

Activity Management Plan 2021

Coastal Urban Drainage 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 Coastal 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>The scheme meets its scheme specific service levels.</p> <p>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 88%</p> <p>Some historical nuisance flooding has not been resolved and needs system improvement to ensure it is better managed. Budget has been allowed for investigation and implementation of capacity improvements.</p>
Resource Consents	<p>The scheme is currently achieving its targets relating to resource consent compliance. However, a new 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. \$2.6 m budget allowance has been made for this, commencing in 2027/28, but further work is needed to clarify exactly how the required outcomes will be achieved.</p>
Capacity and Performance	<p>Modelling indicates that there is adequate capacity in Woodend, but some nuisance flooding does occur. A small budget is available, which it is intended to use on a reactive basis, in response to issues that arise during rain events. A larger budget is included for Woodend capacity investigations and implementation of resulting works</p> <p>The performance of open drains relies on annual maintenance programme to ensure efficiency of operation.</p>
Asset Condition	<p>Given the relatively young age of drainage assets, they are assumed to be in good condition. This will be verified over time with the targeted CCTV programme</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Previous operational risk assessment work is becoming outdated and needs a refresh, in conjunction with an update of the DRA.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> <p>The Outfalls to the Waimakariri River via Saltwater Creek, and at Collins Drive in Waikuku Beach both pose a high risk of failure and resulting flood risk.</p> <p>The flap valve inspection and maintenance programmes undertaken by ECan and Waimakariri District Council needs ongoing attention to assist manage these risks.</p>
Disaster Resilience	<p>There are 1.5km of reticulated mains considered to be at extreme or high risk in an earthquake. No specific mitigation actions have been identified for this scheme for facilities or for piped and open drains.</p>
Growth Projections	<p>Long term growth in East Woodend will be managed through a proposed new Stormwater Management Area at Petries Road. This is intended to treat and attenuate flows from the east (and north east) Woodend Outline Development Plan areas as well as a portion of the existing Woodend urban catchment. Two stages are anticipated with construction phases in 2022/23 and 2028/29. The growth component will be funded via Development Contributions</p>

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 Coastal 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 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 Urban Drainage Scheme comprises the combined coastal settlements of Waikuku, Waikuku Beach, Woodend, The Pines Beach and Kairaki. These settlements are characterised by their low elevations, saturated soils and their extensive drainage networks of predominantly open drains.

Woodend discharges stormwater into four separate catchments, the largest proportion of which enters the McIntosh Drain. This latter discharge is controlled by a pond south of the town (Archers Pond, privately owned) which provides a degree of attenuation of flows from the urban area. The other Woodend catchments include a small retention basin at the south end of Woodend (Pankhurst Basin), a number of new stormwater management areas associated with recent development (Petries Rd, Copperbeech, Kesteven Pl and Shrimpton Ave), a network of open drains and a small amount of stormwater pipe, including the piping replacing the Woodend Box Drain.

Waikuku has one stormwater management area (Northside Drive). Waikuku Beach and Pines / Kairaki settlements discharge into coastal waterways and the Taranaki Stream and Saltwater Creek,

running along the low-lying land west of the coastal sand dunes. These waterways tend to be very flat, and their discharge is affected by tides. Floodgates control the seaward discharge points. Earthquake damage to the drainage infrastructure identified as needing repair in these settlements has been repaired.

Over the years, a lot of effort has gone into upgrading the drainage systems. This process of improving the stormwater system of these coastal areas is continuing, although future challenges are foreseeable with the likelihood of rising groundwater levels as a consequence of sea level rise.

The freeholding of land in the Pines / Kairaki and Waikuku Beach areas has assisted with funding for this type of work. The “beach” nature of the townships is to be retained under the proposed District Plan, and so extensive kerb and channelling is not planned.

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

Scheme Parameter	Statistics	Source
Drainage System	Gravity	
Drainage Area	214 ha	Source - GIS Layer
Reticulation and Treatment	Piped and open drains, one private and six Council attenuation and treatment ponds. One gross pollutant trap.	
Length of Reticulation and Open Channel	14.0 km Mains 2.1 km Channel Reduced length reflects decision not to include privately maintained drains.	Drainage Asset Valuation Tables 9-4 and 9-5, pages 66 to 68
Total Replacement Value	\$18,342,397	
Depreciated Replacement Value	\$15,857,575	
Rated Properties	2,008	Source 2019/20 Rating Query

Table 3: Open Channel Drain Data Summary

Open Channel Drains	
Material	Length (m)
Unlined Drain	1,994
Natural form	59
Total	2,052

Table 4: Other Stormwater Asset Data Summary

Stormwater Assets	
Asset Type	Count
Inlet (Sump)	5
Manhole	269
Node	0
Valve	5
Total	279

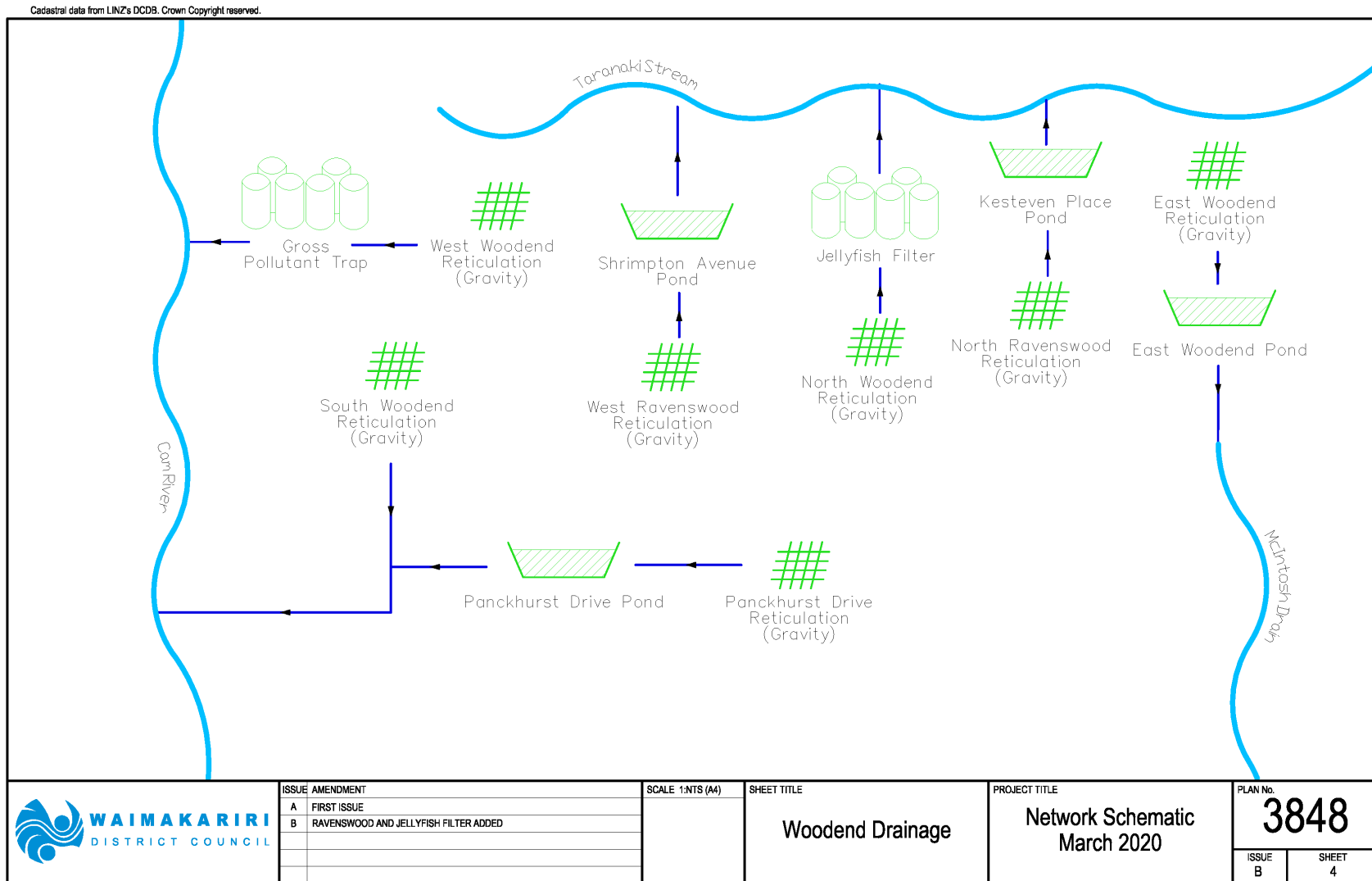
Table 5: Stormwater Pipe Data Summary – Coastal Urban

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	0m	121m	1,332m	2,559m	2,023m	1,498m	999m	1,961m	471m	279m	66m	11,310m
Perforated HDPE	0m	371m	0m	0m	0m	0m	0m	0m	0m	0m	0m	0m	371m
Pvc	0m	29m	721m	1,231m	15m	121m	0m	15m	0m	0m	0m	0m	2,133m
Other	122m	0m	0m	0m	62m	0m	0m	30m	0m	0m	0m	0m	213m
Total	122m	399m	842m	2,563m	2,636m	2,145m	1,498m	1,043m	1,961m	471m	279m	66m	14,027m

