WAIMAKARIRI
DISTRICT COUNCIL

Activity Management Plan 2021

Tuahiwi Wastewater Scheme

3 Waters | July 2021

Prepared by

Waimakariri District Council

215 High Street,

Private Bag 1005

Rangiora 7440,

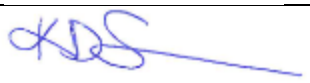
New Zealand

waimakariri.govt.nz

Revision History:

Revision Nº	Description	TRIM	Date
A	Draft for Presentation to U and R Committee	200120006523	18/12/2020
B	Draft for presentation to Council	200120006523	23/02/2021
C	Final for presentation to Council	200120006523	

Document Acceptance

Action	Name		Signed	Date
Prepared by	Gavin Hutchinson	Wastewater Asset Manager		17/01/2021
	Simon Collin	Infrastructure Strategy Manager		15/01/2021
	Chris Bacon	Network Planning Team Leader		17/02/2021
Reviewed by	Kalley Simpson	3 Waters Manager		17/02/2021
Approved by	Gerard Cleary	Manager Utilities and Roading		17/02/2021
Adopted by	Council			

Contents

Tables

Figures

1 Executive Summary

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

Table 1: Key Asset Management Components

Resource Consents	There are no resource consents for the Tuahiwi Wastewater Scheme.
Levels of Service	The scheme is currently meeting all level of service requirements.
Capacity and Performance	The existing reticulation has the design capacity for peak wet weather flow.
	The scheme upgrade that is being undertaken in 2021/22 as part of the Government Stimulus Package is expected to improve I&I and provide capacity for growth.
Asset Condition	The majority of scheme assets are in good condition, with only minor replacements required over the next 20 years, once the current programme of works has been completed.
Risk Assessment	There are no high risks on the scheme as indicated by the Risk Assessment.
Disaster Resilience	The Disaster Resilience Assessment shows the Turiwhaia Road pump station is a moderate risk from lightning and pandemic. Further assessment of this pump station will be required to identify any required resilience improvements.
Growth Projections	Demand over the next 50 years on this scheme is projected to increase by 526%. The current programme o works will provide sufficient capacity to meet this future demand.

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 Tuahiwi wastewater scheme, its condition and performance, and identifies future funding requirements including upgrades where necessary. Note that the scheme situation changed in late 2020 with the availability of the government Covid-19 stimulus grant. Council decided to use part of this funding to upgrade the scheme network, which is expected to both reduce the infiltration and Inflow (I & I) and improve the capacity to cater for possible future growth.

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

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

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

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

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

All figures within this AMP exclude inflation.

3 Related Documents

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

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

4 Scheme Description (What Do We Have?)

The Tuahiwi Wastewater Scheme is part of the Eastern Districts Sewer Scheme. It is a Septic Tank Effluent Pumping (STEP) system. Raw sewage is collected in private on-site septic tanks where it receives primary treatment and screening. The primary treated effluent is pumped to the Tuahiwi Road pump station where it is further pumped to the Woodend reticulation system and treatment plant.

The on-site septic tanks are owned and maintained by the individual property owners. The Council owns and maintains the individual pumps in the septic tanks of existing properties, though new

properties connecting to this scheme are required to own and maintain their own pumps. Any replacement pump required for an existing connection will be transferred into the customer's ownership at the time of the pump replacement.

The Council is responsible for cleaning the sludge out of the septic tanks for all connections on this scheme on a three yearly basis. The common rising mains and pump stations are owned and operated by the Council.

The effluent is treated at the Woodend Wastewater Treatment Plant, and this is covered in the Woodend Wastewater Scheme AMP.

Some key statistics (2019/20 year) of the scheme are shown in Table 2 to 5. The extent of the currently serviced area and comprehensive flow data records are presented in Figure 13 and Figure 14.

A schematic view of the treatment system is presented in Figure 1. Refer to the Overview AMP for a plan of how the Tuahiwi system fits within the overall scheme.

Table 2: Scheme Statistics for 2019/2020

Scheme Parameter	Statistics	Source
Type of Supply	Septic Tank Effluent Pumping System (STEP)	
Treatment	Oxidation ponds (Woodend)	
Length of Reticulation	6.5 km	Wastewater Asset Valuation Tables 8-5 and 8-6, pages 59 to 62
Total Replacement Value	$1,061,013	
Depreciated Replacement Value	$817,410	
Number of Connections	76	2019/20 Rating Query
Number of Rating Charges	98	
Average Daily Flow (5 year average)	22 m^3/day	Flow Data Analysis – Sewer
Average Daily Flow/connection (5 year average)	293 l/day/con	
Peak Daily Flow (5 year average)	67 m^3/day	
Peak Daily Flow/connection (5 year average)	895 l/day/con	

Table 3: Wastewater Pressure Pipe Data Summary

Wastewater Pressure pipe length (m) by diameter and pipe material					
Pipe material	**Pipe Diameter (mm)**				
	50	**100**	**150**	**200**	**Total**
Pe	1,452m	0m	0m	0m	1,452m
Pvc	695m	4,302m	0m	0m	4,997m
Other	14m	0m	0m	0m	14m
Total	**2,161m**	**4,302m**	**0m**	**0m**	**6,463m**

