

# **Activity Management Plan 2021**

## **Mandeville Wastewater Scheme**

**3 Waters | July 2021**








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## 1 Executive Summary

The following table provides a summary of the key asset management issues of the Mandeville Area Wastewater Scheme identified through consideration of the levels of service, consents, asset condition, risk analysis, disaster resilience, growth projections, and capacity assessment:

**Table 1: Key Asset Management Components**

Resource Consents	There are no specific resource consent requirements for Mandeville.
Levels of Service	Level of service targets are generally being met.
Capacity & Performance	The existing reticulation system meets the design capacity for the peak wet weather flow, but system inundation from high I and I with elevated groundwater remains a significant risk, notwithstanding the repairs of the private septic tanks in the reticulation that were carried out after the 2014 storm to reduce inflow and infiltration into the network
Asset Condition	The majority of the scheme is in good condition, with only minor replacements required over the next 50 years.
Risk Assessment	There are no high or extreme risks to this scheme identified through the Risk Assessment.
Disaster Resilience	Identified medium risks through the Disaster Resilience Assessment are earthquake, lightning and pandemic. An assessment of the Bradley's Road Pump Station is required to determine resilience.
Growth Projections	The connections served by the scheme are predicted to increase by 61% in the next 50 years.

## 2 Introduction

The purpose of this Activity Management Plan (AMP) is to outline the significant issues associated with the Council's assets and to show how the Council proposes to manage the schemes in the future.

This plan summarises the various components of the Mandeville area wastewater scheme, its condition and performance, and identifies future funding requirements including upgrades where necessary.

The data that has been relied upon to produce this document was taken at the end of the 19/20 financial year. i.e. 30 June 2020. More up to date scheme statistics are available on document TRIM 121108078891 which is to be updated quarterly.

Further details of the asset management practices used by Council to manage this scheme are summarised in the District Wastewater AMP Overview document.

Projects identified to improve asset management processes for this scheme will also benefit the performance of other 3 waters schemes and are managed at a District level for efficiency.

Projects are also identified within this AMP that will maintain or improve levels of service.

Repair of wastewater asset damage from the Canterbury earthquake sequence has now been completed. No significant legacy effects are expected.

All figures within this AMP exclude inflation.

## 3 Related Documents

The following related documents have been used as reference documents or for guidance in the development of some of the sections in this Activity Management Plan

- Waimakariri District Plan
- Population in the Waimakariri District (TRIM 170328030077)
- New Projections for LTP 2021-2031 (TRIM 200908117997)
- WDC Asset Management Policy (TRIM 180605062091)
- 2019 Customer satisfaction Survey (TRIM 200313034937)
- Development Contributions Policy 2021/22 (TRIM 200729095963)

## 4 Scheme Description (What Do We Have?)

The Mandeville Area Wastewater Scheme is a Septic Tank Effluent Pumping (STEP) system comprised of several subdivisions that were amalgamated in 2012/13 and 2013/14 into the EDWS. The properties within Mandeville, Ohoka Meadows, Swannanoa, Millfield and Mandeville Park all became part of the Mandeville Area Wastewater Scheme from June 2013. The privately owned Ohoka Utilities wastewater scheme also transferred to Council ownership in late 2015 and is now included in the Mandeville Area scheme. The adjacent Ohoka Downs remains a private system.

Raw sewage is collected in private on-site septic tanks where it receives primary treatment and screening. The primary treated effluent is then pumped from the Bradley's Road pump station to the Rangiora Wastewater Treatment Plant for additional treatment and disinfection.

The reticulation consists of pressure mains laid throughout the subdivisions. Each connected lot has an isolation valve and non-return valve located in a toby box at the property boundary.

The on-site septic tanks and pumps are owned and maintained by the individual property owners, while the reticulation, common rising main and Bradley's Road pump station are owned and operated by the Council. The Council currently undertakes the cleaning the sludge out of the septic tanks on a three yearly basis.

Some key statistics (2019/20 year) of the scheme are shown in Table 2 to 6. The extent of the currently serviced areas are presented in Figure 13 to 14 and comprehensive flow data records in Figure 16.

A schematic view of the treatment system is presented on the following page Figure 1.

**Table 2: Scheme Statistics for 2019/2020**

Scheme Parameter	Statistics	Source
Type of Supply	Septic Tank Effluent Pumping System	
Treatment	Rangiora Wastewater Treatment Plant	
Length of Reticulation	47.9 km	Wastewater Asset Valuation Tables 8-5 and 8-6, pages 59 to 62
Total Replacement Value	\$8,972,166	
Depreciated Replacement Value	\$8,143,205	
Number of Connections.	538	2019/20 Rating Query
Number of Rating Charges	594	
Average Daily Flow (4 year average)	233 m3/day*	Sewer flow data analysis for Bradleys Rd Pump Station.
Average Daily Flow/connection (4 year average)	481 l/day/con	
Peak Daily Flow (4 year average)	459 m3/day	
Peak Daily Flow/connection (4 year average)	965 l/day/con	
*Flow recording is undertaken at the Bradleys Road Pump Station and Rangiora Wastewater Treatment Plant.		

**Table 3: Wastewater Gravity Pipe Data summary**

Wastewater Gravity pipe length (m) by diameter and pipe material								
Pipe Material	Pipe Diameter (mm)							
	50	100	150	200	225	250	300	Total
PE	0m	4m	0m	0m	0m	0m	0m	4m
PVC	0m	13m	0m	0m	0m	0m	0m	13m
OTHER	0m	3m	0m	0m	0m	0m	5m	7m
<b>Total</b>	<b>0m</b>	<b>19m</b>	<b>0m</b>	<b>0m</b>	<b>0m</b>	<b>0m</b>	<b>5m</b>	<b>23m</b>

**Table 4: Wastewater Pressure Pipe Data Summary**

Wastewater Pressure pipe length (m) by diameter and pipe material						
Pipe Material	Pipe Diameter (mm)					
	50	100	150	200	250	Total
Polyethylene	4,895m	11,349m	503m	572m	905m	18,224m
Polyvinylchloride	7,964m	5,312m	1,809m	9,685m	0m	24,771m
Other	267m	19m	21m	0m	0m	307m
<b>Total</b>	<b>13,127m</b>	<b>16,680m</b>	<b>2,332m</b>	<b>10,257m</b>	<b>905m</b>	<b>43,302m</b>

**Table 5: Wastewater Valve Data summary**

Wastewater Valves	
Diameter (mm)	Count
50	176
100	121
150	7
200	14
<b>Total</b>	<b>318</b>



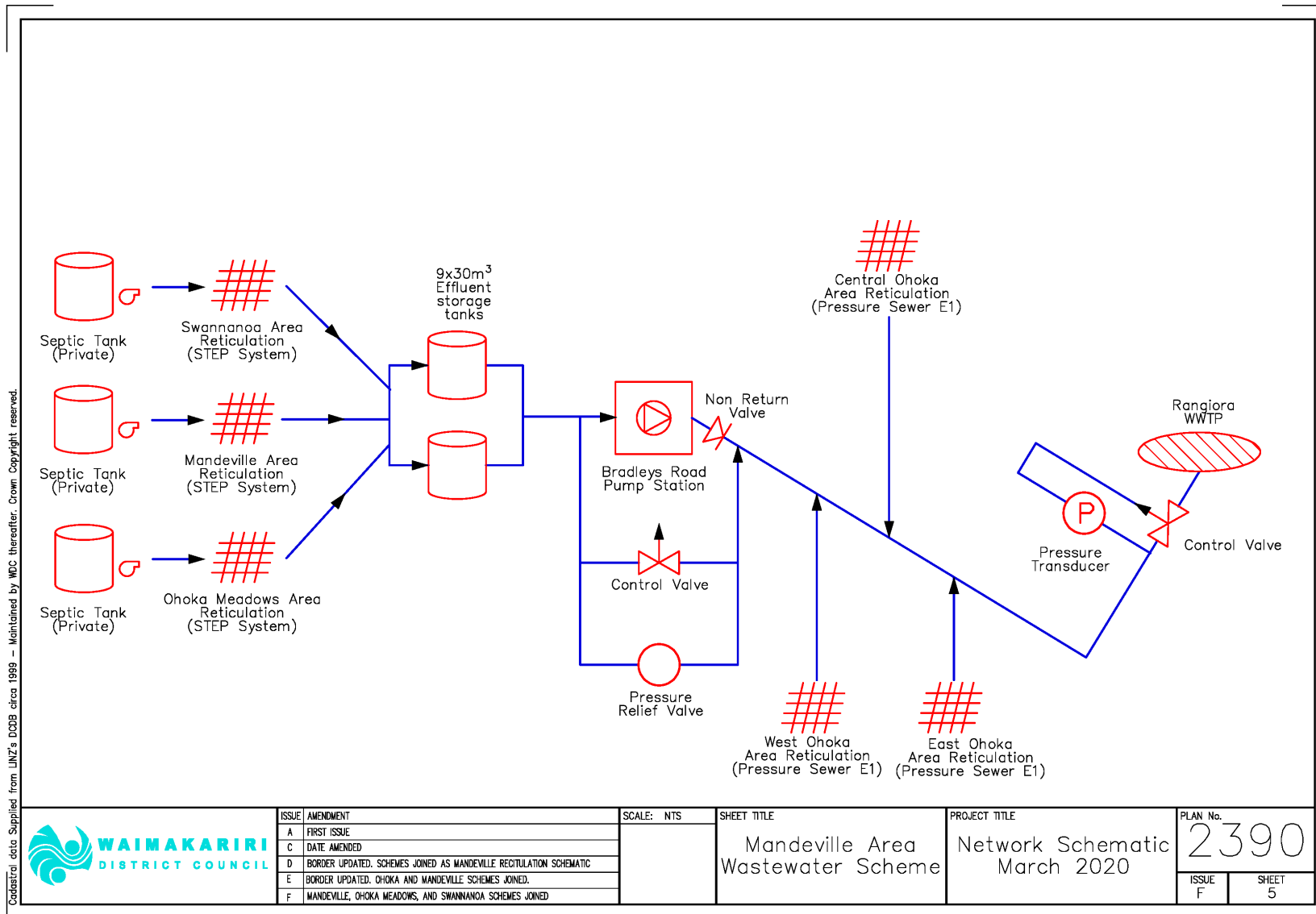
**Table 6: Wastewater Manhole Data Summary**