Table 6: Data References

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

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:

- 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 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 expected to change with time 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 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	There were no consent breaches that resulted in non-compliance reports being received from Environment Canterbury for FY 19/20.	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	-	Woodend has been modelled for 1 in 50 yr event, which shows nuisance flooding. Unlikely for 1 in 10 year event	Achieved	N/A	-	-	-	
	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 confirmed the McIntosh Drain catchment will cope. The other two catchments have coped with worse storms without floor level flooding.	Achieved	N/A	Y	Y	Y	Y
	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%	100%	No outstanding nuisance drainage issues recorded	Achieved	N/A	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. The 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-Pines Kairaki

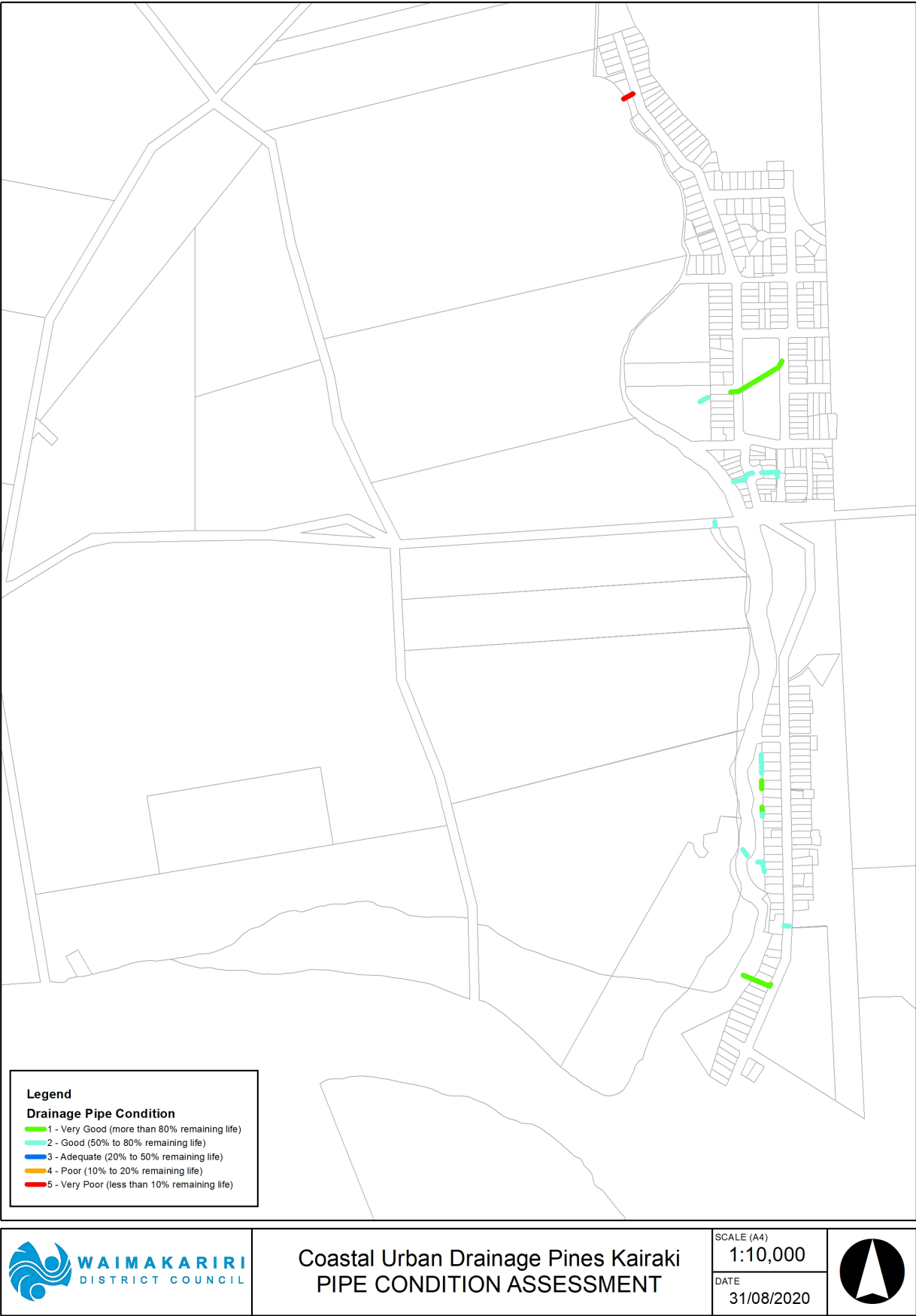
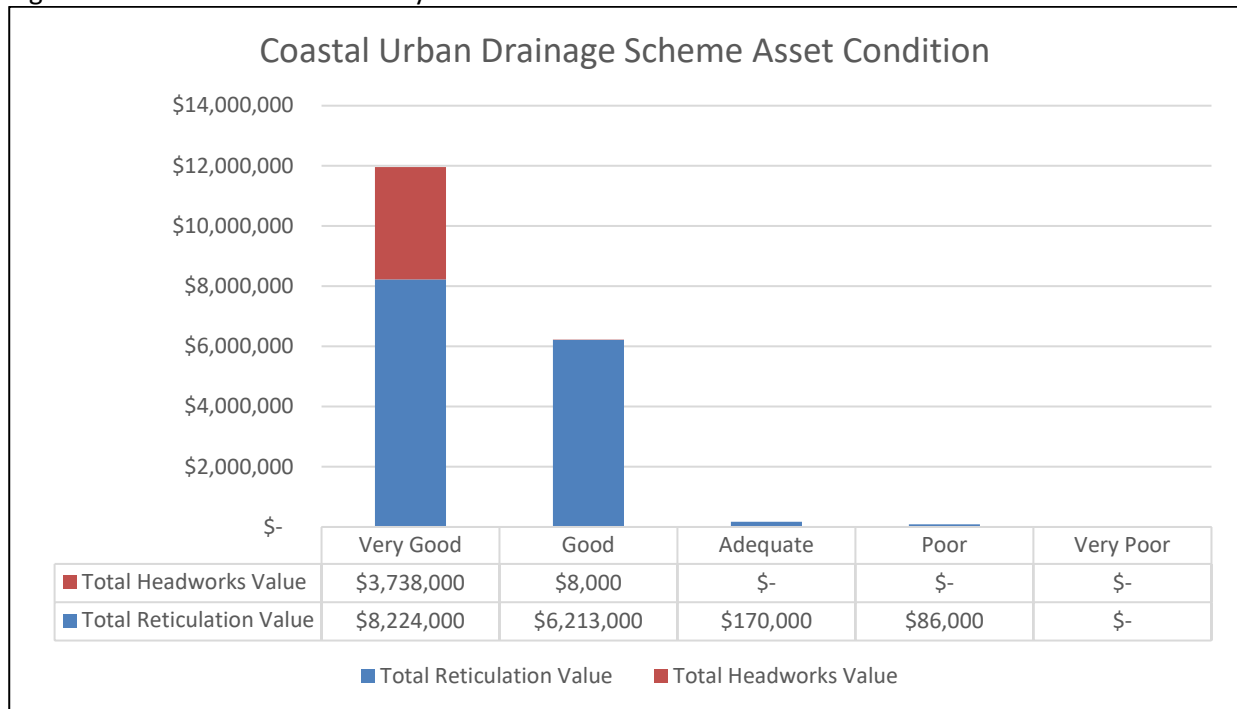


Figure 3: Asset Condition Summary



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

Table 8: 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>	8.4 km 58%	\$ 8,224,000 56%	\$ 3,738,000 100%	\$ 11,962,000 65%
2	Good <i>Between 50% and 80% of life remaining</i>	6.0 km 41%	\$ 6,213,000 42%	\$ 8,000 0%	\$ 6,221,000 34%
3	Adequate <i>Between 20% and 50% of life remaining</i>	0.0 km 0%	\$ 170,000 1%	\$ - 0%	\$ 170,000 1%
4	Poor <i>Between 10% and 20% of life remaining</i>	0.0 km 0%	\$ 86,000 1%	\$ - 0%	\$ 86,000 0%
5	Very Poor <i>Less than 10% of life remaining</i>	0.0 km 0%	\$ - 0%	\$ - 0%	\$ - 0%
Total		14.4 km	\$14,693,000	\$3,746,000	\$18,439,000

