Tasman District Council

Stormwater

Activity Management Plan

2015 — 2045

July 2015

<table>
<tr><th colspan="3">Quality Assurance Statement</th></tr>
<tr><td rowspan="5">Tasman District Council
189 Queen Street
Private Bag 4
Richmond 7050
Telephone: (03) 543 8400
Fax: (03) 543 9524</td><td>Version:</td><td>Draft – January 2015</td></tr>
<tr><td>Status:</td><td>Draft</td></tr>
<tr><td>Project Manager:</td><td>Dwayne Fletcher</td></tr>
<tr><td>Prepared by:
AMP Author</td><td>
Ian McComb</td></tr>
<tr><td>Approved for issue by:
Engineering Manager</td><td>
Peter Thomson</td></tr>
</table>

For full Quality Assurance Statement, Refer Appendix Z

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1 Activity Description

1.1 What We Do

The stormwater activity encompasses the provision of stormwater collection, reticulation, and discharge systems in Tasman district. The assets used to provide this service include drainage channels, piped reticulation networks, tide gates, detention or ponding areas, inlet structures, discharge structures and quality treatment assets.

The stormwater sumps and road culvert assets are generally owned and managed by Council's transportation activity or by the New Zealand Transport Agency (NZTA), depending upon whether they are located on local roads or state highways. This stormwater activity does not include land drains or river systems, which are covered under the Council's Rivers activity. Nor does it cover stormwater systems in private ownership.

The Council manages its stormwater activities under 15 Urban Drainage Areas (UDAs) and one General District Area. The General District Area covers the entire district outside the UDAs. Typically these systems include small communities with stormwater systems that primarily collect and convey road run-off to suitable discharge points.

A complete description of the assets included in the stormwater activity is in Appendix B.

1.2 Why We Do It

The Council undertakes the stormwater activity to minimise the risk of flooding of buildings and property from surface runoff and small urban streams. By providing a high-quality stormwater network, the Council enables the safe and efficient conveyance and disposal of stormwater from the urban drainage areas, which improves the economic and social well-being of the district by protecting people and property from surface flooding.

The Council has a duty of care to ensure that the effects of any runoff from its own properties is remedied or mitigated. Because most of its property is mainly in the form of impermeable roads in developed areas, this generally means that some level of reticulation system is constructed. The presence of this system means it also becomes the logical network for dealing with private stormwater disposal.

2 Community Outcomes and Our Goal

The Council operates, maintains and improves the stormwater infrastructure assets on behalf of its ratepayers. It undertakes to meet the level of service they require to enhance community well-being by reducing the risk of flooding of buildings and property from surface runoff.

The community outcomes that the stormwater activity contributes to most are shown in Table 2-1.

Table 2-1: Community Outcomes

Community Outcomes	How Our Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	Stormwater arising within urban development areas is controlled, collected, conveyed and discharged safely to the receiving environment. This activity can be managed so the impact of the discharges does not adversely effect the health and cleanliness of the receiving environment.
Our urban and rural environments	The stormwater activity ensures our built urban and rural

are people-friendly, well-planned and sustainably managed.	environments are functional, pleasant and safe by ensuring stormwater is conveyed without putting the public at risk or damaging property, businesses or essential infrastructure.
Our infrastructure is efficient, cost effective and meets current and future needs.	The stormwater activity is considered an essential service that should be provided to all properties within urban drainage areas in sufficient size and capacity. This service should also be efficient and sustainably managed.
Our communities are healthy, safe, inclusive and resilient.	The stormwater activity provides for the transfer of runoff through urban areas to minimise risk to life and propoerty damage.
Our communities have opportunities to celebrate and explore their heritage, identity and creativity.	The stormwater activity incorporates natural waterways that have extensive areas of high cultural, recreational and biodiversity.
Our communities have access to a range of social, educational and recreational facilities and activities.	The stormwater activity provides for runoff management to minimise disruption of access to community facilities due to storm events.
Our Council provides leadership and fosters partnerships, a regional perspective and community engagement.	The stormwater activity provides for runoff management across the territorial boundary with Nelson City. Schools, Iwi and other groups are engaged with the natural waterways elements of the network.
Our region is supported by an innovative and sustainable economy.	The stormwater activity underpins the economy by minimising risk and damage from flooding. Allowance for climate change in design provides for future sustainability.