Wastewater Manholes	
Diameter (mm)	Count
900	0
1050	15
1200	7
<b>Total</b>	<b>22</b>

**Table 7: Data References**

Data Reference	Trim Reference	Other Ref
Flow Data Analysis – Sewer	<a href="#">121108078891</a>	
2020 3 Waters Asset Valuation	<a href="#">200824109857</a>	
2020 50 Year Water and Sewer Growth Forecast	<a href="#">200224024348</a>	

Figure 1: Network Schematic



## 5 Scheme Management Issues (What Do We Need to Consider?)

There are a number of key aspects to consider when managing a wastewater scheme, these include

- Target & actual levels of service
- Asset condition & criticality
- Capacity & performance of the supply
- Risks associated with the supply
- Growth predictions for the scheme

These issues have been assessed in detail and are explained in the following sections.

### 5.1 Levels of Service

Table 8 sets out the performance measures and targets for the scheme, and performance achievement against targets since 2008.

Mandatory performance measures are measured at the district wide level and are not included in the individual wastewater scheme AMPs. They are located in the District Overview Wastewater Activity Management Plan. However there is considerable overlap between the measures at Scheme and District levels. Mandatory measures cover overflows, consent compliance, time to respond to faults, and complaints. The Scheme LOS measures include more detail, and cover complaints, consent compliance, overflows and outages, but not response times, which are only measured at scheme level.

None of the WDC targets are expected to change over the 10 year LTP period, so only the one target value has been shown in this document

Performance in Table 8 is measured against the performance measures set in 2018, as part of the 2018-28 Long Term Plan process. Going forward from 2021 onwards, performance will be against the modified set of performance measures that were presented to the Council's Utilities and Roading Committee in 2020 (refer report 200406043184[v2]), and subsequently approved by Council. These revised levels and targets are detailed in the District Overview Water Supply Activity Management Plan.

**Table 8: Elective (non-mandatory) Levels of Service Targets and Performance Measures as Assessed in 2020**

\* Note A "Y" indicates that the LOS has been met, and an "N" indicates it has not been met

# Details of performance measures may have been modified between various revisions of the AMP. The Previous Results reported are as assessed against the most relevant performance measure at the time of assessment.

Section	Level of Service	2018 – 2021 Performance Measure	2018 – 2021 Target	2020				Previous Results#			
				Result	Commentary	Status	Action to Address	2017	2014	2011	2008
Customer Complaints	Complaints - Midges & Insects - Treatment	Number of events that lead to complaints about midges and insects at treatment plants	Nil per Year	Nil	There were no complaints regarding midges or insects.	Achieved	N/A	Y	Y	Y	Y
	Complaints - Odour - Reticulation	Number of events that lead to complaints about odour from the reticulation	Less than 5 per year	<5	This level of service is met.	Achieved	N/A	Y	Y	Y	Y
	Complaints - Odour - Treatment	Number of events that lead to complaints about odour at treatment plants	Less than 5 per year	<5	This level of service is met.	Achieved	N/A	Y	Y	Y	Y
Outages	Outages - Events >8 hours	Number of events that cause a loss of service to any property for >8 hrs (does not include private laterals)	Nil per year	Nil	This level of service is met.	Achieved	N/A	Y	Y	Y	Y
Overflows	Overflows - Existing Reticulation	Minimum return period of rainfall event that can be accommodated in network components designed prior to May 1999 without overflows occurring	1 in 2 year	Nil	This level of service is met.	Achieved	N/A	Y	Y	Y	Y
Overflows	Overflows - New Reticulation	Minimum return period of rainfall event that can be accommodated in network components	1 in 5 year	Nil	This level of service is met.	Achieved	N/A	Y	Y	Y	Y

Section	Level of Service	2018 – 2021 Performance Measure	2018 – 2021 Target	2020				Previous Results <sup>#</sup>			
				Result	Commentary	Status	Action to Address	2017	2014	2011	2008
		designed after May 1999 without overflows occurring									
Overflows	Overflows - Private Property	<p>Number of recorded overflows on private property found to be the result of</p> <p>(a) blockage in the main</p> <p>(b) Insufficient capacity in the reticulation system for any rainfall up to a 1 in 2 year event, for areas designed prior to 1999.</p> <p>(c) Insufficient capacity in the reticulation system for any rainfall up to a 1 in 5 year event for areas designed after 1999.</p>	Nil per year	Nil	This level of service is met.	Achieved	N/A	Y	Insf. Data	Y	Y



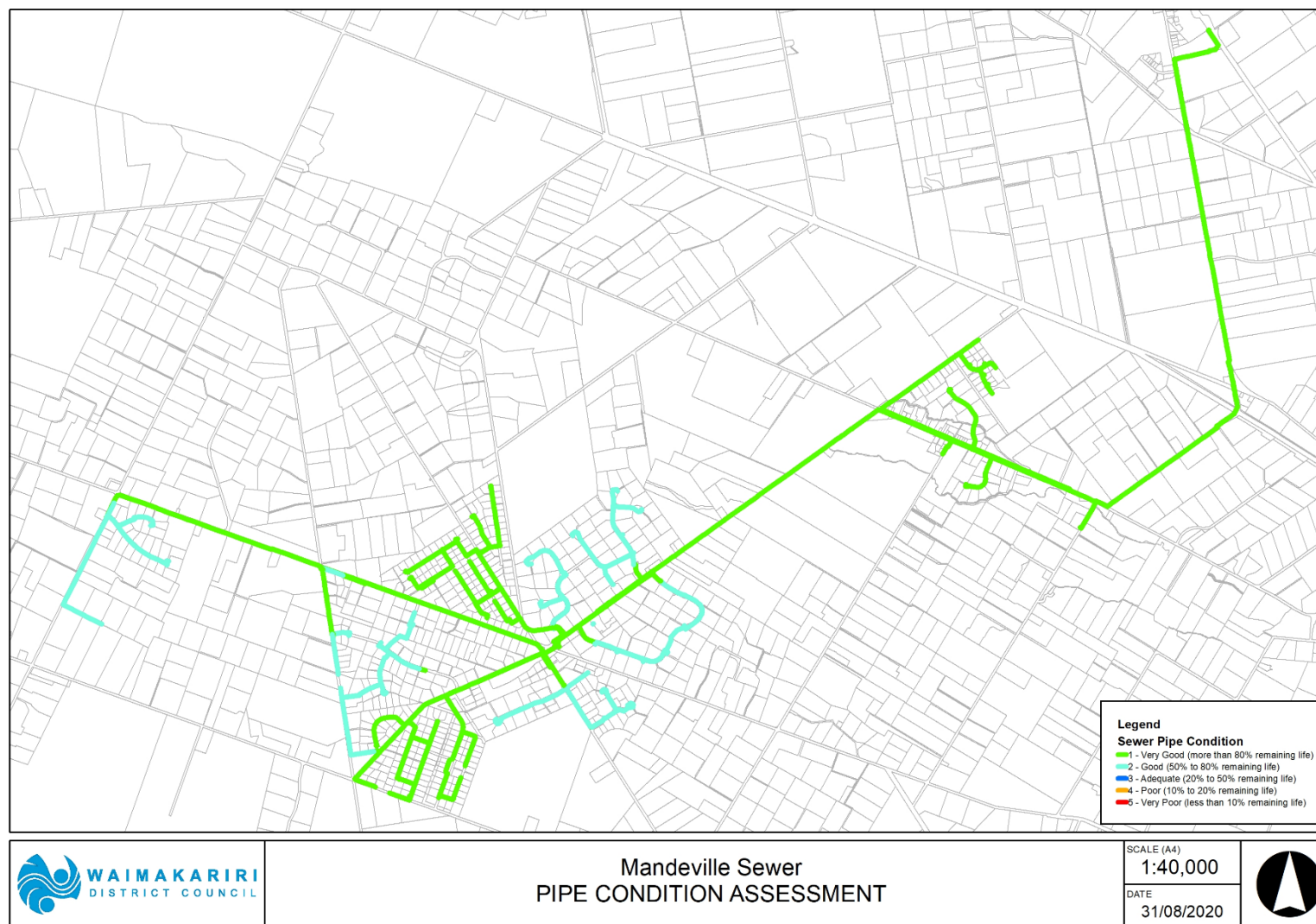
## 5.2 Asset Condition

The current assessment of asset condition is based on theoretical remaining useful life derived from component age and adopted useful life. Adjustments to the remaining life are made to individual components where information is available to suggest the theoretical remaining life is inappropriate.

