costs of the wastewater reticulation. The annual operational and capital expenditures over the last ten years are summarised in the following table.

*Source Annual plans and Annual reports*

## Wastewater Critical Assets

Critical Assets are identified as being:

- The Colombo Road siphon
- Homebush wastewater treatment facility
- The wastewater trunk mains network
- Pump stations

## Significant Negative Effects

The significant negative effects of the sewer reticulation in the Masterton district are outlined in the following table

## Resource Consents

Council does not require resource consents pertaining to the wastewater **reticulation** in the district. Council does have resource consents for **discharging** to the environments.

## Data Confidence Level

The data confidence levels for this asset are shown in the following table, where, A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

| WASTEWATER RETICULATION DATA CONFIDENCE LEVELS | | | | |
|---|---|---|---|---|
| Attribute | D | C | B | A |
| | | | | |
| Physical parameters | | | | |
| | | | | |
| Asset capacity | | | | |
| | | | | |
| Asset condition | | | | |
| | | | | |
| Valuations | | | | |
| | | | | |
| Historical expenditures | | | | |
| | | | | |
| Design standards | | | | |
| | | | | |

## Design Standards

Council requires design of all new wastewater reticulation to comply with NZS 4404: 2010 Land Development and Subdivision Engineering.

| Significant negative effects of sewer reticulation services | | |
|---|---|---|
| | Significant negative effects | How we will/do mitigate |
| Social | None identified | |
| Cultural | None identified | |
| Environmental | Any overflows or breakages (though not likely) may have localised negative effects on the environment and potentially public health. | Maintenance and renewal plans aim to minimise risk of overflows and breakages. |
| Economic | None identified | |

## Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Maintenance of the wastewater services in the Masterton district includes the following items, blockage clearing, flushing, inspections, sewer pipe CCTV and cleaning, manhole cleaning, source detection, manhole inspections, & pump station maintenance.

**Blockage Clearance, Flushing, Inspections**

These tasks are currently carried out by Council's maintenance Contractor, City Care Limited.

Council's wastewater maintenance contract is held by City Care Ltd. Note that it excludes the wastewater treatment assets. The term of contract has been granted extensions until 2017, as the Contractor has met the performance requirements specified in the contract.

Masterton District Council will review the cost-effectiveness of the current arrangements for meeting the needs of the community within the district for good-quality local infrastructure, local public services, and the performance of regulatory functions according to the LGA act 2002 (section 17a)

### Sewer Pipe CCTV & Cleaning

A list was used to plan Councils pipe cleaning & CCTV programme for sewers. Pipes of structural grade 5 were removed from this list as it is assumed these pipes will be replaced. Note this list allows for, heavy cleaning, CCTV before & after cleaning, source detection, manhole condition inspections, and manhole cleaning.

## Sewer Pipes

The renewal/replacement programme of wastewater pipe is for 2 to 4km for $1.1m per annum. This programme is based on estimates to replace, reline or repair currently identified grade 5 pipes asset management grading system. All project work priorities regarding timing of grade 5 renewal/replacement are based on the optimised renewal decision-making (ORDM) framework.

Not included are flow monitoring, lateral access chambers and GST.

This list was used to plan Council's renewal programme for sewers.

### Pump station Maintenance

Information on pump station maintenance has been incorporated into this plan with services and renewals included in the Pump Stations inventory.

### Renewal/Replacement Plan

Renewal work restores, rehabilitates, replaces or renews an existing asset to its original capacity. Decisions on replacement and/or renewals of components of the asset have and will continue to be based on consideration of the following factors:

- Cost of repairs over a period being greater than replacing the component using net present value comparisons and life cycle costs.
- The level of service cannot be delivered either in quality or quantity.
- The risk to the asset of a component failure causing significant downstream effects.

One or several of these factors may have a bearing on the justification for replacement/renewal or acquisition of a component of the asset.

The rates used for estimating the cost of replacement of pipes include:

- Establishment and disestablishment
- Pipe installation, including excavation, pipe bedding and reinstatement of pavement (asphalt)
- Repair or replacement of 1.2m dia. manholes at approx. 50m spacing
- One 100mm dia. private lateral per 10m of main (lower laterals only)
- Traffic control

### Sewer Manholes

Manholes with a structural grade of 6 (EoL) require replacement. The cost of replacement of these manholes is included in the sewer pipe replacement.

### Pump stations

Some pump station renewal work is expected within the next ten years and will be programmed by priority.

### Renewal Strategy – Optimised renewal decision-making (ORDM) framework

The ORDM process is a risk-based methodology which assesses the probability of each failure mode (including structural, hydraulic However, it must be noted that the ongoing programme of collecting further asset information and variation of market prices for sewer renewal/replacement, as well new technology advances in the industry, mean that the priority list is provisional and will be subject to change with new information.

### ORDM inputs for sewerage reticulation

ORDM used the following information to assess the probability of sewer failure:

- Structural Failure: CCTV records, age profiles, Material profiles, soil type profiles.
- Hydraulic/Capacity Failure: catchment (current/future) flow monitoring, overflow records.
- Performance Failure: System performance, Inflow and infiltration, overflow studies.
- Operations and Maintenance Failure: Repair records, maintenance records and costs.

capacity, performance, operational and performance) and the consequence (or damages) of the failures.

A scoring system of 1 to 5 is employed to quantitatively assess the risk components. For example, structurally failed sewer sections will attract a failure mode probability of 5, and sewer overflow caused by network problems will also attract a score of 5.

The risks of failure (for each failure mode) of each section of sewer are assessed and calculated by quantifying the product of their probability and consequence of failure. Pipe sections with a high risk of failure are then ranked and the top group is included in the priority 1 list.

Currently the ORDM for sewerage reticulation failure probability assessment include the following factors:

- Structural consideration based on CCTV (number and major/nature of faults, etc.)
- Capacity considerations (current observation, future subdivision potential)
- Performance considerations (Inflow/infiltration, dips etc.)
- Maintenance considerations (blockage/surcharge/overflow, tree roots etc.)

The above probability rating is then multiplied by the consequence of failure rating to obtain the overall risk score. The utility service department maintains and updates a database on the reticulation network. Each year the highest ranked sites are considered for renewal/replacement.

## Predictor Models and Data

In 2017, Council have started to implement and provide Life Cycle models using Assetic Predictor.

The objective of this prediction modelling analysis is to model the deterioration of Council's Wastewater reticulation pipe network assets by developing a simulation model using Assetic Predictor. The model does not include main truck renewals.

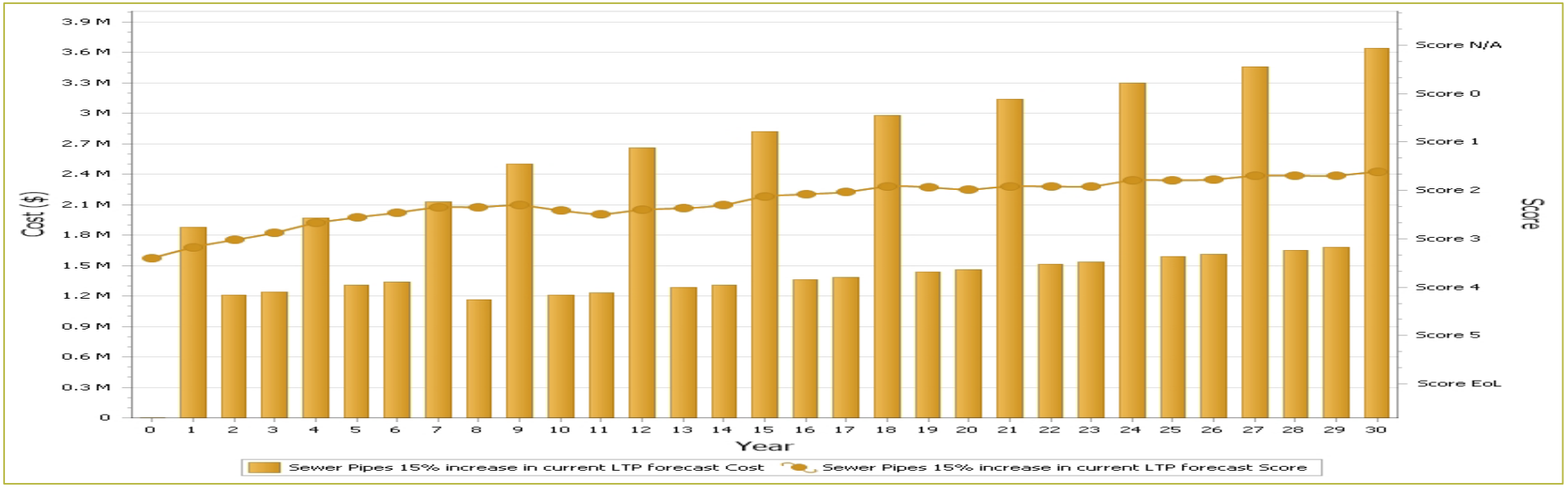
The graph below demonstrates Renewal Cost vs Overall Condition Index (OCI). Using the LTP forecast Wastewater renewal spend of $1,100,000 2021 dollars per annum. (NB: Wastewater pipe assets only)

## Wastewater main trunk renewals

The renewal plan is to undertake staged wastewater main trunk renewals, and council have set aside financial provision throughout this LTP year 2021 - 2031 to undertake this work.