Table 4: Wastewater Valve Data Summary

Wastewater Valves	
Diameter (mm)	**Count**
50	13
100	8
Total	**21**

Table 5: Wastewater Manhole Data summary

Wastewater Manholes	
Diameter (mm)	**Count**
900	4
Total	**4**

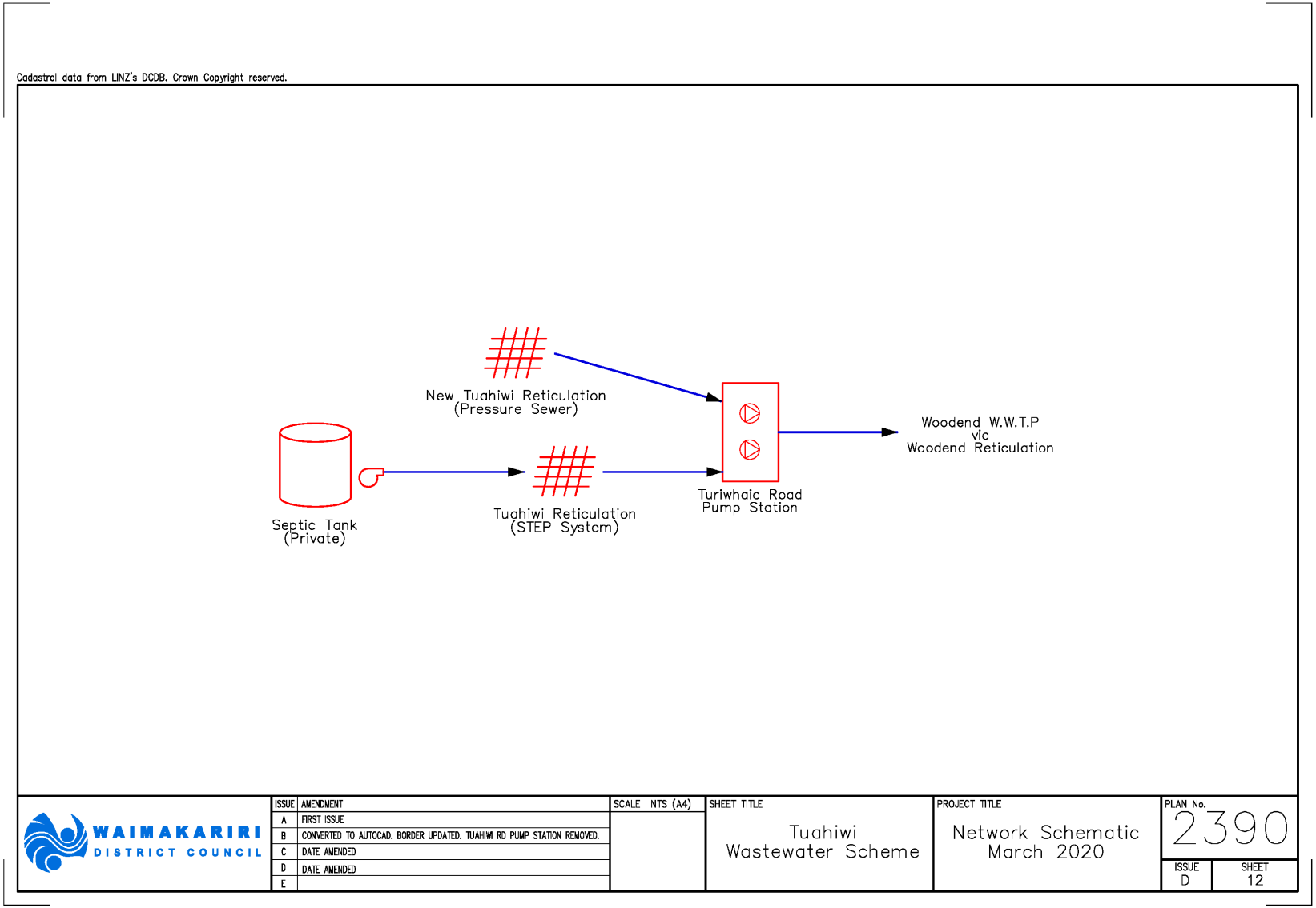
Table 6: Wastewater Manhole Data Summary – Tuahiwi

Wastewater Manholes	
Diameter (mm)	**Count**
900	1
Total	**1**

Table 7: Data References

Data Reference	Trim Reference	Other Ref
Sewer flow data analysis	121108078891	
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 wastewater scheme, these include:

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

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

5.1 Levels Of Service

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

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

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

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

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

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

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

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

Section	Level of Service	2018 – 2021 Performance Measure	2018 – 2021 Target	2020				Previous Results#			
				Result	Commentary	Status	Action to Address	2017	2014	2011	2008
	Overflows - Private Property	Number of recorded overflows on private property found to be the result of (a) blockage in the main (b) Insufficient capacity in the reticulation system for any rainfall up to a 1 in 2 year event, for areas designed prior to 1999. (c) Insufficient capacity in the reticulation system for any rainfall up to a 1 in 5 year event for areas designed after 1999.	Nil per year	Nil	This level of service is met.	Achieved	N/A	Y	Insf. Data	Y	Y

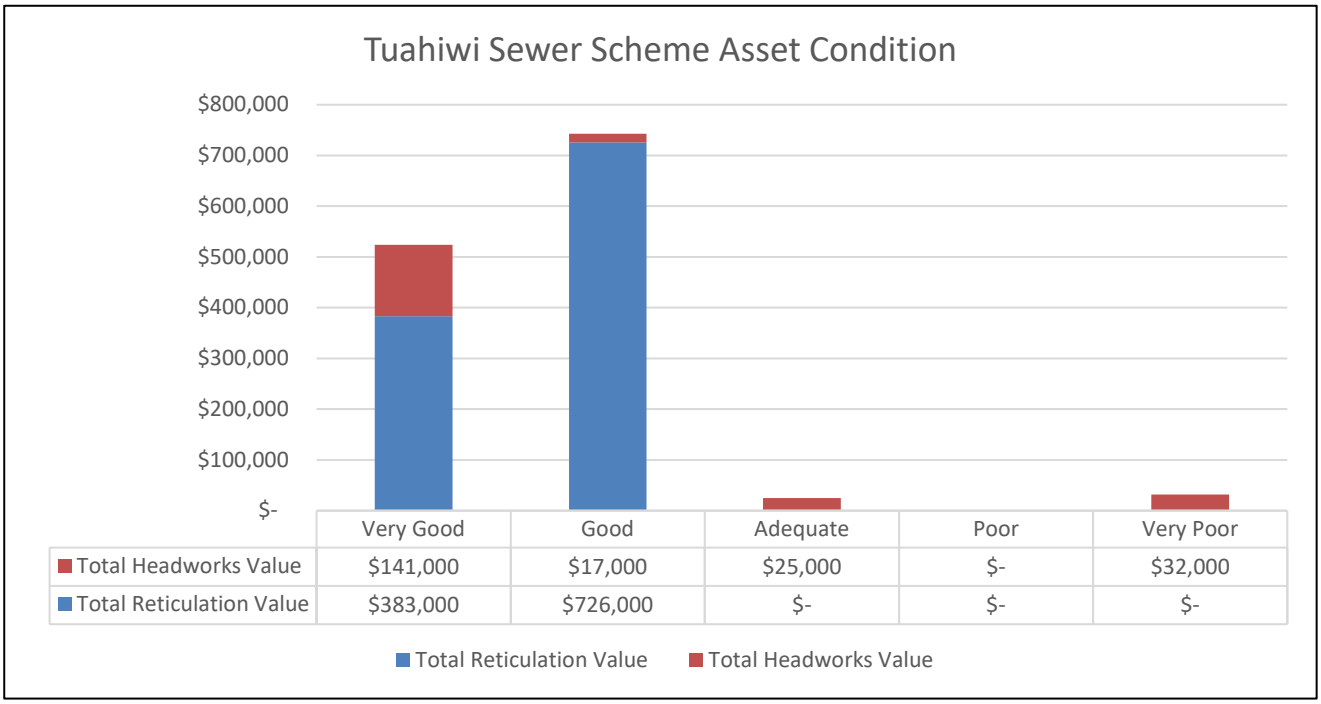
5.2 Asset Condition

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

Figure 2 below, shows the assessed pipe condition for all pipes within the scheme. Figure 3 summarises the theoretical asset condition for both the network and headworks in a graph, while Table 9 provides more detail about the value of the assets within different asset condition categories. All of this information is based on the assets as at the latter half of 2020. The upgrade works will generally improve the asset condition profile of the scheme, and increase the value.