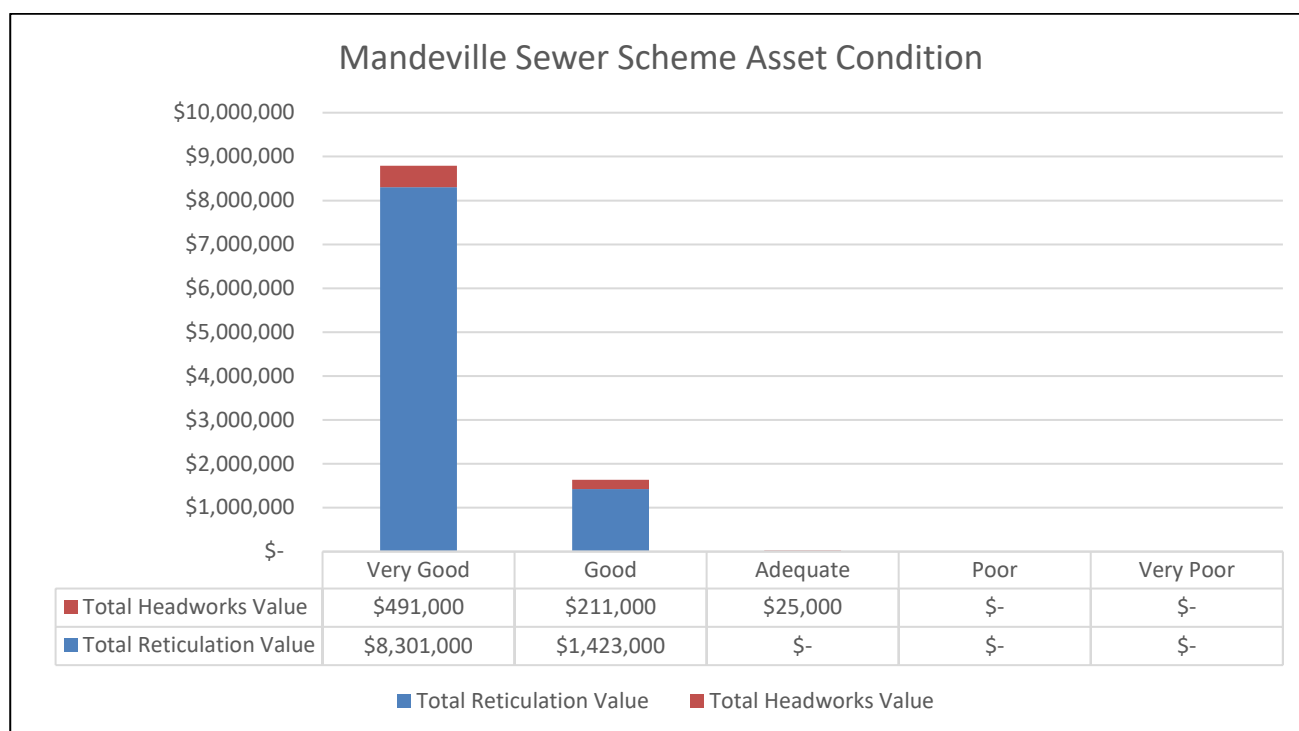
The asset lives of the pressurised Mandeville system is informed by a recent comprehensive burst analysis of the water supply assets, looking particularly at pipe material and age. This analysis has resulted in an adjustment to pressure pipe asset lives.

Figure 2 below, shows the assessed pipe condition for all pipes within the scheme. Figure 3 summarises the theoretical asset condition for both the network and headworks in a graph, while Table 9 provides more detail about the value of the assets within different asset condition categories.

**Figure 2: Pipe Condition Assessment Plan**



**Figure 3: Asset Condition Summary**



“Headworks” is inclusive of all above ground assets associated with the wastewater supply scheme e.g. buildings, pump sets.

**Table 9: Pipe Condition Summary**

Condition Grade	Definition	Pipeline Quantity	Total Reticulation Value	Total Headworks Value	Total Value
1	Very Good <i>More than 80% of life remaining</i>	37.1 km 78%	\$ 8,301,000 85%	\$ 491,000 68%	\$ 8,792,000 84%
2	Good <i>Between 50% and 80% of life remaining</i>	10.8 km 22%	\$ 1,423,000 15%	\$ 211,000 29%	\$ 1,634,000 16%
3	Adequate <i>Between 20% and 50% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ 25,000 3%	\$ 25,000 0%
4	Poor <i>Between 10% and 20% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
5	Very Poor <i>Less than 10% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
<b>Total</b>		<b>47.9 km</b>	<b>\$9,724,000</b>	<b>\$727,000</b>	<b>\$10,451,000</b>

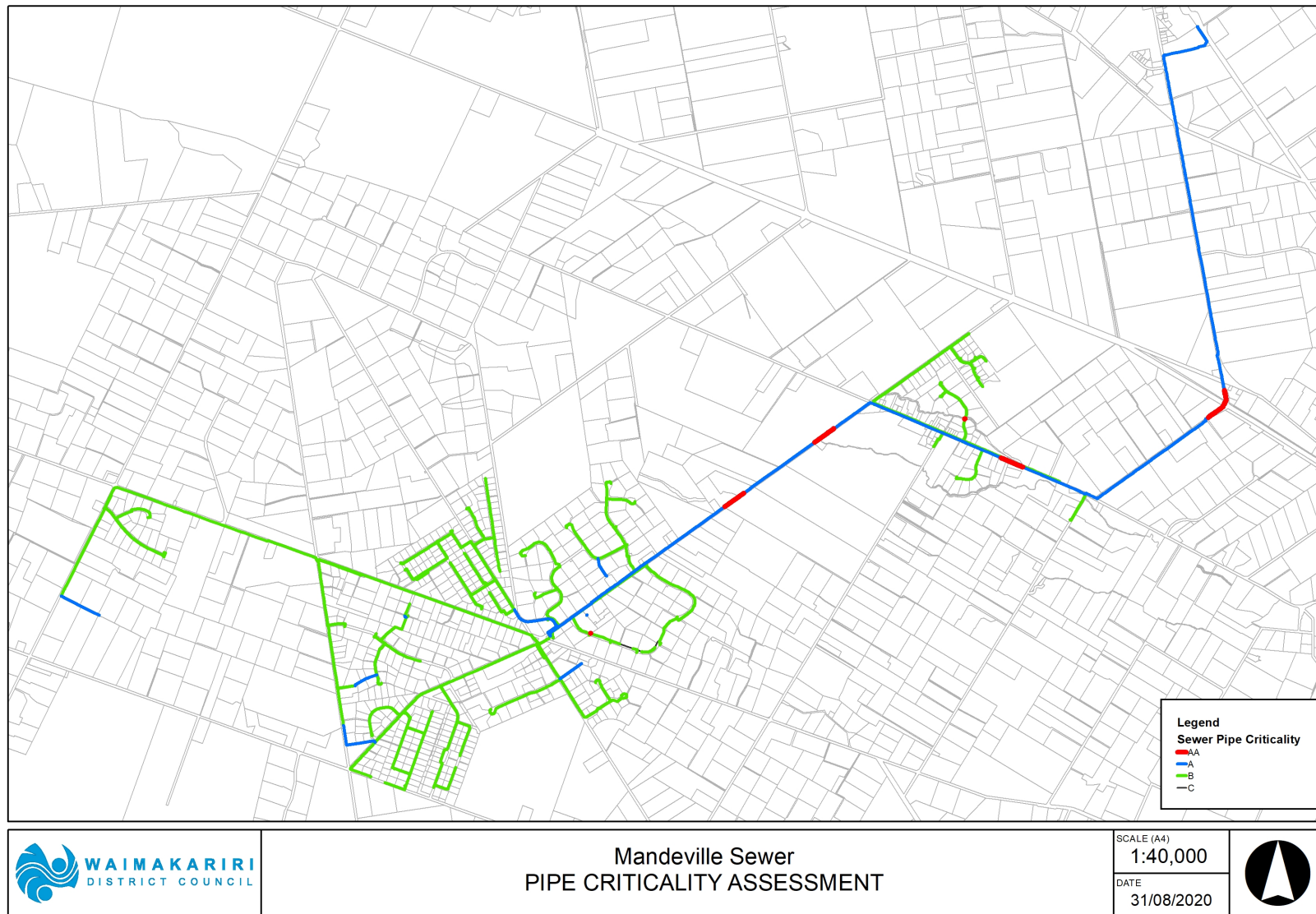
### 5.3 Asset Criticality

Asset criticality provides an indication of the importance of an individual asset and the corresponding impact on the service delivery should the asset fail for any reason. Criticality is used in risk based investment decisions to help decide when an asset should be replaced to avoid the consequences of failure. The Council has developed an assessment process which scores assets from most critical 'AA' to least critical 'C'. Further details of the criticality assessment methodology is covered in the WS Overview AMP.

The pipe criticality scoring process has been significantly improved through automation and dynamic links to GIS data layers for this AMP.

Figure 4 provides a spatial view of asset criticality for the scheme.

**Figure 4: Pipe and Facilities Criticality**





## 5.4 Risk Assessment

An Operational Risk Assessment was first undertaken for the Mandeville Wastewater Scheme in 2004, and it has been regularly updated since that time. It was last updated for the 2015 AMP review. At the last review there were no high risks remained for the Mandeville wastewater scheme.

The District Wide Overview details the risk events considered and includes a summary of the risk assessment results for all the wastewater supply schemes and is useful in indicating overall wastewater network priorities.

Table 10 summarises the number of events at each level of risk for the Mandeville Wastewater Scheme.