This Renewal spend begins in year 1 (2021) of the LTP at $1,100,000 (2021and decreases in year 8 of the 2031 - 2051 LTP/IS. See figure below. Main truck provision has been included every 3 years ($600,000 2021 dollars)

10 and 30-year scenario modelling for Wastewater reticulation pipes. Condition Score and Spend 2021 –2031 & 2051 (includes trunk main provision)



### Asset Creation Plan

Council has no current plans to create any new assets but may consider, as part of Urban fringe Upgrade to support growth. IE: Millard Ave and Andrews Street

### Network Investigation

Data collection for inflow / infiltration performance and for future modelling work was started in 2016 and is ongoing.

### Financial Forecast

Council has made a strategic decision to improve the current levels of service for this activity. Maintenance and renewal work, as well as some capital expenditure, is scheduled to enable this. See the following table.

**Wastewater reticulation maintenance, renewal and capital costs**

| Action/work | Driver for action | Estimated cost (in current $) | Scheduled for | How this will be funded |
|---|---|---|---|---|
| Reticulation Inspections: CCTV Pipe and Manhole Inspection (Urban) | It is known that maintenance and renewal work is required to ensure current levels of service are maintained.<br>Inspection and survey will assist with planning that maintenance and renewal work. | $140,000 pa | 2021/22 to 2024/25 | Rates funded |
| Network Investigating | Data collation for I/I performance and future modelling work, which will enhance asset management. | $50,000 pa | 2021/22 to 2024/25 | Depreciation fund |
| Sewer Reticulation Renewals or heavy maintenance: Pipes, Manholes, Lower Laterals (Urban) | Based on condition assessments from CCTV work, and service request history - work to be undertaken on identified pipes and manholes will be heavy maint, relining or full replacement according to need. | $1,100,000 pa<br>$500,000 (laterals) | 2021/22 to 2031/32<br>2021/22 | Depreciation fund<br>External funding |

| Wastewater reticulation maintenance, renewal and capital costs | | | | |
|---|---|---|---|---|
| Action/work | Driver for action | Estimated cost (in current $) | Scheduled for | How this will be funded |
| | This will help to address inflow and infiltration issues experienced in some areas and ensure current levels of service are at least maintained. | | | |
| Trunk main renewals | Based on condition assessments | $600,000 of year indicated | 2021/22<br>2024/25<br>2027/28 | Depreciation fund |
| Pumping station renewals | To maintain current levels of service. | $50,000<br>$50,000 | 2021/22<br>2024/25 | Depreciation fund |

## Disposal Plan

Council does not currently have a disposal plan for its wastewater reticulation assets. Given the nature of these assets, a specific disposal plan is not considered necessary.

## Wastewater Treatment Introduction

This Asset Management Plan covers the wastewater treatment and disposal schemes Council owns and maintains, which includes Masterton's Homebush wastewater treatment plant, Riversdale Beach, Castlepoint, and Tinui.

The objective of these wastewater treatment schemes is to remove solids and pathogens and reduce the oxygen demand of the wastewater, prior to discharge to the environment.

**Asset Description Wastewater Treatment**

**Masterton's Homebush WWTP** is located along the Te Whiti Road approximately 6km from the centre of Masterton beside the Ruamahanga River. It was constructed in 1970 and upgraded in 2013-15.

The Masterton Homebush WWTP consists of the following:

- Oxidation ponds: two primary ponds operating in parallel and five maturation ponds operating in series
- Inlet works & influent pumping station
- Live storage (controlled by automated valves) of up to 275,000$m^3$ in the ponds for when irrigation or river discharge is not possible
- Pond effluent pumping station and distribution system
- Border-strip irrigation system covering a net area of 75 hectares.

Effluent is discharged to the Ruamahanga River when flows exceed half median flow and irrigated to land when river flow is low and/or weather conditions dry.

**Castlepoint's WWTP** was constructed in 1994. It consists of an oxidation pond and 3 wetland cells. The plant currently serves a population of up to 1,300 during peak holiday periods.

The plant operates continuously and is monitored telemetrically.

**Tinui's septic tank** is located beside the Community Hall on Black Hill Road, Tinui and is pumped together with the wastewater discharged from the school septic tank to a constructed wetland for final treatment and disposal to land. The tank currently serves a population of approximately 114.

**Riversdale Beach's WWTP** has been constructed and received effluent at the end of 2011. The system is gravity fed with the exception of a hand full of properties that required small pump systems to reach the reticulation network. There are 5 pump stations operating across the network: 4 lift pumps and 1 main pump station. Effluent is pumped 2.8km to the treatment plant which consists of 3 treatment ponds lined with 2mm thick HDPE (high density polyethylene) liner and a spray irrigation scheme. The scheme has been built to cater for the peaks expected with holiday populations.

### Asset Capacity

The current load capacity of the **Masterton WWTP** is 2,744 kg BOD/day in winter and 3,500 kg BOD/day in summer. There has been flow and load projections undertaken to 2027 as part of the Preliminary Design Report for the Masterton WWTP upgrade. These projections were taken into consideration in the design of the WWTP upgrade and sufficient capacity exists.

The **Castlepoint WWTP** was designed to cope with loads varying from 22 people midweek in winter to almost 600 during the Christmas and Easter holiday periods (Opus, 2004). However, during holiday periods the population can reach 1,300 people. An aerator was installed to enable the WWTP to cope with greater demand and to help prevent overloading.

Rainfall can also contribute to overloading, partly due to the direct inflow of rainwater (due to illegal connections etc.) and partly due to the reduced ground soakage/evapotranspiration rate (Opus 2005).

The newly constructed **Tinui** wetland is designed to accept septic tank treated wastewater from the Tinui village, play centre, hall and school. Work was undertaken to upgrade the reticulation to overcome previous wetland overloading from inflow & infiltration during winter. The work was undertaken from 2007 to 2011 and fully restored the system.

The new wastewater system at **Riversdale WWTP** was operational from the end of 2011. The scheme has been built to cater for peak summer populations and additional land has been acquired to enable further expansion in the future if required.

### Asset Condition

Council's wastewater treatment staff assesses the condition of the various components of each treatment plant. An inventory is used to detail the maintenance schedule for each item of plant, which is continuously upgraded. Treatment plant equipment dates from 1992 to the present day.

### Asset Valuation

The Wastewater Treatment asset components and land were valued as follows, as at 30th June 2020

| Masterton district council wastewater treatment asset valuation | | | |
|---|---|---|---|
| Item | Optimised replacement cost ($) | Optimised depreciated replacement cost ($) | Annual depreciation ($) |
| Masterton WWTP | 39,665,675 | 35,211,308 | 676,703 |
| Castlepoint WWTP & reticulation | 2,649,145 | 1,696,343 | 65,891 |
| Tinui WWTP & reticulation | 792,043 | 642,735 | 14,442 |
| Riversdale WWTP & reticulation | 12,128,385 | 8,604,257 | 277,293 |

| Masterton district council wastewater treatment land and capital valuation (awaiting 2021 Valuations) | | | | |
|---|---|---|---|---|
| Location | Assessment no. | Area (ha) | Use | 2017 value |
| Jetty Rd Castlepoint | 1797015120 | 2.4180 | Castlepoint sewerage scheme | 195,000 |
| Jetty Rd Castlepoint | 1797017802 | 0.0890 | Esplanade reserve | 6,500 |
| 399 Te Whiti road | 1798003600 | 113.0562 | Potential sewage disposal site | 2,010,000 |
| Mstn-Martinborough | 1798003700 | 91.2298 | Sewerage treatment plant | 5,600,000 |
| 1641 Homewood Rd | 1800011450 | 17.0070 | Riversdale sewerage plant | 540,000 |

### Historical Expenditures

The annual operational and capital expenditures for the urban and rural treatment plants over previous years are summarised in Finance section.

### Critical Treatment Assets

Critical Assets are identified as being;

- Homebush wastewater treatment facility. Inclusive of the wetlands and settling pond areas.

### Significant Negative Effects

The significant negative effects of wastewater treatment in the Masterton district are outlined in following table.

| Significant Negative Effects of Wastewater Treatment Services | | |
|---|---|---|
| | Negative effects | How we will/do mitigate |
| Social | Failure or overloading of the treatment plants that causes overflows of untreated sewage to water bodies could potentially present a public health risk. | This is unlikely at Homebush with the new pond capacities. WWTP's will have management plans developed. |
| Cultural | Failure or overloading of the treatment plants that causes overflows of untreated sewage to water bodies could be considered culturally undesirable. | This is unlikely at Homebush with the new pond capabilities. WWTP's will have management plans developed. |
| Environmental | Failure or overloading of the treatment plants that causes overflows of untreated sewage to water bodies would have localised negative effects on the environment.<br>Low dissolved oxygen levels in the ponds due to reduced photosynthesis could result in odour issues. | Monitoring and maintenance at the WWTP's will capture the potential for overflows before they occur. |
| Economic | None identified. | |

## Resource Consents Held

| Resource Consents |
|---|
| Resource consents are held for the following WWTP, |
| • Council has a new consent from Greater Wellington Regional Council (GWRC) WAR090066 for the Homebush wastewater treatment plant. (exp 08 Dec 2034) |
| • Council has a consent from Greater Wellington Regional Council (GWRC) WAR090356 for Riversdale's wastewater treatment. (exp 30 Sep 2039 |
| • Council has a consent from Greater Wellington Regional Council (GWRC) WAR050019 for Tinui's wastewater treatment. (exp 30 Sep 2030 |
| • Council has a consent from Greater Wellington Regional Council (GWRC) WAR080010 for Castlepoint's wastewater treatment. (exp 10 Apr 2029) |

### Data Confidence Level

The data confidence levels for this asset are shown in Table 6.19, where, A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

| Wastewater Treatment Data Confidence Levels | | | | |
|---|---|---|---|---|
| Attribute | D | C | B | A |
| | | | | |
| Physical parameters | | | | |
| | | | | |
| Asset capacity | | | | |
| | | | | |
| Asset condition | | | | |
| | | | | |
| Valuations | | | | |
| | | | | |
| Historical expenditures | | | | |
| | | | | |
| Design standards | | | | |
| | | | | |

### Design Standards

The applicable design standards for wastewater treatment plants are too numerous and complex to describe here. Several factors must be considered, including location, costs and statutory requirements. Design reports are available for the Homebush and Riversdale schemes.

