

Activity Management Plan 2021

Rangiora Urban Drainage Scheme

3 Waters | July 2021








Prepared by
Waimakariri District Council
215 High Street,
Private Bag 1005
Rangiora 7440,
New Zealand
waimakariri.govt.nz

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Prepared by	Kalley Simpson	3 Waters Manager		17/02/2021
	Simon Collin	Infrastructure Strategy Manager		21/01/2021
	Chris Bacon	Network Planning Team Leader		17/02/2021
Reviewed by	Kalley Simpson	3 Waters Manager		17/02/2021
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1 Executive Summary

The following table provides a summary of the key asset management issues of the Rangiora Urban Drainage 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

Levels of Service	<p>Recent capacity upgrades have improved LOS, and \$2.6 M more capital works are planned to complete them. More work is needed to identify remaining houses that may be at risk during the design event, and to plan any necessary work to fully achieve LOS.</p> <p>Some nuisance flooding is still occurring which needs system improvement to ensure it is better managed. Budget has been allowed for ongoing improvements, including for both minor capacity and treatment improvements.</p> <p>Customer satisfaction (high or very high) for drainage, taken from the triennial survey, is 87%, for this scheme.</p>
Resource Consents	<p>The scheme is currently achieving its targets relating to resource consent compliance. However, a new Rangiora urban network discharge consent has been applied for as required under the Land and Water Regional Plan and the outcome is pending. It is expected that the new consent conditions will require considerable expenditure (both opex and capex) over time to improve water quality discharging into receiving waters. Budget allowance has been made for this, commencing in 2026/27, but further work is needed to clarify exactly how the required outcomes will be achieved.</p>
Capacity & Performance	<p>There has been an improvement in stormwater capacity and performance with the recent construction or upgrade of stormwater systems, with more works planned. The system is modelled, but establishment of house floor levels in critical areas is required to know if the LOS is being met</p>
Asset condition	<p>The asset condition of the reticulation system is assumed to be generally good. This is due to much of the system being relatively young and there being no AC pipes, which have a shorter life than concrete and pvc.</p> <p>This will be verified over time with the targeted CCTV programme</p> <p>Drains and streams are maintained in perpetuity. A significant new project in this AMP is the 3 Brooks Enhancement project, which will replace and repair old infrastructure such as retaining walls, clear out weedy vegetation, and naturalise some stretches of Rangiora's 3 brooks</p>
Risk Assessment	<p>Previous operational risk assessment work is becoming outdated and needs a refresh, in conjunction with an update of the DRA. Planned for 2021.</p>
Disaster Resilience Assessment (DRA)	<p>There are no facilities or reticulation mains on this scheme that are a high or extreme hazard in an earthquake, flood or other event.</p> <p>The Middlebrook pump station is the only asset on this scheme identified as being at risk, but the consequences of failure are minor.</p>
Growth Projections	<p>As new development is required to maintain stormwater discharge at predevelopment levels, there is not a close correlation between growth projections, and capital projects or stormwater discharge.</p>

2 Introduction

The purpose of this Drainage 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 Rangiora Urban drainage 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.

Further details of the asset management practices used by Council to manage this scheme are summarised in the District Drainage 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 drainage 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)
- Flood Mitigation Works and Funding (TRIM 141009110892[v2])
- Northbrook Enhancement Optioneering – 3 Brooks (TRIM 191030151124)

4 Scheme Description (What Do We Have?)

Rangiora is an urban town with a population of approximately 18,000 people. It is located some 8 km north of the Waimakariri River, 1km south of the Ashley River and about 6 km from the coast.

It is bisected by three major spring fed streams (North Brook, Middle Brook, and South Brook) traversing the lower half of the Rangiora urban area.

In the eastern part, the town is drained by the Railway Drain, with spring fed base flow at its lower end. All of the above streams and drains form part of the extended tributaries of the Ruataniwha (Cam River) catchment.

Both the Railway Drain and the North Brook discharge into the Northbrook Ponds, before re-joining the North Brook downstream. The principal purpose of these ponds is to reduce the amount of sediment entering the river systems from storm water runoff from the town. At Southbrook Park there are smaller ponds that cater for the Green Street catchment. There is also a small pump station in the Green Street catchment that provides a base flow to the upper reaches of the Middle Brook for ecological purposes.

At the northern end of Rangiora is the North Drain, running west to east across the town. This is a man-made drain, which eventually discharges to the Ashley River. A large grassed swale area to the west of the Railway provides some treatment of the drainage flow.

New subdivisions in Rangiora are required to provide their own attenuation and treatment ponds for stormwater, and there are an increasing number of stormwater management areas (SMAs) on the outskirts of the town. Subdivisions in the northwest of Rangiora have systems of specialised soakage areas to take stormwater to ground. In the southern parts of the town stormwater management ponds are required. New SMAs have been recently constructed for the Westpark, Townsend Fields and Rymans developments, and the Council is constructing one on FY20/21 in Pentecost Road to service existing areas and to cater for some growth.

Stormwater assets in the Rangiora urban drainage scheme include:

Stormwater Management Areas (Total 22):

- Charles Upham Drive SMA
- Westpark East SMA
- Westpark West SMA
- Springbrook SMA
- Southbrook Pond A SMA
- Arlington Park SMA
- Ballarat Road SMA
- Chesterfield Place SMA
- Awa Place SMA
- Enverton Drive SMA
- Oxford Park East SMA
- Oxford Park West SMA
- Sloan Avenue SMA
- Sparks Lane SMA
- Koura Drive SMA
- Belmont Avenue SMA
- Southbrook Park SMA
- Southbrook Pond C SMA
- Lillybrook Park SMA
- The Oaks SMA
- Chatsworth Ave SMA (not yet commissioned)
- Townsend Fields SMA (not yet commissioned), including a 'Stormfilter' for treatment

One Groundwater Pump Station:

- Middlebrook GWPS

Some key statistics (end of 2019/20 year) of the scheme are shown in Table 2 to 6.

The extent of the currently serviced area is presented in Appendix 1, and a schematic of the network is shown in Figure 1 below.

Table 2: Scheme Statistics for 2019/2020

Scheme Parameter	Statistics	Source
Drainage System	Gravity fed with one pump station	
Drainage Area	915 ha	Source - GIS Layer
Reticulation and Treatment	Open drains and piped networks, 22 stormwater management areas (consisting of stormwater attenuation ponds and ground soakage treatment systems) and one groundwater pump station. One Stormfilter at Townsend Fields	
Length of Reticulation	42.3 km Main 11.8 km Channel	Drainage Asset Valuation Tables 9-4 and 9-5, pages 66 to 68
Total Replacement Value	\$52,135,570	
Depreciated Replacement Value	\$44,666,152	
Rated Properties	7,697	Source 2019/20 Rating Query

Table 3: Pipe Data Summary

Stormwater pipe length (m) by diameter and pipe material													
Pipe Material	Pipe Diameter (mm)												
	100	150	225	300	375	450	525	600	750	900	1050	>1200	Total
Concrete	0m	203m	1,659m	4,246m	5,513m	7,064m	3,644m	4,290m	3,593m	2,843m	465m	739m	34,259m
Perforated HDPE	95m	1,274m	0m	0m	0m	0m	0m	5m	0m	0m	0m	0m	1,375m
PVC	82m	145m	1,566m	3,380m	756m	100m	0m	9m	0m	0m	0m	0m	6,038m
Other	102m	48m	318m	130m	0m	67m	19m	0m	0m	0m	0m	0m	684m
Total	279m	1,670m	3,543m	7,757m	6,269m	7,231m	3,663m	4,304m	3,593m	2,843m	465m	739m	42,356m

Table 4: Open Channel Drain Data Summary

Open Channel Drains	
Material	Length (m)
Unlined Drain	8,724
Lined Drain	3,031
Total	11,755