**Table 10: Number of Events per Level of Risk**

<b>Risk Level</b>	<b>2004</b>	<b>2008</b>	<b>2011</b>	<b>2014</b>
Extreme risks	-	-	0	0
High risks	-	-	0	0
Moderate risks	-	-	5	6
Low risks	-	-	11	9
Not applicable	-	-	20	21
<b>Total</b>	-	-	<b>36</b>	<b>36</b>

The table shows there are currently no extreme or high risks within the Mandeville Area Wastewater Scheme.

District wide, moderate risks are being deferred until extreme and high risks have been addressed.

## 5.5 Disaster Resilience Assessment

The 2009 Disaster Resilience Assessment (DRA) is a desk top study that primarily considered the risks to above ground structures presented by natural hazard events across all Council operated 3 Waters schemes. The original assessment was updated in 2012 using revised hazard and asset behaviour information captured during the 2010-11 Canterbury earthquake sequence.

Risk from earthquake events that could induce liquefaction on brittle pipes (AC and earthenware) is managed using a reticulation vulnerability score. This is used as an input to the risk based renewals assessment.

### Above Ground Facilities

The above ground facilities were assessed for risk of failure against 13 natural and 2 manmade hazard scenarios. The following risk profile (Table 11) reflects the likelihood of the event occurring and the consequence on the community of the facility failing. Hazards classified as having 'No Known Risk' have been omitted from the table.

**Table 11: Risks to Above Ground Facilities**

Threat	Mandeville WWTP
100 yr Local Flooding	N
475 yr Earthquake Induced Slope Hazard	L
Earthquake (50 yr)	M
150 Yr Earthquake	L
475 Yr Earthquake	L
Wildfire	L
Snow 150 Yr	L
Wind 100 Yr	L
Lightning	M
Pandemic	M
Terrorism / Sabotage	L
E =- Extreme, H = High, M = Moderate, L = Low	

The scheme is located outside the zone of potential liquefaction thereby reducing possible impact and asset damage from an earthquake event.

All wastewater sites in the District have been identified as at moderate risk from lightning and pandemic.

The Councils response to these risks is being managed at a district level via the DRA Action Plan and related projects. Refer to the District level AMPs for details. Since there is some overlap of the DRA and Operational Risk Assessment, a review and potential integration of the risk assessment methodologies is planned, prior to risk assessments next being carried out.

## 5.6 Growth Projections

### Situation

The Mandeville Area Wastewater Scheme is the result of the combination of three previously separate wastewater schemes in the Mandeville area. These are the Swannanoa, Mandeville (including Mandeville Park and Millfield), Ohoka Meadows and Ohoka Utilities schemes. There is also a private scheme in the area, Ohoka Downs, which is not connected to the scheme.

The Mandeville Area Wastewater Scheme was incorporated into the Eastern District's Sewer Scheme between 2013 and 2015. This amalgamation has alleviated previous capacity issues with each of the three separate treatment plants, which have now all been decommissioned.

Growth on the scheme can now be assessed in terms of the overall Eastern District's Sewer Scheme capacity, and more specifically, capacity of the Rangiora Wastewater Treatment Plant and pipeline from Rangiora to Kaiapoi. The reticulation capacity within the Mandeville area scheme is also a factor in assessing potential for growth (see following section on Capacity and Performance).

The overall district population growth scenario used for the 2021 AMP update was supplied by Council's Development Planning Unit, broken into towns and rural areas. Wastewater growth projections were calculated using the New Projections for LTP 2021-2031 (TRIM 200908117997), which was the basis for infrastructure planning.

Due to issues that have occurred with the Census 2018, the population projections that would normally be used as a basis for updating the work previously developed by the Council's Development Planning Unit have not been released by Stats NZ in time for the development of this assessment.

However, based on the historical growth patterns of new dwelling Building Consents over the last three years (636 in 2017/18, 661 in 2018/19 and 615 in 2019/20), the projections used for the previous LTP/infrastructure strategy remain valid to be used for infrastructure planning. As the timeframe for this infrastructure planning is for the thirty years between 2021 to 2051, the previous population projections have been extended out a further three years, as documented in New Projections for LTP 2021-2031 (TRIM200908117997)

It is important to provide a brief comment on COVID19 and the impact it could have on population projections. At the time of writing this paragraph (August 2020), New Zealand is currently in Level 3 restrictions in Auckland and Level 2 restrictions in the remainder of the country. While international migration is currently low arising from the COVID19 travel restrictions, a significant number of New Zealanders are returning home due to the impact of COVID19 on overseas countries. This has contributed to a high level of population growth nationally over the last six months, which has had a flow on effect to growth in the Greater Christchurch and Waimakariri Districts. How long this might continue for and when international migration (from other countries) might return to pre COVID levels is still to be determined. However the existing population projections remained the most appropriate to use for infrastructure planning at this time.

### Demand

Demand on the Mandeville wastewater scheme is expected to increase by 16%, by the end of the 2021-31 Long Term Plan (LTP) period. This projection is based on 86 connections being established from 2019/20 to 2030/31, as identified in the 2020 50 Year Water and Sewer Growth Forecast Report (TRIM reference number 200224024348).

The number of new residential connections are predicted to increase by 8 per year, during the 2021-31 Long Term Plan (LTP) period to accommodate this demand. Demand beyond the 2021-31 LTP period (2030/31 to 2070/71) is forecast to transition to a slightly lower growth profile resulting in an average of 6 new connections per year (Table 12).

**Table 12: Growth Projections**

Mandeville-Ohoka	Rates Strike July 2019	Years 1 - 3	Years 4 - 10	Years 11 - 20	Years 21 - 30	Years 31 - 50
	2019/20	2021/22 to 2023/24	2024/25 to 2030/31	2031/32 to 2040/41	2041-42 to 2050/51	2051/52 to 2070/71
Projected Connections	536	572	622	693	755	862
Projected Rating Units	592	628	678	749	811	918
Projected increase in Connections		7%	16%	29%	41%	61%
Projected Average Dry Weather Flow (m3/day)	248	273	307	354	396	468
Projected Peak Wet Weather Flow (m3/day)	1,208	1,330	1,499	1,737	1,948	2,307

Note that the time frames have been chosen to reflect the periods 3, 10, 20 and 30 years from the AMP release date, however due to the time it takes to complete the analysis the base rates strike data used was from 2019/20.

Longer term, connections are projected to increase by 61%. This long term projection is lower than the 2017 growth projection, of 109% (used for the 2017 AMP). Both projections utilised the best data and information available to project the connections for the wastewater schemes at the time. The base population projections given to PDU for 2019 infrastructure planning were more area specific than the 2017 projections (separating the Mandeville area into residential and rural), and has given a better projection for the Mandeville scheme.

Average Dry Weather Flow (ADWF) and Peak Wet Weather Flow (PWWF) projections have been based on the assumptions that for future development areas the Engineering Code of Practice (ECOP) ADWF or PWWF per person is added to the existing flow.

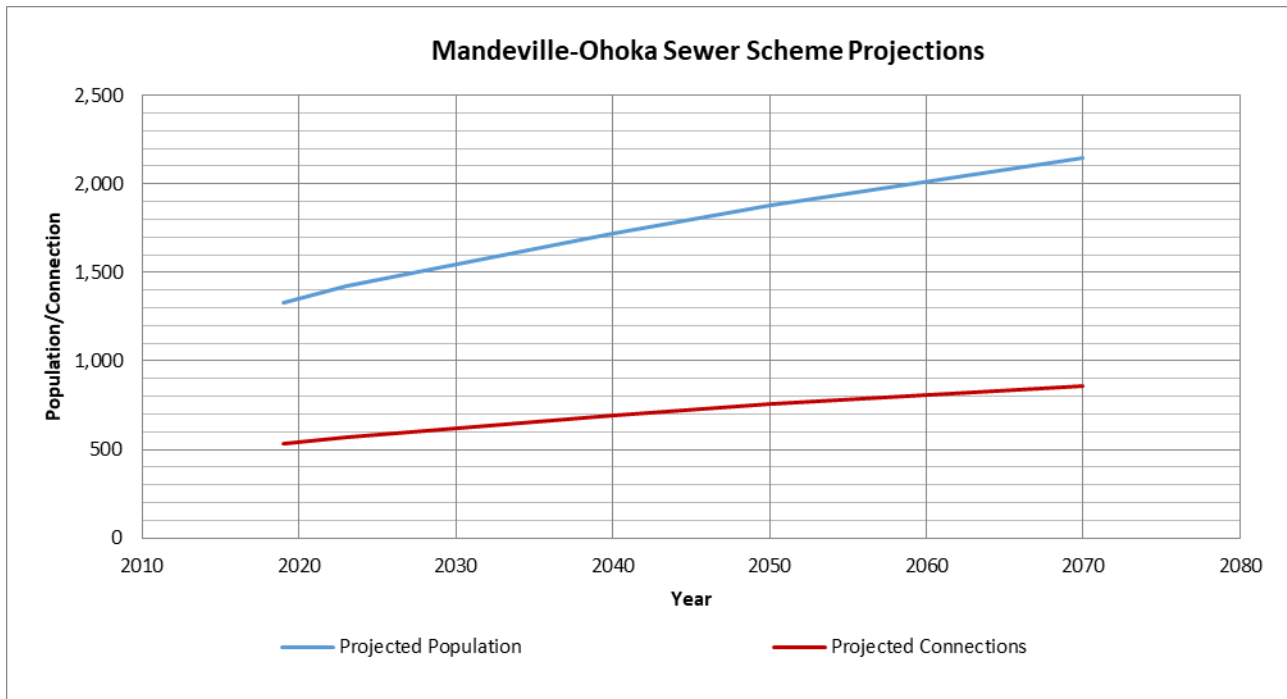
The assumptions made to calculate the future ADWF were based on the ECOP, with the residential 0.675m3/prop/day and non-residential 0.2m3/Ha/day; and the future PWWF was based on the ECOP, at residential 3.375m3/prop/day and non-residential 1m3/Ha/day.