Figure 2: Pipe Condition Assessment Plan

Figure 3: Asset Condition Summary



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

Table 9: Pipe Condition Summary

Condition Grade	Definition	Pipeline Quantity	Total Reticulation Value	Total Headworks Value	Total Value
1	Very Good *More than 80% of life remaining*	2.9 km *45%*	$ 383,000 *35%*	$ 141,000 *66%*	$ 524,000 *40%*
2	Good *Between 50% and 80% of life remaining*	3.5 km *55%*	$ 726,000 *65%*	$ 17,000 *8%*	$ 743,000 *56%*
3	Adequate *Between 20% and 50% of life remaining*	0.0 km *0%*	$ - *0%*	$ 25,000 *12%*	$ 25,000 *2%*
4	Poor *Between 10% and 20% of life remaining*	0.0 km *0%*	$ - *0%*	$ - *0%*	$ - *0%*
5	Very Poor *Less than 10% of life remaining*	0.0 km *0%*	$ - *0%*	$ 32,000 *15%*	$ 32,000 *2%*
Total		**6.5 km**	**$1,109,000**	**$215,000**	**$1,324,000**

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. The Council has developed an assessment process which scores assets from most critical 'AA' to least critical 'C'.

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

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

Figure 4: Pipe and Facilities Criticality

5.4 Risk Assessment

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

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

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

Table 10: Number of Events per Level of Risk

Risk Level	2004	2008	2011	2014
Extreme risks	0	0	0	0
High risks	1	0	0	0
Moderate risks	13	13	9	7
Low risks	2	6	6	8
Not applicable	3	20	24	24
Total	**19**	**39**	**39**	**39**

The table shows there are no high or extreme risks identified on this scheme.

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

5.5 Disaster Resilience Assessment

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

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

Above Ground Facilities

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

Table 11: Risks to Above Ground Facilities

Threat	Turiwhaia Rd PS
475 yr Earthquake Induced Slope Hazard	L
Earthquake (50 yr)	L
150 Yr Earthquake	L
475 Yr Earthquake	L
Wildfire	L
Snow 150 Yr	L
Wind 100 Yr	L
Lightning	M
Pandemic	M
Terrorism / Sabotage	L
E = Extreme, H = High, M = Moderate, L = Low	

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

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

The Councils response to these risks is being managed at a district level via the DRA Action Plan and related projects. Refer to the District level AMPs for details.

5.6 Growth Projections

Situation

There is significant potential for growth of the Tuahiwi community; although until recently there was a low level of growth expected in the Tuahiwi area.

The Maori Reserve 873 Further Information Report (Trim 150304033504), provides land use guidelines to suggest densities, setbacks, and other items related to future development in the Tuahiwi area. Council staff are seeing increased interest in development in the Tuahiwi village area, and a conservative approach to growth projections has been taken, with capacity works planned that will enable considerable growth to occur within this scheme

Population growth

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

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

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

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

Demand

Based on the above projections demand on the Tuahiwi wastewater scheme is expected to increase by 114%, by the end of the 2021-31 Long Term Plan (LTP) period. This projection is based on 86 new dwellings and connections being established from 2019/20 to 2030/31, as identified in the 2020 50 Year Water and Sewer Growth Forecast Report (TRIM reference number 200224024348).

Due to uncertainties, a conservative approach has been taken and the number of connections have been projected to increase by 8 per year for the full 50 year projection period (see Table 12).

Table 12: Growth Projections

Tuahiwi	Rates Strike July 2019	Years 1 - 3	Years 4 - 10	Years 11 - 20	Years 21 - 30	Years 31 - 50
	2019/20	2021/22 to 2023/24	2024/25 to 2030/31	2031/32 to 2040/41	2041-42 to 2050/51	2051/52 to 2070/71
Projected Connections	76	107	162	241	319	476
Projected Rating Units	97	128	183	262	340	497
Projected increase in Connections		41%	114%	217%	320%	526%
Projected Average Dry Weather Flow (m3/day)	36	57	94	147	200	306
Projected Peak Wet Weather Flow (m3/day)	184	290	475	740	1,004	1,534

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

Longer term, connections are projected to increase by 526%. This projection, of 400 new connections, is the same as the projection used for the 2017 AMP.

Average Dry Weather Flow (ADWF) and Peak Wet Weather Flow (PWWF) projections have been based on the assumptions that for future development areas the Engineering Code of Practice (ECOP) ADWF or PWWF per person is added to the existing flow. The assumptions made to calculate the future ADWF were based on the ECOP, with the residential 0.675m3/prop/day and non-residential 0.2m3/Ha/day; and the future PWWF was based on the ECOP, at residential 3.375m3/prop/day and non-residential 1m3/Ha/day.

On average Tuahiwi's existing Inflow/Infiltration level is considered very high resulting in above-average Peak Wet Weather Flow (PWWF). The reason for very high infiltration is that Tuahiwi is in a wet area and the original scheme was retro fitted to existing aged septic tanks. The statistics shown at the end of this AMP do not support this view, but the flow meter is not connected to SCADA, and has to be read manually, and is also not located directly adjacent to the pump station. Data shown is therefore questionable.