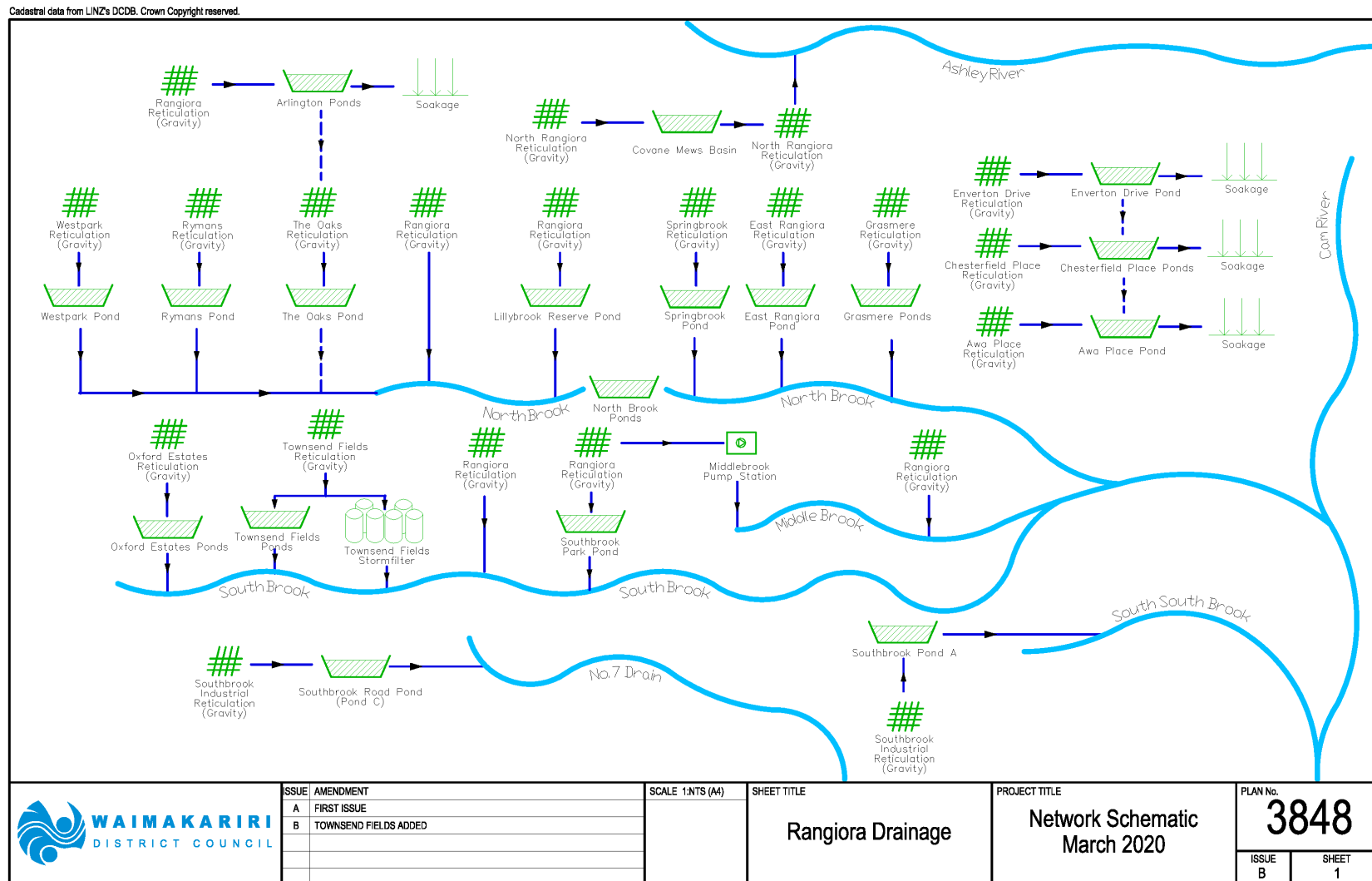
Table 5: Other Stormwater Asset Data Summary

Stormwater Assets	
Asset Type	Count
Inlet (Sump)	72
Manhole	806
Node	26
Valve	4
Total	908

Table 6: Data References

Data Reference	Trim Reference
2020 3 Waters Asset Valuation	<u>200824109857</u>
2017 30 Year Connection & Rating Unit projection	<u>171026115834</u>
2020 50 Year Water and Sewer Growth Forecast	<u>200224024348</u>

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 drainage scheme, these include:

- Target & actual Levels of Service
- Asset condition & Criticality
- Capacity & performance
- Risks
- 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 7 sets out the performance measures and targets for the scheme, and records achievement against targets since 2008.

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

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

Performance in Table 7 is measured against the performance measures set in 2018, as part of the 2018-28 Long Term Plan process. Going forward from 2021, 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 TRIM 200406043184[v2]), and subsequently approved by Council. These revised levels and targets are detailed in the District Overview Water Supply Activity Management Plan.

Table 7: Elective (non-mandatory) Levels of Service Targets and Performance Measures as Assessed in 2020

*** Note “Y” indicates that the LOS has been met, and “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
Resource Consent	Consent Breach	Number breaches of consent conditions that result in an ECan report that identifies compliance issues.	Nil per year	Nil	No ECan monitoring reports received	Achieved	N/A	Y	Y	Y	Y
Flooding	Flooding - CBD Nuisance or Carriageway	Minimum return period of flood event that can be accommodated in the system without having nuisance flooding of properties or road carriageways in the CBD area.	1 in 10 year	-	The 2-D model results indicated that there may be some nuisance flooding as a result of the 10 year storm in the Rangiora CBD.	Not achieved	None. LOS is changing from 2021 forward, to be based on complaints	N	N	N	N
	Flooding - Dwellings	Minimum return period of flood event that can be accommodated in the system without having flooding of dwellings.	1 in 50 year	-	1 in 50 year modelling has been carried out to determine flood levels but until floor level surveys are carried out it is not known how many dwellings are at risk.	Not achieved	Requires floor levelling to be carried out	N	N	N	N
	Flooding - Nuisance or Carriageway	The percentage of complaints about nuisance flooding caused by lack of capacity that are investigated and a project planned to resolve the issue. Applies to rain events with an Average Recurrence Interval of 5 years or less.	100%	81%	3 unresolved issues from one event. Issues directed to roading, and 3 Waters unaware	Not achieved	Develop system to ensure 3 Waters is informed to enable follow up	Y	N	N	N

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.

A targeted wastewater CCTV programme was started in 2016 to survey the reticulation network and assign evidence based condition ratings. Only a small amount of the network has been inspected so far and while the data has been placed in the Asset Register, it has not yet been analysed. The expected purchase of the widely used InfoAssets software for this purpose will aid this analysis. As data is gathered and analysed, the rate of CCTV inspections may need to be increased.

This data has been used in the renewals model.