On average Mandeville's existing Inflow/Infiltration level is considered low, resulting in below-average Peak Wet Weather Flow (PWWF).

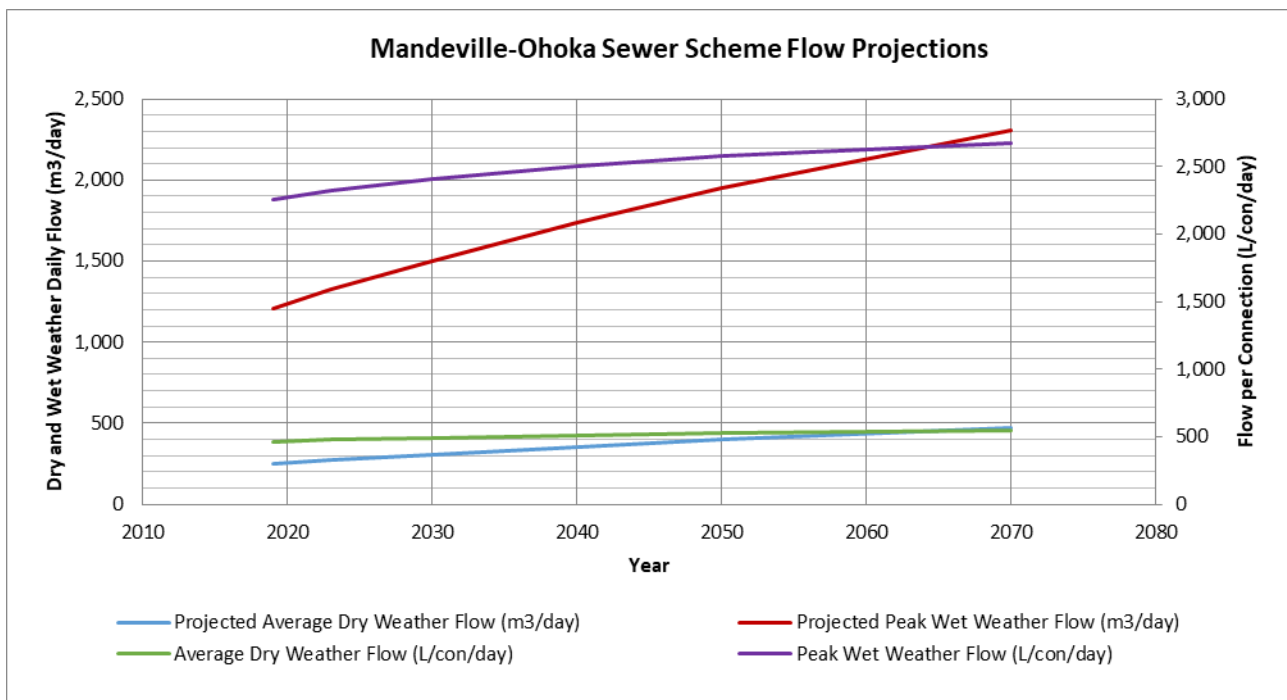
## Projections

Figure 5 & Figure 6 present the projected growth and corresponding demand trends for the Mandeville Area wastewater scheme.

**Figure 5: Population Projections**



**Figure 6: Flow Projections**





## **5.7 Capacity & Performance**

This section of the AMP considers the capacity and performance of the Mandeville Area Wastewater Scheme. The specific aspects of the scheme that have been considered are the treatment plant and the reticulation system. These are discussed in more detail in the following sections.

### **Treatment Plant**

Effluent from the Mandeville scheme is transferred via a pressure pipeline to the Rangiora Wastewater Treatment Plant, following primary treatment through removal of solids within the septic tanks on the connected properties. The treatment process of the Rangiora plant is discussed in the Rangiora AMP.

The combined effect of the amalgamation of the Swannanoa, Mandeville, Ohoka Meadows, and Ohoka Utilities schemes with the EDSS utilised approximately 2.5% of the capacity in the Rangiora to Kaiapoi pipeline, and 3.5% of the capacity of the Rangiora Wastewater Treatment Plant.

### **Reticulation System**

The reticulation system is relatively new. All of the houses are connected to modern style septic tanks and pumped into a common rising main, generally with low pressure pumps.

The existing reticulation system has sufficient capacity to accommodate the existing peak wet weather flow during the 2-year rainfall (target design level of service). A Tram Road sewer extension (approximately 2km) was completed in 2016/17 to connect the Swannanoa reticulation directly into the Bradley's Road pump station.

For the connected Mandeville properties, inflow and infiltration flows have created issues in the past. Instances of high ground water levels, and overland stormwater flow have inundated the system, causing loss of service and wastewater overflows. Following the June 2014 flood event, Council undertook works on private septic tanks to reduce the issues with inflow and infiltration entering the reticulation system, so some improvement has been made to the situation.

In addition to these septic tank improvements, improvements to land drainage in the area have been made. These drainage upgrades will divert much of the overland flows away from the private properties and could improve scheme operation during future major rainfall events. However significant residual and unresolved risk remains.

A 2017 study of these issues (TRIM 170424039743) has a suite of recommendations aimed at reducing this risk. Further work is required to better understand the situation, and some data is being gathered as part of the current septic tank cleaning round. At this stage no future budget has been allocated to address the situation, but it should be noted that the assets that may need the most attention are not Council assets, but are owned by individual homeowners.

The Council continues to clean and empty the septic tanks on the connected properties every three years and this cost is charged to the connected properties as part of their targeted rate. This provides the Council with an opportunity to inspect the private systems regularly to ensure that they are adequately maintained.

## 6 Future Works & Financial Projections (What Do We Need To Do?)

This section covers the future works required to meet the target levels of service, maintain the asset in an acceptable condition, reduce the risks to an acceptable level and accommodate growth.

Financial forecasts do not include inflation.

### 6.1 Operation & Maintenance

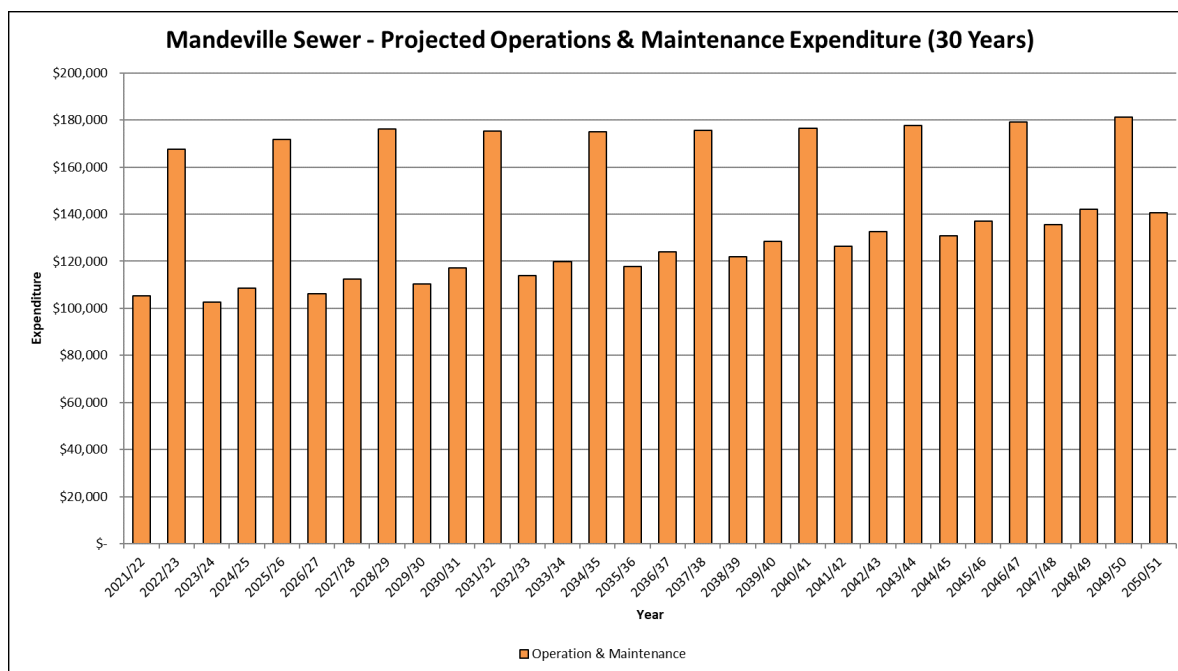
Operation and maintenance (O&M) expenditure incorporates the day to day running of the water supply network and allows the system to carry on functioning to deliver the agreed levels of service.

The O&M programme includes a combination of reactive and planned tasks. Examples of the differing nature of these tasks is summarised within the Overview document.

While there are no known deferred maintenance items, it is expected that the recent implementation of an Asset Management Information System (AMIS) will enable improved planned maintenance regimes. For example the new system will allow analysis of blockages that will identify where a pre-emptive regular cleaning programme should prevent blockages from occurring.