Projections

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

Figure 5: Population Projections

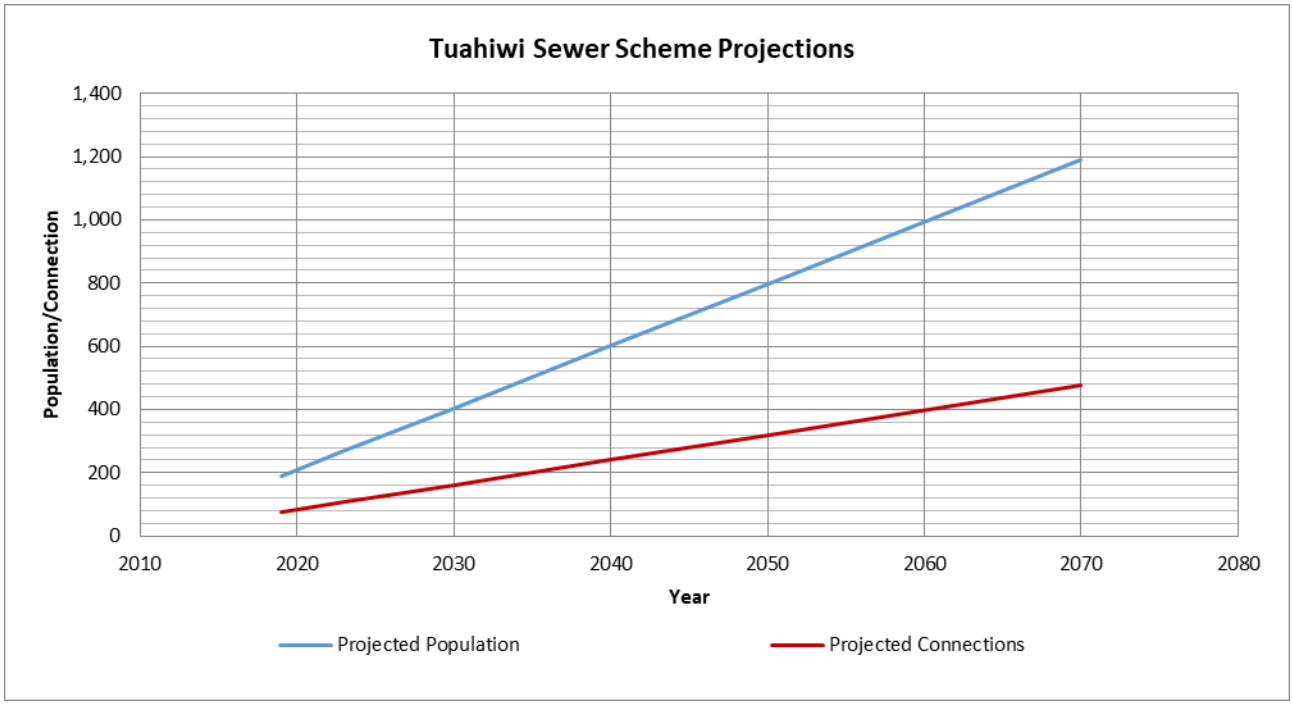
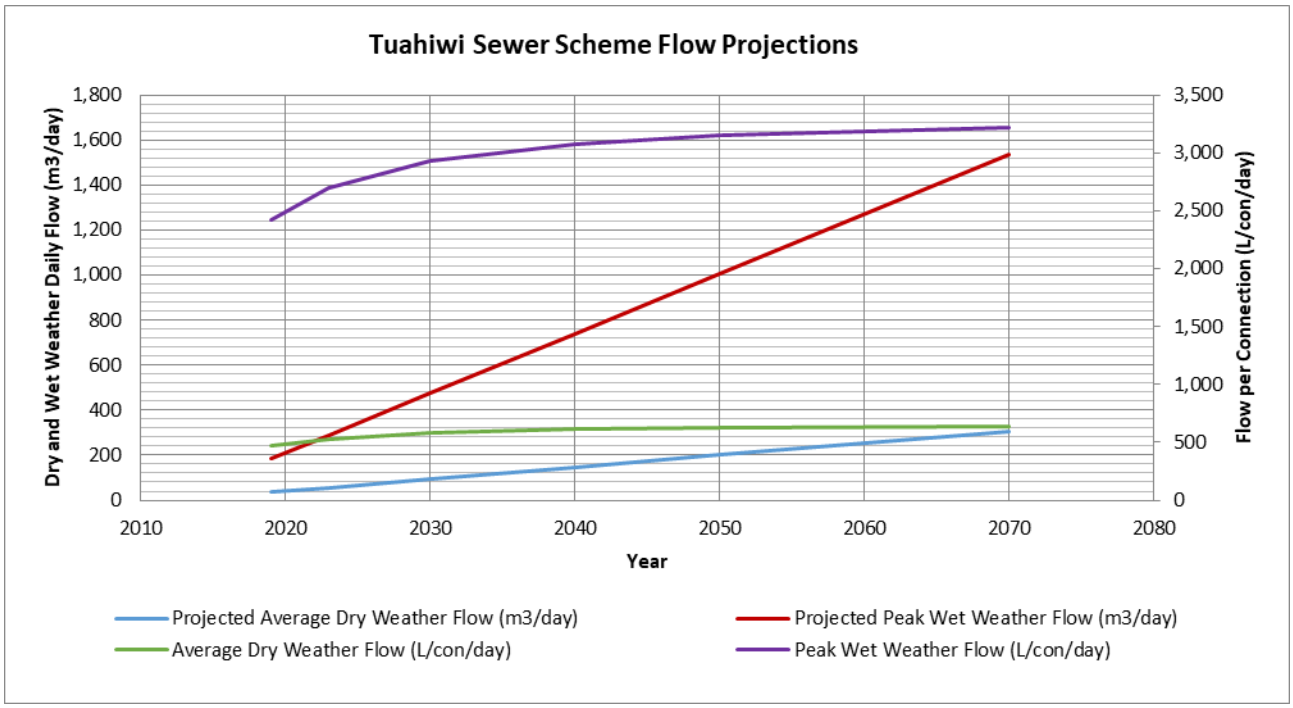


Figure 6: Flow Projections



5.7 Capacity & Performance

This section of the AMP considers the capacity and performance of the Tuahiwi Wastewater Scheme. Treatment is not considered here as wastewater is pumped to the Woodend wastewater treatment plant.

Reticulation System

The capacity of the wastewater reticulation has been assessed using a desktop sewer model evaluation. The model shows that that the existing reticulation system has sufficient capacity to accommodate the existing peak wet weather flow during the 2 year rainfall (target level of service), but this assumes that I and I runs at average levels. However there is virtually no spare capacity for growth.

Although the wastewater reticulation is a closed system, I&I does appear to be a problem in this area. The majority of the houses have retrofitted existing septic tanks with effluent pump stations. Some of the septic tanks are in poor condition and allow the ingress of groundwater. Stormwater drainage is a problem in some areas, which may have encouraged illegal connections from stormwater pipes.

The governments 2020 Covid-19 stimulus package associated with the 3 Waters reform initiative, phase 1 of which Council has agreed to be part of, has provided an opportunity to fund the upgrade of the Tuahiwi network, without overly burdening the rates base which normally funds it. The proposed upgrade works will provide for growth into the foreseeable future and, and reduce the I and I which the system suffers from.

Included in the stimulus programme of work is replacing all of the old private septic tanks with modern polythene tanks and macerator pumps. This may reduce the I and I, although the private gravity systems upstream of the new tanks, may be a continuing source of stormwater.

Ownership of the new chambers and pumps will transferred to, and vested in the homeowner and future maintenance will be their responsibility. Similarly for new properties, the cost of installing the chamber and pump systems, and their maintenance will be borne by the property owner.