### Maintenance Plan

Maintenance of the WWTPs, includes maintenance of sites and equipment, and monitoring according to resource consent conditions. This includes things like maintaining the grounds and plant, removing screening, undertaking water quality testing and flow measurements.

Maintenance at the WWTPs is scheduled using a Microsoft Access database that has all items of plant recorded with its own maintenance schedule.

The current access database will be progressively incorporated into the new 'Assetic' asset management system.

This gives frequency of inspection and details items to be maintained/checked with each inspection. This schedule covers all Councils water and sewage treatment plant mechanical items. From these inspections any plant requiring more than the normal maintenance work is scheduled for the necessary repair work.

### Removal of Screenings to Landfill

The operators remove the screenings to landfill as required.

### Water Quality Testing

Water quality testing is carried out monthly on the treated effluent. The samples are analysed for the following, biochemical oxygen demand (BOD), faecal coliforms, total phosphorus, dissolved reactive phosphorus (DRP), suspended solids (SS), conductivity, dissolved oxygen (DO), enterococci, pH, nitrite nitrogen, nitrate nitrogen, total kjeldahl nitrogen (TKD), ammonia nitrogen,

This information provides both consent compliance information and information for future upgrade work.

### Flow Measurements

Flow measurements are included in compliance reports to Greater Wellington Regional Council for wastewater treatment sites.

### Renewal/Replacement Plan

Wastewater treatment plant renewals are based on either the required service level no longer being maintained and/or no longer

complying with required standards thereby requiring renewal, or the fact that failures are so frequent or expensive to fix that renewal is a more cost-effective option than repair.

Allied to the analysis of network replacement needs, the wastewater treatment plant operators have developed a list of plant requiring renewal. The parameters outlined above are considered before actual renewal is carried out.

In summary, the key considerations when deciding whether to renew or repair plant that has deteriorated include:

- Levels of service (are these being met?)
- Compliance (with standards, consents, and legislation.)
- Affordability (cost of replacement versus repair)
- Sustainability (now versus future)

**The Masterton Homebush WWTP** A plan for Homebush's operation including pasture renewal (which is a four-yearly cycle) has been prepared.

**The WWTP at Tinui** was upgraded between 2007 and 2011 from a septic tank system to a pumping station and wetland system. Reticulation and private drainage were replaced during this period. There is no expectation to perform more renewal and/or replacement work.

### Asset Creation Plan

The Wastewater strategy (see appendix E) will require staged upgrades or additions to the wastewater treatment plant over the next 30 years. These upgrades or additions are outlined in the following table.

### Financial Forecast

Council has made a strategic decision to maintain the current levels of service for this activity. Maintenance and renewal work identified in this section to enable this is outlined in the following table.

## Disposal Plan

Council does not currently have a disposal plan for its wastewater treatment assets. Given the nature of these assets, and extended lifespan, a specific disposal plan is not considered necessary

| Wastewater treatment maintenance, renewal & capital costs identified | | | | |
|---|---|---|---|---|
| Action/work | Driver for action | Estimated cost | Scheduled for | How this will be funded |
| Homebush upgrade | Waste disposal strategy-<br>• Technical review and project plan<br>• Public engagement<br>• Distribution pipeline and associated equipment<br>• Extended distribution pipeline and associated equipment | $80,000<br>Existing budgets<br>$5,000,000<br><br>$5,000,000 | BY 2023<br>Ongoing from 2023<br><br>2028/29 | Loan funded |
| Homebush consent | Consent renewal / upgrade | $32,000,000 | 2030/35 | Loan funded |
| Homebush equipment replacement | Renewal of equipment.<br>• Pumps<br>• Scada upgrade<br>• Step screen<br>• Aerators<br>• Harvest equipment<br>• Ventrac mower<br>New equipment<br>• Renewable energy aerators | $40,000<br>$15,000<br>$80,000<br>$160,000<br>$80,000<br>$27,000<br><br>$450,000 | 2021/22<br>2021/22<br>2020/21<br>2022/23<br>2021/22<br>2021/22<br><br>2021/22 (External F) | Depreciation fund and external funding |
| Riversdale/Castlepoint - equipment renewal | Renewal of equipment<br>• Riversdale step screen<br>• Castlepoint step screen<br>• Aerators<br>• Pumps / generator set | $60,000<br>$60,000<br>$30,000<br>$15,000 p/a | 2025/26<br>2030/31<br>2022/23<br>2021 - 2022 | Depreciation fund |
| Sludge disposal | Treatment pond at capacity | $2,000,000 | 2034 | Depreciation fund |

# FINANCIAL SUMMARY

## Financial summary

This section summarises the forecast level of expenditure required to enable the proposed level of service and action the proposed projects set out in this asset management plan. Here we also discuss historical expenditure, funding sources (past & future) and the implications of these for council's financial sustainability.

Estimates of future costs and revenues have been developed using best available information and expected flow on effects calculated using established financial assumptions and policies in the long-term plan 2021

The intended approach to service delivery for the activities of wastewater services have been selected considering resource availability and cost efficiency and effectiveness. A predominantly more in-house approach has been taken to looking after and developing these important assets which include our wastewater treatment plant, urban and rural wastewater connections, and services. Our in-house management is supported by consultants and contractors where appropriate.

As a council we try to strike the optimal balance between maintenance and renewals. We have several big commitments in this area which will have significant impacts on our district. These include ongoing reticulation and treatment plant renewals, investigations and upgrading the Homebush treatment plant. Our wastewater activities are essential to the health and longevity of life for our district therefore we have a programme of maintenance to ensure that these assets do not get worn down and incur expensive replacement costs.

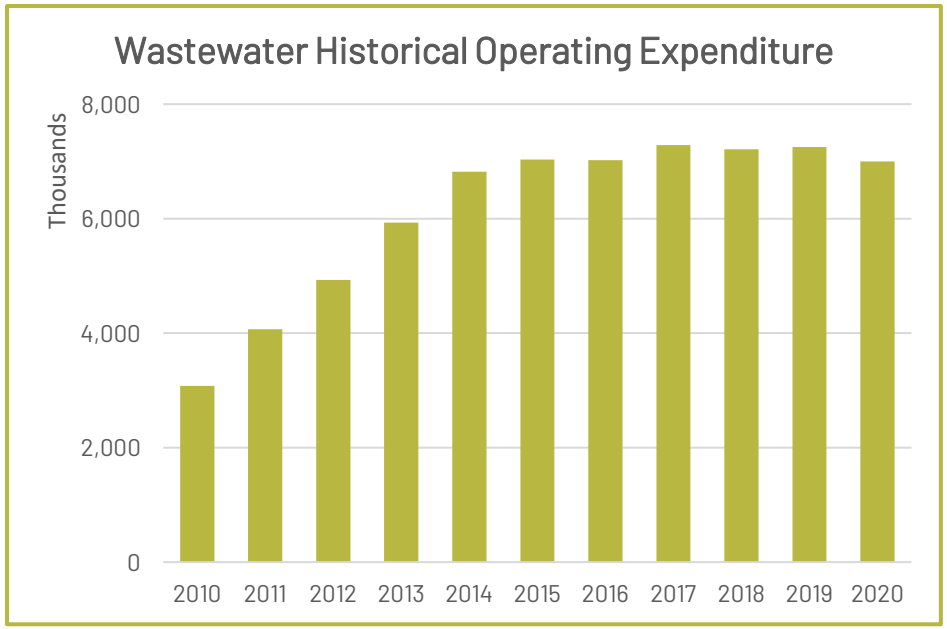
## Historical Financial Performance

We summarise in the table and graph below historical financial performance of Wastewater to place in context our current 10-year projections.

Past spending must be considered when we make our forecasts as it impacts our current financials through interest, depreciation and maintenance costs that arise when we make capital asset purchases, and the appropriateness of past operational spending influences the required maintenance programme going forward and available reserve funding.

The graph operating expenditure for Wastewater Activity for the past 10 years.