2.1 Our Goal

The Council aims to achieve an acceptable level of flood protection in each UDA and the remaining General District stormwater area.

3 Key Issues for the Stormwater Activity

The most important issues relating to the stormwater activity are shown below in Table 3-1.

Table 3-1: Key Issues for the Stormwater Activity

Key Issue	Discussion
Damage to stormwater assets from storms and heavy rainfall events.	In December 2010, December 2011 and April 2013 the Tasman district experienced extremely heavy rainfall which led to flooding, slips and debris flows resulting in damage to Council infrastructure and private property. This was particularly destructive in Murchison and Golden Bay in 2010, Golden Bay in 2011, and Richmond in 2013. These events depleted the Council's disaster funds and more provison for future events has been included in this AMP. Final repairs \ from these events are also amognst the projects.
Catchment management	The Council plans to undertake Catchment Management Plans (CMPs) to better manage and mitigate the impacts of stormwater discharges on receiving

planning is needed.	environments. This planning work needs to involve the regulatory part of Council which controls discharges into the environment, and engineering staff responsible for managing stormwater infrastructure. Hydraulic modelling and identification and protection of significant assets and secondary flow paths are key components of the CMPs.
Stormwater policy.	There is a lack of policy regarding the management of stormwater systems. For example the ownership and maintenance of key waterways and the responsibility for stormwater from private land and from state highways managed by the New Zealand Transport Agency. The Council's Project Stormwater will be addressing these issues.
Meeting growth needs.	There are a number of projects planned that are driven fully or partially by the need to cater for future growth. The Council applies development contributions to these projects so that developers meet the cost of the growth component of projects rather than ratepayers. The cost of development contributions can act as a disincentive for growth.
Land purchase needed.	In order to undertake some of the stormwater capital works planned over the 10 years, the Council will need to purchase large amounts of land. The cost of this land is reasonably significant and in some cases is controversial as owners do not wish to sell. The wider use of designations and Public Works Act provisions may be necessary.

4 Operations, Maintenance and Renewals Strategy

4.1 Operations and Maintenance

The day-to-day operational, inspection and maintenance of the stormwater systems is carried out by Downer NZ Ltd under the maintenance contract C688. This maintenance contract is managed and administered by the Council with MWH New Zealand Ltd acting at the Engineer to the Contract. The contract will end on 30 June 2017.

The contract is primarily based on a comprehensive schedule of rates and a combination of lump sum payments. This provides all parties involved with a vested interest in optimising both pro-active and reactive maintenance requirements.

Some of the key aspects of this contract are:

- Performance-based;
- emphasis on proactive maintenance;
- programme management;
- quality management;
- detailed schedule of works;
- measurement of performance;
- team approach to problem solving.

Operation and maintenance is discussed in detail in Appendix E.

4.2 Renewals

Renewal expenditure is major work that does not increase asset design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is new works expenditure.

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

The renewal programme has been developed by the following.

- Taking asset age and remaining life predictions from the valuation data in Confirm, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs.
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures through the Customer Services System, the GPS locating of pipe breaks, blockages and over land flows, and contract reporting structures.
- Undertaking a review to identify opportunities for bundling projects across assets, optimised replacement, timing across assets – especially between pipe upgrades and roading works, and smoothing of expenditure.

The renewal programme is reviewed in detail at each Activity Management Plan (ie. three yearly), and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

Renewals are discussed in detail in Appendix I.

5 Effects of Growth, Demand and sustainability

5.1 Population Growth

A comprehensive Growth Demand and Supply Model (GDSM or growth model) has been developed for Tasman district. The growth model is a long term planning tool, providing population and economic projections district wide. The population projections in the growth model have been taken from Statistics New Zealand population projections derived from the 2013 census data, using a "medium" growth rate projection for all settlement areas (see below).