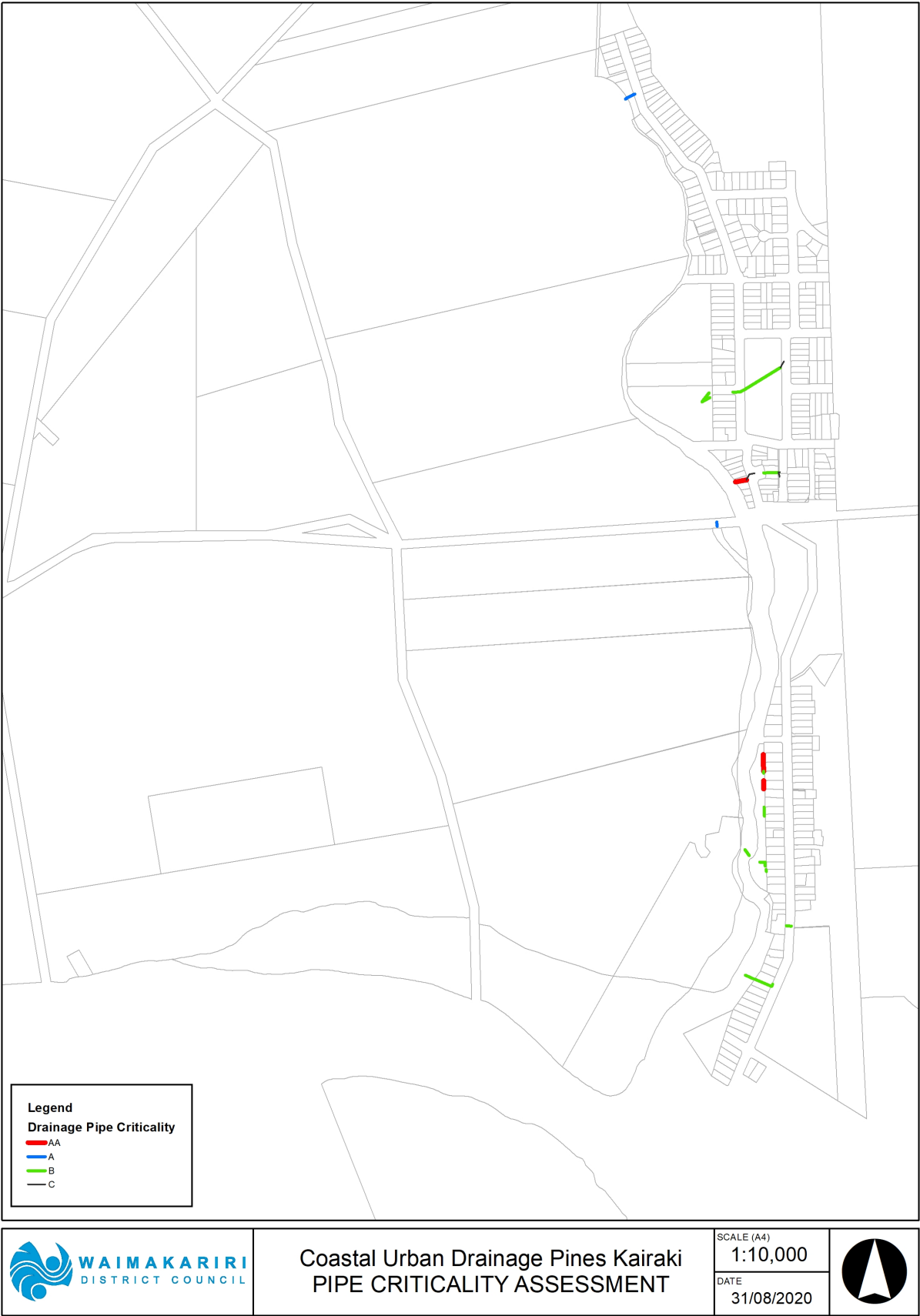
5.3 Asset Criticality

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 for this AMP.

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

Figure 4: Pines Kairaki Area Reticulation Criticality



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.

At that review nine high risks remained across the component parts of this 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 risks for the Coastal Urban Drainage Scheme by sub-scheme area.

Table 9: Number of Events per Level of Risk

Risk Level	2004			2008			2011			2014		
	WK	WD	PK	WK	WD	PK	WK	WD	PK	WK	WD	PK
Extreme risks	0	0	0	0	0	0	0	0	0	0	0	0
High risks	0	2	1	0	1	0	5	4	5	3	3	3
Moderate risks	8	15	11	8	15	12	7	11	10	9	12	12
Low risks	7	6	3	7	7	3	4	9	1	4	9	1
Not applicable	12	4	12	12	4	12	12	4	12	12	4	12
Total	27			27			28			28		

Note: The sub-scheme areas in the table above are indicated by the following codes:

Waikuku Beach: **WK** Woodend: **WD** Pines / Kairaki: **PK**

The more recent 2011 and 2014 Risk Assessments show a decrease in the number of high risks identified for each of the three sub-scheme areas over previous years, and a small increase in the number of moderate risks. The increase is predominantly due to the effects of the earthquake on the drainage infrastructure.

The high risks for the Coastal Urban Drainage Scheme are shown in greater detail for each sub-scheme area in the tables on the following 3 pages. In summary, these tables indicate that there are 3 outstanding high risks for each scheme. Of these high risks, a number require a review of the methodologies within the Risk Assessment and Disaster Resilience Assessment for rating likelihood and consequence for each event. This will assist to quantify the earthquake hazard to pipes and pipe joints and prioritise any necessary resilience upgrades.

The other high risk applicable to both the Pines/Kairaki and Waikuku Beach sub-scheme areas relates to the potential failure of the drainage outfalls. This is being mitigated by improved coordination between Environment Canterbury and the Waimakariri District Council of the flap valve maintenance programmes for each outfall.

Table 10 : Improvements Required (Waikuku Beach)

Risk Event & Cause	Reasoning	Response – updated comments	Project Details - updated	Project Ref	2011	2014
COLLECTION						
Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity	Risk reduced as there have been no customer complaints relating to flooding within the last three years	Risk to be re- evaluated at next review of operational risks. High risk seems overly conservative	N/A	-	H	H
Natural disaster & other due to earthquake	Pipe joints and manhole connections could be susceptible to liquefaction	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H
DISPOSAL						
Stormwater unable to be discharged due to failure of outfall	Collins Drive flap valve has caused flooding in the past	Maintenance check on WDC flap valves, continue to liaise with ECan to ensure maintenance of their flap valves	Flap Valve Inspection Programme implemented and ongoing	-----	H	H
Natural disaster & other due to earthquake	Failure of stopbanks and floodgates is a possibility. These are the responsibility of ECan	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H
Natural disaster & other due to flood / tsunami	Risk of Ashley River flood restricting the outlet has been reassessed	Risk reduced	N/A	-	H	M

Table 11: Improvements Required (Woodend)

<i>Risk Event & Cause</i>	<i>Reasoning</i>	<i>Response –updated comments</i>	<i>Project Details- updated</i>	<i>Project Ref</i>	<i>2011</i>	<i>2014</i>
COLLECTION						
Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity	Risk reduced as most upgrades identified in the 2010 Stormwater Management Plan being implemented.	Risk reduced	N/A	-	H	M
Natural disaster & other due to earthquake	Pipe joints and manhole connections could be susceptible to liquefaction.	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores.	Risk Assessment Update	IP045	H	H
TREATMENT						
Natural disaster & other due to earthquake	Pipe joints and pond bunds could be susceptible to liquefaction.	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H
DISPOSAL						
Natural disaster & other due to earthquake	Pipework and headwalls could be damaged by earthquake.	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H

Table 12: Improvements Required (Pines Kairakei)

Risk Event & Cause	Reasoning	Response – updated comments	Project Details- updated	Project Ref	2011	2014
COLLECTION						
Overflow or flooding of stormwater from pipes or open drains due to insufficient reticulation capacity	Risk has reduced due to drainage improvement works undertaken as part of EQ recovery and also partial retreat of residential housing in the red zone	Risk Reduced	N/A	-	H	M
Natural disaster & other due to earthquake	Pipe joints and manhole connections could be susceptible to liquefaction	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H
DISPOSAL						
Stormwater unable to be discharged due to failure of outfall	Outfalls to Waimakariri River via Saltwater Creek. Flap valve has caused flooding in the past	Maintenance check on WDC flap valves, continue to liaise with ECan to ensure maintenance of their flap valves	Flap Valve Inspection Programme - ongoing	-----	H	H
Natural disaster & other due to earthquake	Failure of stopbanks and floodgates is a possibility. These are the responsibility of ECan	Review risk assessment methodology as part of 2021 AMP improvement plan and use DRA information to better inform risk scores	Risk Assessment Update	IP045	H	H
Natural disaster & other due to flood / tsunami	Risk of Flood in Waimakariri River restricting the outlet has been reassessed	Risk reduced	N/A	-	H	M

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 in this scheme will be vulnerable to damage in 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 1.5km 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 scheme.

Table 13 details the hazard impacts that the scheme is exposed to.

Table 13: Risks to Assets

Threat	Hazard Impact
Flooding	Up to 1.5 metres of flooding from local sources in small areas of the scheme. Over 2 metres flooding 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 of inundation modelled to affect part of the scheme
Wildfire	Low to extreme threat
Snow	30-40cm could be expected
Wind	Medium and High threat
Lightning	District wide hazard
Terrorism	District wide hazard

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 Overview 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 could include:

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

Of the three Coastal Urban Drainage areas, Woodend has the most potential for significant development. However, for any rezoned residential areas or major developments, Council's policy is that stormwater discharge must be restricted to predevelopment levels. This will mean that the effects of growth should not be reflected in increased stormwater runoff.