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 8 provides more detail about the value of the assets within different asset condition categories

Figure 2: Pipe Condition Assessment Plan

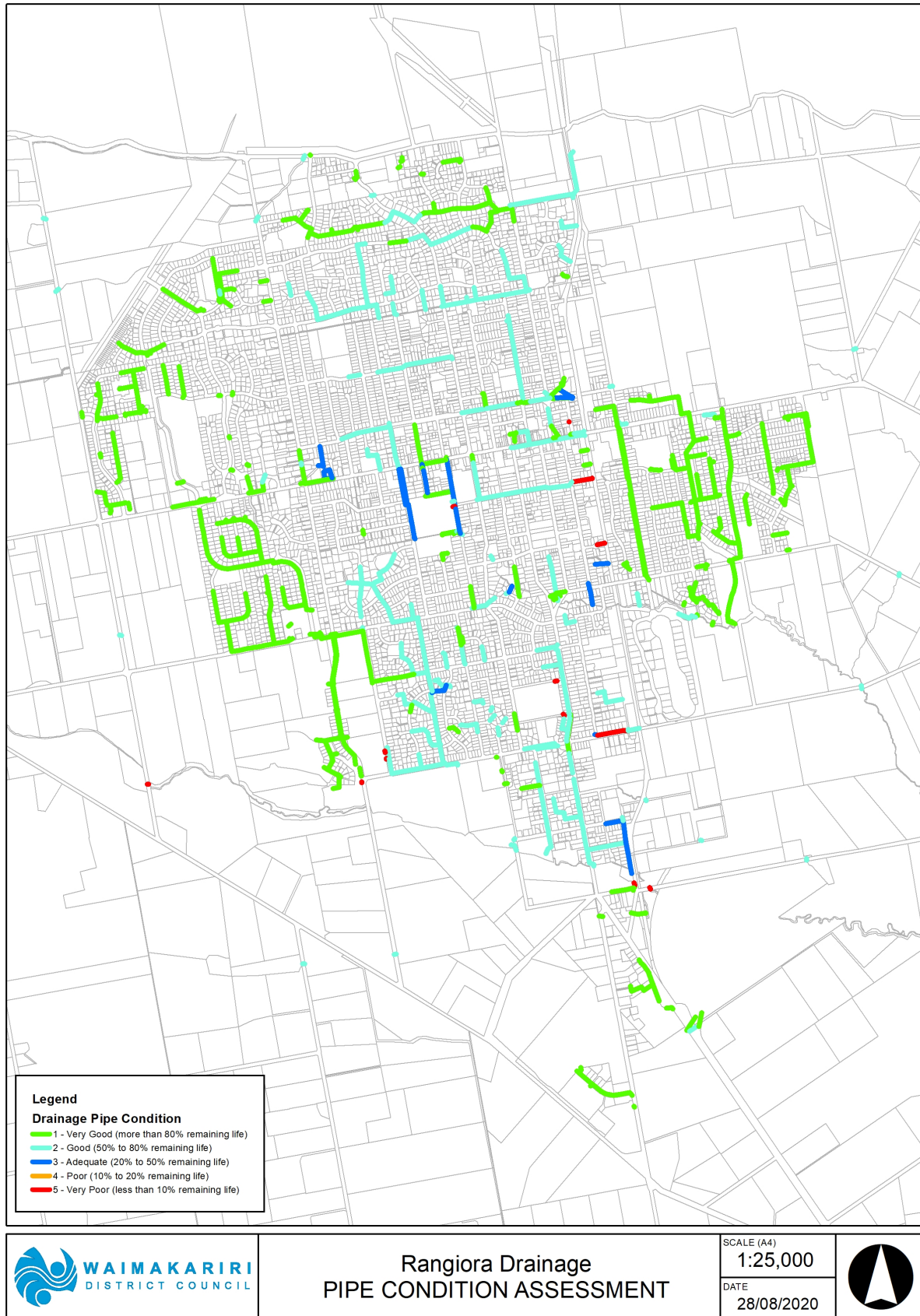
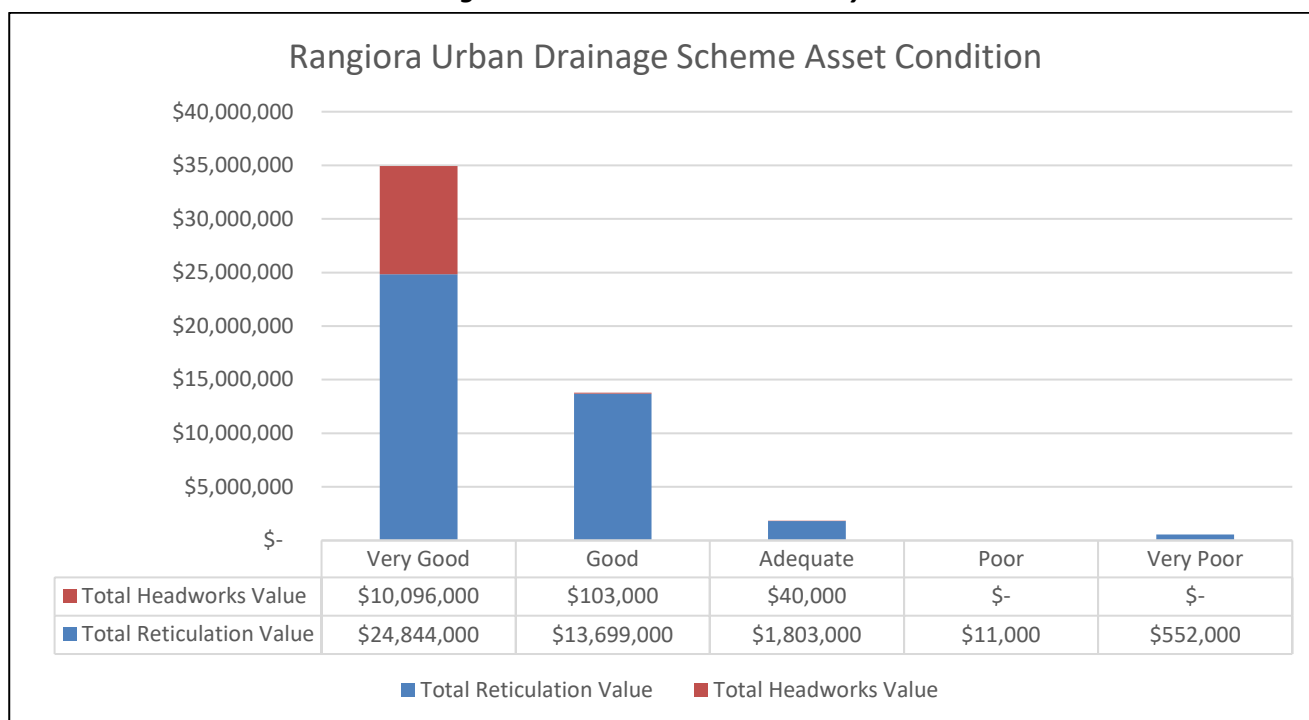


Figure 3: Asset Condition Summary



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

Table 8: Asset 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>	25.3 km 59%	\$ 24,844,000 61%	\$ 10,096,000 99%	\$ 34,940,000 68%
2	Good <i>Between 50% and 80% of life remaining</i>	14.6 km 34%	\$ 13,699,000 33%	\$ 103,000 1%	\$ 13,802,000 27%
3	Adequate <i>Between 20% and 50% of life remaining</i>	2.4 km 6%	\$ 1,803,000 4%	\$ 40,000 0%	\$ 1,843,000 4%
4	Poor <i>Between 10% and 20% of life remaining</i>	0.0 km 0%	\$ 11,000 0%	\$- 0%	\$ 11,000 0%
5	Very Poor <i>Less than 10% of life remaining</i>	0.4 km 1%	\$ 552,000 1%	\$- 0%	\$ 552,000 1%
Total		42.7 km	\$40,909,000	\$10,239,000	\$51,148,000