The supply potential is assessed as well as demand, and a development rollout for each settlement is then examined. The ultimate outputs of the GDSM include a projection of the district's population, and forecast of where and when new dwellings and business buildings will be built and a forecast of the number of new stormwater connections. The development rollout from the Growth Model informs capital budgets (new growth causes a demand for network services) which feed into the AMPs and in turn underpin the Long Term Plan and supporting policies eg, Development Contributions Policy. The 2014 growth model is a fourth generation growth model with previous versions being completed in 2005, 2008 and 2011. The Growth Demand and Supply Model is described in brief in Appendix F and in more detail in a separate model description report.

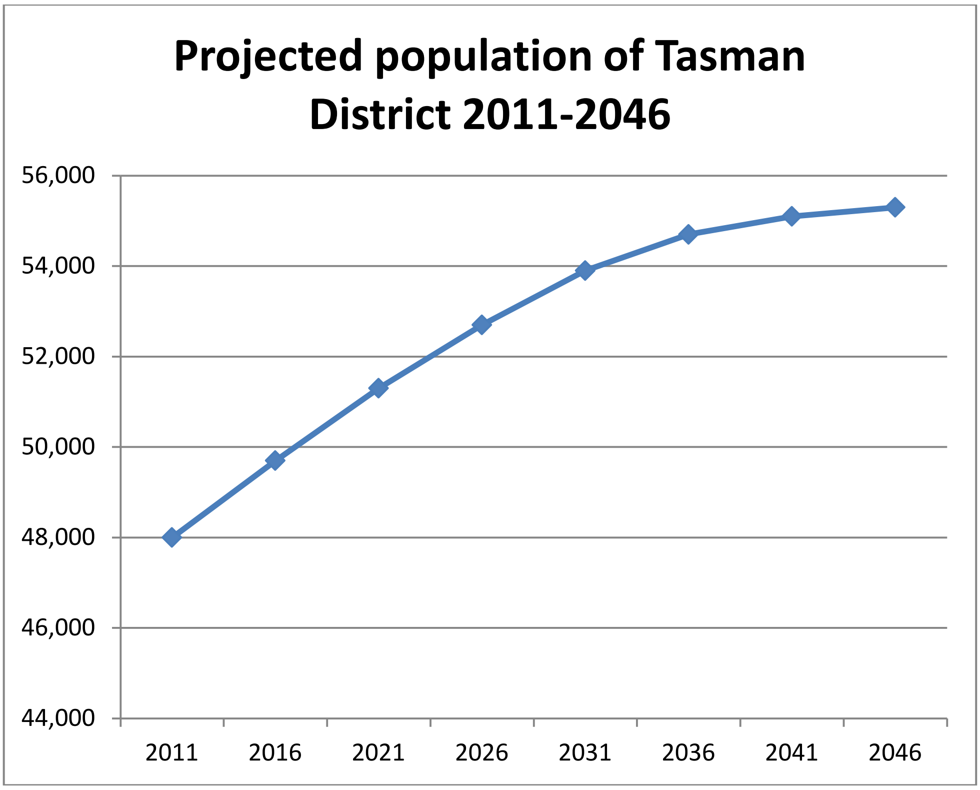


Figure 5-1: Projected Population Growth for Tasman District

5.2 Sustainability

The Local Government Act 2002 requires local authorities to take a sustainable development approach while conducting its business, taking into account the current and future needs of communities for good-quality local infrastructure, and the efficient and effective delivery of services.

Sustainable development is a fundamental philosophy that is embraced in Council's Vision, Mission and Objectives, and is reflected in Council's community outcomes. The levels of service and the performance measures that flow from these inherently incorporate the achievement of sustainable outcomes.

Many of the Council's cross-organisational initiatives are shaped around the community well-being (economic, social, cultural and environmental) and take into consideration the well-being of future generations. This is demonstrated in:

- the Council's Integrated Risk Management approach which analyses risks and particularly risk consequences in terms of community well-being;
- the Council's Growth Demand and Supply Model which seeks to forecast how and where urban growth should occur taking into account opportunities and risks associated with community well-being;
- the Council adopting a 30 year forecast in the Activity Management Plans and the 30 year plus Infrastructure Strategy, to ensure the long term financial implications of decisions made now are considered;
- the adoption of a Strategic Challenges framework and work programme that includes consideration of natural hazards, financial sustainability and growth in the district.

