

Activity Management Plan 2021 Coastal Rural Drainage Scheme

3 Waters | July 2021



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Contents

1	Exec	cutive Summary	4
2	Intro	oduction	5
3	Rela	ted Documents	5
4	Sche	eme Description (What Do We Have?)	5
5	Sche	eme Management Issues (What Do We Need to Consider?)	9
	5.1	Levels of Service	9
	5.2	Asset Condition	11
	5.3	Asset Criticality	13
	5.4	Risk Assessment	13
	5.5	Disaster Resilience Assessment	14
	5.6	Growth Projections	14
	5.7	Capacity and Performance	16
6	Futu	re Works & Financial Projections (What Do We Need To Do?)	17
	6.1	Operation & Maintenance	17
	6.2	Renewals Programme	18
	6.3	Capital Works	18
	6.4	Financial Projections	22
	6.5	Valuation	23
	6.6	Revenue Sources	23
7	Impi	rovement Plan	24
	7.1	2021 Improvement Plan	24

Tables

Table 1: Key Asset Management Components	4
Table 2: Scheme Statistics for 2019/2020	6
Table 3: Stormwater Pipe Data summary	7
Table 4: Other Stormwater Asset Data Summary	7
Table 5: Open Channel Drain Data Summary	7
Table 6: Data References	8
Table 7: Elective (non-mandatory) Levels of Service Targets and Performance Measure in 2020	
Table 8: Pipe Condition Summary	12
Table 9: Number of Events per Level of Risk	13
Table 10: Risks to Assets	14
Table 11: Growth Projections	16
Table 12: Summary of Capital Works (Includes Renewals)	20
Table 13: Asset Valuation	23
Table 14: 2021 AMP Improvement Plan	24
Figures	
Figure 1: Asset Condition Summary	12
Figure 2: Annual Water Operation & Maintenance 30-Year Budget	17
Figure 3: Annual Water Renewals 150-Year Budget	18
Figure 4: Projected Capital Works Expenditure	19
Figure 5: Projected Capital Upgrade Works (not to scale)	21
Figure 6: Projected Total Expenditure	22
Figure 7: A1 - Plan of Serviced Area as of November 2017	25

1 Executive Summary

The following table provides a summary of the key asset management issues of Coastal Rural 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

	There is only one scheme specific service level which has been met
Levels of Service	Although not a scheme specific service level, with analysis now possible down to scheme level, customer satisfaction (high and very high) can be reported for this scheme at 100%. The district target is 90%
	There were no service requests from within the scheme boundaries that met the threshold for a complaint regarding insufficient flood capacity
Resource Consents	No consents relate specifically to this scheme, but a new district wide consent has recently been granted from Ecan for the maintenance of rural waterways
Capacity & Performance	The existing drainage system is adequate for the needs of the local farming community. The stormwater and land drainage system is working and there have been no reported cases of flooding property damage.
Asset Condition	Apart from open drains, the Coastal Rural Drainage scheme has few other drainage assets .
Risk Assessment	The outfalls to the Ashley River via the Taranaki Stream and Leggets Drain are a high risk to this scheme. This risk is being mitigated via improved maintenance of the system flap valves by both Environment Canterbury and the Waimakariri District Council.
Disaster Resilience	There are 800m of pipework that have been identified as being at high or extreme risk of earthquake damage on this scheme. These mains are AA critical concrete mains with rubber ring joints located in the high liquefaction susceptibility area. There are no plans to replace these pipes
Growth Projections	Future growth will have some impact, but it will be mitigated by the Council requirement to control discharges to predevelopment levels.

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 Coastal Rural 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 the 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.

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])

4 Scheme Description (What Do We Have?)

The Coastal Rural Drainage Scheme extends along the coast, from the Ashley River in the north to the Waimakariri River in the south. The Rangiora Woodend Road and the Main North Road roughly define the west boundary and the coastal dunes the east boundary. The area excludes the coastal settlements of Waikuku Beach, Pegasus, Woodend, and Pines / Kairaki. A map outlining the rating area can be found in Appendix A.

The area is essentially productive farming units, particularly dairying and characterised as low lying, with an extensive network of man-made drains but also remnant wetlands.