Given the low lying nature of the Outline Development Plan (ODP) area and the fact that most of Woodend drains through this area, the Council has developed a Stormwater Management Plan for Woodend to develop and implement (construct) the drainage system for the entire ODP area. This is in the form of the partially complete Stormwater Management Area at Petries Road. The new SMA will also treat a portion of the existing Woodend urban catchment. Plans of the ODP's are shown in Figure 16 and Figure 17

This will ensure an integrated and economic approach to Stormwater Management for new development and a large portion of the existing urban catchment. In addition the proposed Stormwater Management Area will accommodate many different developers in the Outline Development Plan area.

Most of the cost required to implement this plan will be recovered through Development Contributions generated from the ODP 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 in the number of properties expected to be included within the whole drainage scheme are included in **Error! Reference source not found.** below.

Table 14 : Growth projections

	Rates Strike	Years 1 - 3	Years 4 - 10	Years 11 - 20	Years 21 - 30
Coastal 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	2008	2412	2881	3484	4017

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 Urban drainage connections were counted in Woodend, Waikuku, Ravenswood, Waikuku Beach and Pines-Kairaki Beach population growth areas, from New Projections for LTP 2021-2031 (TRIM200908117997). The population growth rate from these areas was proportioned and combined to produce a growth rate for Coastal Urban connections, for the development horizons in **Error! Reference source not found.**

5.7 Capacity & Performance

The capacity of the Woodend stormwater system has been assessed using the Councils hydraulic models. Funding has been allocated for capacity improvements, with construction in 2025/26 and 2026/27

The performance of the drainage system at the Waikuku Beach and Pines / Kairaki settlements meets the target service levels for drainage capacity.

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, capital works are required.

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

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

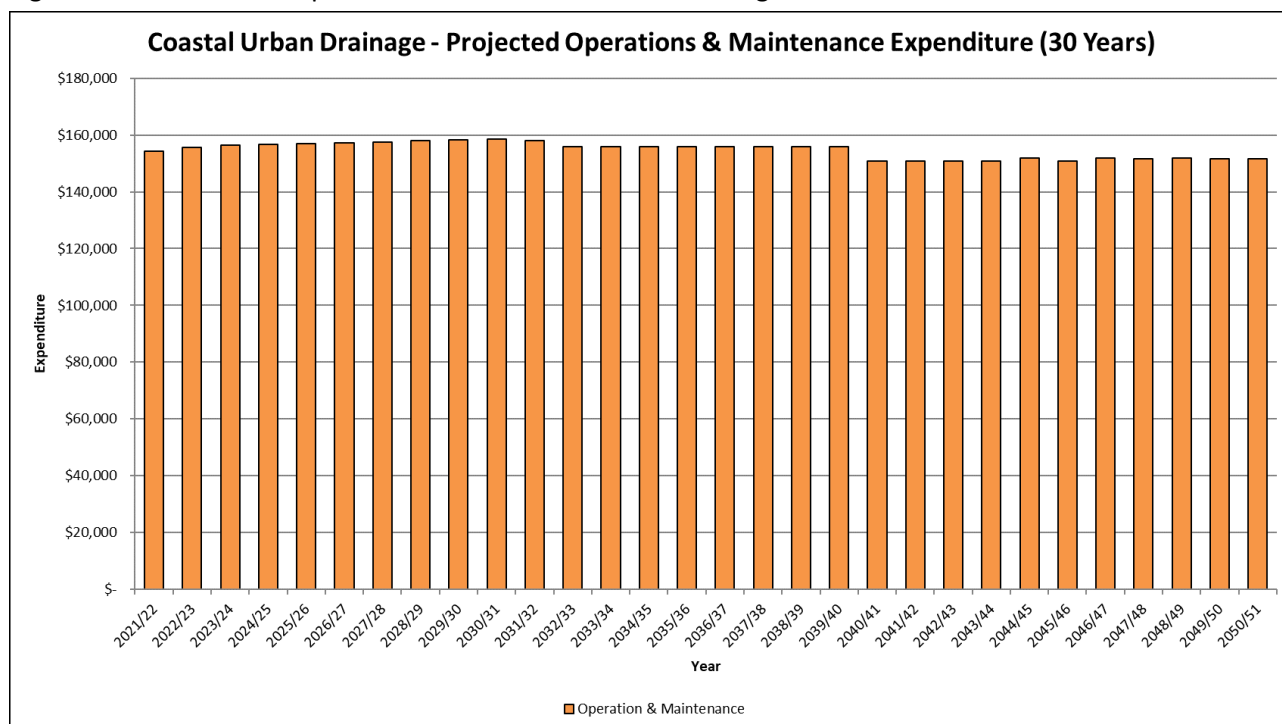
Little active maintenance is carried out on the reticulated network. The CCTV programme now under way will provide information as to whether more active maintenance is required.

The scheme has a number of consented Stormwater Management Areas within its boundaries, but the majority are still maintained by developers. Two are maintained by WDC. There have been no consent breaches for these two consents that have resulted in an Ecan report identifying compliance issues.

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.

Figure 5: Annual Water 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.

The planned renewals for this scheme, which are the outcome from this two stage process, are shown spatially and temporally in Figure 6, Figure 7 and Figure 8 below.