O&M budgets are set based on a combination of past expenditure (for reactive tasks), cost estimates for planned works, and adjustments going forward to account for growth, inflation, depreciation and any significant new works planned. Further detail of this process is provided in the Overview document. The end result of this is shown in Figure 7.

**Figure 7: Annual Operation & Maintenance 30-Year Budget**



The three yearly cycle of spikes comes from the three yearly round of septic tank cleaning.

## 6.2 Renewals Programme

Renewals programme are determined in two stages. The renewals model, details of which are provided in the overview document, provides a long term view of the funding required to ensure that a renewals fund is sufficient to enable future asset renewals, without needing to borrow.

For wastewater, for those schemes connected to it the model is operated at the Eastern Districts Sewer Scheme level. It provides Asset Managers, at a scheme level, prioritised candidates based on criticality, risk, and expected asset life on for consideration for inclusion in the LTP. Asset Managers consider other factors such as other works that may be planned in the area, as well as local asset history, in determining final projects for the LTP.

Figure 8 below shows the output from the model only and provides a broad brush spatial view of the likely timeframe for renewals.

**Figure 8: Pipe Renewal Time Frames**

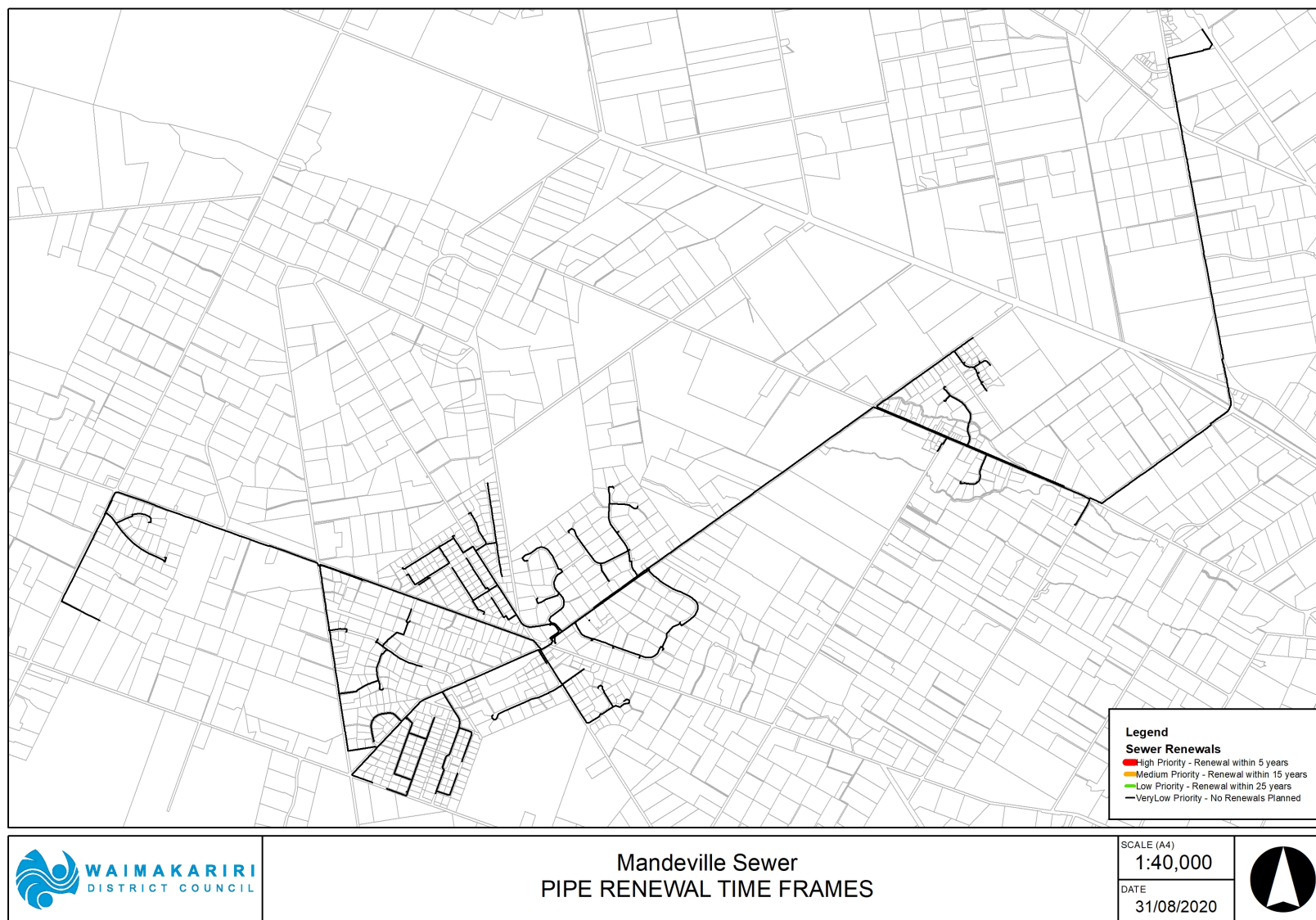
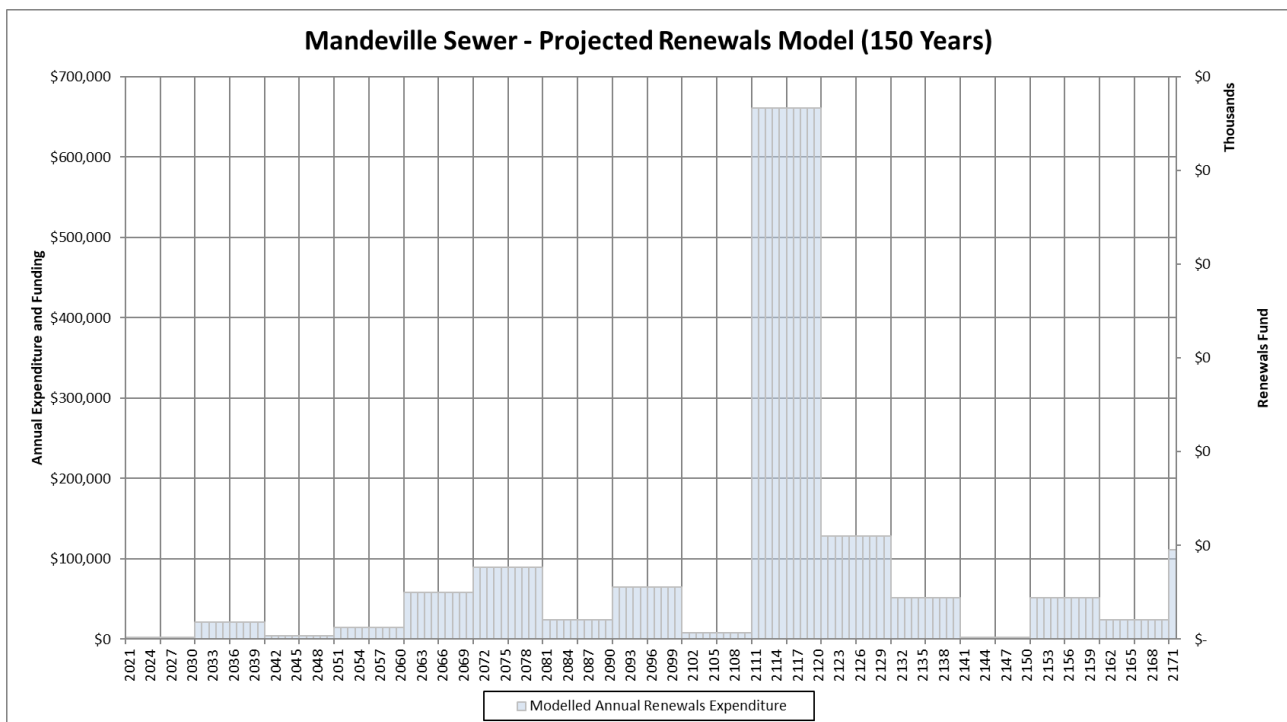


Figure 9 below shows the renewals expenditure from the model only. Budgeted depreciation funding, modelled annual funding required, and the modelled renewals fund are not shown on this graph, but are shown on the equivalent graph in the Overview AMP. This is because all properties that are connected to the Eastern District Wastewater Scheme (EDWS) are charged using the same set of (differential) rates.

The figure only shows the output from the model, so expenditure shown in the graph for the first ten years may be different from the expenditure shown in the final budget, as adjustments may have been made by the Asset Manager from the direct renewals model outputs. The final renewals budget put forward into the draft LTP, is included in the capital works graph. There are no deferred renewals

**Figure 9: Annual Renewals Expenditure, 150 Year Budget**



### 6.3 Capital Works

The following graph shows the 50 year budget for all capital works, including projects driven by growth and levels of service (Figure 10). Renewals expenditure showing in the first ten years of the graph, includes the actual planned programme, not the model output.