*Historical Wastewater Expenditure*




*Historical Operating Expenditure*

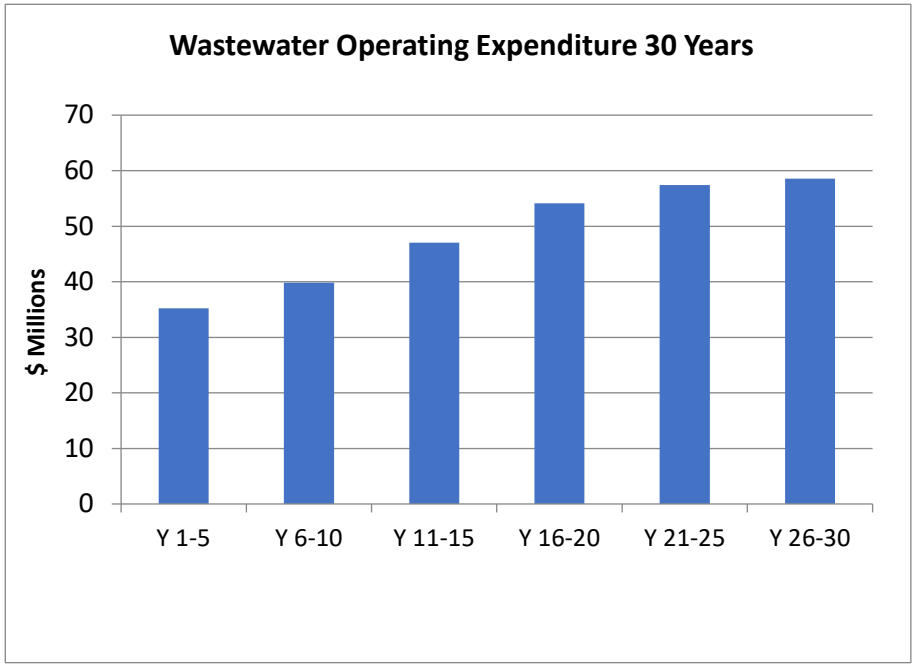
| Activity | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wastewater | | | | | | | | | | | |
| Operating Expenditure | 3,076,912 | 4,066,306 | 4,931,401 | 5,929,696 | 6,818,162 | 7,032,553 | 7,023,914 | 7,283,210 | 7,210,231 | 7,248,950 | 6,999,427 |

*Forecast Operating Expenditure*

| Wastewater | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating expenditure | 4,446,358 | 3,630,873 | 3,573,337 | 3,601,252 | 3,674,445 | 3,815,020 | 3,933,406 | 3,965,449 | 4,127,140 | 4,136,776 |
| Depreciation | 2,916,345 | 3,203,086 | 3,227,927 | 3,257,953 | 3,663,963 | 3,684,163 | 3,683,352 | 4,082,107 | 4,167,804 | 4,222,491 |
| Total Operating expenditure | 7,362,703 | 6,833,959 | 6,801,264 | 6,859,205 | 7,338,408 | 7,499,183 | 7,616,758 | 8,047,556 | 8,294,944 | 8,359,267 |

Forecast Wastewater Operating expenditure 2021 – 2031


Forecast Wastewater Operational Expenditure 2021 – 2051

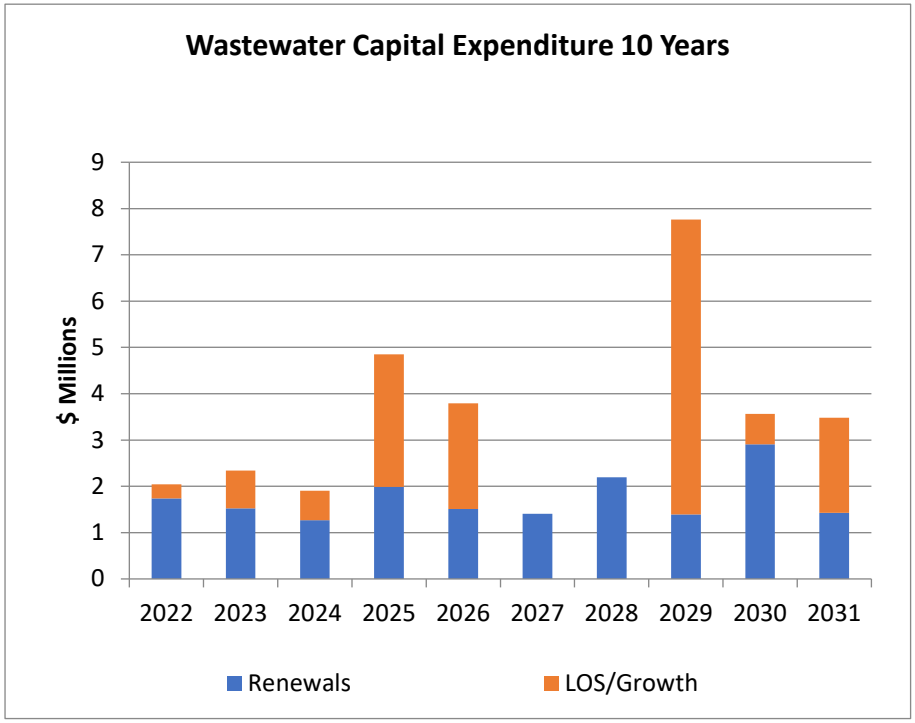


## Capital Expenditure

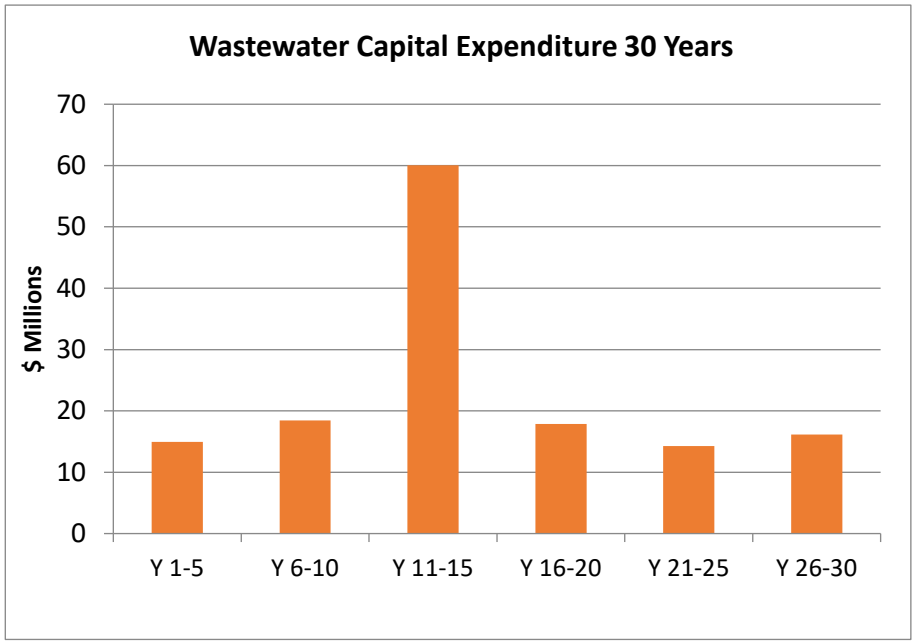
Investment in long life assets is essential to our Wastewater and Sewerage activities and responsibilities as it stands as a core component of our overall infrastructure Indeed, as has recently been shown by national events water services are of utmost importance to the health and wellbeing of our community.

Over the current LTP 2021-31 timeframe we are projecting to invest $33.3M into our Wastewater, Sewerage assets.

*Forecast Capital Expenditure Wastewater 2021 - 2031*




*Forecast Capital Expenditure Wastewater 2021 – 2051*



## Forecast Wastewater Capital Expenditure Summary

| WASTEWATER SERVICES | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Plan 2020/21 | Capital Expenditure Summary | Source of Funds | LTP Year 1 2021/22 | LTP Year 2 2022/23 | LTP Year 3 2023/24 | LTP Year 4 2024/25 | LTP Year 5 2025/26 | LTP Year 6 2026/27 | LTP Year 7 2027/28 | LTP Year 8 2028/29 | LTP Year 9 2029/30 | LTP Year 10 2030/31 |
| $ | **Capital Projects** | | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| | **Urban Sewerage system** | | | | | | | | | | | |
| 50,000 | Network investigations | Depn Reserves | - | - | 106,500 | 110,300 | - | - | - | - | - | - |
| 1,300,000 | Sewer reticulation renewals | Depn Reserves/Loan | 1,100,000 | 1,124,200 | 1,171,500 | 1,768,043 | 1,257,300 | 1,188,484 | 1,966,807 | 1,145,700 | 2,511,800 | 1,234,800 |
| 20,000 | Urbanisation of Millard Ave | Subdiv contrib | - | 817,600 | - | - | - | - | - | - | - | - |
| 310,000 | Homebush plant & equipment renewals | Depn Reserve | 152,000 | 51,100 | 53,250 | 66,180 | 205,740 | 59,250 | 61,350 | 76,380 | 132,200 | 137,200 |
| | Homebush aerators - stimulus project | External Funds | 450,000 | - | - | - | - | - | - | - | - | - |
| | Wastewater renewals - CBD project | Depn Reserve | - | - | - | 107,057 | - | 115,016 | 119,093 | 123,557 | 128,313 | - |
| | Homebush consent renewal & plant upgrade | Loan | - | - | - | - | - | - | - | - | 661,000 | 2,058,000 |
| 300,000 | Homebush irrigation extension | Loan | 300,000 | - | 532,500 | 2,757,500 | 2,286,000 | - | - | 6,365,000 | - | - |
| **1,980,000** | **Total Urban Sewerage system** | | **2,002,000** | **1,992,900** | **1,863,750** | **4,809,080** | **3,749,040** | **1,362,750** | **2,147,250** | **7,710,637** | **3,433,313** | **3,430,000** |
| | **Rural Sewerage schemes** | | | | | | | | | | | |
| - | Castlepoint wastewater upgrade | Reserves | - | 204,400 | - | - | - | - | - | - | - | - |
| - | Castlepoint wastewater plant consent upgra | Reserves | - | 102,200 | - | - | - | - | - | - | - | - |
| 5,000 | Castlepoint sewerage plant renewals | Reserves | 10,000 | 10,220 | 10,650 | 11,030 | 11,430 | 11,850 | 12,270 | 12,730 | 92,540 | 13,720 |
| 70,000 | Riversdale Beach scheme renewals | Depn Reserve | 30,000 | 30,660 | 31,950 | 33,090 | 34,290 | 35,550 | 36,810 | 38,190 | 39,660 | 41,160 |
| **75,000** | **Total Rural Sewerage system** | | **40,000** | **347,480** | **42,600** | **44,120** | **45,720** | **47,400** | **49,080** | **50,920** | **132,200** | **54,880** |
| **2,055,000** | **Total** | | **2,042,000** | **2,340,380** | **1,906,350** | **4,853,200** | **3,794,760** | **1,410,150** | **2,196,330** | **7,761,557** | **3,565,513** | **3,484,880** |
| | **Capital Funding** | | | | | | | | | | | |
| (300,000) | Loan funds | | (300,000) | - | (532,500) | (3,088,400) | (2,286,000) | - | (368,100) | (6,365,000) | (1,322,000) | (2,058,000) |
| | External funds | | (450,000) | - | - | - | - | - | - | - | - | - |
| (1,755,000) | Transfer from reserves | | (1,292,000) | (2,340,380) | (1,373,850) | (1,764,800) | (1,508,760) | (1,410,150) | (1,828,230) | (1,396,557) | (2,243,513) | (1,426,880) |
| **($2,055,000)** | **Total capital funding** | | **($2,042,000)** | **($2,340,380)** | **($1,906,350)** | **($4,853,200)** | **($3,794,760)** | **($1,410,150)** | **($2,196,330)** | **($7,761,557)** | **($3,565,513)** | **($3,484,880)** |
| **$0** | **Rates Requirement (Capital)** | | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** |