Figure 6: Pipe Renewal Time Frames – Pines Kairaki



Figure 7: Pipe Renewal Time Frames – Waikuku Beach

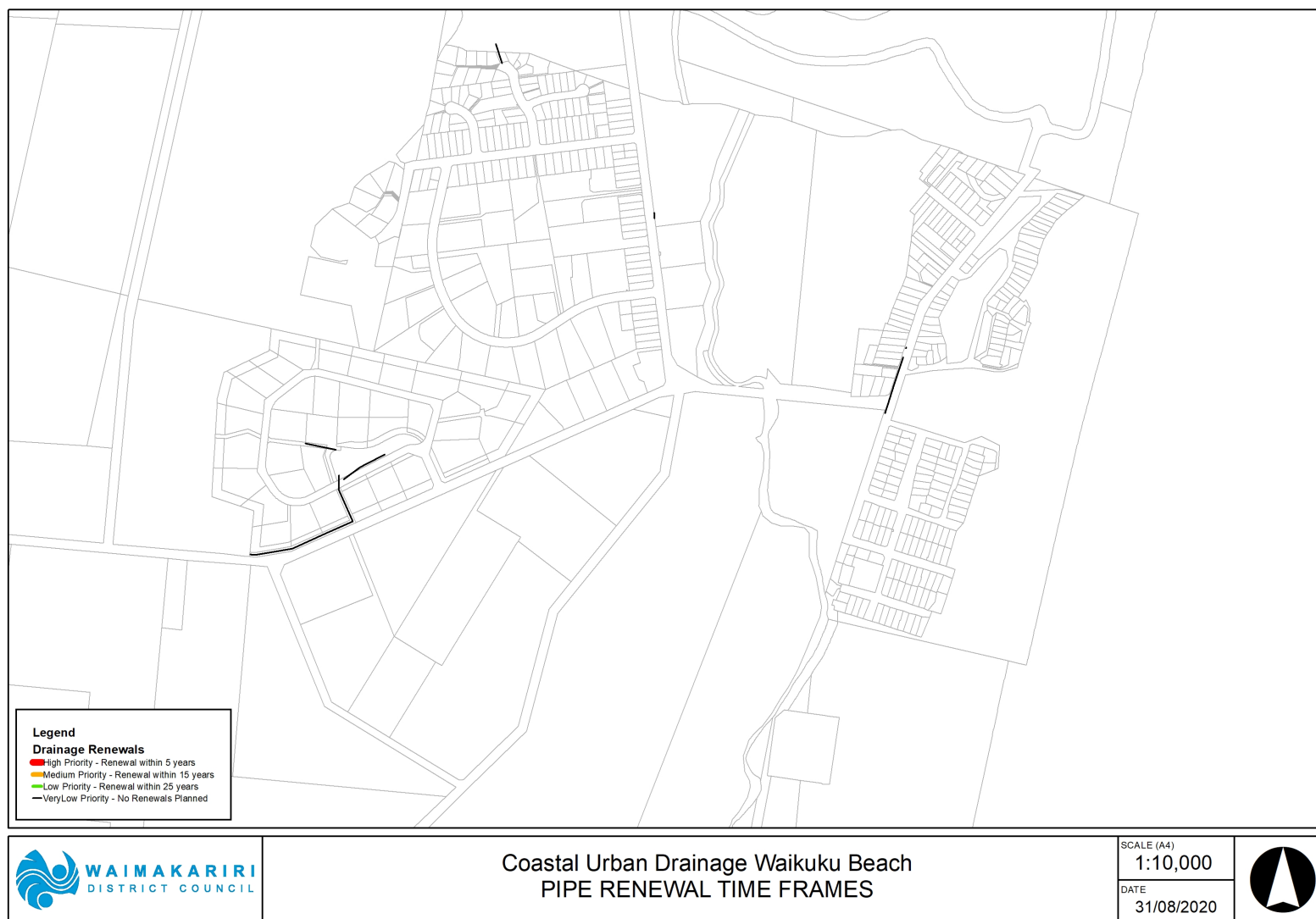


Figure 8: Pipe Renewal Time Frames – Woodend

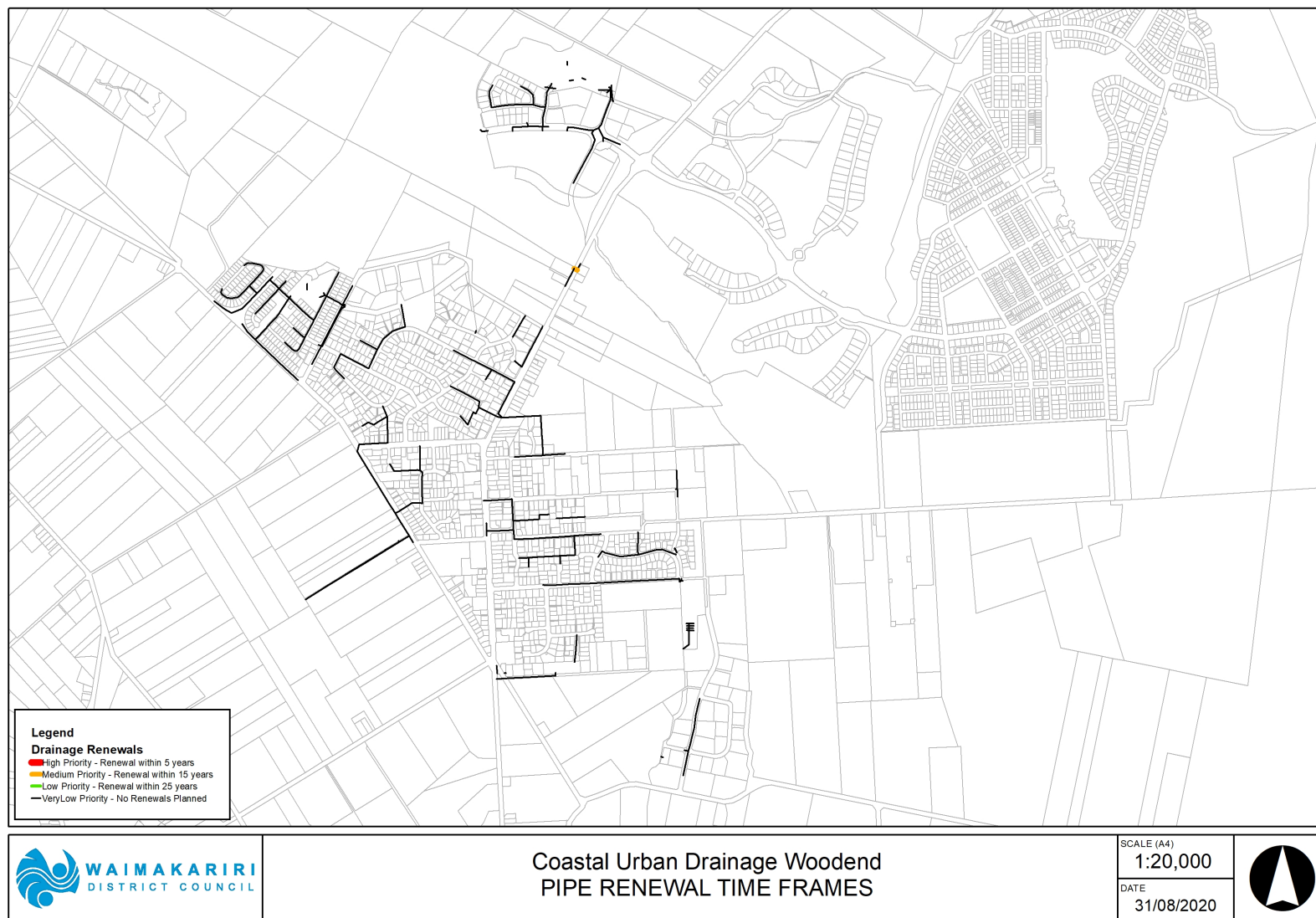
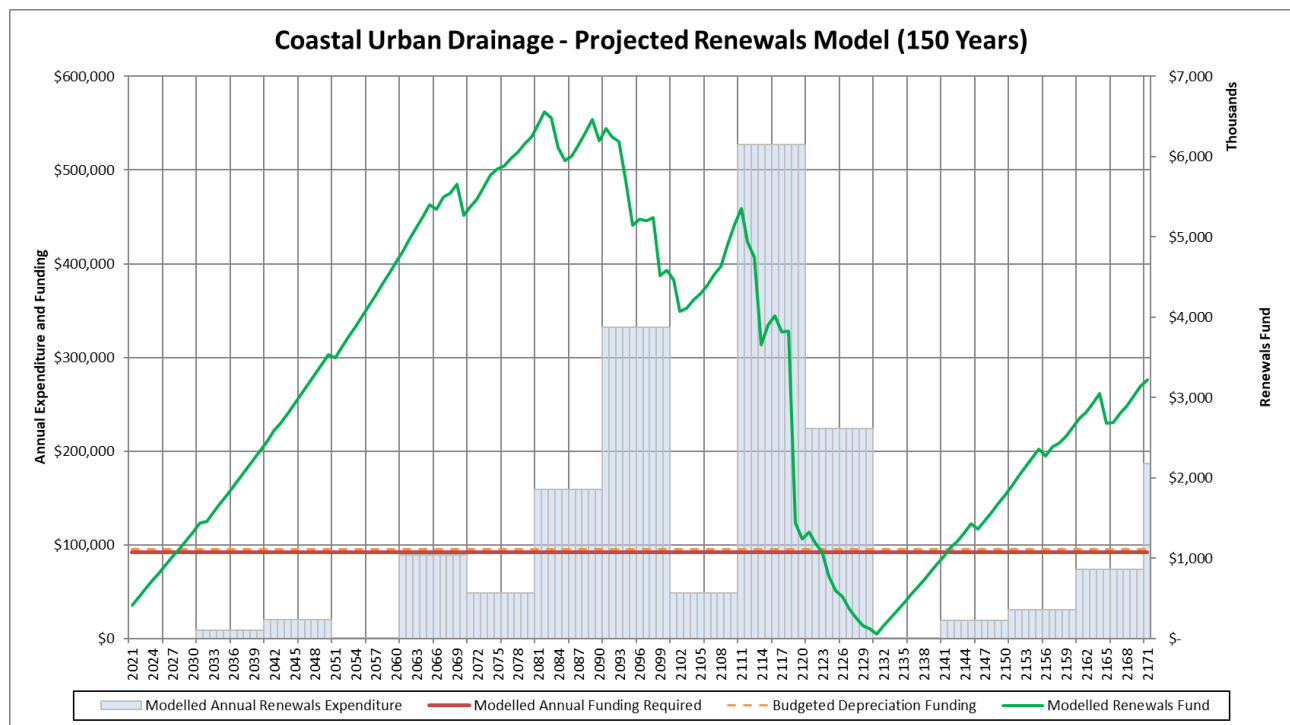


Figure 9 below shows the financial output from the model alone. Over a 150 year period it shows the projected expenditure; the value in the renewals fund; the level of funding required to ensure the fund can meet the required renewals programme, and the annual depreciation.

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 9: Projected Water 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.

As may be seen, the annual funding required is matched by the depreciation funding, showing that future renewals are fully funded.

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. There is a drainage upgrade for the Pines Kairaki catchment planned for construction in 2024/25, and a new detention pond is planned for East Woodend, with the majority of the work being carried out in 2028/29, which explains the spike in the graph below. Budget allowance has also been made starting in 2027/28 for meeting the network upgrade requirements expected to come from the global stormwater discharge consents, although the conditions of these are not yet known. The 2022/23 spike is from three Woodend drainage improvements, School Rd, Norton place and Box drain

Figure 10: Annual Projected Capital works Expenditure – 50 years

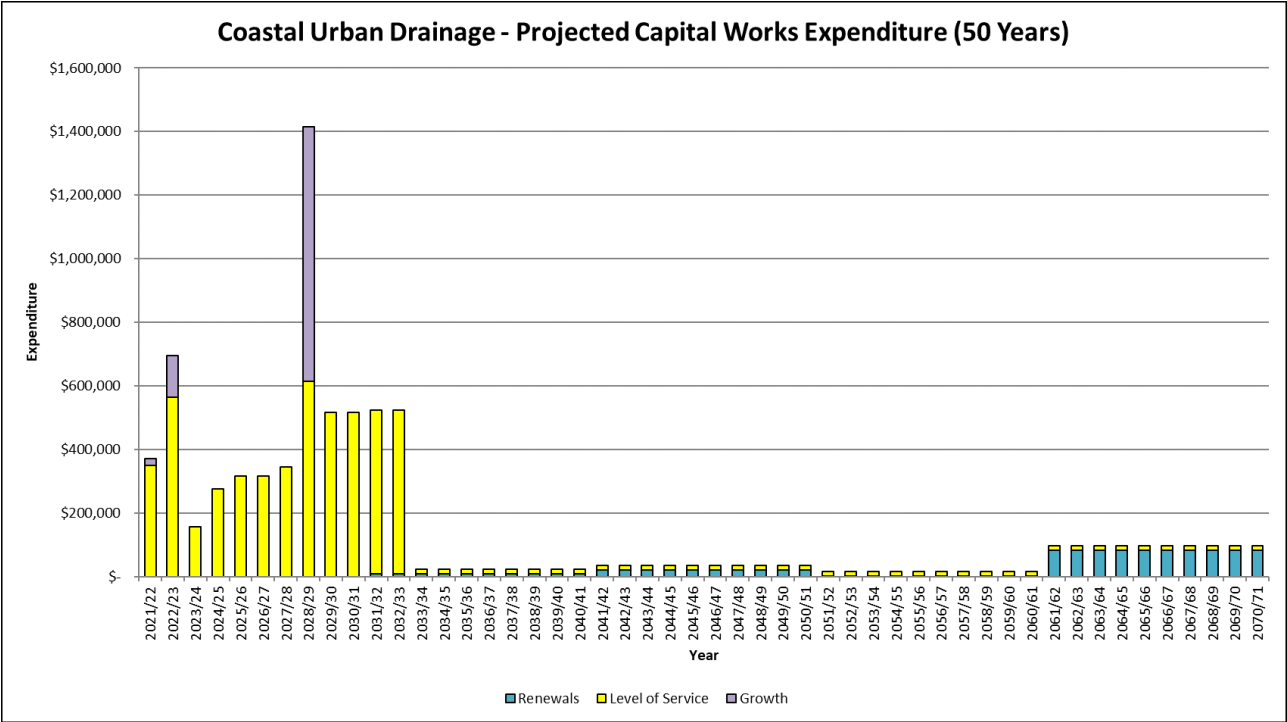


Table 15 shows all planned capital works over the next 50 years, including renewals, but nor flood response works.