**Figure 10: Projected Capital Works Expenditure**

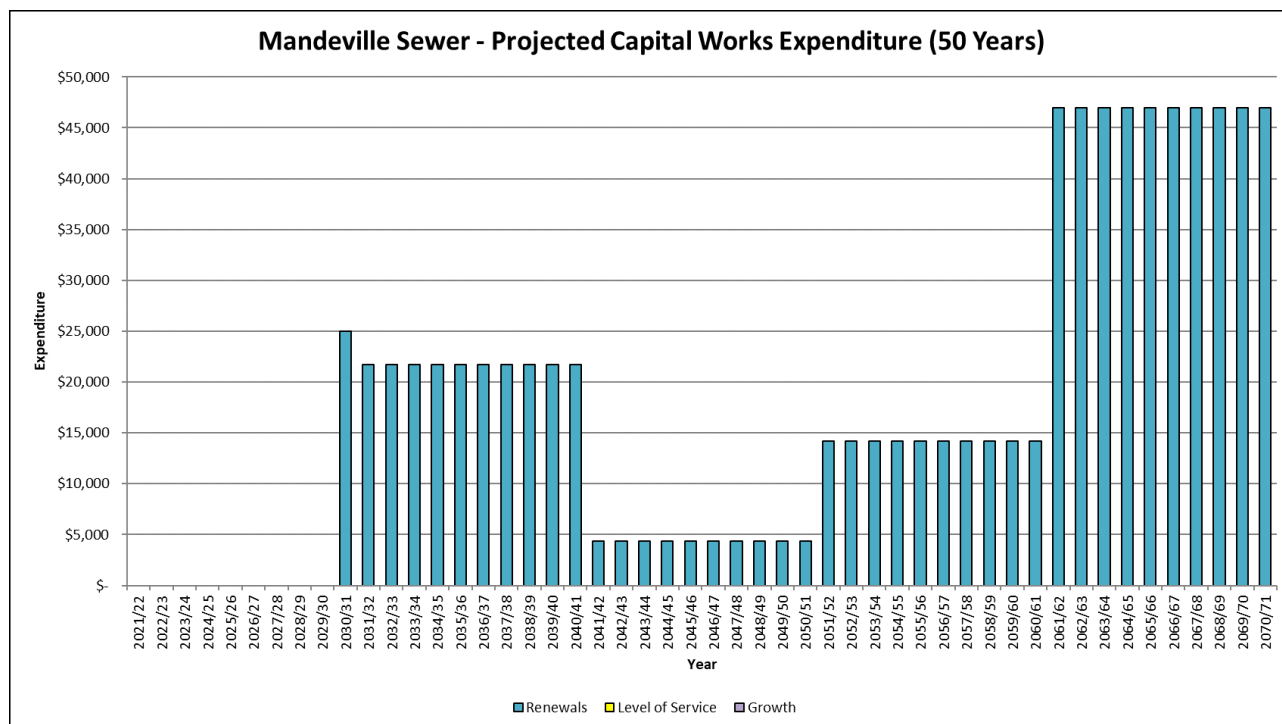


Table 13 on the following page summarises the projected capital works for the next 50 years, including renewals. Figure 11 shows the corresponding location of the projected capital upgrade works.

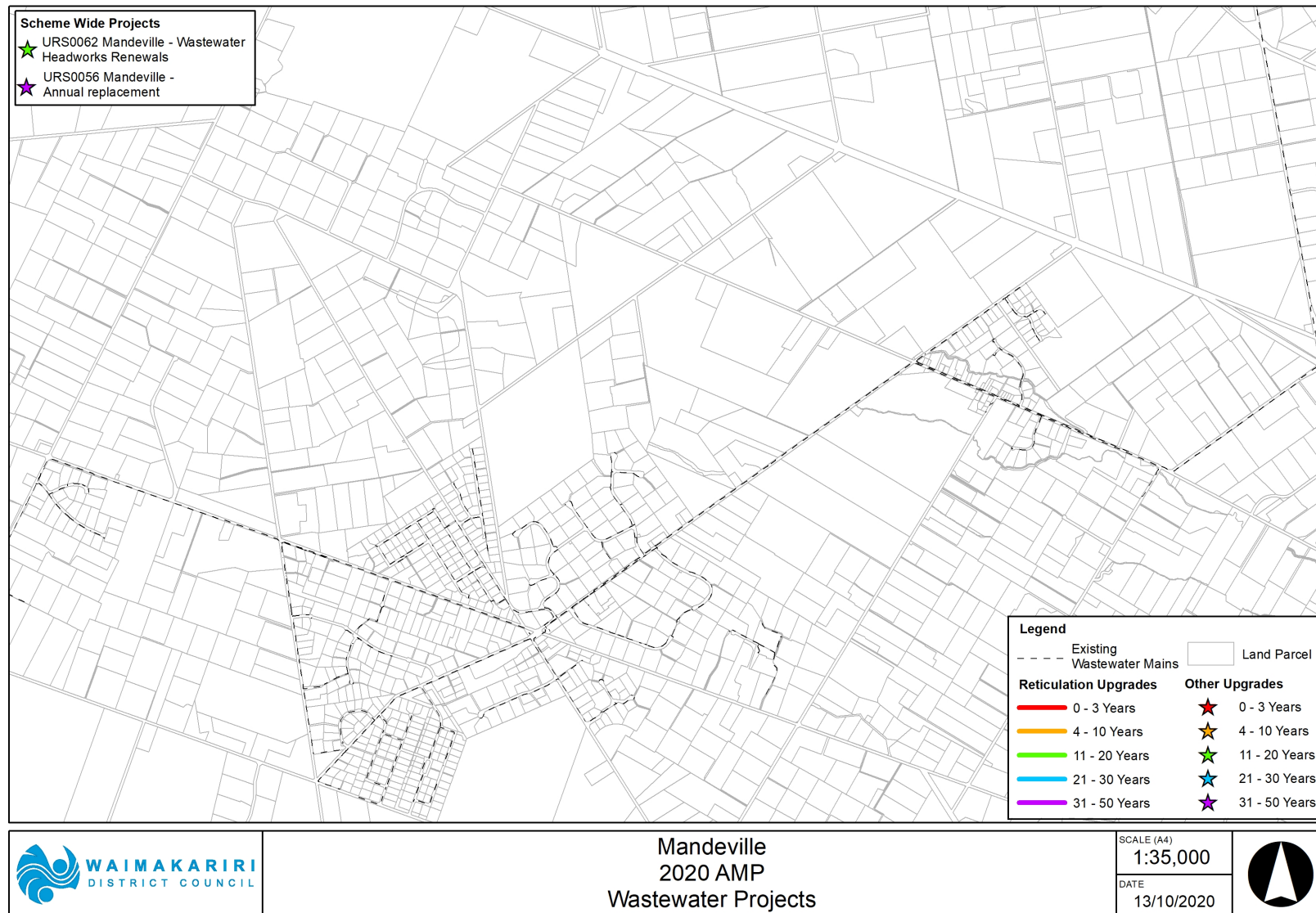
The level of confidence in the budget for the works (High / Medium / Low) is presented in the table. For a more complete discussion on the level of optimisation, refer to the introductory chapter of the AMP. The figures in the table are not adjusted for inflation.

Any programme or project that occurs over a number of years, such as the renewals programme, is only shown within the table for the first year in which it occurs. The Project Value indicates the projected full total cost of the project over the number of years it occurs.

**Table 13: Summary of Capital Works (Includes Renewals)**

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Component	Renewals Component	Growth Component
Year 1 - 10							
2031	URS0062	Mandeville - Wastewater Headworks Renewals	2 - Very Low	\$ 602,186	\$ -	\$ 602,187	\$ -
Year 31 - 50							
2062	URS0056	Mandeville - Annual replacement program	3 - Low	\$ 295,598	\$ -	\$ 295,597	\$ -
Grand Total				\$ 897,784	\$ -	\$ 897,784	\$ -

**Figure 11: Projected Capital Upgrade Works (not to scale)**

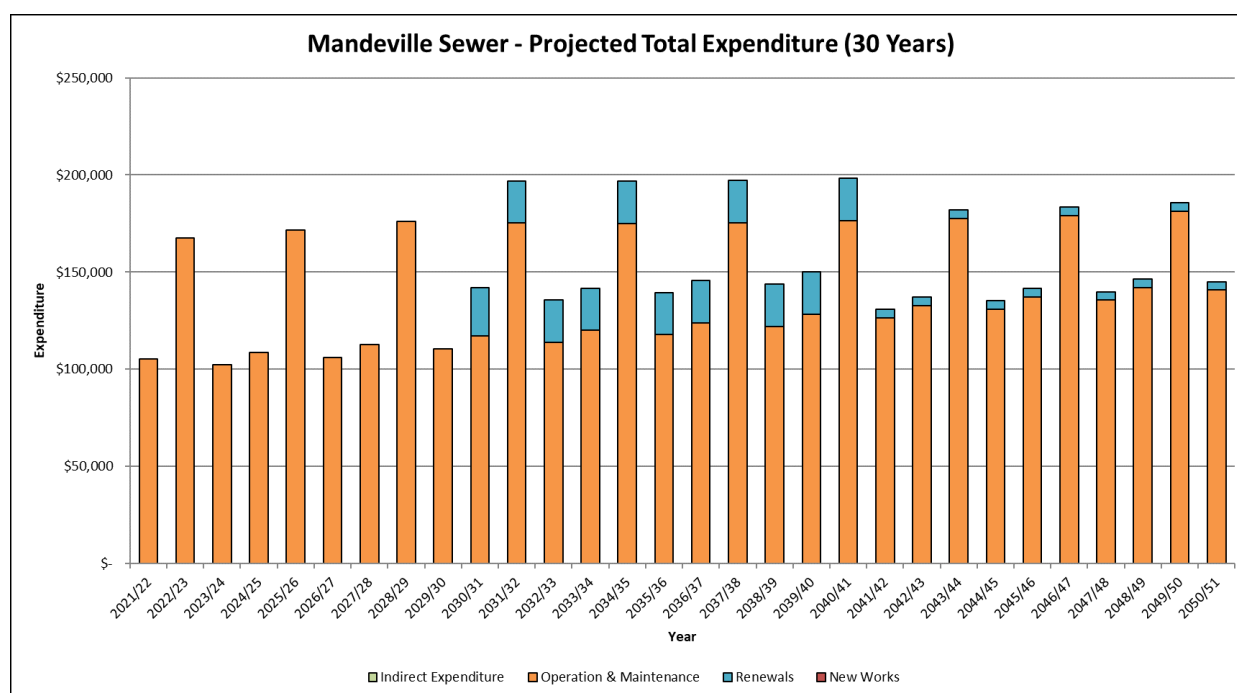


## 6.4 Financial Projections

The following graph summarises the breakdown of projected total expenditure over a 30 year time horizon. It includes both operational and capital expenditure. Capital includes expenditure for growth, levels of service and renewals. Operational costs include operations and maintenance, but not indirect expenditure.