Also included in the package of works from the stimulus grant is an extension of two pressure mains, that will enable access to the system for other potential growth areas

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

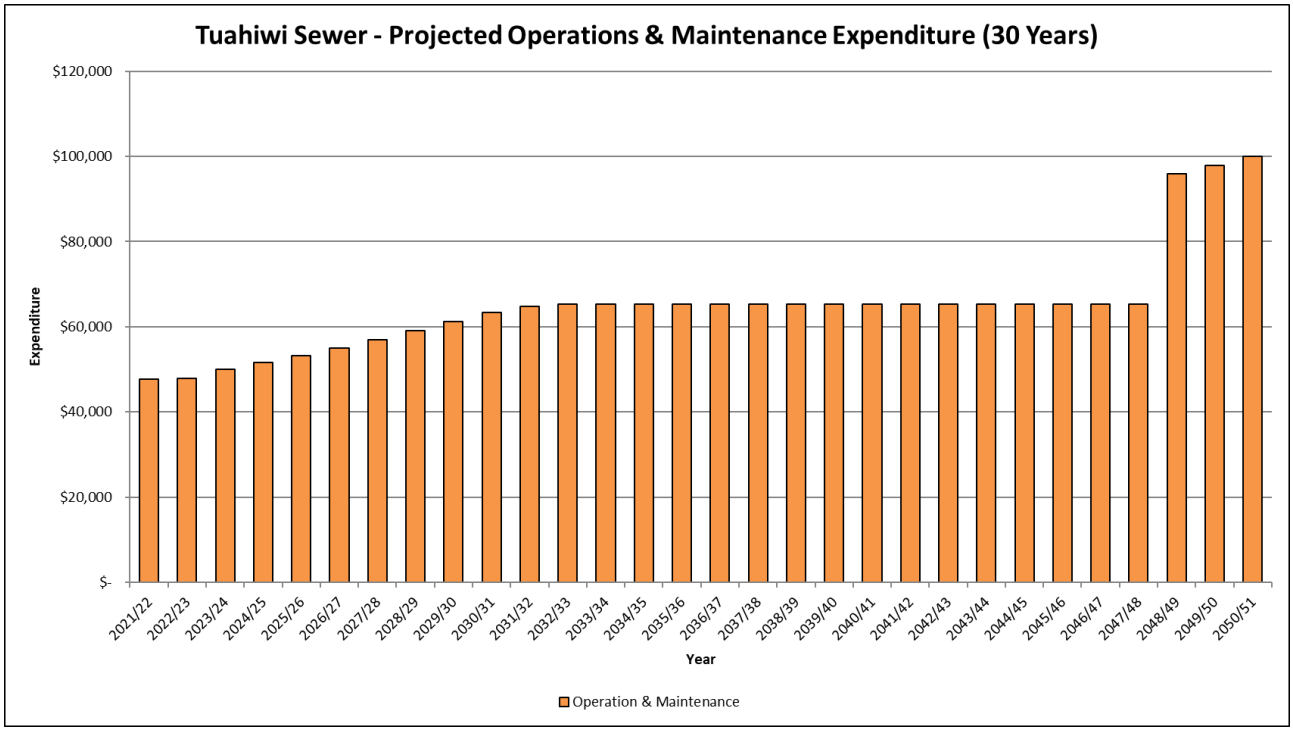
Operation and maintenance (O&M) expenditure incorporates the day to day running of the water supply network and allows the system to carry on functioning to deliver the agreed levels of service.

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

While there are no known deferred maintenance items, it is expected that the recent implementation of an Asset Management Information System (AMIS) will enable improved planned maintenance regimes. For example the new system will allow analysis of repairs that will identify if pipes of a particular type and age, are costing more to maintain than others.

O&M budgets are set based on a combination of past expenditure (for reactive tasks), cost estimates for planned works, and adjustments going forward to account for growth, inflation, depreciation and any significant new works planned. Further detail of this process is provided in the Overview document. The end result of this is shown in Figure 7. With the removal of the old septic tanks the three yearly expenditure spikes that showed in the previous AMP for septic tank cleaning have gone.

Figure 7: Annual 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 both expenditure and the depreciation funding required to ensure that a renewals fund is sufficient to enable future asset renewals, without needing to borrow.

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

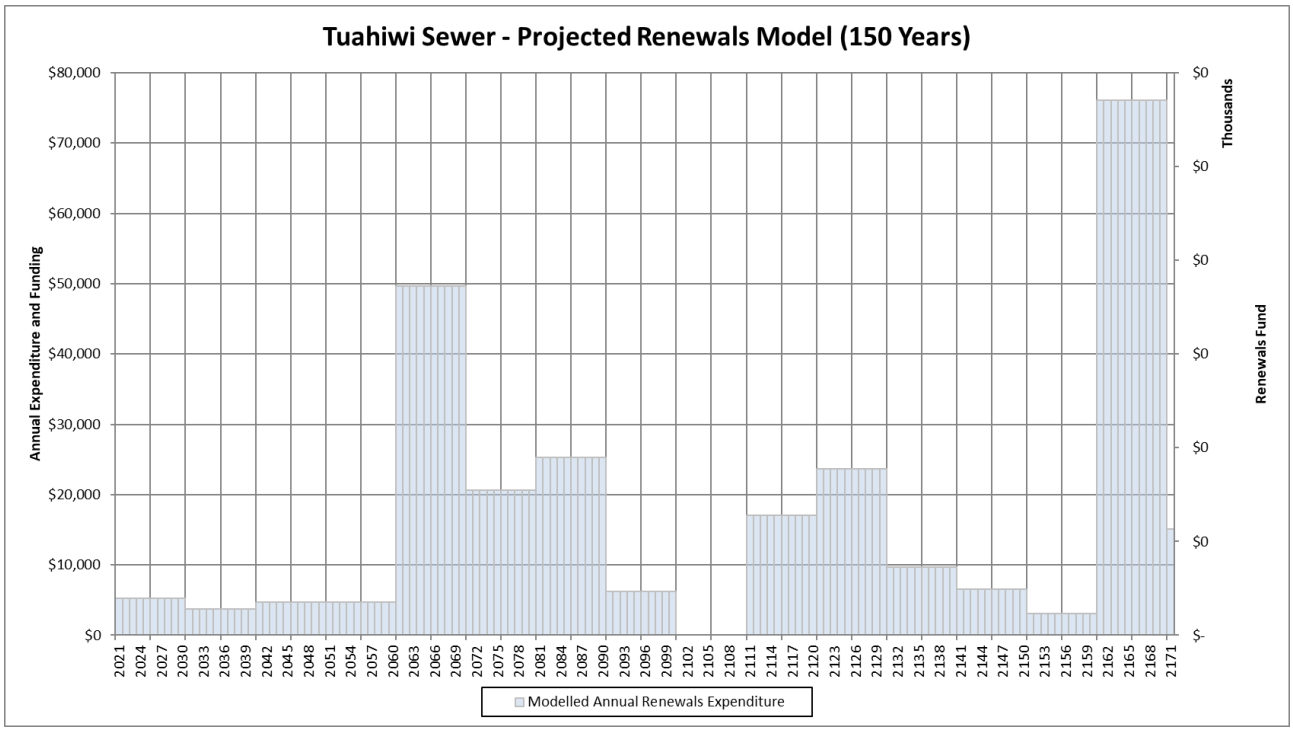
Figure 8 below shows the output from the model only and provides a broad brush spatial view of the likely timeframe for renewals.