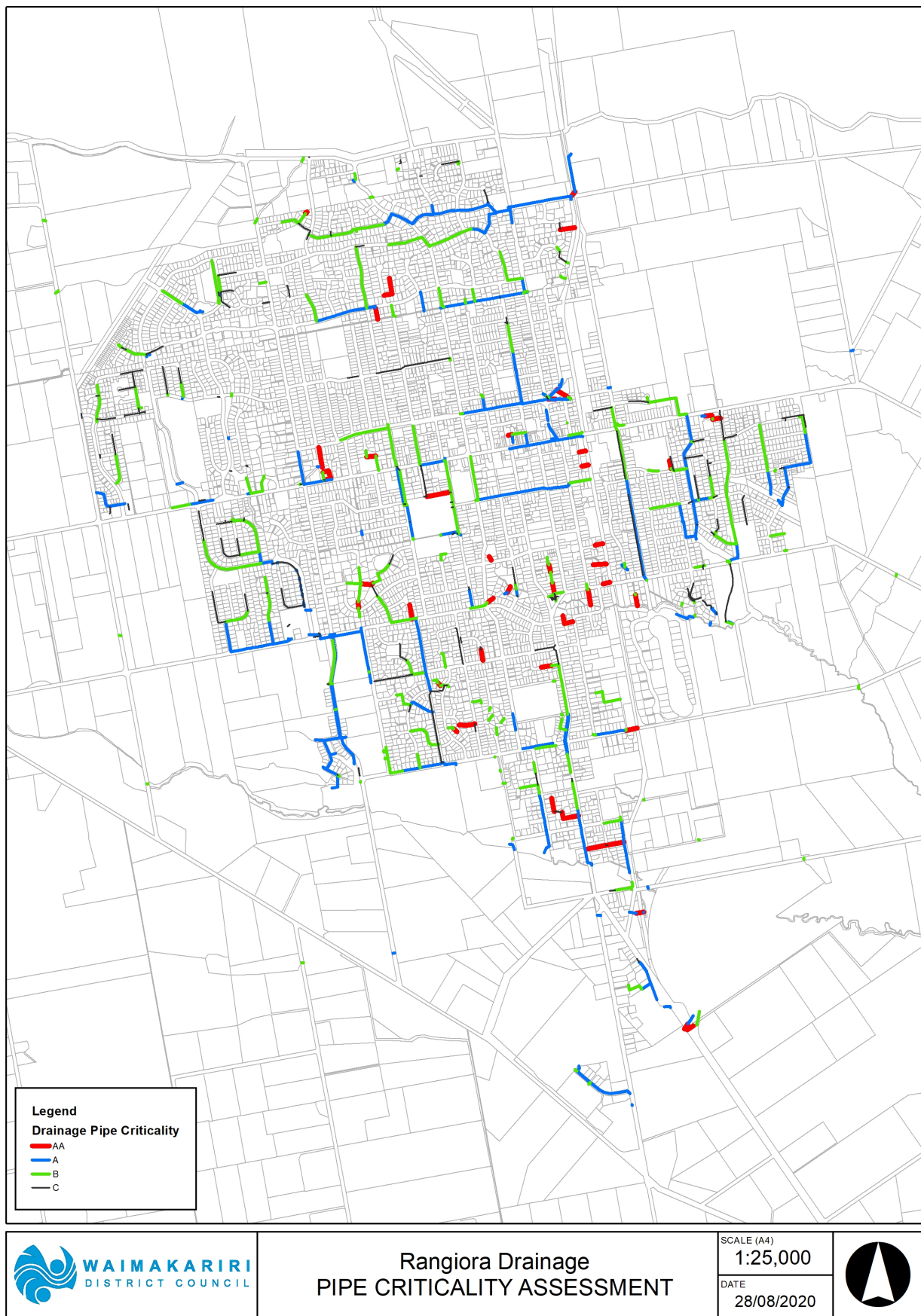
5.3 Asset Criticality

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. For 3 Waters 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 Drainage Overview AMP.

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

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 Rangiora Drainage 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 only one high risk remained for the Rangiora drainage scheme.

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

Table 9 summarises the number of events at each level of risk for the Rangiora Urban drainage scheme:

Table 9: Number of Events per Level of Risk

Risk Level	2004	2008	2011	2014
Extreme risks	0	0	0	0
High risks	1	1	1	1
Moderate risks	13	13	14	13
Low risks	9	9	10	11
Not applicable	4	4	4	4
Total	27	27	29	29

The one high risk that had not changed from earlier risk assessments is the risk of potential overflow or discharge of stormwater from pipes or open drains due to insufficient reticulation capacity. This assessed risk was tested in the 2014 storm, which showed where the highest priority work was required. Table 10 shows planned improvement works identified as needed to mitigate the risks, which have yet to be completed. The table shows both district wide funded projects developed after the 2014 storm, and not yet completed, and more recently identified projects.

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

Table 10 High & Extreme Risks- Improvements Required

Risk Event & Cause	Reasoning	Response	Project Details	Project Ref	2011	2014
Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity.	Stormwater modelling and more specifically recent flooding have identified reticulation capacity areas that need attention.	A programme of works has been implemented, funded from a specific purpose district wide rate	West Belt Trunk Stormwater Pipeline Lehmans Road Stage 2 Dockey Creek Diversion – Lily Road	URD0099 URD0100 URD0102	H	H
Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity.	Stormwater modelling and more specifically recent flooding have identified reticulation capacity areas that need attention.	An ongoing programme of works to reduce risk, funded from scheme targeted rates	North Brook – Janelle to White Wiltshire/Green pipework upgrade.Stage 2 Palmer/Church pipework upgrade Ashley St pipe upgrade Lineside Rd pipe upgrade stage 2	URD0021 URD0022 URD0023 URD0103 URD 0118	H	H

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.

The vulnerability assessment carried out for water and wastewater pipes in areas prone to liquefaction, has not been carried out for the stormwater network, as it contains no AC or earthenware pipes, which are those most vulnerable to damage in an earthquake strong enough to induce liquefaction.

Concrete drainage pipes within the catchment may be vulnerable to damage in such an earthquake but there is no intention to replace these types of pipes because (a) they are expected to be in good condition, and have a high residual value, and (b) the improvement in risk from using other pipe types would be marginal.

Above Ground Facilities

Above ground facilities were assessed for risk of failure against 13 natural and 2 manmade hazard scenarios. There is only one structure within the Rangiora drainage network, a pump station to augment low stream flows. The following risk profile (Table 11) reflects the likelihood of an event occurring and the consequence on the community of the facility failing. Hazards classified as having 'No Known Risk' have been omitted.

Table 11: Risks to Above Ground Facilities

Threat	Middlebrook Pump Station
475 yr Earthquake Induced Slope Hazard	L
100 Yr Ashley Flood	L
500 Yr Ashley Flood	L
Earthquake (50 yr)	L
150 Yr Earthquake	L
475 Yr Earthquake	L
Wildfire	L
Snow 150 Yr	L
Wind 100 Yr	L
Lightning	L
Pandemic	M
Terrorism / Sabotage	L
E = Extreme, H = High, M = Moderate, L = Low	

Up to 40cm of flooding has been modelled to affect the pump station in the event of an Ashley River breakout. However this is a pump to augment low flow, and therefore the consequences of pump failure are low

The wildfire threat is rated as high for this site however the facility is considered to be resilient lowering the overall risk score.

The most significant risk impacting on the Rangiora scheme is the risk of staffing issues as a result of a pandemic.

The Council's 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.

5.6 Growth Projections

There are a number of factors that are likely to influence future demand on land drainage systems. These may include:

- Population trends
- Changes in land use
- Climate change
- Changes in legislation
- Advancements in drain management

Significant residential growth and further pressure for urban development has led to rezoning neighbouring rural land as residential. It is in these areas that the urban expansion is taking place, particularly on the west and east sides of Rangiora. However with a policy of requiring developers to ensure that runoff is held to predevelopment levels, any new development should not adversely impact on land drainage in the area. In some instances, where zoned land is in multiple ownership, Council may carry out the necessary works to meet the runoff and treatment requirements, and subsequently recoup the costs through Development Contributions.

An annual adjustment of the urban drainage area boundaries is carried out, to ensure that newly developed areas adjacent to the boundary are brought within the boundary and rated accordingly.

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. 3 waters 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.

Growth in the number of properties expected to be included within the drainage scheme are included in Table 12 below.