The main waterways are the Taranaki Stream and the Waikuku Stream that drain the area north of Woodend to the Ashley River, and the McIntosh Drain and Saltwater Creek that drain the area south of Woodend to the Waimakariri River.

A number of rural lifestyle blocks and residential development schemes are being planned or under development in various parts of this drainage area. Although significant development is underway, the impact on stormwater runoff will be minimal if pre-development runoff is maintained through the use of mitigation devices such as attenuation ponds, which it is Council policy to achieve.

While Pegasus is excluded from the Coastal Rural Drainage Area, the rural residential area of Mapleham is included.

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

Table 2: Scheme Statistics for 2019/2020

Scheme Parameter	Statistics	Data Source
Drainage System	Gravity	
Drainage Area	4932 ha	Source - GIS Layer
Reticulation & Treatment	Piped and open drains, no formal treatment	
Length of Reticulation and Open Channel	1.0 km Main 46.8 km Channel	Drainage Asset Valuation
Total Replacement Value	\$2,474,082	Tables 9-4 and 9-5, pages 66 to 68
Depreciated Replacement Value	\$2,336,513	
Properties rated	641	Source 2019/20 Rating Query

Table 3: Stormwater Pipe Data summary

	Stormwater pipe length (m) by diameter and pipe material												
							P	Pipe Dia	meter (n	nm)			
Pipe Material	100	150	225	300	375	450	525	600	750	900	1050	>1200	Total
Concrete	0m	0m	0m	12m	65m	0m	0m	88m	192m	0m	204m	0m	562m
Perforated HDPE	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m
Pvc	0m	67m	340m	0m	0m	0m	0m	0m	0m	0m	0m	0m	406m
Other	0m	0m	4m	0m	0m	0m	0m	0m	0m	0m	8m	0m	12m
Total	0m	67m	344m	12m	65m	0m	0m	88m	192m	0m	212m	0m	980m

Table 4: Other Stormwater Asset Data Summary

Stormwater Assets					
Asset Type	Count				
Inlet (Sump)	1				
Manhole	13				
Node	0				
Valve	0				
Total	14				

Table 5: Open Channel Drain Data Summary

Open Channel Drains							
Material Length (r							
Unlined Drain	46,720						
Lined Drain	42						
Total	46,763						

Table 6: Data References

Data Reference	Trim Reference
2020 3 Waters Asset Valuation	200824109857
2020 50 Year Water and Sewer Growth Forecast	200224024348

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:

- Desired & actual levels of service
- Asset condition & criticality
- Capacity & performance
- Risks
- Growth predictions for the scheme

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

5.1 Levels of Service

Table 7 sets out the performance measures and targets for the Coastal Rural Drainage 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 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 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.

While the level of customer satisfaction with the service, as measured by the three yearly survey, is not a level of service at scheme level, the latest survey has enabled that measurement. 100% of those surveyed reported a high or very high level of satisfaction, but it should be noted the sample size was very small.

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.

	Lovelof	2010 2021	2010			2020			Previous	s Results*	
Section	Level of Service	2018 – 2021 Performance Measure	2018 – 2021 Target	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	0%	There were no consent breaches that resulted in non-compliance reports being received from Environment Canterbury for FY 19/20.	Achieved	N/A	Υ	-	-	-

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.

Figure 1 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.

Coastal Rural Drainage Scheme Asset Condition \$900,000 \$800,000 \$700,000 \$600,000 \$500,000 \$400,000 \$300,000 \$200,000 \$100,000 Very Poor Very Good Good Adequate Poor ■ Total Headworks Value \$-\$-\$-\$-\$-■ Total Reticulation Value \$806,000 \$219,000 \$-\$-\$2,000 ■ Total Reticulation Value ■ Total Headworks Value