Figure 8: Pipe Renewal Time Frames

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

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

Figure 9: Annual Renewals Expenditure, 150 Year Budget



6.3 Capital Works

The following graph shows the 50 year budget for all capital works, including projects driven by growth and levels of service (Figure 10). Renewals expenditure showing in the first ten years of the graph, includes the actual planned programme, not the model output. It does not show projects funded by the Covid-19 stimulus grant. The 2023/24 spike is for the replacement of the rising main delivering Tuahiwi wastewater to the Woodend system

Figure 10: Projected Capital Works Expenditure

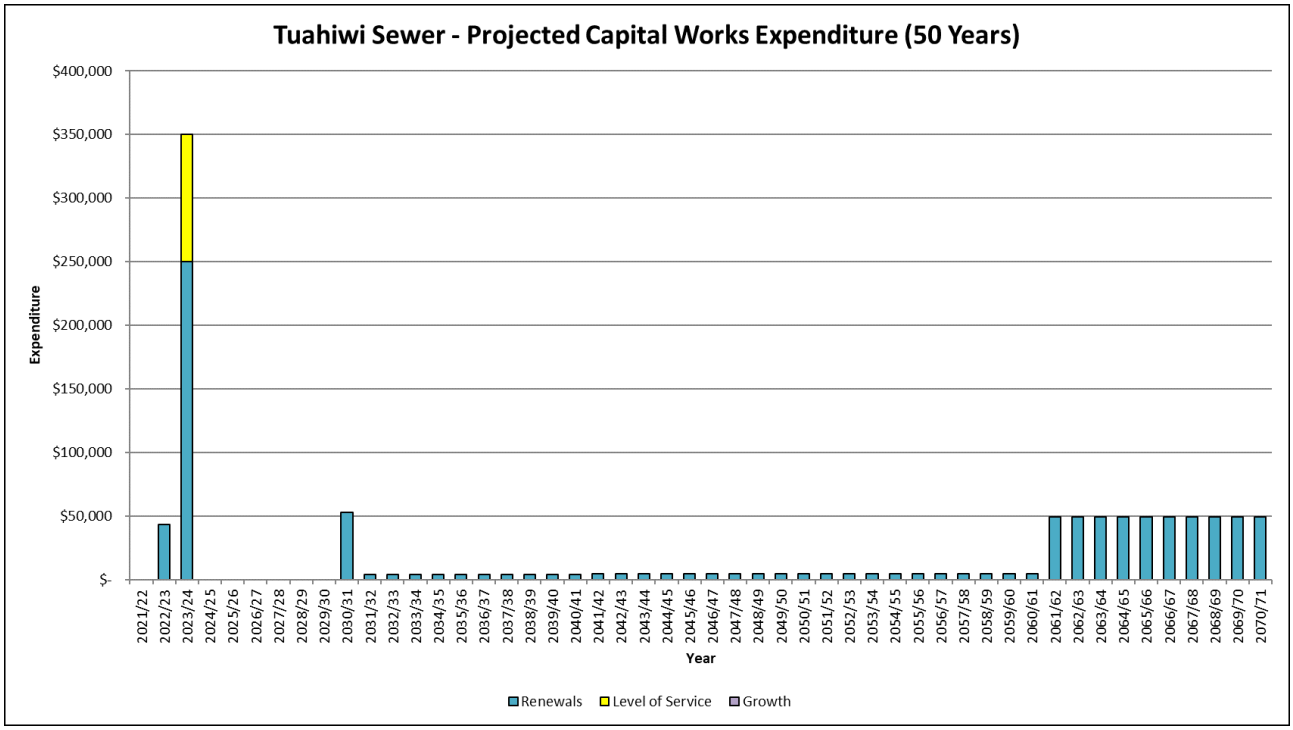


Table 13 on the following page summarises the projected capital works for the next 50 years, including renewals, and including work funded by the stimulus grant. Figure 11 which shows the corresponding location of the projected capital upgrade works, also includes work funded by the stimulus grant.

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

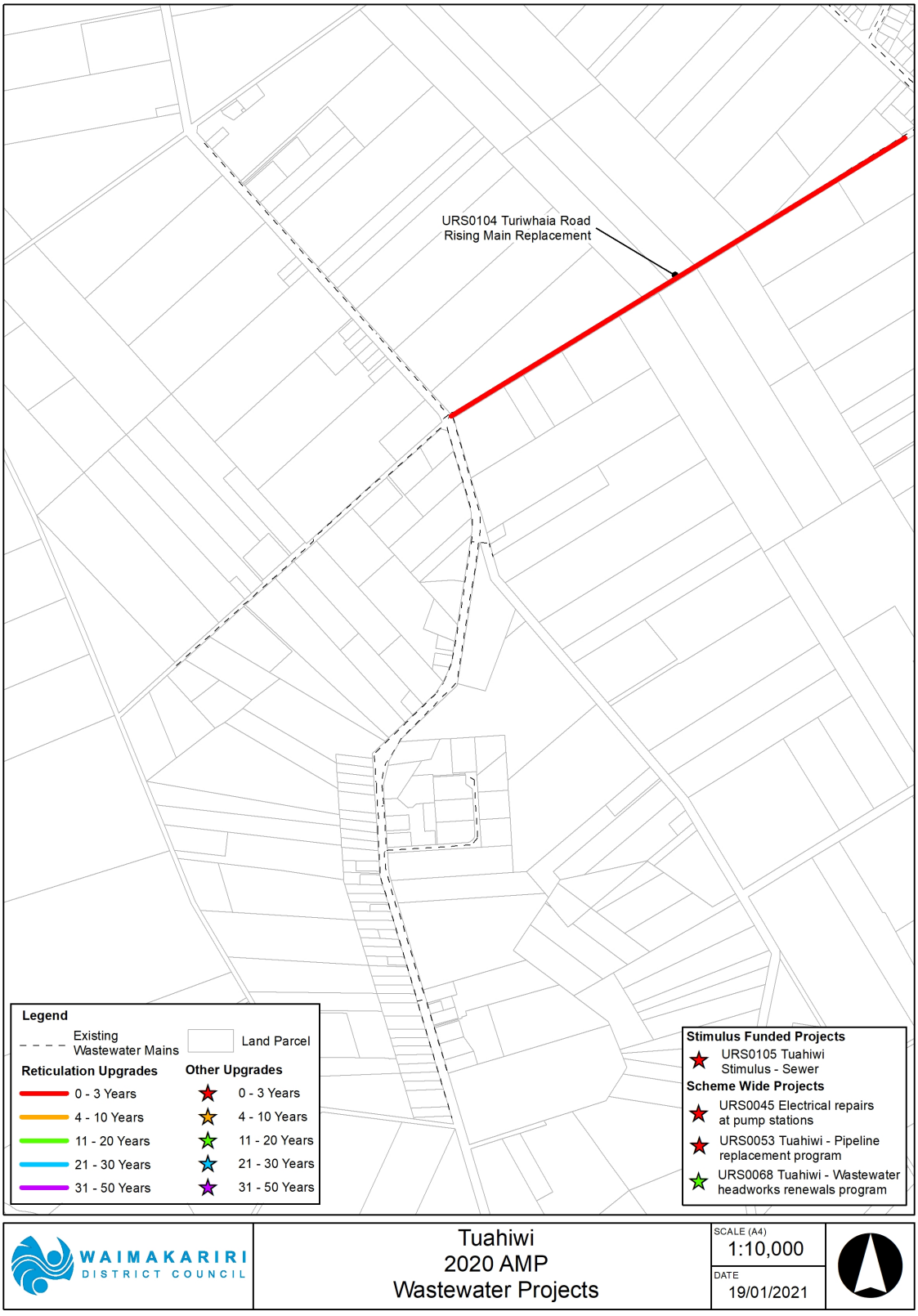
Any programme or project that occurs over a number of years, such as the renewals programme, is only shown within the table for the first year in which it occurs. The Project Value indicates the projected full total cost of the project over the number of years it occurs.