## Key Projects by Activity

Over the next 10 years we are planning to invest in renewing wastewater reticulation and renewing and upgrading our treatment plan. We set out here key projects by activity and show in graphical form the past, current budget and future forecast total spend by year.

- Wastewater reticulation renewals, Years 1-10, $14.4M
- Homebush aerators, Year 1 $450K
- Homebush treatment plant & equipment upgrade, Years 1-10, $1.4M
- Homebush consent renewal and plant upgrade, Years 9 & 10, $2.7M
- Homebush irrigation extension, Years 1, 3,4,5 & 8, $12.2M

## Estimated Future Public Debt

New borrowings are proposed to fund future capital projects. Details of the proposed new borrowings are shown on the forecast wastewater Capital Expenditure Summary.

## Insurance Coverage

The Council insures its buildings and structures under a comprehensive material damage policy.

## Estimated Future Loan Repayment and Loan Interest Cost

Future borrowing requirements are shown in on the forecast wastewater Capital Expenditure Summary. Loan repayments costs on any existing borrowings are included within the activity budgets.

## Financial Forecast

The graphs and tables above show the financial forecasts for operational and capital expenditure for the next 10 and 30 years.

## Future Depreciation Projections.

Future depreciation will be based on existing depreciation that flows out of infrastructural valuations, plus the additional depreciation that is generated by new capital expenditure and revaluations.

## Changes in Service Potential

Council maintains the assets to retain their condition and overall value at nationally accepted levels. A programme of routine maintenance where and when required is used to achieve this.

## Assumptions and Confidence Levels

## Basis of Preparation

The financial information in this plan has been prepared following the provisions of Public Benefit Entity (PBE) Standard - Financial Reporting Standard 42 'Prospective Financial Statements' (PBE FRS 42). The purpose of the financial forecasts in this long-term plan is to provide "best endeavours" costing of Masterton District Council's plans to enable it to achieve its Community Outcomes, in collaboration with other stakeholders, over the 10-year period 2021-2031.

## Basis of Assumption

Prospective information is based on several assumptions. Risks and uncertainties surround these assumptions. The basis of the assumptions surrounding the information is found in Planning Assumptions in the LTP. The information should therefore be used carefully, with these best endeavours purpose in mind. The Local Government Act 2002 Schedule 10 (1)(e) requires that information relating to levels of service, estimated expenses and revenue be provided in detail for three financial years, and indicative for the subsequent seven financial years. Over time, information becomes increasingly indicative from the time it was first prepared.

The approach taken to budget development has been that of preparing 'forecasts' on a best estimate basis. In this case, a forecast refers to financial information based on assumptions on future events the Council expects to occur and based on Council's expected response to these events. The Council has not taken an approach where hypothetical ("what-if") projections are used.

The figures presented are budgeted. However, the opening balance of the 2021/22 year is based on the estimated actual result, with this estimation having been made in June 2021.

The major limitation of the forecasting approach, as with any approach, is that events may change over time and undermine the accuracy of assumptions made. The actual financial results achieved for the period are likely to vary from the information presented and the variations may be material.

The review of assumptions underlying the financial information was undertaken in preparation of the Long-Term Plan (LTP). However, the assumptions themselves were adopted by Council resolution to approve the Draft LTP for public consultation in April 2021. (Please refer to LTP 2021 document for full assumptions)

## Assumptions and Risk Assessments

A number of assumptions were made in preparing the Draft 2021-2031 Long Term Plan (LTP). These assumptions are necessary as the planning term is for 10 years and the stating of assumptions ensures that all estimates and forecasts are made on the same basis. There are four categories of planning assumptions in this document:

Demand Assumptions

- Resident population
- District growth

Political Environment

- Policies
- Governance

Operating Environment

- Resource consents
- Natural disasters
- External factors
- Human resources

Financial Assumptions

(Please see the full LTP document for the assumptions detail.)

## Funding Mechanism

Operating costs are to be funded by rates and user charges as per the Council's Revenue & Financing Policy. Capital renewals should be funded from depreciation reserves to the extent that the reserve funds can sustain the renewals programme. Upgrade projects should be loan funded to ensure intergenerational equity i.e., those receiving the benefits should pay.

# PLAN IMPROVEMENT AND MONITORING

## Introduction

In preparing this Plan there remain a number of areas where improvement to the level of detail is needed. This improvement will be phased reflecting a process of continuous enhancement of the management confidence provided by the Plan. This further work will have the effect of:

Enhancing analysis for planning purposes

Improving operational efficiency

## Current Improvement Plan

Recommendations for improvement were made throughout this Plan. The following summarises these improvements.

| Wastewater Asset Management Plan Improvement Plan | | | | |
|---|---|---|---|---|
| NO. | ITEM | REPORT SECTION | YEAR | BY WHO |
| 1 | Review current level of service every 3 years | LOS | 2031 | MAO |
| 2 | Monitor trends identified in the Growth & Demand section and update this Plan accordingly. | Growth and demand | Yearly | USM /Asset management and policy team |
| 4. | Undertake further monitoring & analysis work to better understand the effect of climate changes on demand. | Growth and demand | From 2021 | USM – as part of modelling project |
| 5. | Include results and implications of the CCTV inspection data that is currently being collated. | Lifecycle | Ongoing | Asset Officer |
| 6. | Show assessed grades for sewer pipes on Asset system to assist with maintenance and renewal planning. | Lifecycle | 2022 | Asset Officer – as part of new AM system |

| Wastewater Asset Management Plan Improvement Plan | | | | |
|---|---|---|---|---|
| NO. | ITEM | REPORT SECTION | YEAR | BY WHO |
| 7. | Verify data from manhole condition inspections carried out in 2005 & 2014 and inspect/grade all remaining sewer manholes. | Lifecycle | 2022 | Asset Officer – as part of new AM system |
| 8. | Inspect and grade sewer manholes in Castlepoint using a system consistent with Masterton urban inspections. | Lifecycle | 2022 | Asset Officer – as part of new AM system |
| 9. | Inspect and grade sewer manholes in Tinui using a system consistent with Masterton urban inspections. | Lifecycle | 2022 | Asset Officer – as part of new AM system |
| 10. | Undertake further work to establish which manholes need to be replaced so that they coincide with sewer pipe replacements | Lifecycle | 2021 and ongoing | USM |
| 11. | Review valuation replacement costs for assets | Lifecycle | 2021 | Finance Manager |

## Monitoring and Review

The above 'Improvement Plans' should be monitored and reviewed once in every 12 months. Appropriate actions then can be taken for further improvement. This Plan will be reviewed every three years.

# REFERENCES


Beca Carter Hollings & Ferner Ltd (2004a) Masterton Urban Area Wastewater Infrastructure Upgrade Project Issues and Options.

Beca Carter Hollings & Ferner Ltd (2004b) Technical Memorandum 4 – Collection System Study- Final Report.

Beca Steven (1993) Masterton Town Drain - Stormwater Improvements: Feasibility Study Report.

Beca Steven (1995a) Sewer Infiltration Study.

Beca Steven (1995b) Stormwater Management Plan Town Drain.

Beca Steven (1996) Masterton Town Drain - Stormwater Improvements: Feasibility Study Report.

Beca Steven (1997) Riversdale Township Sewage and Stormwater Disposal Study.

Beca (2008) Masterton Sewerage Reticulation Planning Report.

Business & Economic Research Ltd (2001) A Core Scenario for the Wairarapa to 2006.