Table 12: Growth Projections

	Rates Strike	Years 1 - 3	Years 4 - 10	Years 11 - 20	Years 21 - 30
Rangiora Urban	2019/20	2021/22 to 2023/24	2024/25 to 2030/31	2031/32 to 2040/41	2041-42 to 2050/51
Projected Properties	7697	8571	9790	11429	12871

Note that the time frames have been chosen to reflect the periods 3, 10, 20, 30 and 50 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. In the Rangiora scheme Council has one project planned to accomodate growth, where it is appropriate for Council to take the lead, and thereby facilitate growth, which may be otherwise slower because of multiple ownership issues within zoned areas.

5.7 Capacity & Performance

Significant flooding occurred in west Rangiora during the June 2014 flood event, which was above the design standard ARI. This was caused by overland flow from the rural area to the north-west, in combination with undersized section of waterways and reticulated mains in the township. The management of secondary flow paths was a further issue.

A number of new upgrades have been completed, funded by the district wide Flooding Response rate, with three projects still to be completed:

- Overflow pipeline on West Belt from North Brook to Townsend Road extension FY26/27 – 28/29
- Construction of box culverts and wide swale on east side of Lehman's Road (refer TRIM 141010111299). FY 26/27-27/28
- Dockey Creek overflow diversion at Lilly Road to the Cust River FY 24/25-26/27

There are also 5 upgrades planned for Rangiora funded by the scheme to improve performance:

- Construction Phase upgrade North Brook from Janelle to White Street. Remaining budget is for upgrade of White Street culvert. FY 21/22

- Design and construction of Wiltshire/Green pipe upgrade from Parkhouse Drive to Green Street FY24/25-25/26
- Palmer/Church Pipe upgrade from Douglas Street to Church Street. To align with K&C works. FY 22/23
- Upgrade sumps in Kingsbury Ave, pipework in Ashley Street and weir modifications at Edwards Street on North Drain. FY 23/24-24/25
- New pipework in Lineside Road (Railway Road to Flaxton Road) and in Railway Road at the outfall FY 21/22-22/23

Outstanding at this stage is the necessary floor levelling of houses which the modelling indicates may be vulnerable, which will confirm if the levels of service are being met. This is included at the end of this document as an improvement project

With regard to the piped systems of the stormwater network in general, modelling indicates that there is reasonable capacity particularly for the commercial area where a number of improvement works have been carried out. However some areas of nuisance flooding are indicated by the modelling, and to fully meet the capacity requirement of the 10 ARI level of service, further capital works would be required. The current strategy is to analyse and investigate complaints after rain events, to determine if capital works are warranted. A general budget has been allowed to accommodate such works

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.

6.1 Operation & Maintenance

Maintenance of the open drains is a combination of proactive and reactive work. Drains known to require clean out are completed on an annual basis, with other drains being cleaned when notification is given by adjacent landowners. Much of the routine work is done in the summer months when weed growth is at its peak. In some locations only hand cleaning and or spraying is possible given the limited access available.

Depending on weed growth, some areas may be cleaned more than once a year. This is particularly so where drains are in highly visual areas such the many retention ponds, North Drain or parts of the North Brook. In addition to weed-spraying, drains are cleaned out and re-shaped with a digger depending on condition.

Grassed areas adjacent to drains and the urban drains themselves are maintained under a Greenspace maintenance contract. Inlet grills and more rural drains are maintained by the WDC Drainage Maintenance Contractor.

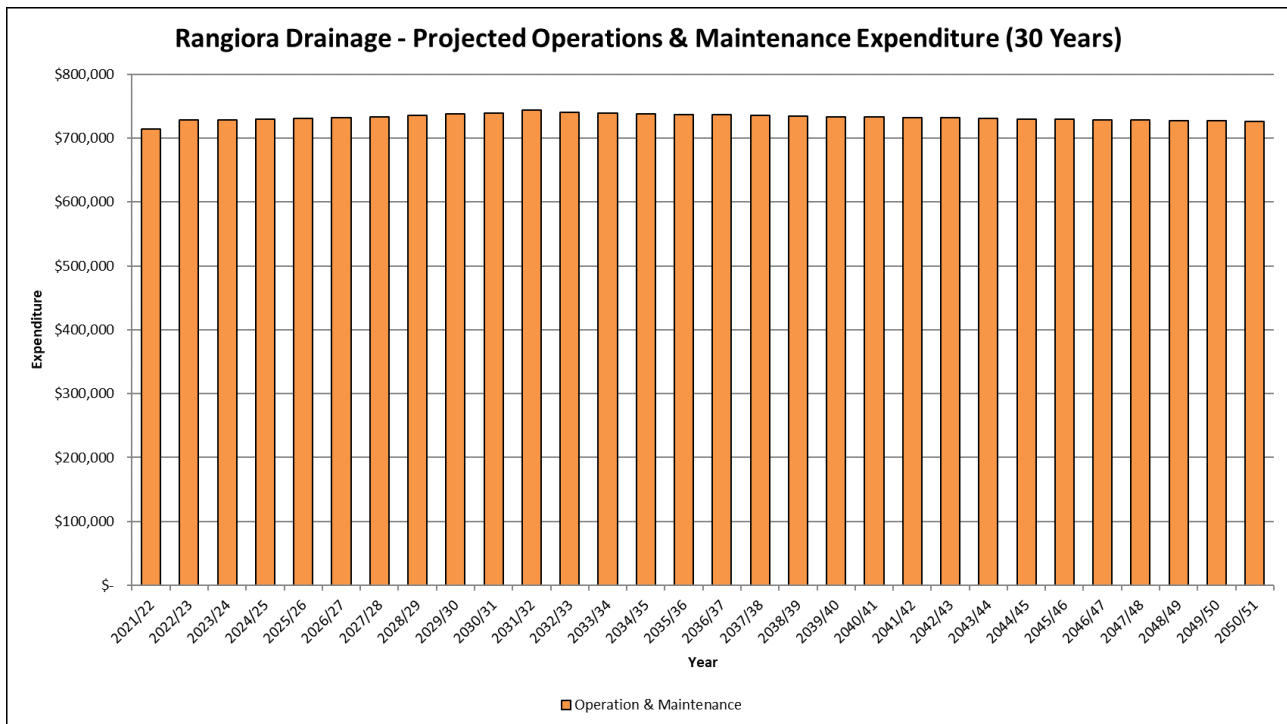
Little active maintenance is carried out on the reticulated network. The CCTV programme now under way will provide information as to whether more active maintenance is required.

Figure 5 shows the projected Operations and Maintenance budget over the next 30 years.

Systems are not yet in place to capture the cost distinction between planned and unplanned maintenance, and while there is no known deferred maintenance, the CCTV programme may reveal asset condition in some pipes to be less than what has been assumed.

Rangiora has a number of Stormwater Management Areas, built over the years to accommodate new developments. The first flush basins of the larger facilities, will need to be cleaned out at intervals to remove the contaminants, but the basins have not yet been in service for long enough for that to have yet been needed. The timeframe for cleaning of the first ones is approaching and the O&M budget includes an annual averaged sum to carry out this work. However there is some concern that the original estimates upon which this annual sum is based may not have been sufficient. This cannot be fully resolved until tendered prices have been arranged for the work. If the budget does prove to be low, the timeframe for cleaning may need to be extended, until budgets can be adjusted.

Figure 5: projected Operation & Maintenance 30-Year Budget



6.2 Renewals Programme

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

The model prioritises candidates for consideration by Asset Managers for renewal based on criticality, risk, and expected asset life. Renewal of pipework assets are then programmed on an annual basis, taking into account the outputs from the renewals model, but also being informed by other works that may be planned in the area, as well as local asset history for the cases where a particular asset may be performing differently than its base life suggests.

Figure 6 below shows the output from the model only and provides a broad brush spatial view of the likely timeframe for renewals.