Table 13: Summary of Capital Works (Includes Renewals & Stimulus grant funded work)

Year	Project ID	Project Name	Level of Confidence	Project Value	LOS Component	Renewals Component	Growth Component
Year 1 - 10							
2023	URS0045	Tuahiwi - Electrical repairs at pump stations	7 - High	$ 43,000	$ -	$ 43,000	$ -
2024	URS0053	Tuahiwi - Pipeline replacement program	3 - Low	$ 466,216	$ -	$ 466,216	$ -
2031	URS0068	Tuahiwi - Wastewater headworks renewals program	2 - Very Low	$ 203,425	$ -	$ 203,426	$ -
2024	URS0104	Replacement and upgrade of the Turiwhaia Rd rising main	3 - Low	$ 350,000	$ 100,000	$ 250,000	
2022	URS0105	Central Tuahiwi Sewer Upgrade- stimulus funded	3 - Low	$ 1,042,000	$ 1,042,000		
Grand Total				$ 2,104,642	$ 1,142,000	$ 962,642	$ -

Note: Tuahiwi Wastewater Scheme renewals/replacement items indicates the total renewals programme value for the 50 years

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



6.4 Financial Projections

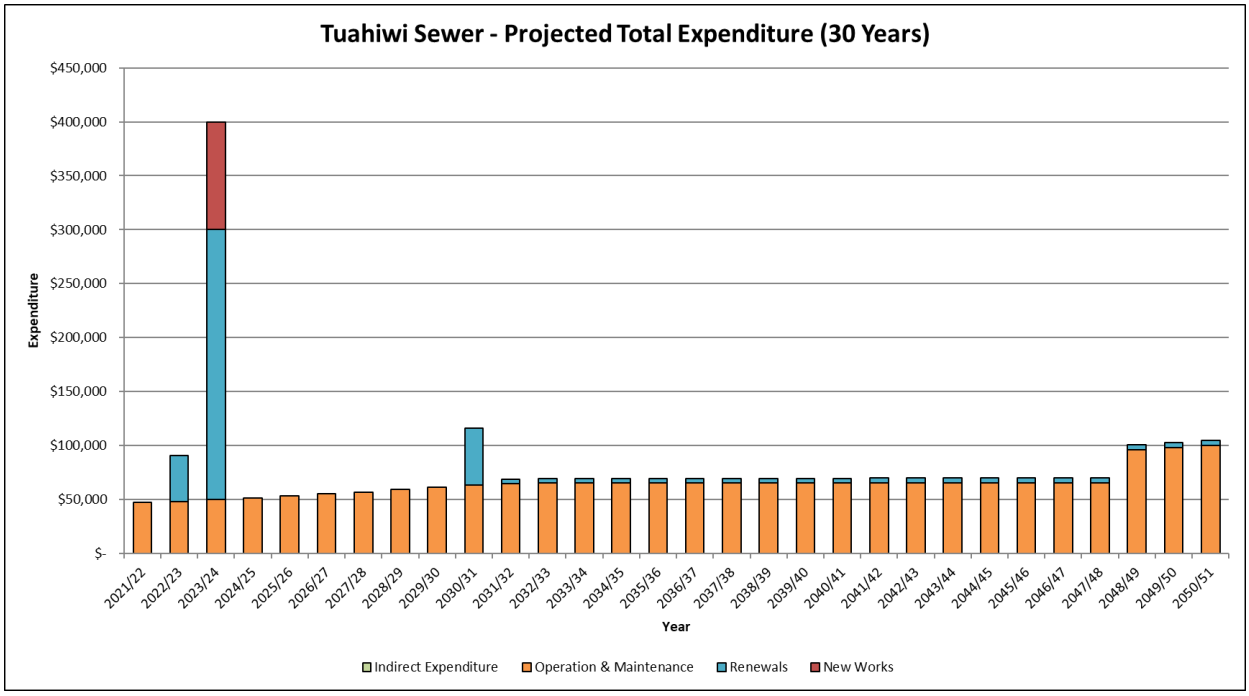
The following graph summarises the breakdown of projected total expenditure over a 30 year time horizon. It includes both operational and capital expenditure, but not capital funded from the stimulus fund. Operational costs include operations and maintenance, but not indirect expenditure.

Indirect expenditure includes interest, rating collection costs, costs associated with maintaining the Asset Register, and other internal overhead costs.

For systems connected to the Eastern District Wastewater Scheme, these costs are aggregated within the Eastern District Scheme budget.

Capital includes expenditure for growth, levels of service, renewals and carry forwards, but excludes projects funded from other than the rating scheme, e.g. stimulus grant.

Figure 12: Projected Expenditure



6.5 Valuation

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

Table 14: Asset Valuation

Asset Type	Unit	Quantity	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Manhole	No.	4	$61,592	$56,624	$493
Valve	No.	22	$60,437	$54,007	$679
Main	m	6,463	$644,850	$506,163	$6,448
Service Line	properties	83	$79,044	$56,505	$790
Facilities			**$215,090**	**$144,111**	**$5,713**
Total			**$1,061,013**	**$817,410**	**$14,123**

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).