Indirect expenditure includes interest, rating collection costs, costs associated with maintaining the Asset Register, and other internal overhead costs. For systems connected to the Eastern District Wastewater Scheme, these costs are aggregated within the Eastern District Scheme budget.

**Figure 12: Projected Expenditure**



## 6.5 Valuation

A full peer reviewed valuation of assets is carried out on a three yearly cycle, using the asset data in our asset management information system. Table 14 below provides a summary of the replacement cost, depreciated replacement cost and annual depreciation for this scheme

**Table 14: Asset Valuation**

Asset Type	Unit	Quantity	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Manhole	No.	29	\$514,541	\$492,227	\$4,323
Valve	No.	344	\$820,168	\$743,257	\$9,393
Main	m	47,891	\$6,417,867	\$5,866,979	\$64,206
Service Line	properties	522	\$492,358	\$432,416	\$4,924
<b>Facilities</b>			<b>\$727,232</b>	<b>\$608,326</b>	<b>\$18,605</b>
<b>Total</b>			<b>\$8,972,166</b>	<b>\$8,143,205</b>	<b>\$101,449</b>

## 6.6 Revenue Sources

Revenue is provided from two key sources; targeted rates and Development Contributions. Development contributions are calculated in accordance with Council's Development Contributions Policy (TRIM [191129168016](#)), while targeted rates are charged in accordance with Council's Revenue and Financing Policy (TRIM 180522056008).

## 7 Improvement Plan

### 7.1 2021 Improvement Plan

Table 15 details the scheme specific improvements and relevant district wide improvements recommended to address the management issues identified in Section 3. Each improvement item has been tagged to either a capital project or, a process improvement project to help manage and track Councils response. Short term indicates within the first three years of the LTP, long term, out beyond 2021.

If the table is empty, this indicates that all improvements required are either district wide improvements (covered by the Overview AMP), or covered by a capital project or projects, covered in the Capital Works section.

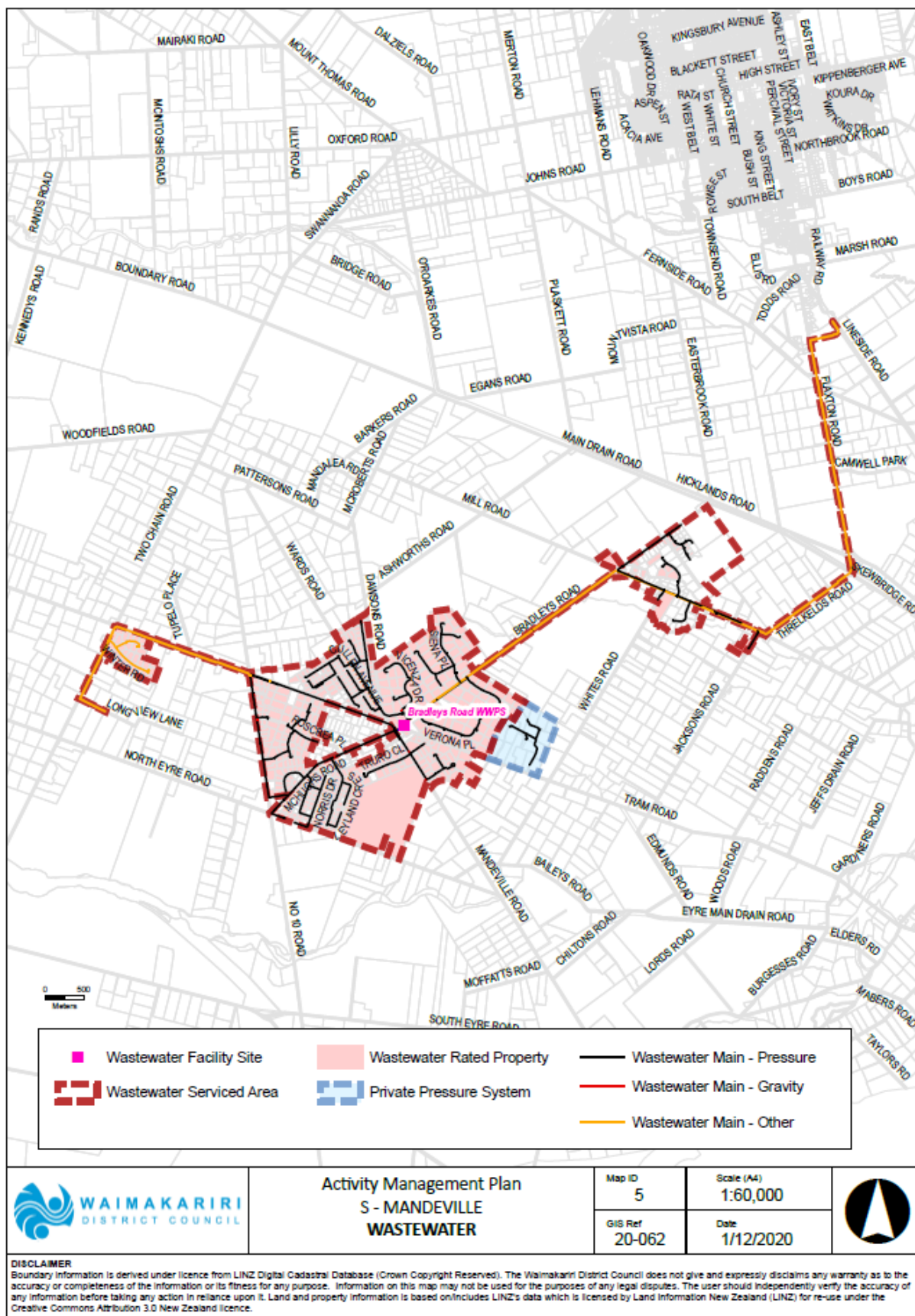
**Table 15: 2021 AMP Improvement Plan**

Project Ref	AMP Section	Project Description	Priority	Status	Estimated Cost
NA	NA	NA	NA	NA	NA

# APPENDIX 'A'.

# PLANS

Figure 13: A1 - Plan of Served Area - Mandeville





**Figure 14: Mandeville Area Wastewater Statistics**

Mandeville Area Wastewater Statistics

Mandeville Area

19/20

Updated: Jun-20

Note that shading indicates the relative quantity measured for the ten year period (i.e. the lowest value has no shading, the highest has complete shading.)

	July '09 - June '10	July '10 - June '11	July '11 - June '12	July '12 - June '13	July '13 - June '14	July '14 - June '15	July '15 - June '16	July '16 - June '17	July '17 - June '18	July '18 - June '19	July '19 - June '20	5 yr Average	10 yr Average
Average Daily Flow m <sup>3</sup> /day	-	-	-	-	237	130	201	212	232	248	270	233	153
Average Dry Weather Flow m <sup>3</sup> /day	-	-	-	-	145	125	108	206	231	245	268	212	133
Peak Daily Flow m <sup>3</sup> /day	-	-	-	-	2,304	402	604	338	507	422	425	459	500
Peak Weekly Flow m <sup>3</sup> /day	-	-	-	-	1,911	222	250	246	307	299	294	279	353
Peak Monthly Flow m <sup>3</sup> /day	-	-	-	-	867	185	236	232	265	275	287	259	235
Peak Instantaneous Flow L/s	-	-	-	-	-	-	-	-	-	-	-	-	-
Peak Month	Jul	Jul	Jul	Jul	Jun	Jul	Jun	Dec	Aug	Jun	Aug		
Peak Week	Week 27	Week 27	Week 27	Week 27	Week 25	Week 28	Week 24	Week 52	Week 25	Week 23	Week 21		
Peak Day	1/07/2009	1/07/2010	1/07/2011	1/07/2012	13/06/2014	2/06/2015	25/06/2016	16/12/2016	18/05/2018	1/06/2019	30/01/2020		
Peak Day Rainfall mm					6	0	0	0	0	59.8	0		
Peak Day Weather					Wet	Dry	Wet	Wet	Wet	Storm	Dry		
Total Annual Volume m <sup>3</sup>	-	-	-	-	43,413	47,600	36,873	77,919	84,975	91,135	99,225	78,025	48,114

Rating Connections	-	-	-	-	267	305	427	454	478	518	538		
Rating Charges	-	-	-	-	275	314	499	492	530	572	594		
Average Daily Flow per Connection L/con/day	-	-	-	-	889	425	472	468	484	479	503	481	372
Peak Daily Flow per Connection L/con/day	-	-	-	-	8,629	1,318	1,415	744	1,061	815	790	965	1,477

Data Quality	0	0	0	0	very high	very high	very high	very high	very high	high	high		
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