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.

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

Table 15: 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	URD004 1	Stormwater Minor Improvements	5 - Medium	\$ 750,000	\$ 750,000	\$ -	\$ -
2022	URD004 4	East Woodend Detention Pond 2.5Ha	0	\$ 1,120,000	\$ 330,000	\$ -	\$ 790,000
2022	URD011 4	School Road Drainage Upgrade	0	\$ 405,000	\$ 405,000	\$ -	\$ -
2022	URD011 5	Norton Place Drainage Upgrade	0	\$ 260,000	\$ 260,000	\$ -	\$ -
2022	URD013 5	Box Drain Improvements	0	\$ 220,000	\$ 220,000	\$ -	\$ -
2024	URD003 8	Stormwater Quality Upgrade	0	\$ 81,910	\$ 81,910	\$ -	\$ -
2024	URD004 3	Pines Kairaki Upgrade	0	\$ 260,000	\$ 260,000	\$ -	\$ -
2024	URD013 6	Woodend Capacity Improvements	1 - Coarse	\$ 660,000	\$ 660,000	\$ -	\$ -
2028	URD004 5	Global Consent Implementation Works	0	\$ 2,600,000	\$ 2,600,000	\$ -	\$ -
2029	URD004 6	East Woodend Upgrade McIntosh Drain 1072m	0	\$ 160,000	\$ -	\$ -	\$ 160,000
2029	URD004 7	East Woodend Internal reticulation	0	\$ 40,000	\$ -	\$ -	\$ 40,000
Year 11 - 20							
2032	URD008 9	Coastal Urban Drainage Long Term Reticulation Renewals	3 - Low	\$ 1,011,164	\$ -	\$ 1,011,165	\$ -

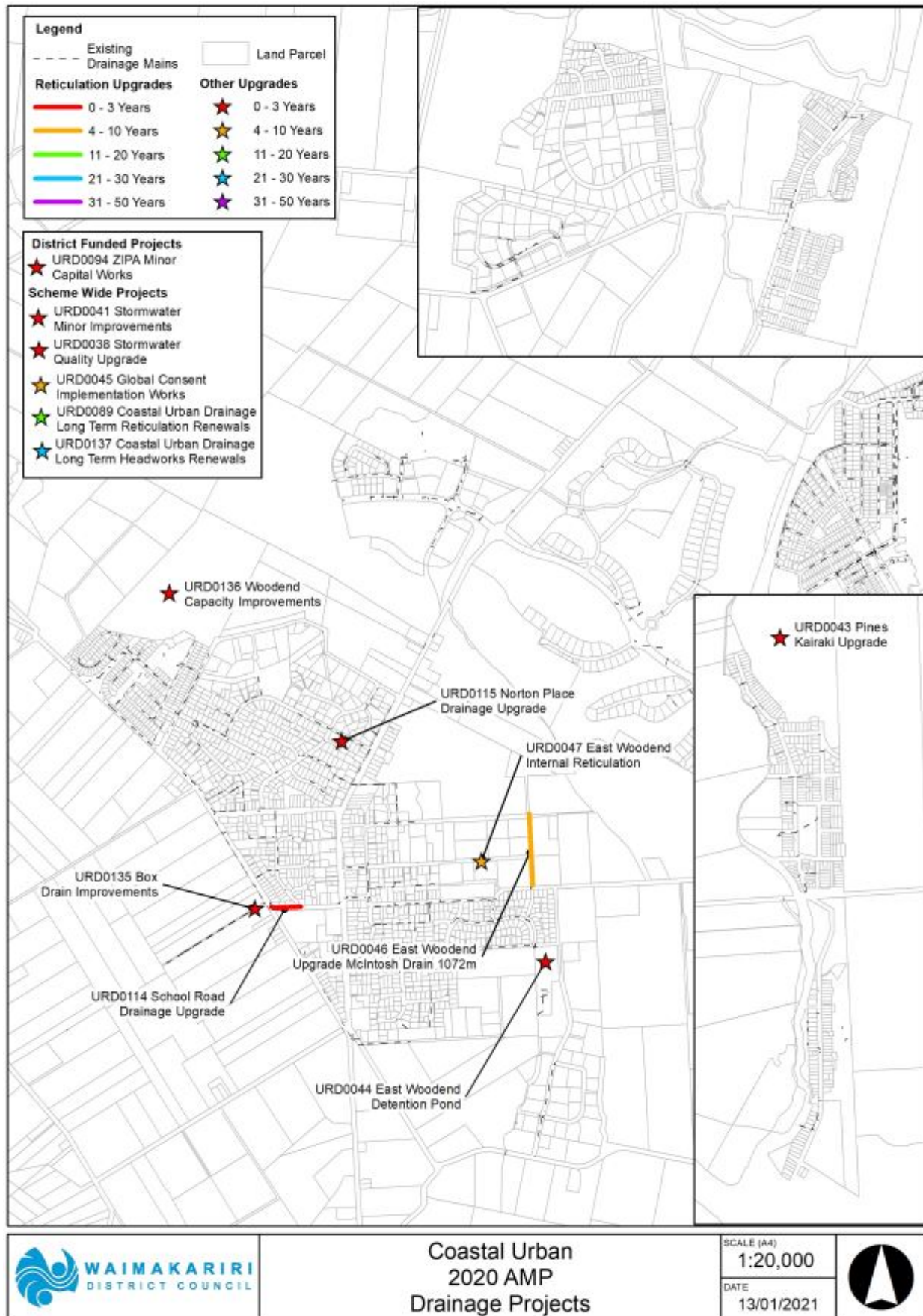
Year 21 - 30							
2042	URD013 7	Coastal Urban Drainage Long Term Headworks Renewals	3 - Low	\$ 97,120	\$ -	\$ 97,121	\$ -
Grand Total				\$ 7,665,195	\$ 5,566,910	\$ 1,108,286	\$ 990,000

Note: The Coastal Urban Drainage Headworks Renewals items indicate the total renewals programme value for the 50 years beginning in the year shown.

Flood Response Programme

There are no works planned within this scheme funded by the district wide flood response rate.

Figure 11: Projected Capital Upgrade Works (not to scale)
Includes works funded through the flood response works (if any)

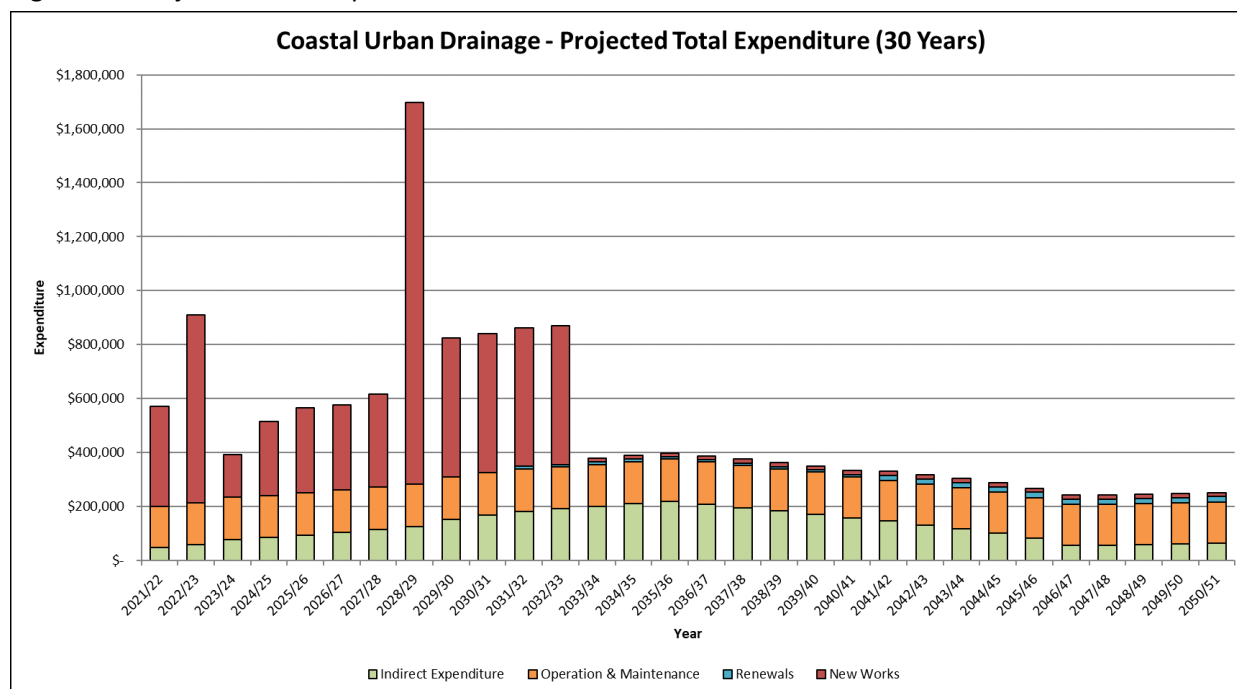


6.4 Financial Projections

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 12: 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 16 below provides a summary of the replacement cost, depreciated replacement cost and annual depreciation for this scheme