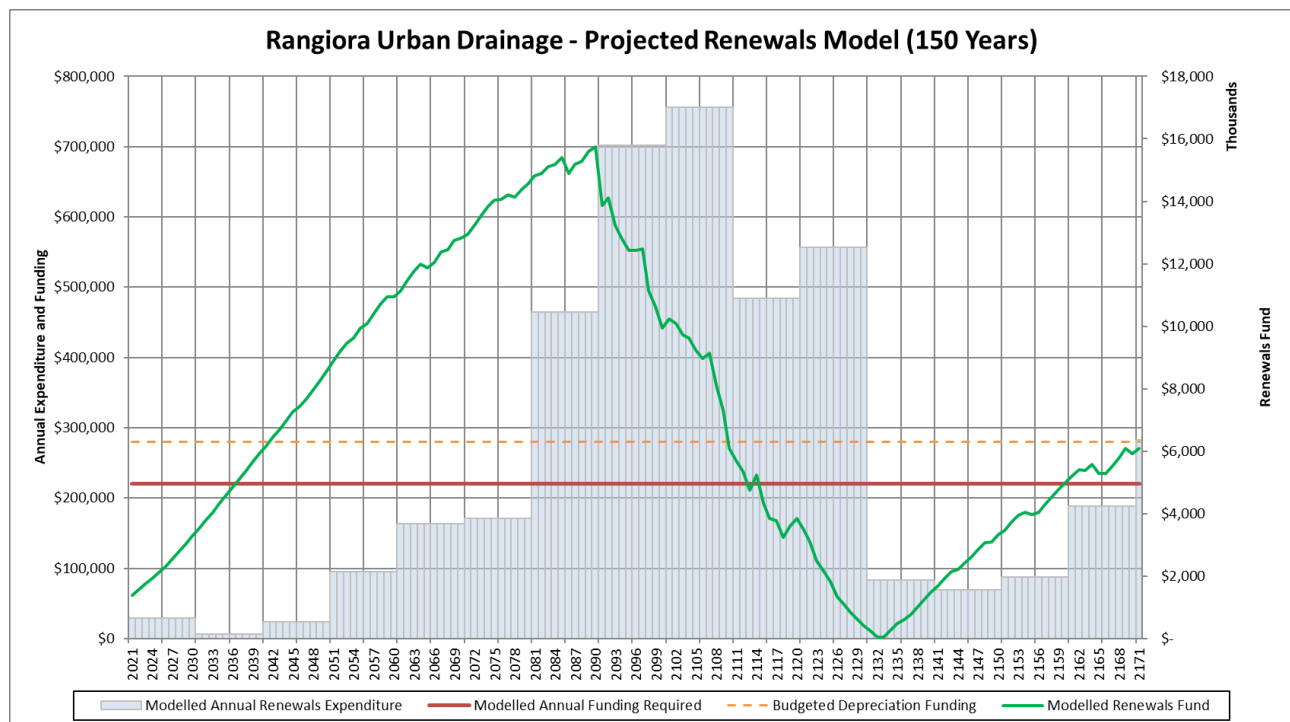
Figure 6: Pipe Renewal Time Frames



Figure 7 below shows the financial output from the model alone. Over a 150 year period it shows the projected expenditure; the value in the renewals fund; the level of funding required to ensure the fund can meet the required renewals programme, and the annual depreciation.

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 LTP, as adjustments may have been made by the Asset Manager from the direct renewals model outputs. Individual scheme AMPs detail the actual planned renewals budgets for the first ten years.

Figure 7: Drainage Projected Renewals 150 year Budget



The key parameters in the figure above are explained below:

- **Modelled Annual Renewals Expenditure:** This is the direct output from the renewals model, recommending the annual investment to be made in renewals each year.
- **Modelled Annual Funding Required:** This is the amount of annual renewals funding required, to ensure there are sufficient funds available to carry out the recommended annual renewals each year.
- **Budgeted Depreciation Funding:** This is the actual amount of depreciation being collected, which is extracted from the Council's budgets.
- **Modelled Renewals Fund:** This is the modelled balance in the renewals account, assuming the annual funding and annual expenditure is completed as per the recommendations from the renewals model. As can be seen, this account is maintained as a surplus, peaking later this century, before being drawn down as the first lifecycle of current assets is completed.

The key point to note is that the Budgeted Depreciation Funding is less than the Modelled Annual Funding Required. The reason for this discrepancy is as follows:

Depreciation Discount Factor: Council's financing of future renewals incorporates the expectation that depreciation funding can be invested at a higher rate of return over the life of the assets than

inflation. Further information regarding this approach is provided in the Finance Policy. This concept is embodied in the scheme budgets in the form of a discount rate (referred to in the budgets as the 'Depreciation Discount Factor'). This reduces the annual depreciation funding required from rates, while still ensuring that there will be sufficient funding available to renew assets at the end of their useful life. The renewals model takes a simpler and more conservative approach to the way this effect is calculated, which accounts for the difference shown in Figure 7.

6.3 Capital Works

Figure 8 below shows the 50 year budget for all capital works, including projects driven by growth and levels of service. It does not show flood improvement work which is expenditure funded by the district drainage rate. An allowance has been made starting in 2026/27 to meet the requirements of the new global discharge consent that is required to be obtained, which accounts for the majority of the expenditure shown between 2027/28 and 2036/37

Figure 8: Annual Projected Capital works Expenditure – 50 years

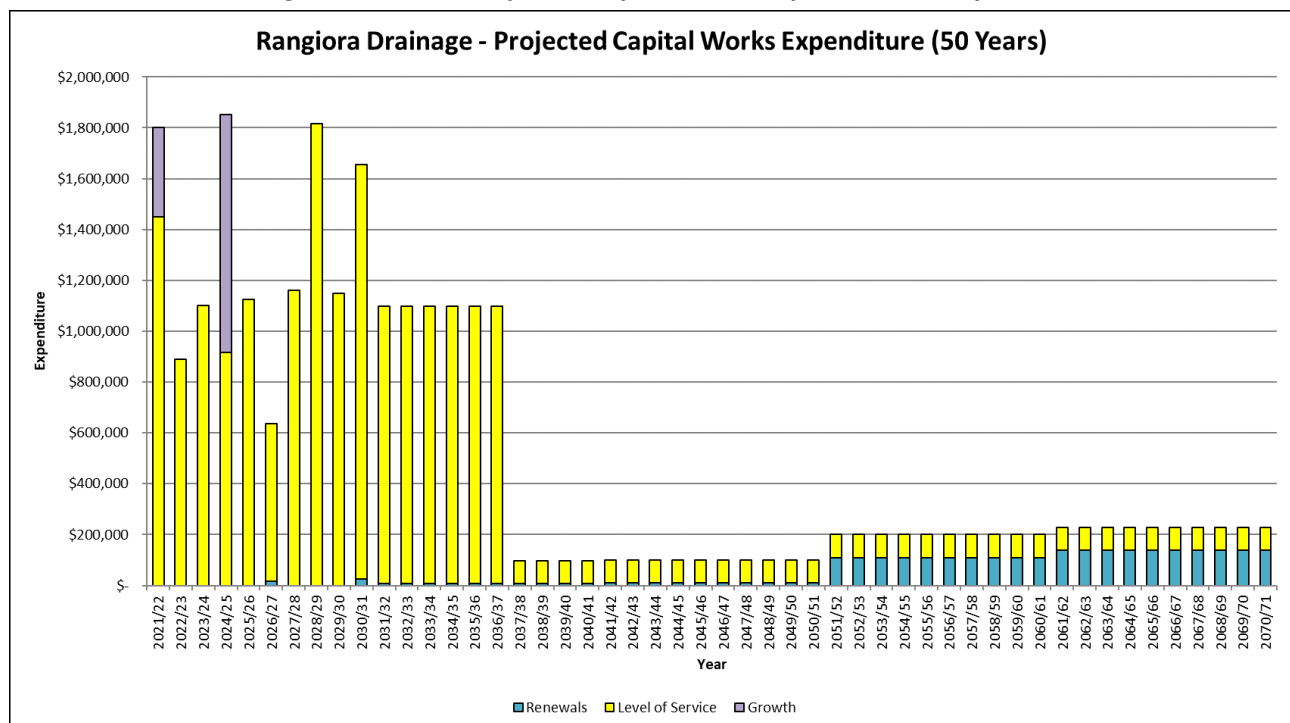


Table 13 below shows all planned capital works over the next 50 years, including renewals, but not flood response works. Project URD0117 is the main contributor to the 21/22 spike, URD0037 is the major 24/25 growth project, URD0012 causes the 28/29 spike and URD0126 the 30/31 spike

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 total cost of the project over the number of years it occurs.