Department of Statistics (2004) Population projections for the Masterton District 2001 (base) – 2021, retrieved 13 August 2004 from Statistics NZ website: GHD Ltd (2006) Report for Masterton Demographic Projection and Growth Forecast Review.

Hauber, G. (1995) "Wastewater Treatment in NZ: Evaluation of 1992/1993 Performance Data – ORGD" Water & Wastes in NZ, 85: 28-34, May 1995.

Masterton District Council (1995) Stormwater Management Plan for Town Drain - Stormwater Drainage Standard; Report 086/95.

Masterton District Council (1996) Toward 2020 - Strategic Plan.

Masterton District Council (1998) Draft Statement on Levels of Service for Asset Management Planning.

Masterton District Council (1999) Services Maintenance Contract 1999/2002 Contract Documents (contract no. 3-99/02).

Masterton District Council (2001) Annual Report Year Ended 30th June 2001.

Masterton District Council (2002) Annual Report 2001 – 2002.

Masterton District Council (2003) Annual Report 2002 – 2003.

Masterton District Council (2004a) Annual Report 2003/2004.

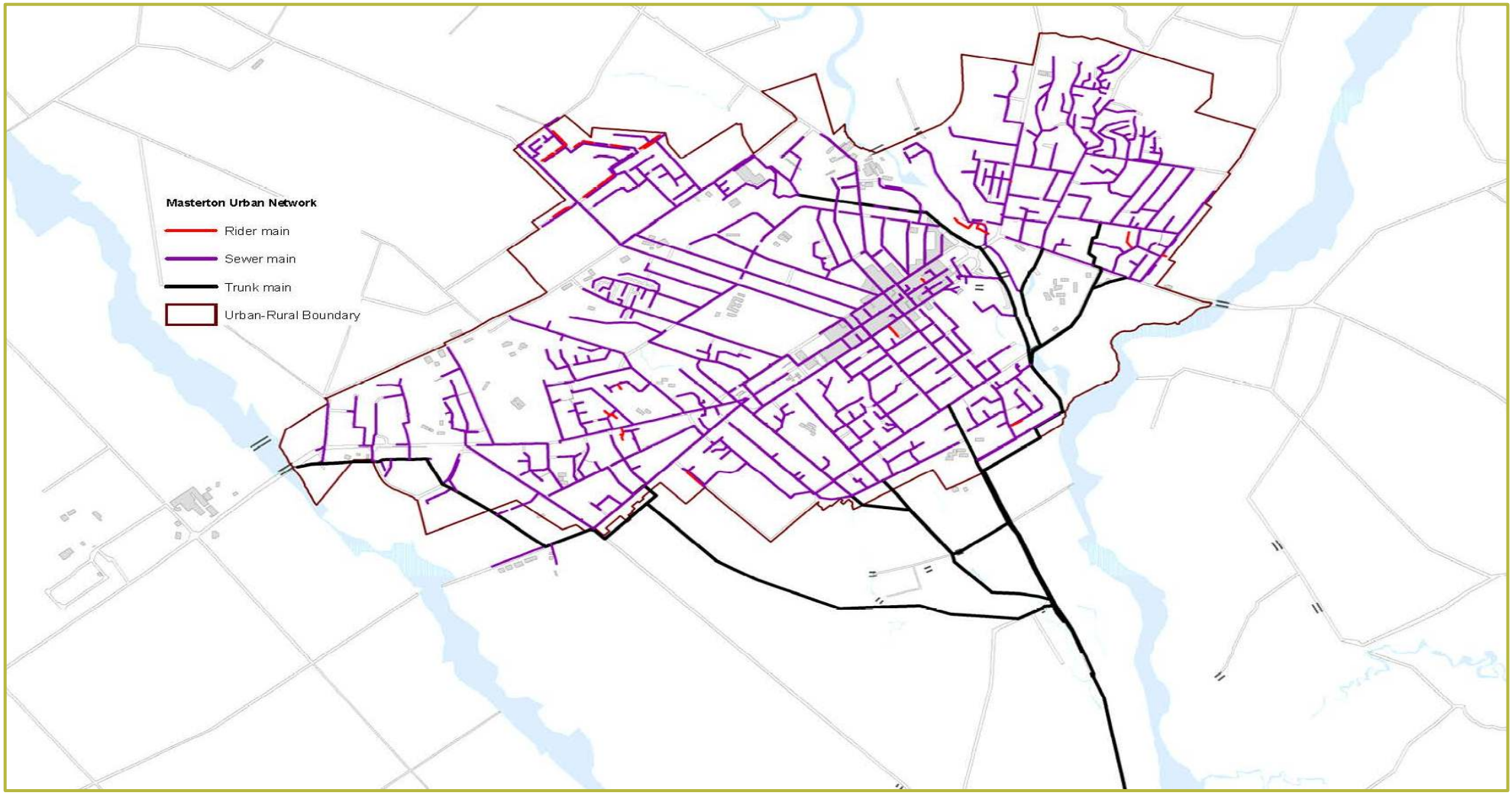
Masterton District Council (2004b) Asset Management Plan & Code of Service, Wastewater & Stormwater.

Masterton District Council (2004c) Health & Safety Policy October 2004.

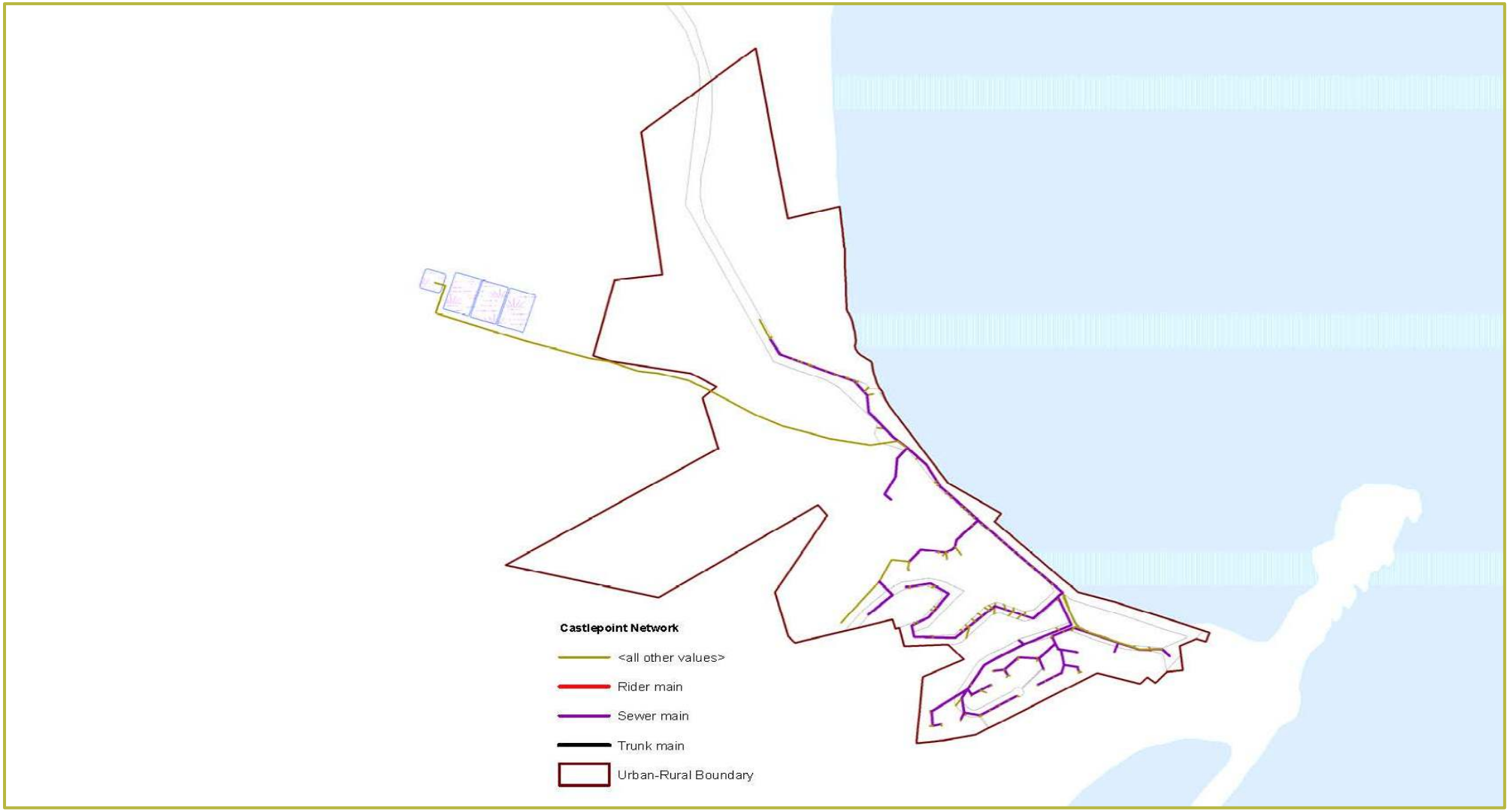
Masterton District Council (2004d) Trade Waste Bylaw 2004.