Table 16: Asset Valuation

Asset Type	Unit	Quantity	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Manhole	No.	269	\$2,711,905	\$2,317,257	\$27,119
Sump	No.	5	\$10,609	\$9,125	\$106
Valve	No.	5	\$19,293	\$18,818	\$193
Network Main	m	14,027	\$11,790,647	\$9,741,124	\$118,777
Open Channel	m	2,052	\$63,426	\$62,856	\$18
Facilities			\$3,746,517	\$3,708,395	\$8,660
Total			\$18,342,397	\$15,857,575	\$154,874

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).

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 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 17: 2021 AMP Improvement Plan

Project Ref	AMP Section	Project Description	Priority	Status	Estimated Cost
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 Coastal Urban scheme one change was approved by Council for Norton Place in the Woodend catchment.

During the June 2019 rainfall event a house was flooded at the end of the Norton Place cul-de-sac, in Woodend. Investigation work undertaken this year identified a preferred option that is proposed to be constructed next financial year. The estimate has been updated as part of this work and an additional budget of \$40,000 is required to implement the preferred option. Given that this project still requires consultation with the Greenspace team, community board and the community Council approved deferring the construction budget to the 2022/23 financial year. The additional \$40,000 increases the Coastal Urban drainage rate by \$1.12 or 0.6% from 2023/24.

APPENDIX 'A'.