Figure 1: Asset Condition Summary

Table 8: Pipe Condition Summary

Condition Grade Definition		Pipeline Quantity	Total Reticulation Value	Total Headworks Value	Total Value
1	Very Good More than 80% of life remaining	0.8 km <i>79%</i>	\$ 806,000 78%	\$ - 0%	\$ 806,000 78%
2	Good Between 50% and 80% of life remaining	0.2 km 20%	\$ 219,000 21%	\$ - 0%	\$ 219,000 21%
3	Adequate Between 20% and 50% of life remaining	0.0 km <i>0%</i>	\$ - 0%	\$ - 0%	\$ - <i>0%</i>
4	Poor Between 10% and 20% of life remaining	0.0 km <i>0%</i>	\$ - 0%	\$ - 0%	\$ - <i>0</i> %
5	Very Poor Less than 10% of life remaining	0.0 km <i>0%</i>	\$ 2,000 <i>0%</i>	\$ - 0%	\$ 2,000 <i>0%</i>
7	otal	1.0 km	\$1,027,000	\$-	\$1,027,000

[&]quot;Headworks" is inclusive of all above ground assets associated with the scheme.

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 for pipes and other replaceable assets 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. However it does not apply to the majority of rural drainage scheme assets, which are open drains and channels which can be maintained effectively in perpetuity. The criticality assessment is used as an input to the renewals model

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

5.4 Risk Assessment

An Operational Risk Assessment was first undertaken for the components of the Drainage Scheme in 2004, and it has been regularly updated since that time. It was last updated for the 2015 AMP review.

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 risks for the Coastal Rural Drainage scheme.

Risk Level 2004 2008 2014 2011 Extreme risks 0 0 0 0 4 3 High risks 1 Moderate risks 6 6 9 10 Low risks 8 8 3 3 Not applicable 12 12 12 12 Total 27 28 28

Table 9: Number of Events per Level of Risk

The table shows three outstanding high risks on this scheme and one with a reduced risk since the 2011 risk assessment.

Two of the three high risks are connected with natural disasters and require a future project to align the rating methodologies used in the Risk Assessment and Disaster Resilience Assessment for likelihood and consequence. This would assist to better prioritise the high hazards and identify the improvement actions for this scheme.

The third high risk is to the outfall to the Ashley River. This is being mitigated by improved coordination between Environment Canterbury and the Waimakariri District Council of the flap valve maintenance programmes for each outfall.

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 this 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 on the eastern side of the scheme will 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. A length of 0.8km of RRJ concrete pipes has been identified as being at high or extreme risk in these circumstances.

Above Ground Facilities

There are no above ground drainage assets in this rural scheme.

Table 10 details the hazard impacts that the scheme is exposed to.

Threat Hazard Impact Ponding up to 2 metres of flood waters from local sources in small areas of the Flooding scheme. Up to 3.5 metres of ponding possible from an Ashley River breakout in small parts of the scheme. Earthquake Vulnerable to shaking effects Liquefaction High threat Slope Hazard Low to very low threat Tsunami Greater than 3 metres inundation modelled to affect parts of the scheme Wildfire Low to extreme threat Snow 30-40cm could be expected Wind Medium and High threat District wide hazard Lightning Terrorism District wide hazard

Table 10: Risks to Assets

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

The only known potential development area within this drainage scheme is the Gressons Road development. This may increase the area's population over the next five to ten years.

However with a policy of runoff being held to predevelopment levels, any new development should not adversely impact on land drainage in the area.

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. Stormwater growth projections were calculated using the New Projections for LTP 2021-2031 (TRIM200908117997), 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 for the Stormwater schemes was calculated using the WDC population projections (TRIM200908117997). Growth in the number of properties expected to be included within the whole drainage scheme are included in Table 11 below.

Table 11: Growth Projections

	Rates Strike	Years 1 -	Years 4 - 10	Years 11 - 20	Years 21 - 30
Coastal Rural	2019/20	2021/22 to 2023/24	2024/25 to 2030/31	2031/32 to 2040/41	2041-42 to 2050/51
Projected Properties	1034	1134	1274	1463	1631

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.

To calculate connection growth numbers from the population projections, existing Coastal Rural drainage connections were counted then the rural population growth profile (from New Projections for LTP 2021-2031 (TRIM200908117997)) was applied, for the development horizons in Table 11.

5.7 Capacity and Performance

The existing drainage system is adequate for the needs of the local farming community. The stormwater and land drainage system is working and there have been no reported cases of flooding property damage.

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 a retention ponds. In addition to weed-spraying, drains are cleaned out and re-shaped with a digger depending on condition.