At the activity level, a sustainable development approach is demonstrated by the following.

- catchment management within the Urban Drainage Areas;
- taking climate change into consideration in hydraulic modelling and design standards;

- consideration of low impact design where appropriate; and
- planning for future drainage before growth occurs.

6 Changes Made to Activity or Service

Table 6-1 summarises the key changes for the management of the stormwater activity since the 2012 Activity Management Plan.

Table 6-1: Key Changes

Key Change	Reason for Change
Moving towards obtaining Resource Consents for stormwater discharges.	The Council has a legal obligation to obtain resource consents for their stormwater discharges. The Council is looking to seek consents in conjunction with a catchment management approach to stormwater through the life of this AMP.
Level of service changes	The Council has adjusted its level of service statements to: • reflect the Council's inability to fully control stormwater; • focus its efforts on flooding that impacts building floor areas; • incorporate the new National Reporting measures.

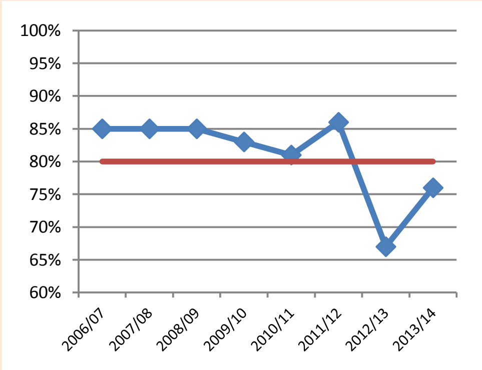
7 Level of service and performance measures

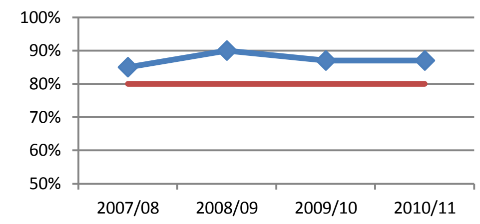
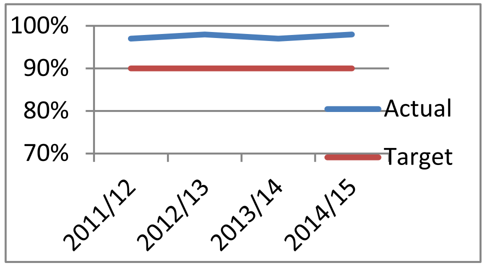
Table 7-1 summarises the levels of service and performance measures for the stormwater activity. Development of the levels of service is discussed in detail in Appendix R. The shaded rows indicate those Levels of Service and performance measures which are included in the Long Term Plan (LTP). The current performance values are based on the 2013/14 year.

Table 7-1: Levels of Service

ID	Levels of Service (we provide)	Performance measure (We will know we are meeting the level of service if…)	Current Performance	Future Performance Year 1 2015/16	Future Performance Year 2 2016/17	Future Performance Year 3 2017/18	Future Performance (targets) in Year 10 2024/25
Community Outcome: Our unique natural environment is healthy and protected.							
1	**Our stormwater systems do not adversely affect or degrade the receiving environment.**	Council has resource consents in place for each of the 15 stormwater UDAs. Resource consents are held in Council's Confirm database.	**Actual** = 0 Resource consents will be obtained in conjunction with catchment management plans for each UDA.	1 of 15 Richmond	2/15 Motueka	4/15 Takaka & Mapua	15/15
2		Compliance with resource consents is achieved, as measured by the number of; • abatement notices • infringement notices • enforcement orders, or • convictions issued. (Mandatory measure 2)	**Actual = NA** (New measure, data will be recorded in NCS).	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
3	**We have adequate knowledge of our stormwater systems capacity and usage to facilitate improvement**	The number of Urban Drainage Areas that have Catchment Management Plans meets the target.	**Actual = 0** A draft plan exists for Richmond and this is be finalised to be the template for the other settlements. The AMP will record progress on completing plans.	1 of 15	2	4	All 15
4		The number of flooding events that occur (per year) is less is less than the target. As measured through complaints recorded in the Confirm database. (Mandatory measure 1)	**Actual = NA** (New measure, data will be recorded in Confirm)	<20	<20	<20	<20
5		Number of habitable floors affected in each flood event for each 1000 properties connected to the stormwater system is less than the target. As measured through complaints recorded in the Confirm database.	Actual = NA (New measure, data will be recorded in Confirm)	<5	<5	<5	<5