# APPENDIX & MAPS

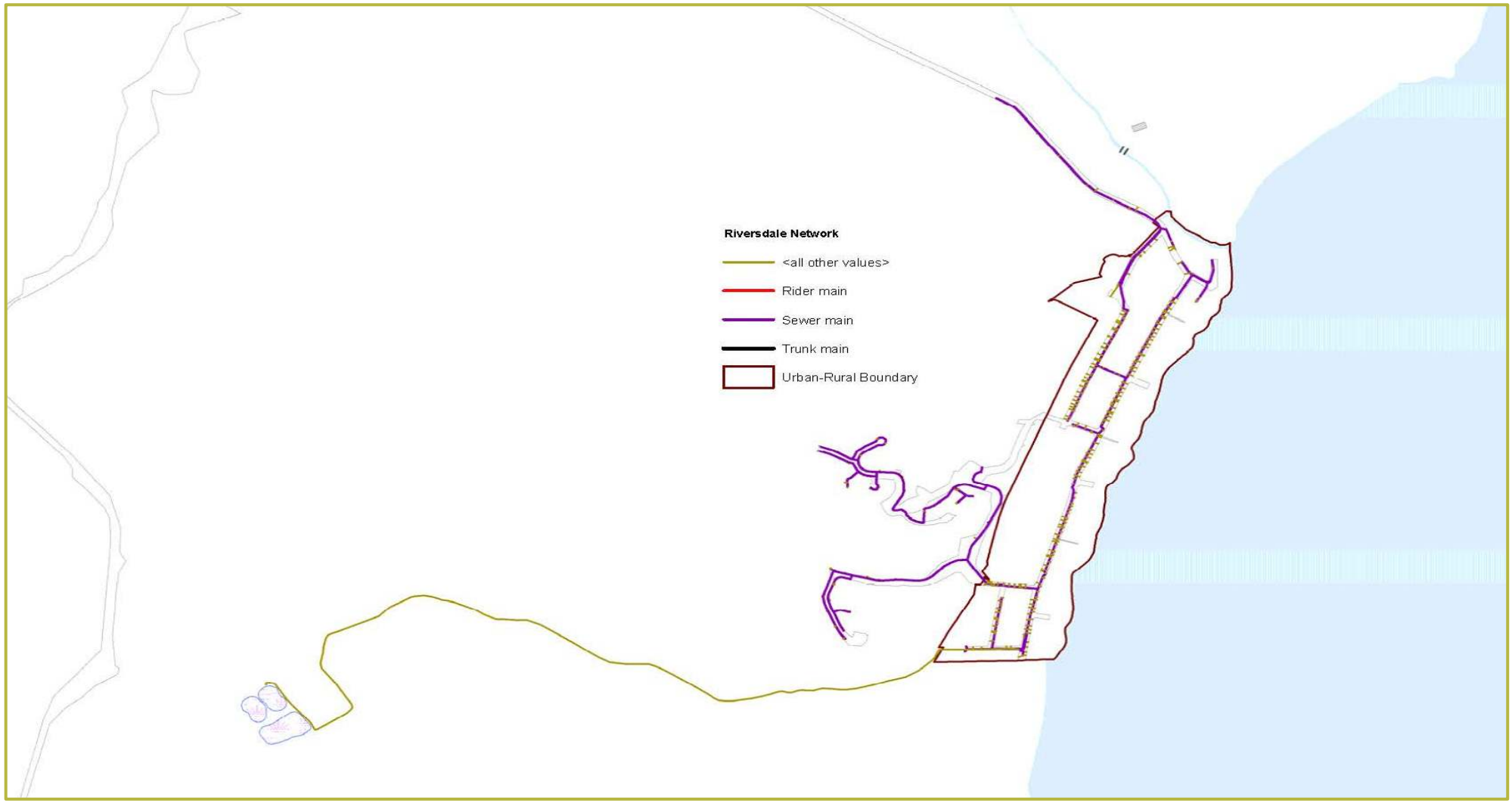
***Appendix A – Masterton network***



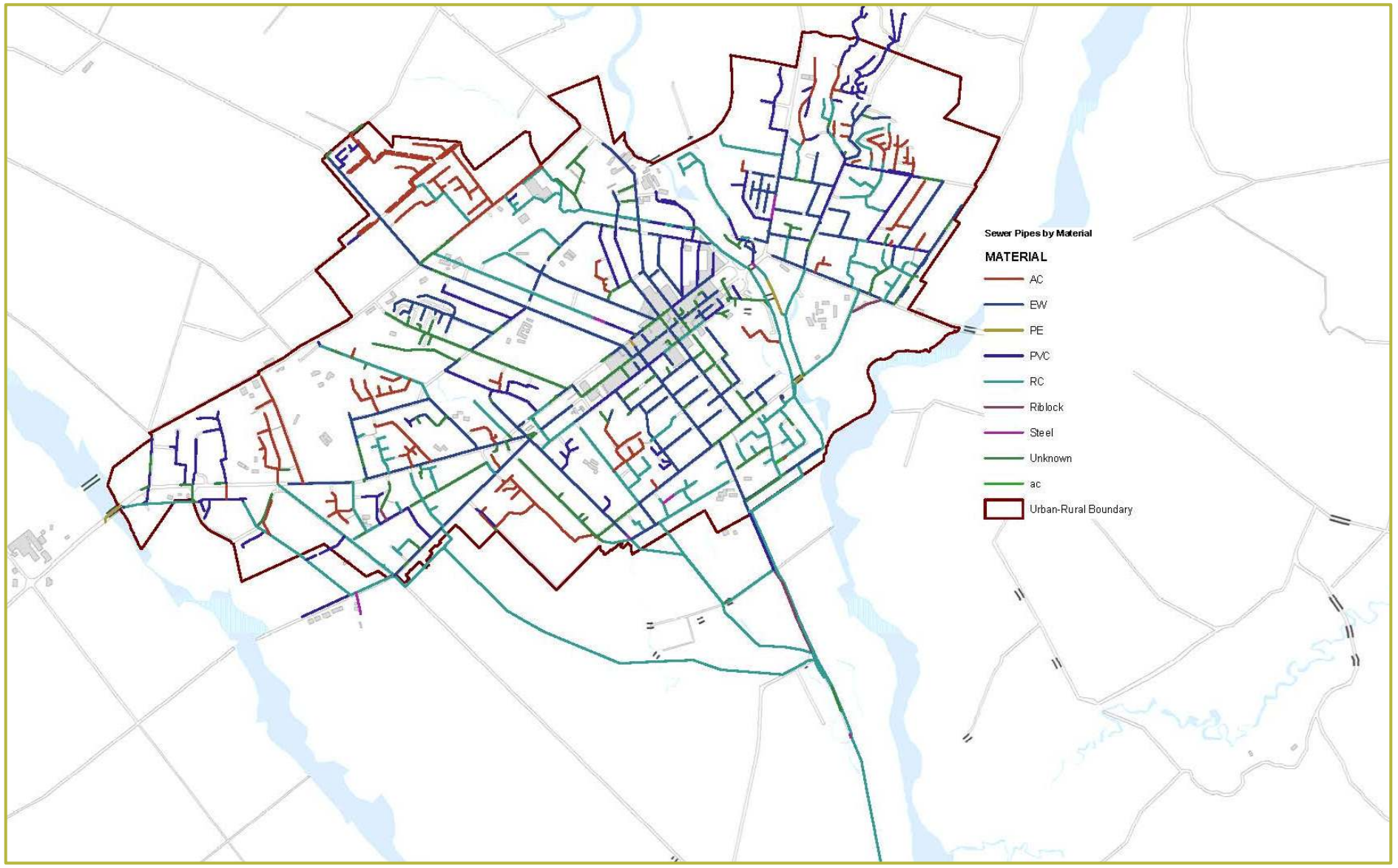
***Appendix B – Castlepoint network***



***Appendix C – Riverdale network***



***Appendix D – Masterton Urban - by Material***



Appendix D

## Homebush Strategic Plan

### Purpose

The purpose of this report is to present the Homebush Wastewater Strategy to the Committee and to seek the Committee's endorsement of the Strategy for Council adoption.

### Executive Summary

The Homebush Working Group was established 18 months ago in order to provide Governance oversight of the Homebush Wastewater Treatment Plant. As has been previously reported to Council, the Governance Group has considered a range of options to achieve the Council's goal of reducing the discharge of water to the Ruamahanga River over time.

The consideration of options resulted in the beneficial reuse of the treated water for irrigation and productive purposes being the preferred option.

As a result of this, on 7 December 2016, the Council resolved that it would develop a long-term strategic plan for the future management of Masterton's wastewater discharges with a focus on land application.

The strategy has been developed in accordance with this resolution. The intention is to guide decision making in making Homebush treated water available to the wider farming community and effectively used beyond the existing discharge site.

The strategy recognises that this will only be achieved in partnership with the community and that significant investment in infrastructure will be required.

Discussion

The Working Group has spent considerable time looking at all options available. Following adoption of the preferred option, the Working Group has developed the strategy in order to achieve this (see Attachment 1).

The strategy consists of 8 Key Objectives and includes aspirational goals. It is recognised that achieving these will be an incremental process

Critical to the success of this strategy will be engagement with the community, and in particular the neighbouring landowners. Council officers are currently drafting a communication plan to introduce the strategy to the community and highlight the opportunities for productive uses.

Adoption of the strategy by Council will be the first step in implementing the next stage of the Homebush development and achieving the Councils stated goal of reducing the volume of effluent discharged to the river.

Recommendations

That the Committee receives the Homebush Wastewater Strategy; and recommends that Masterton District Council adopt the Homebush Wastewater Strategy

This document provides and overview and guidance on the opportunity to allow wastewater from Masterton's Homebush wastewater treatment plant to be effectively utilised on and beyond the current water discharge area.