Figure 9 shows spatially, all the capital works planned, regardless of the funding source

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							
2022	URD0008	Under Channel Piping	0	\$ 3,000,000	\$ 3,000,000	\$ -	\$ -
2022	URD0009	Stormwater Minor Improvements	0	\$ 1,500,000	\$ 1,500,000	\$ -	\$ -
2022	URD0021	North Brook - Janelle to White	5 - Medium	\$ 270,000	\$ 270,000	\$ -	\$ -
2022	URD0031	Three Brooks Enhancement Work - Kowhai Ave	5 - Medium	\$ 320,000	\$ 320,000	\$ -	\$ -
2022	URD0103	Ashley Street Pipe Upgrades	5 - Medium	\$ 500,000	\$ 500,000	\$ -	\$ -
2022	URD0104	East Belt Rain Gardens & Soakpits	5 - Medium	\$ 200,000	\$ 200,000	\$ -	\$ -
2022	URD0112	Southbrook Pipeline - Southern Cross Road to Flaxton Road	0	\$ 350,000	\$ -	\$ -	\$ 350,000
2022	URD0117	Wiltshire / Green Pipework Upgrade Stage 1	0	\$ 855,000	\$ 855,000	\$ -	\$ -
2022	URD0118	Lineside Road Drainage Upgrade Stage 2	5 - Medium	\$ 400,000	\$ 400,000	\$ -	\$ -
2022	URD0120	Oxford Road Drainage Modifications	0	\$ 50,000	\$ 50,000	\$ -	\$ -
2022	URD0121	Townsend Field - E/O Pipework	0	\$ 290,000	\$ -	\$ -	\$ 290,000
2022	URD0127	Southbrook Pond C Access Bridge	0	\$ 80,000	\$ 80,000	\$ -	\$ -
2023	URD0012	North Drain Treatment	3 - Low	\$ 1,130,000	\$ 1,130,000	\$ -	\$ -
2023	URD0014	Middle Brook Treatment	1 - Coarse	\$ 380,000	\$ 380,000	\$ -	\$ -
2023	URD0023	Palmer / Church Pipework Upgrade	0	\$ 151,000	\$ 151,000	\$ -	\$ -
2023	URD0116	Railway Drain Treatment	1 - Coarse	\$ 300,000	\$ 300,000	\$ -	\$ -
2023	URD0122	Three Brooks Enhancement Work - North Brook / Geddis Street	5 - Medium	\$ 500,000	\$ 500,000	\$ -	\$ -
2024	URD0017	Blackett Street Piping	1 - Coarse	\$ 500,000	\$ 375,000	\$ 125,000	\$ -
2025	URD0018	Johns Road Stormwater Main	0	\$ 100,000	\$ 75,000	\$ -	\$ 25,000
2025	URD0022	Wiltshire / Green Pipework Upgrade Stage 2	0	\$ 477,000	\$ 477,000	\$ -	\$ -
2025	URD0037	Todds Road SW Pond	0	\$ 935,000	\$ -	\$ -	\$ 935,000
2025	URD0123	Three Brooks Enhancement Work - Middle Brook Tributary	5 - Medium	\$ 200,000	\$ 200,000	\$ -	\$ -
2026	URD0119	East Belt to Cam River Connection	1 - Coarse	\$ 500,000	\$ 500,000	\$ -	\$ -

2027	URD0090	Rangiora Urban Drainage Long Term Headworks Renewals	3 - Low	\$ 370,869	\$ -	\$ 370,869	\$ -
2027	URD0124	Three Brooks Enhancement Project - North Brook Victoria to Newnham	5 - Medium	\$ 450,000	\$ 450,000	\$ -	\$ -
2028	URD0015	Network Discharge Consent Implementation Works	1 - Coarse	\$ 9,400,000	\$ 9,400,000	\$ -	\$ -
2029	URD0125	Three Brooks Enhancement Work - Middle Brook Martyn to Bush	5 - Medium	\$ 225,000	\$ 225,000	\$ -	\$ -
2030	URD0126	Three Brooks Enhancement - Middle Brook Bush to King	5 - Medium	\$ 600,000	\$ 600,000	\$ -	\$ -
Year 11 - 20							
2032	URD0142	Rangiora Drainage Long Term Renewals	0	\$ 2,336,266	\$ -	\$ 2,336,266	\$ -
Grand Total				\$ 26,370,135	\$ 21,938,000	\$ 2,832,135	\$ 1,600,000

Note: the Rangiora Urban Drainage Headworks Renewals item indicates the total renewals programme value for the 50 years beginning 2028/29.