		(Mandatory measure 1)					

ID	Levels of Service (we provide)	**Performance measure** (We will know we are meeting the level of service if…)	Current Performance	Future Performance			Future Performance (targets) in Year 10
				Year 1	Year 2	Year 1	
				2015/16	2016/17	2015/16	2024/25
Community Outcome: Our stormwater and essential services are sufficient, efficient and sustainably managed							
6	**Our stormwater activities are managed at a level which satisfies the community.**	% of customers satisfied with the stormwater service. As measured through the annual resident survey.	**Actual = 76%.** The annual residents' survey was undertaken in May/June 2014 and 76% of receivers of the service were found to be satisfied with the service they received. This is the second year below the 80% target value. 	80%	80%	80%	80%
7		Complaints per 1000 connections are less than the target - as recorded through Council's Confirm database (Mandatory measure 4)	**Actual = NA** (New measure, data will be recorded in Confirm)	<20	<20	<20	<20

ID	Levels of Service (we provide)	Performance measure (We will know we are meeting the level of service if …)	Current Performance	Future Performance Year 1 2015/16	Future Performance Year 2 2016/17	Future Performance Year 1 2015/16	Future Performance (targets) in Year 10 2024/25
8	**We have measures in place to respond to and reduce flood damage to property and risk to the community within stormwater UDAs.**	The median response time to attend a flooding event, is less than the target (3 hours). - as recorded through Council's Confirm database (Mandatory measure 3)	**Actual = NA** (New measure, data will be recorded in Confirm)	<3 hours	<3 hours	<3 hours	<3 hours
9		All open drains are maintained in a flood ready state As measured through audits undertaken by the Engineer.	**Actual = 88%** 	80%	80%	80%	80%
10		Critical stormwater assets are maintained in a flood ready state and checked prior to any event in which weather warnings are notified. As recorded through audits carried out by the Contract Engineer.	**Actual = Critical assets are identified and assessed for Risk.** Where mitigations measures are required, they have been included for action in the AMP.	100%	100%	100%	100%
11		% of faults responded to within contract timeframes (e.g. priority = clear obstructions in stormwater system in one working day) - as recorded through Council's Confirm database.	**Actual = 98%** in 2013/14. The operations and maintenance contractor is required to meet a target of 90% of faults to be responded to and fixed within specified timeframes. This is monitored through contract 688. 	>90%	>90%	>90%	>90%

8 Key Projects

Table 8-1 details the key capital and renewal work programmed for years 2015 to 2025. A full list of capital and renewal projects for the 30 year period is included in Appendix F and I respectively.

Table 8-1: Significant Projects

Project ID	Project Name	Description	Year 1 ($)	Year 2 ($)	Year 3 ($)	Years 4 to 10	Project Driver[1]
160002	Brightwater - Mt Heslington Drain Diversion.	Improve Railway Diversion drain plus new Mt Heslington Stream diversion. Rintoul Place, block off 375mm culvert and ditch along SH to drain towards the stock yard.				2,235,534	G/LoS
160008 160066 160069	Mapua – Langford Drive, Pomona Road/Stafford Drive, Crusader Drive	Upgrading works to reduce localised flooding.				718,665	G/LoS
160009	Pinehill Heights	Upgrading works to reduce localised flooding.				386,438	G/LoS
160014	Motueka - new development areas.	Network upgrade to accommodate new development and upgrade existing system from the area north of King Edward Street and connecting to the Woodland Drain.				2,767,184	G/LoS
160021	Pohara main settlement	Upgrade culverts Boyle Street, Ellis Creek Abel Tasman Drive and channels to manage flood and repair flood damage 2011-2014.	900,000				G/LoS
160025	Lower Borcks Creek Catchment Works - SH6 to outlet including land,	Borcks Creek catchment works.	1,000,000	1,000,000	1,000,000	5,000,000	G/LoS
160030	Richmond - Hill Street.	New stormwater system from Kingsley Place to Hill Street and along to Angelus Avenue.				1,349,293	G/LoS