Background

Masterton district council (mdc) was granted resource consent in May 2009 to discharge wastewater from its upgraded Homebush WWTP to adjacent land and the Ruamahanga river. The irrigated area receives wastewater under a non-deficit regime, meaning that a considerable portion is lost to drainage. Further, albeit with the exception of low flows, a portion of wastewater can be discharged to the Ruamahanga river.

Community preference is to reduce and potentially eliminate any wastewater discharge to the Ruamahanga river. Ideally all water would be used for beneficial use, and ideally at a rate that minimise drainage and ultimately any loss to surface water.

MDC Homebush wastewater treatment plant working party

MDC convene a working party group of 13 members who share an interest in the operation and management of the Homebush WWTP and its discharge. The group consists of community members, iwi, elected councillors and council staff. The group provide opinion and feedback on current and proposed operations concerning the Homebush WWTP to council staff.

In early 2017 the working party group participated in a series of meetings to contribute towards the establishment of strategic plan for the management of wastewater produced at the Homebush WWTP. The development of this plan was assisted by council staff and Lowe environmental impact, specialists in wastewater land treatment and community wastewater discharges.

Strategic plan

An initial strawman strategic plan was developed and following engagement with the working party has evolved into the following plan. This plan includes a:

Vision

Goals

Objectives

The preparation of the vision, goals and objectives was assisted with an analysis of risks and opportunities, using both a swat and peste analysis. These analyses are attached in appendix a and b.

## Vision

The following vision has been established:

“wastewater is managed in an environmentally and fiscally sound wa y for our community.”

## Goals

The following goals have been established:

We (the community and council) will take a staged approach to:

Being well engaged and educated in managing wastewater

Taking an innovative and affordable approach to wastewater solutio ns

Being recognised as a smart manager of wastewater

Minimising volume

Minimising land and water effects

## Objectives

To implement the vision and goals, the following objectives have been developed.

- Objective 1 – project plan: establish an overall project plan with clear timelines
- Objective2 - engagement: have the community understand the importance of, and actively manage, their water and wastewater solutions
- Objective 3 - land identification: identification of land suitable for treated wastewater irrigation (and available for purchase, lease or collaboration with owners)
- Objective 4 - flow and volume characteristics: gather comprehensive data and information on flow and volume characteristics of water to be available to farmers / owners
- Objective 5 - develop market: develop means of on-selling available water
- Objective 6 - develop infrastructure: develop plan and implement inf rastructure
- Objective 7 - reduce river discharge: over time reduce river discharges and ideally eliminate and direct river (piped) discharge, particularly during lower flows
- Objective 8 - high flow land passage: any (reduced) discharge to river is via land passage

Further detail on the objectives is provided in appendix c, including how the objectives will be implemented and how success will be measured.

Implementation and forward plan

Following confirmation and approval of the vision, goals and objectives by council, an implementation and forward plan can be developed. This will detail a programme of works for the next 20 years, and provide linkage to object 1; being the development of a project plan

## Appendices

Appendix a: swot analysis

- Strengths
- Council and community are well informed and familiar with issues
- There is good coordination and information exchange
- There is good access to contacts
- There is a general preparedness to develop innovative ideas.
- Weaknesses
- Fiscal constraints
- Potential need to build winter storage; and

- Amount of access to large land areas away from houses
- Opportunities
- Water deficit/demand in general area
- Combine infrastructure with regional irrigation scheme
- High potential cost offset due to value to farmers of the resource (water, in particular)
- Threats
- Breakdown in coordination within project team
- Loss of opportunities to use suitable land as clean water systems are developed and land is developed into smaller properties
- Change in public perception of applying wastewater to land
- Adverse perception of ratepayers providing infrastructure for private business
- Change in industry acceptability of wastewater grown produce

Political

- Changes in local government = restriction of funds
- Policy to reduce discharges to water
- Industry perception of wastewater irrigation
- Treaty of Waitangi = cultural drivers for land application

Economic

- Irrigated land returns = viability of land application
- Cost restrictions of clean water irrigation schemes
- Allocation of rateable funds restricts development

Social

- Greater environmental pressure from interest groups
- Perception of acceptability, and nimbyism creates limits
- Changes are made to water use and management
- Cultural perceptions and initiatives may increase land application opportunities

Technological

- New technology = higher level of treatment = surface water discharge at an affordable rate...???? Cheaper than the development of irrigation.
- Irrigation technology advances, and at a lower cost, provides for a greater uptake of irrigation.
- Environmental
- New environmental standards = less water to be discharged to the river
- New environmental standards = more water to be discharged to the river

## Objective 1 – Project Plan

| | |
|---|---|
| **What will we achieve** | **Establish an overall project plan with clear timelines** |
| **How will we do this** | • Determine targets;<br>• Determine budget;<br>• Determine responsibilities; and<br>• Establish timeline.<br>Include:<br>Investigation of treatment and irrigation opportunities, management of storage |
| **Success will mean** | • Timeline developed with appropriate budget established within 2 years |

## Objective 2 – Engagement

| | |
|---|---|
| **What will we achieve** | **Have the community understand the importance of, and actively manage, their water and wastewater solutions** |
| **How will we do this** | Engage with the community to help them:<br>• understand the importance of wastewater management<br>• collectively identify and develop management solutions<br>• understand individual accountability and responsibility<br>• understand the importance of managing stormwater ingress<br>• understand the importance of managing water use |
| **Success will mean** | • within 5 years a survey of the community would show that 75% of the community would know what a wastewater treatment pond is.<br>• within 5 years a survey of the community would show that 75% of the community would know the percentage of wastewater discharged to the river and aware of the impact on the river.<br>• dry weather ww flows are reduced by 15% in 20 years. |

## Objective 3 – Land Identification

| | |
|---|---|
| **What will we achieve** | **Identification of land suitable for treated wastewater irrigation (and available for purchase, lease or collaboration with owners).** |
| **How will we do this** | • Inventory of suitable land in given radius (10 km).<br>• Concentrate on large titles (over 100 ha)<br>• Discussions regarding feasibility with prospective water users<br>• Establish MoU<br>And<br>• Consider opportunities to make available water to small properties closer to the WWTP |
| **Success will mean** | • Identification of 5x required land area for irrigation within.<br>• MoUs entered into for 2 x land area.<br>• Properties within 3 km of WWTP know water is available.<br>All within the time identified in the project plan. |

## Objective 4 - Flow and Volume Characteristics

| | |
|---|---|
| **What will we achieve** | **Gather comprehensive data and information on flow and volume characteristics of water to be available to farmers/owners** |
| **How will we do this** | • Existing monitoring data collated and used to model flows<br>  • determine how much and when available<br>  • determine storage management requirements<br>• Consider implications of community growth<br>• Consider implications of I and I management<br>• Consider implications of water conservation |
| **Success will mean** | • Accurate flow model created that can predict water on hand at any time, with such information available at a time set in the project plan. |

## Objective 5 - Develop Market

| What will we achieve | Develop means of on-selling available water |
|---|---|
| How will we do this | • Run an awareness prog. and marketing campaign for investors (farmers/businesses etc) to identify the opportunities in participating in a water reuse prog.<br>• Work with our community to recognise the potential of water use<br>• Establish level of interest of farmers/businesses in investing in the development of the infrastructure and the resources required<br>• Establishing a series of preferential packages for farmers/businesses<br>• Assist with guidance on design and consenting of on-farm/business infrastructure |
| Success will mean | • On going local demand created for irrigation water (more water sought than available)<br>• Water users are not compelled to take water<br>• Water users are prepared to invest in infrastructure/pay for water use |

## Objective 6 - Develop Infrastructure

| What will we achieve | Develop, Plan and Implement Infrastructure |
|---|---|
| How will we do this | • Design pumping infrastructure<br>• Following funding and feedback input, establish pumping infrastructure<br>• Determine if 'additional treatment' is needed<br>• Following funding and feedback input, establish additional treatment if required<br>• Design critical reticulation infrastructure (and optimise direction)<br>• Following funding and feedback input, install critical (to property boundary) reticulation infrastructure<br>• Determine appropriate storage requirements<br>• Following funding and feedback input, install storage<br>• Assist with guidance on design and consenting of on-farm/business infrastructure |
| Success will mean | • Affordable, effective irrigation and/or water use scheme designed and installed to supply water to property boundaries |

## Objective 7 – Reduce/Eliminate River Discharge

| What will we achieve | Over time reduce river discharges and ideally eliminate any direct river (piped) discharge, particularly during lower flows |
|---|---|
| How will we do this | • Prepare daily water balance to determine timing and volume of discharges<br>• Explore and maximise opportunities for non-river discharges<br>• Reduce volumes entering the wastewater system |
| Success will mean | In 10 years time no discharge below 20 m3/s (1.5x median) flows<br>In 20 years time no discharge below 37 m3/s (3x median) flow<br>In 30 years piped discharges only occur in exceptional circumstances |

## Objective 8 - High Flow Land Passage

| What will we achieve | Any (reduced) discharge to river is via land passage. |
|---|---|
| How will we do this | • Prepare daily water balance to determine timing and volume of discharges<br>• Identify the extent of land required to achieve a high volume land passage i.e. determine what level of treatment and contact time is required<br>• Address cultural protocols |
| Success will mean | • A high volume land passage system is implemented for any river discharge at a time identified in the project plan. |