PLANS

Figure 13: A1 - Plan of Serviced Area - Woodend

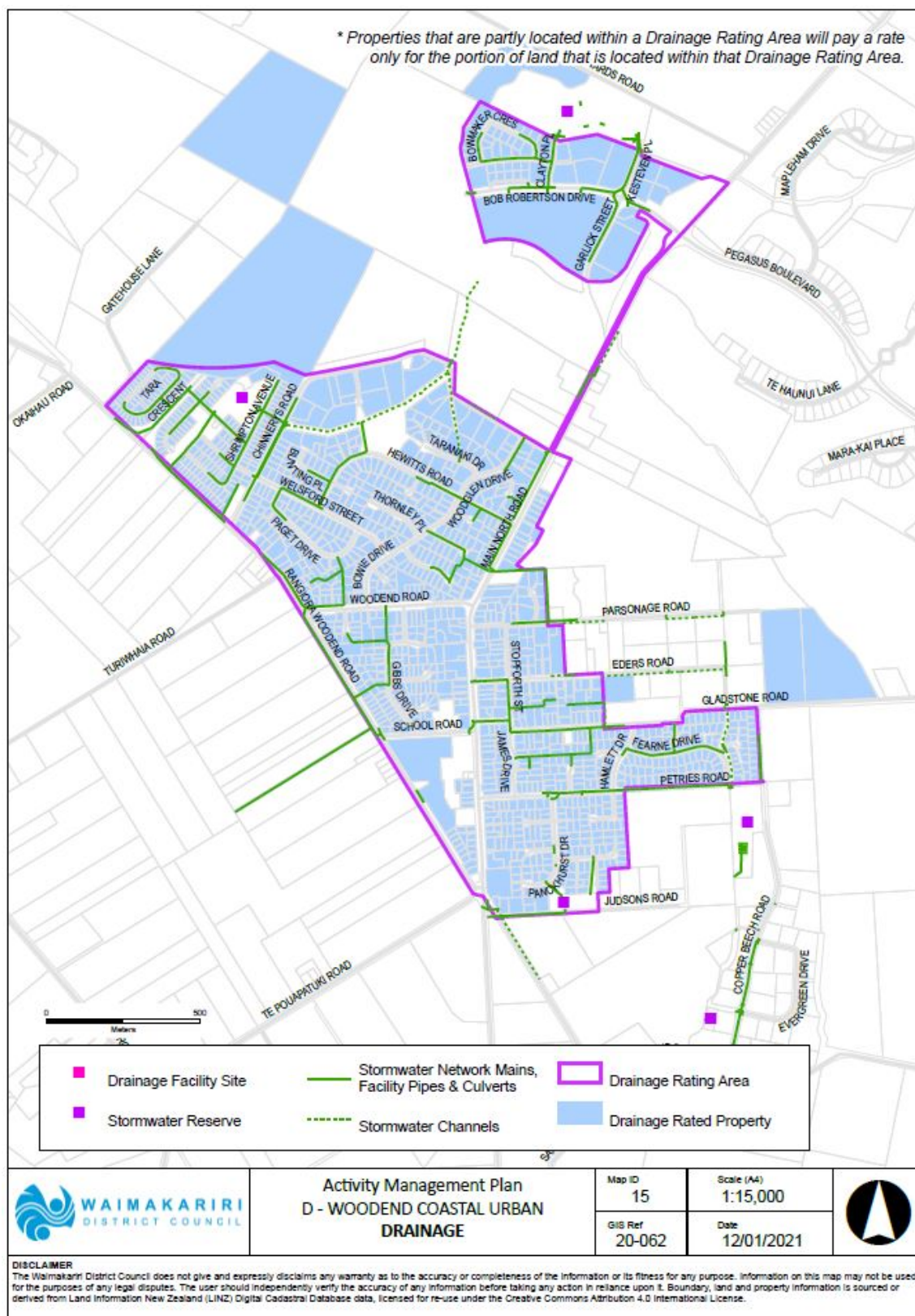


Figure 14: Plan of Serviced Area – Pines and Kairaki

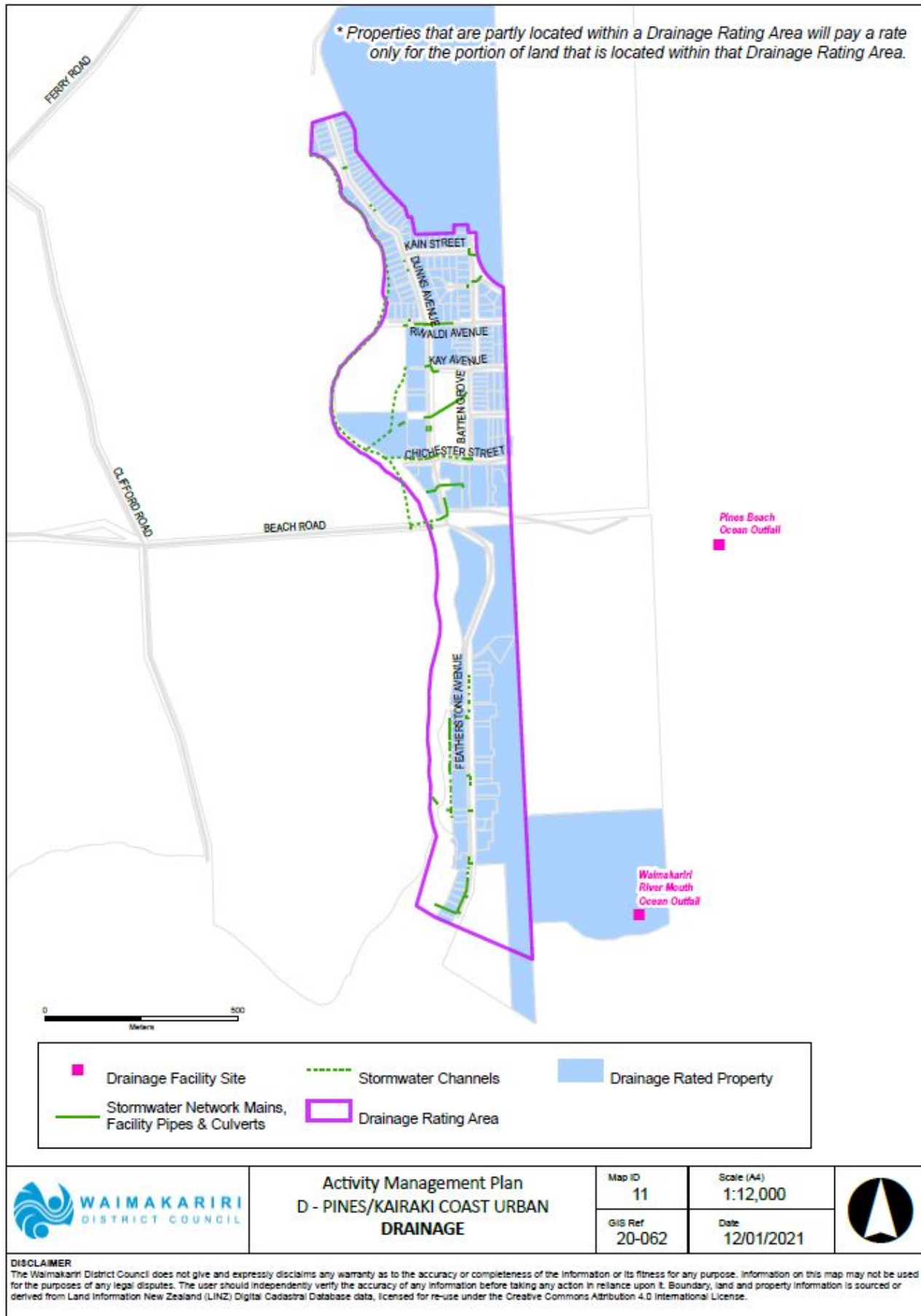


Figure 15: Plan of Serviced Area – Waikuku and Waikuku Beach

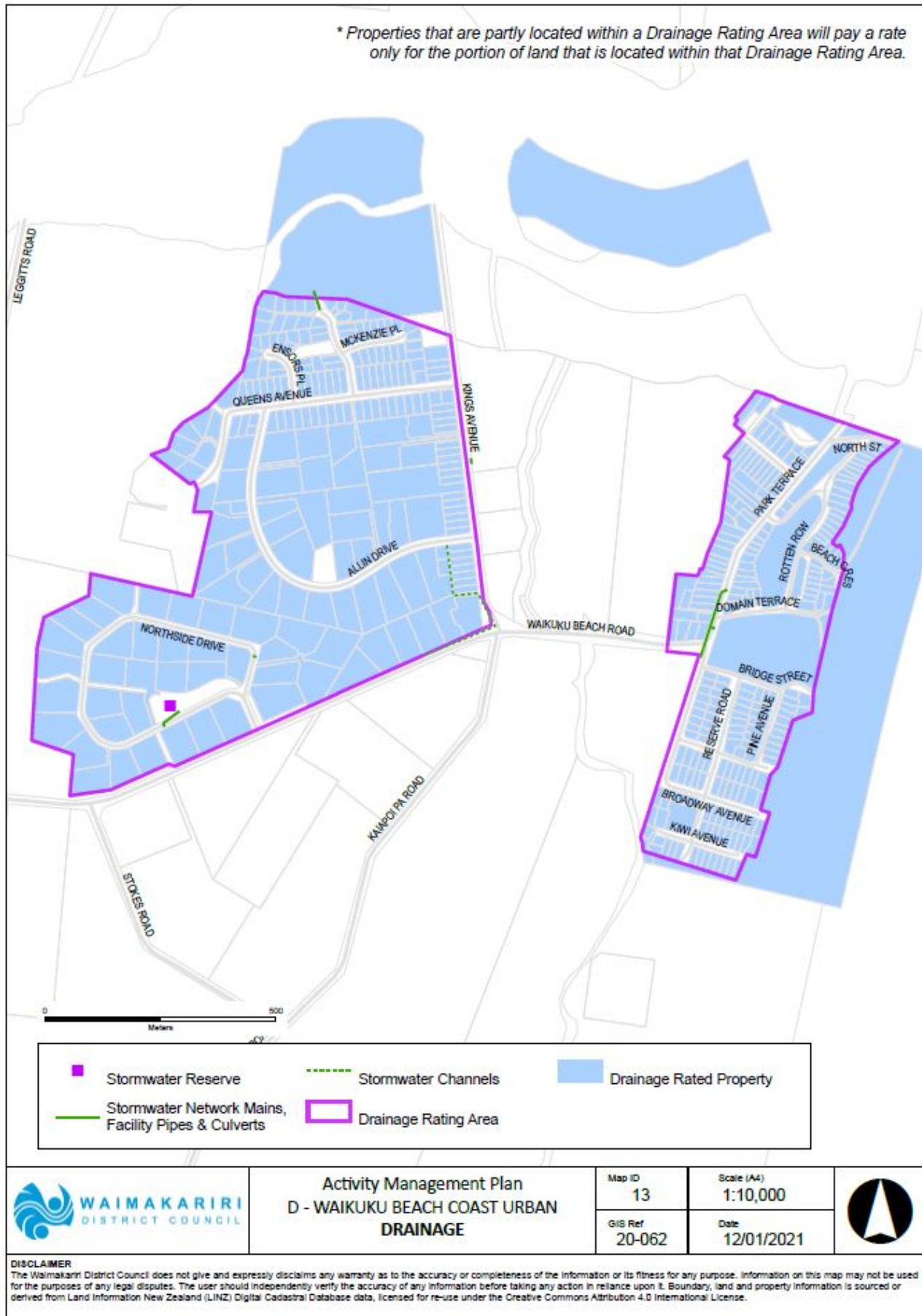


Figure 16: Plan A2: Outline Development Plans: Planned Growth North East Woodend

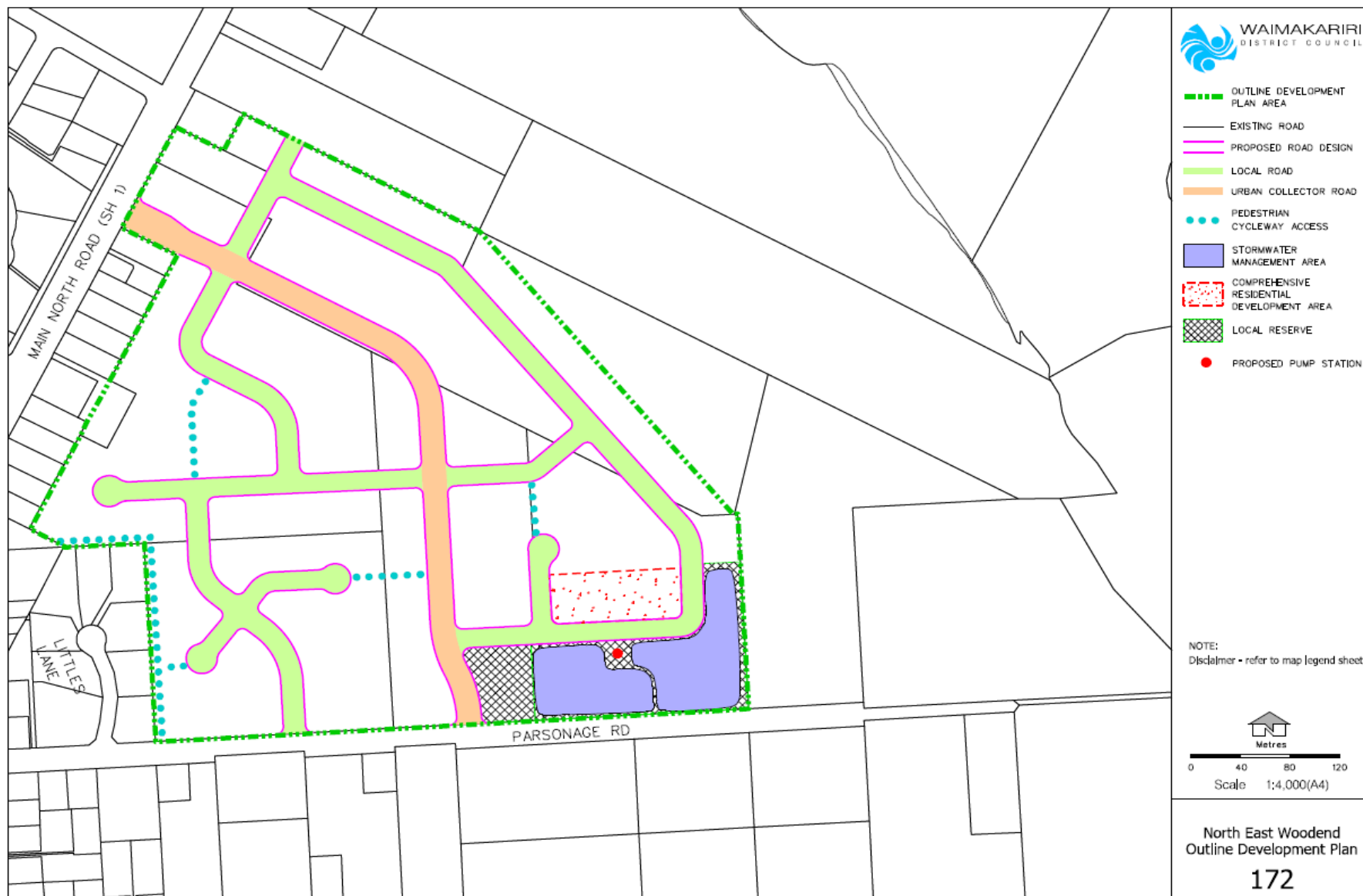


Figure 17: Outline Development Plans: Planned East Woodend