[1] R = Renewal, LoS = Levels of Service, G = Growth

Project ID	Project Name	Description	Year 1 ($)	Year 2 ($)	Year 3 ($)	Years 4 to 10	Project Driver[1]
160032	Richmond - Middlebank Drive.	Installation of stormwater pipe from Gladstone Road to Olympus Way to Middlebank Drive.			1,200,000	2,836,851	G/LoS
160033	Oxford Street CBD.	Partial upgrade option linked to road upgrade.				2,754,924	G/LoS
160034	Richmond - Park Drive.	Increase capacity through Ridings Grove. Duplicate line in walkway reserve and upgrade Hill Street crossing to Q50.	106,178	955,603			G/LoS
160035	Poutama Drain Link	New box culvert to divert stormwater from Waverly Street/Gladstone Road to Poutama Drain.			100,000	1,800,000	G/LoS
160036	Richmond - Queen Street.	Intercept flows upstream junction Salisbury Road and provide additional hydraulic capacity	100,000	2,113,912			G/LoS
160048	Takaka - Commercial Street Upgrade.	New stormwater pipes from Reilly Street to Te Kakau stream at Rose Road				500,000	LoS
160076	Richmond - Salisbury Road Upgrade.	Extend network to William Street.				640,476	G/LoS
160077	Richmond - Ranzau Road/Paton Road/White Road.	Upgrade to White Road and Ranzau Road at Paton Road intersection.	841,439				G/LoS
160169	Beach Road Drain.	Bridge replacement and safety barriers				700,000	G/LoS
160221	Secondary Flow Management Initiatives.	District-wide as derived from the CMPs	50,000	100,000	150,000	1,400,000	G/LoS
160223	Deviation Bund Drainage.	Bird Street and Arbor-Lea Avenue			900,000		G/LoS
160224	Washbourn Drive secondary flow path.	Box culvert under road to address lack of capacity		725,000			G/LoS
160142	Motueka drainage improvements.	Poole, Jocelyn, Wilkie and Fry Streets pipe extension to drain low points.			45,000	405,000	G/LoS

Project ID	Project Name	Description	Year 1 ($)	Year 2 ($)	Year 3 ($)	Years 4 to 10	Project Driver[1]
160073	Queen St Salisbury Road Intersection improvements.	Driven by intersection changes.		432,004			G/LoS
160083	Seaton Valley Stream - Stage 2.	Stream widening at Clinton-Baker.				377,580	G/LoS
160012	Motueka Flap Gates.	Refurbish flap gates.			12,205	107,415	R
160172	Quality Improvement Programme.	Quality improvements as identified in the CMPs except Richmond.				350,000	LoS

Note:

1. See Appendix F for a full detailed list of new capital works projects driven by growth (G), renewals (R) and or an increase in level of service (LoS).
2. See Appendix I for a full detailed list of renewal projects.

9 Management of the Activity

9.1 Strategic Management

The strategic approach to the management of the coastal structures activity is diagrammatically presented below in Figure 9-1.