An additional source of funding has become available on a one off basis for this AMP, in the form of the governments Covid-19 stimulus package funding.

7 Improvement Plan

7.1 2021 Improvement Plan

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

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

Table 15: 2021 AMP Improvement Plan

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

APPENDIX 'A'. PLANS

Figure 13: A1 - Plan of Serviced Area

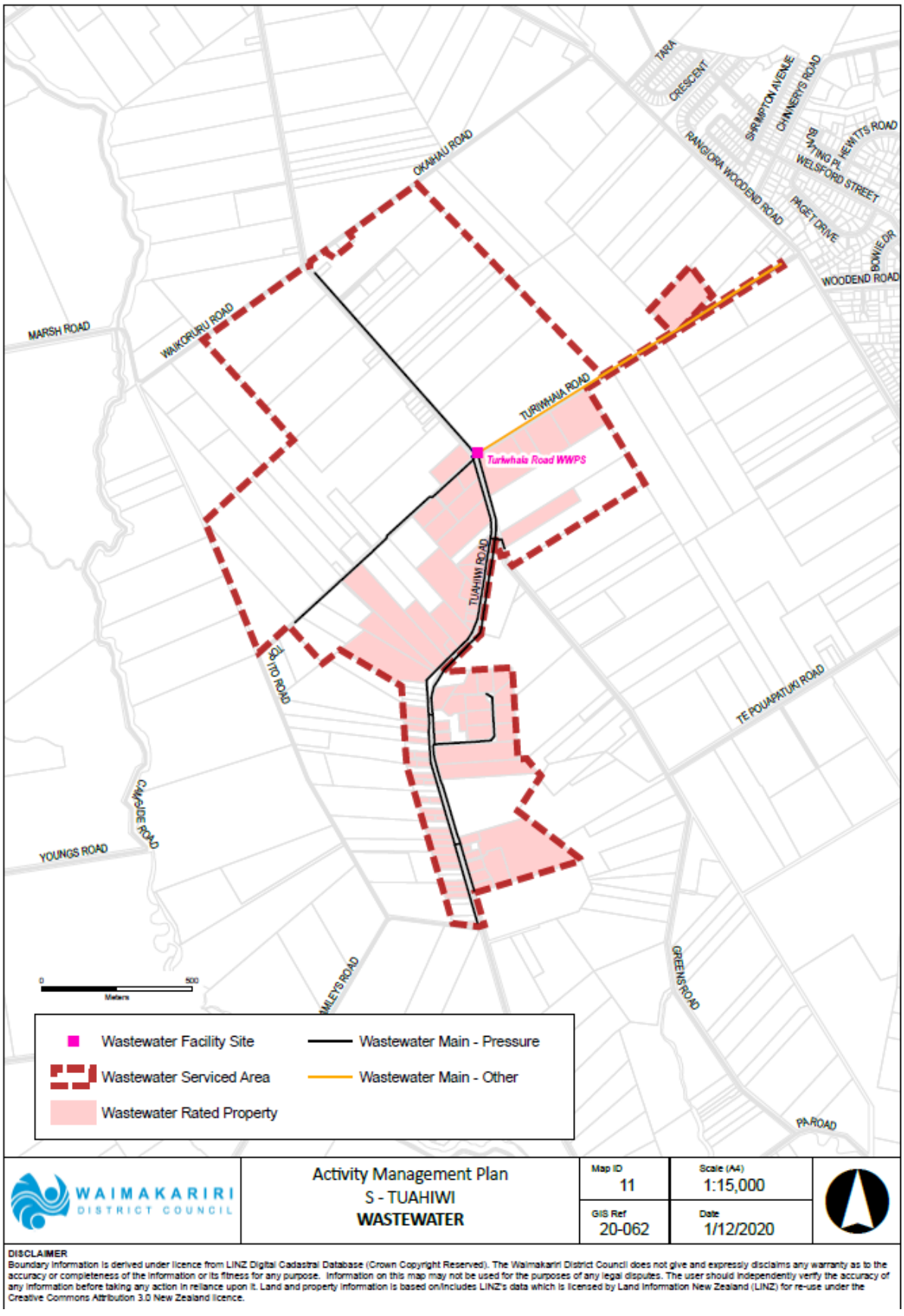


Figure 14: Tuahiwi Wastewater Supply Statistics

Tuahiwi Wastewater Statistics

Tuahiwi | 19/20 | Updated: Jun-20

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

		July '09 - June '10	July '10 - June '11	July '11 - June '12	July '12 - June '13	July '13 - June '14	July '14 - June '15	July '15 - June '16	July '16 - June '17	July '17 - June '18	July '18 - June '19	July '19 - June '20	5 yr Average	10 yr Average
Average Daily Flow	m^3/day	22	44	31	45	68	36	18	21	23	25	-	22	31
Average Dry Weather Flow	m^3/day	20	36	31	41	63	36	19	20	21	18	-	19	29
Peak Daily Flow	m^3/day	35	113	40	109	138	92	39	82	91	58	-	67	76
Peak Weekly Flow	m^3/day	35	113	40	109	138	92	32	82	62	43	-	55	71
Peak Monthly Flow	m^3/day	35	87	36	76	117	71	23	82	40	32	-	44	56
Peak Instantaneous Flow	L/s	-	-	-	-	-	-	-	-	-	-	-	-	-
Peak Month		Jul	Aug	Feb	Aug	Jun	Jul	Feb	Nov	Jun	Sep	Jul		
Peak Week		Week 28	Week 34	Week 44	Week 32	Week 26	Week 28	Week 27	Week 45	Week 25	Week 36	Week 27		
Peak Day		2/07/2009	14/08/2010	22/10/2011	31/07/2012	14/06/2014	1/07/2014	25/06/2016	28/10/2016	15/06/2018	28/12/2018	1/07/2019		
Peak Day Rainfall	mm	0	1.4	7.2	16.9	0	0	0	3.8	0	0.8	0		
Peak Day Weather		Wet	Wet	Wet	Storm	Wet	Dry	Dry	Wet	Wet	Wet	Dry		
Total Annual Volume	m^3	7,901	16,095	11,410	16,550	24,801	13,125	6,742	7,707	7,995	6,427	-	7,218	11,085
Rating Connections		83	84	84	73	75	75	75	75	75	76	76		
Rating Charges		110	110	110	-	96	96	96	96	96	97	98		
Average Daily Flow per Connection	L/con/day	259	522	370	618	901	477	245	280	313	334	-	293	406
Peak Daily Flow per Connection	L/con/day	427	1,350	478	1,498	1,837	1,226	516	1,089	1,208	766	-	895	997
Data Quality		low	low	low	low	low	low	low	low	low	medium	medium		