The new district wide consent for drainage maintenance, will change the emphasis of waterway maintenance practices so that environmental and ecological outcomes are ranked equally with drainage outcomes. A comprehensive management plan has been developed to guide this change (TRIM 201203164171) and which forms part of the consent.

There are no pump stations in the Coastal Rural Scheme, so the WDC Water Unit has no maintenance role. Inlet grills, culverts and open drains are maintained by the Drainage Maintenance Contractor.

Little active maintenance is carried out on the reticulated network.

Figure 2 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.

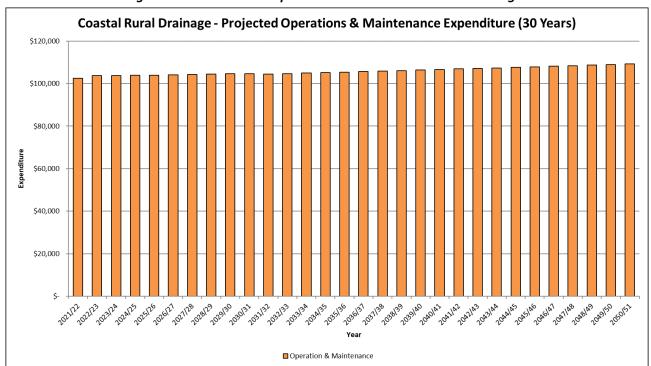


Figure 2: Annual Water Operation & Maintenance 30-Year Budget

6.2 Renewals Programme

Renewal expenditure is work that does not increase the capacity of the existing asset, rather it restores the system to its original capacity. Renewal work is funded from a budget generated by the depreciation component of the rates. The annual funding required to ensure long term funding is available to replace assets in the future is shown in Figure 3

The Coastal Rural Drainage scheme has few renewable assets so the costs involved are relatively small

Since the average condition of the assets is assumed to be good, and the assets are relatively young, few renewals are expected to be needed until at least 2080.

Figure 3 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, which is the income source for the renewals fund.

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.

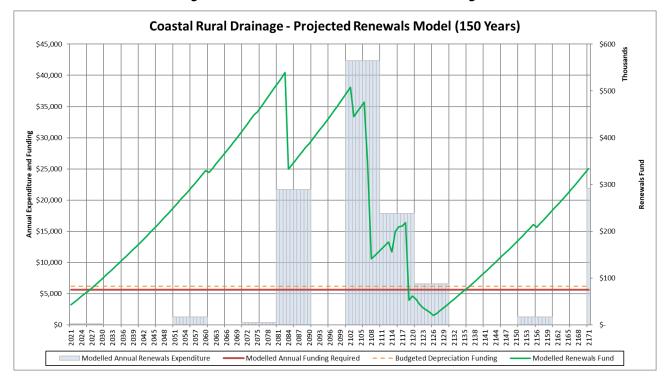


Figure 3: Annual Water Renewals 150-Year Budget

Figure 3 shows that the budgeted depreciation matches the required funding to meet future renewals commitments. There are also no deferred maintenance issues.

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. It does not show flood improvement works which is expenditure funded by the district drainage rate, although there are no such projects for this scheme anyway.

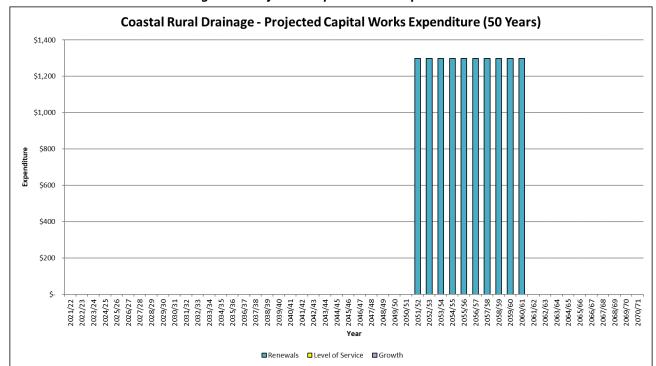


Figure 4: Projected Capital Works Expenditure

Table 12 shows all planned capital works over the next 50 years, including renewals, but not flood response 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.

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.