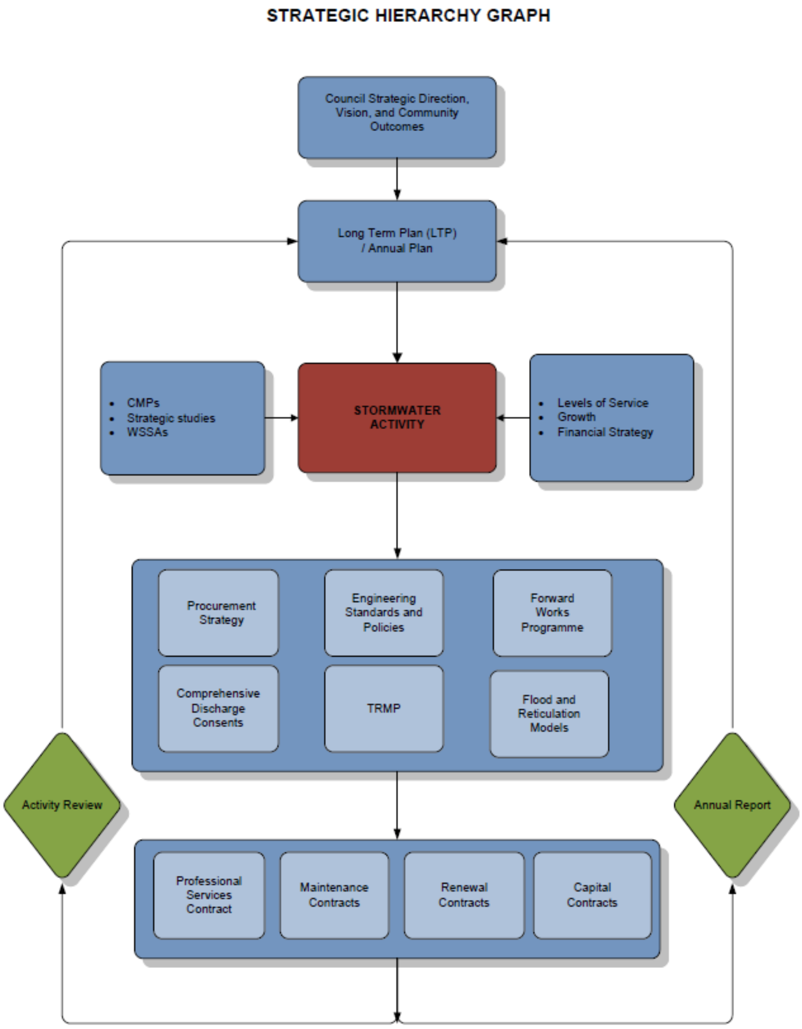


Figure 9-1 Management Strategic Context

9.2 Service Delivery Review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services, and performance of regulatory functions at least every six years.

The Council engaged Morrison Low to review its delivery of services provided by its Engineering Department in 2012. The review recommended a re-organisation of the department to reduce the proportion of asset management services that were provided by external consultants. The re-organisation was implemented during 2013 and has provided cost savings to the Council, an increase in asset knowledge, and greater interaction with customers.

In addition to this review, the Council reviews how it procures and delivers its stormwater services at the time of renewing individual maintenance and renewal contracts. These reviews include consideration of the maintenance specification, how work is packaged together e.g. the size and shape of contact areas. For example, the current operation and maintenance contract for the three water assets expires on 30 June 2017. Prior to tendering for a replacement contract the Council will go through a process to determine:

- which assets to include;
- whether a single or multiple contracts is appropriate;
- the most suitable contract model, performance based, prescriptive, or other;
- which conditions of contract to use;
- what is the most suitable contract term.

The Council is also aware of other opportunities to maximise efficient delivery of services, for example combined contracts or partnerships with Nelson City Council.

9.3 Demand Management

Project Stormwater is a cross-council project incorporating Engineering, Planning, and Environmental Science.

Project Stormwater is focused on improving the Council's management of stormwater to achieve better stormwater values, including quality, quantity and ecological aspects. It covers many departments, affects multiple council processes and represents a fundamental change to the Council's philosophy regarding stormwater and associated land and activity management.

The scope of the project includes a low impact philosophy and to include various aspects of land and activity management, for example, subdivision development, that impact either directly or indirectly on stormwater values. A key goal for the project is an increasing uptake of low impact approaches and successful design and implementation of these developments amongst local developers. This will have a positive impact on demand management (capacity requirements).

All projects identified and delivered under the Stormwater Activity Management Plan are designed to the Council's Engineering Standards. The Engineering Standards have been developed and revised over time to promote best practice and the use of low impact designs. The standards also promote designing to increase recreational amenity of assets and maintain environmental aspects such as natural habitats.

9.4 Significant Effects

The significant negative and significant positive effects are listed below in Tables 9-1 and 9-2 respectively.

Table 9-1: Significant Negative Effects

Effect	Description	Mitigation measure
Flooding	**Social:** Localised flooding in some residential areas due to overloading of the stormwater system. **Economic:** Localised flooding in some commercial areas due to overloading of the stormwater system can have significant immediate and ongoing economic consequences. **Environmental:** Sediments, oils, greases, metals and organic material can be washed into natural water	Catchment management planning. Hydraulic modelling. Capital works.