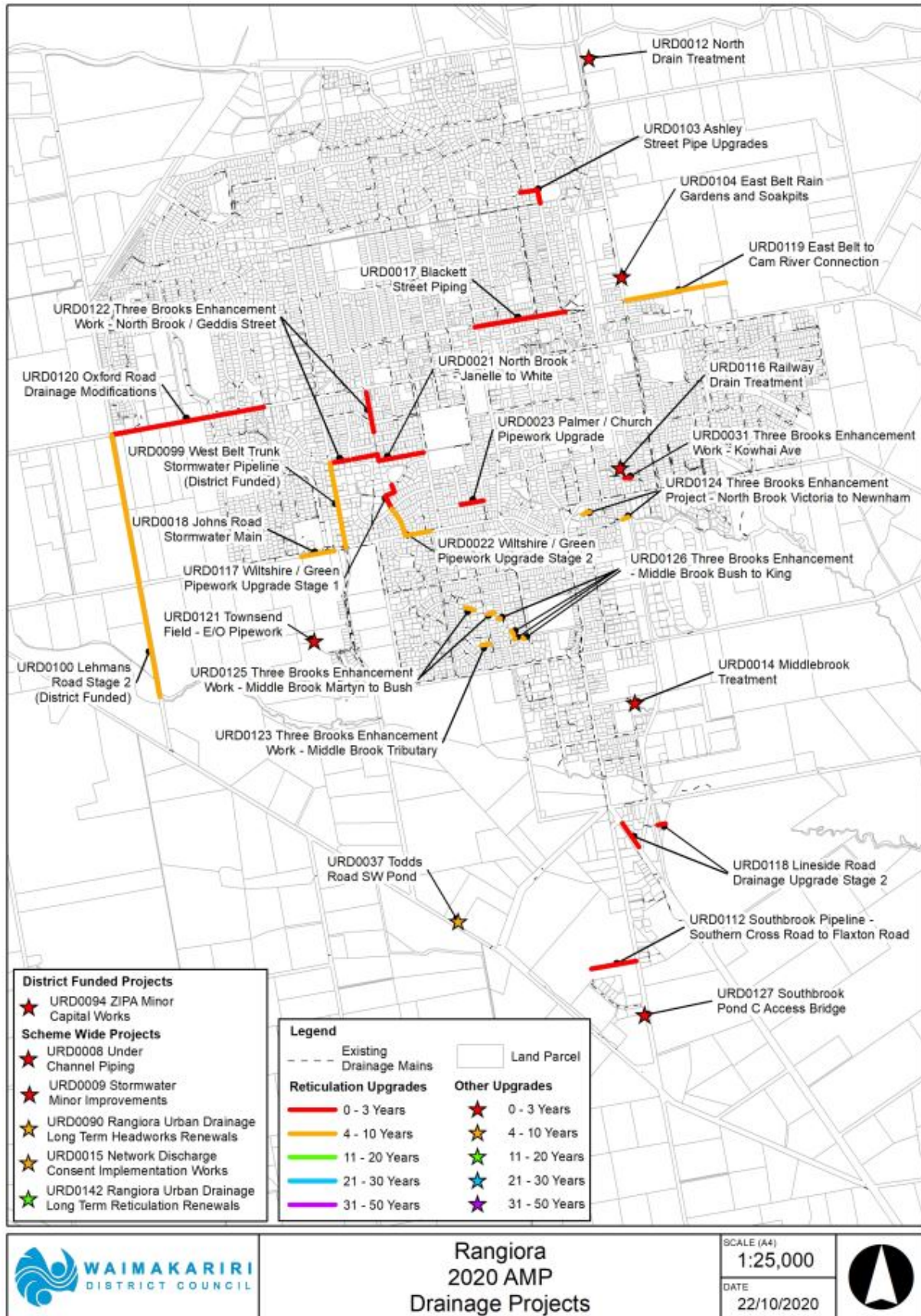
Flood Response Programme

The following additional works, planned within the Rangiora Urban Drainage Scheme geographical boundary, are to be funded by the district wide flood response rate

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Component	Renewals Component	Growth Component
Year 1 - 10							
2027	URD0099	West Belt Trunk Stormwater Pipeline	1 - Coarse	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -
2027	URD0100	Lehmans Road Stage 2	3 - Low	\$ 400,000	\$ 400,000	\$ -	\$ -
Grand Total				\$ 1,400,000	\$ 1,400,000	\$ -	\$ -

Figure 9: Projected Capital Upgrade Works (not to scale)

Includes works funded through the District flood response rate

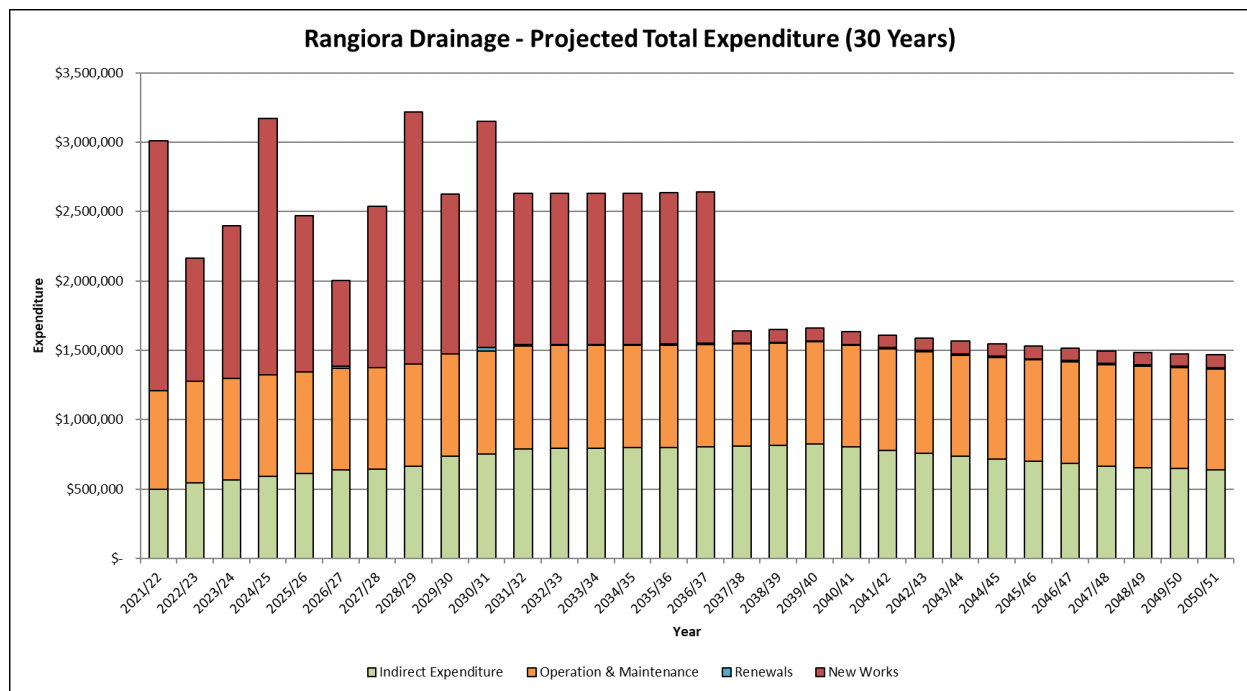


6.4 Financial Projections

The following graph summarises the breakdown of projected total expenditure over a 30 year time horizon. It includes both operational and capital expenditure. Operational costs include operations and maintenance, and indirect expenditure.

Indirect expenditure includes interest, rating collection costs, costs associated with maintaining the Asset Register, and internal overhead costs. Capital includes expenditure for growth, levels of service and renewals, but excludes projects funded by the district wide drainage rate.

Figure 10 Projected Total 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.	806	\$7,937,631	\$6,464,345	\$79,376
Sump	No.	72	\$158,284	\$132,361	\$1,583
Valve	No.	4	\$10,883	\$8,849	\$109
Network Main	m	42,357	\$33,094,490	\$27,270,960	\$330,809
Open Channel	m	11,755	\$695,518	\$648,548	\$1,019
Facilities			\$10,238,765	\$10,141,089	\$16,854
Total			\$52,135,570	\$44,666,152	\$429,751

6.6 Revenue Sources

Revenue is provided from two key sources; 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).

Generally rates are targeted rates charged to homeowners within the schemes geographical boundaries. There is also a district wide Flood Response rate which is used to fund flood improvement works anywhere within the district.

7 Improvement Plan

7.1 2021 Improvement Plan

Error! Reference source not found. 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.

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
IP050	Levels of Service	Dwelling floor level surveys Kaiapoi and Rangiora (Phase 1 scoping only)	Medium	Planned for 2024	\$7,200
IP052	Levels of Service	Define CBD areas, as these feed into Level of Service reporting.	High	Planned for 2021	No budget required, done using in-house resources

8 Change to AMP as a result of Long Term Plan consultation

Some changes to budgets have arisen as a consequence of a staff submission report to Council during LTP hearings 25-26 May (TRIM 210506072970). For the Rangiora Urban scheme the following changes approved by Council have been made:

- A new budget of \$40,000 in 2021/22 was approved for planting the new Pentecost SMA currently being constructed. The current construction works includes grassing the SMA, but additional planting is proposed to integrate this area with the adjacent reserve.
- As part of the Three Brooks Enhancements work it has been identified that the existing retaining wall on the banks of Railway Drain, between the railway line and Kowhai Avenue, needs to be replaced. The investigation work undertaken this year identified that the current budget of \$420,000 for this work is not adequate. This increase is due to a longer length of drain requiring a retaining wall and also construction constraints that limit the type of retaining wall that can be used. An additional budget of \$120,000 was approved to give a revised budget of \$540,000 in the 2021/22 financial year.

- Stage 1 of the North Brook Janelle to White upgrade was completed this year. It is proposed to upgrade the White Street culvert next financial year, which is Stage 2 of the North Brook Janelle to White upgrade. As the Stage 1 works went over budget there was not adequate remaining budget to complete the hydroseeding of the drain works or design for the culvert. Furthermore the need for an additional 10m section of retaining wall has been identified. An additional budget of \$80,000 was approved to give a revised budget of \$350,000 in the 2021/22 financial year.
- The total additional \$240,000 for the budget changes to the three Rangiora projects increases the Rangiora drainage rate by \$1.80 or 0.7% from 2022/23

APPENDIX 'A'. PLANS

Figure 11: Plan of Serviced Area as of January 2021