Table 12: Summary of Capital Works (Includes Renewals)

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Componen t	Renewals Componen t	Growth Componen t
Year 31 - 50							
2052	URD0082	Coastal Rural Drainage Long Term Renewals	3 - Low	\$ 12,992	\$ -	\$ 12,992	\$ -
Grand Total				\$ 12,992	\$ -	\$ 12,992	\$ -

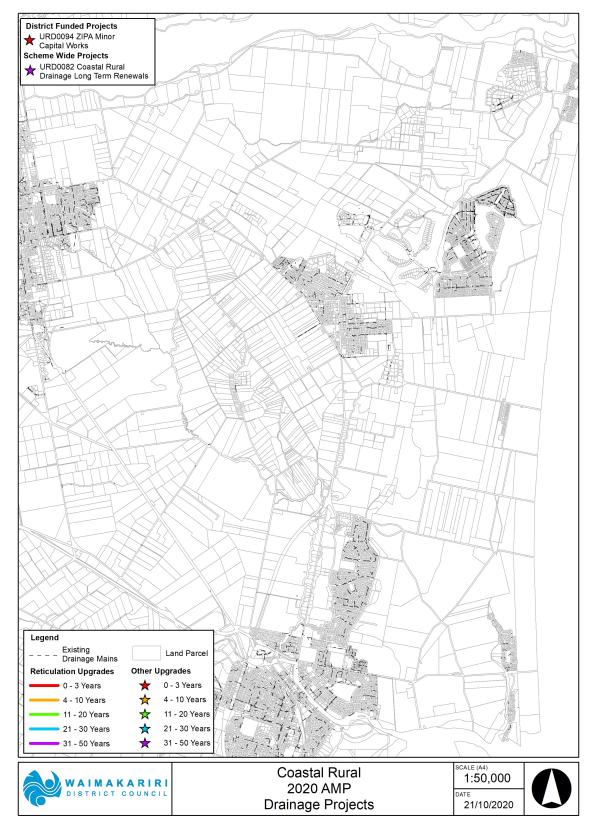
Note: the Coastal Rural Drainage Scheme renewals item indicates the total renewals programme value for the 50 years beginning 2028/29.

Flood Response Programme

There are no additional works, planned within the Coastal Rural Drainage Scheme geographical boundary, that are to be funded by the district wide flood response rate

Figure 5: Projected Capital Upgrade Works (not to scale)

Since no specific assets have yet been identified for renewal, no planned capital works show



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 (including carry forwards), but excludes projects funded by the district wide drainage rate.

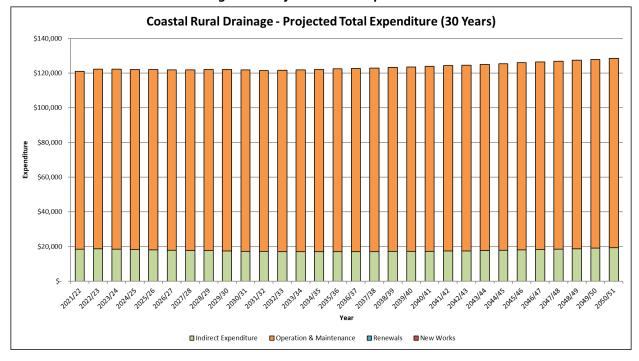


Figure 6: Projected Total Expenditure

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 13 below provides a summary of the replacement cost, depreciated replacement cost and annual depreciation for this scheme

Table 13: Asset Valuation

Asset Type	Unit	Quantity	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation	
Manhole	No.	13	\$125,583	\$116,107	\$1,256	
Sump	No.	1	\$2,122	\$1,969	\$21	
Valve	No.	0	\$-	\$-	\$-	
Network Main	m	980	\$900,847	\$773,321	\$9,008	
Open Channel	m	46,763	\$1,445,530	\$1,445,118	\$13	
Facilities		\$-	\$-	\$-		
Total		\$2,474,082	\$2,336,513	\$10,299		

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 <u>191129168016</u>), 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

Table 14 details the scheme specific 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 the Council's 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 14: 2021 AMP Improvement Plan

Project Ref	AMP Section	Project Description	Priority	Status	Estimated Cost
IP031	5.4 Risk Assessment	Continue flap valve and outfall inspection programme with ECan	Medium	Planned For 2021/22	NA

PLANS

Figure 7: A1 - Plan of Serviced Area as of November 2017