Effect	Description	Mitigation measure
	courses. **Cultural:** Flooding may have adverse effect on the quality of the receiving environment.	
Untreated stormwater discharges	**Environmental:** The discharge of untreated stormwater may have adverse effect on the quality of the receiving environment, eg, stormwater runoff following a dry period often contains many contaminants including sediments, oils, greases, metals and organic material washed from roads and other impervious areas and rubbish and contaminants illegally discharged into the stormwater system. In rural areas, runoff may be contaminated with sediment, herbicides, pesticides, fertilisers and animal waste. **Cultural**: Discharges may have an adverse effect on the quality of the receiving environment.	Catchment management planning. Resource consenting and compliance monitoring Capital works. Tasman Erosion and Sediment Control Guidelines (2014)
Untreated wastewater discharges	**Environmental:** The discharges may have an adverse effect on quality of receiving environment. **Cultural**: Discharges may have an adverse effect on quality of receiving environment.	The Council has an active programme to reduce inflow and infiltration (see Wastewater AMP).
Impact to historic and wahi tapu sites.	**Cultural** - Physical works may have an adverse effect on sites. Uncontrolled stormwater may erode sites.	Consultation prior to works. Record of known heritage sites.

Table 9-2: Significant Positive Effects

Effect	Description
Access and Mobility	The stormwater system maximises access during and after storm events.
Amenity	The Council's engineering standards promote the enhancement of recreational and environmental amenity value when developing new assets through low impact design.
Economic Development	The Council maintains stormwater collection and treatment systems to minimise damage to private and public assets and this encorages development.
Environmneta Protection	The Council's stormwater discharges to a receiving environment can be controlled to minimise any negative environmental

	impact from the discharge. Fish passage and aquatic life is considered when implementing capital projects and often improved.
Safety and Personal Security	The Council maintains stormwater collection and treatment systems to minimise disruption to normal community activities and risk to life.

9.5 Assumptions

The Council has made a number of assumptions in preparing the Activity Management Plan. These are discussed in detail in Appendix Q. Table 9-3 lists the most significant assumptions and briefly outlines the impact of the assumption.

Table 9-3: Significant Assumptions

Assumption Type	Assumption	Discussion
Financial assumptions	That all expenditure has been stated in 1 July 2014 dollar values and no allowance has been made for inflation and all financial projections are GST exclusive.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of the plans if inflation is higher than allowed for, but the Council is using the best information practically available from Business and Economic Research Limited (BERL).
Asset data knowledge	That the Council has adequate knowledge of its assets and their condition so that the planned renewal work will allow the Council to meet the proposed levels of service.	There are several areas where the Council needs to improve its knowledge and assessments but there is a low risk that the improved knowledge will cause a significant change to the level of expenditure required.
Growth Forecasts	That the district will grow as forecast in the Growth Demand and Supply Model (refer to Appendix F).	If the growth is significantly different it will have a medium impact. Developers provide much of the stormwater netweork and the CMPs will deal with culmulative effects.
Timing of capital projects.	That capital projects will be undertaken when planned.	The risk of the timing of projects changing is high due to factors like, resource consents, funding and land purchase. The Council tries to mitigate this issue by undertaking the consultation, investigation and design phases sufficiently in advance of the construction phase. If delays are to occur, it could have significant effects on the level of service.
Funding of capital projects.	That the projects identified will receive funding.	The risk of the Council not funding capital projects is moderate due to community affordability issues. If funding is not secured, it may have significant effect on the levels of service as projects may be deferred. The risk is managed by consulting

Assumption Type	Assumption	Discussion
		with the affected community and appropriate distribution of targeted rates.
Accuracy of capital project cost estimates.	That the capital project cost estimates are sufficiently accurate enough to determine the required funding level.	The risk of large under estimation is low; however the significance is moderate as the Council may not be able to afford the true cost of the projects. The Council tries to reduce the risk by including a standard contingency based on the projects lifecycle.
Changes in legislation and policy.	That there will be no major changes in legislation or policy, except for the need for Council to obtain resource consents for stormwater discharges.	The risk of major change is high due to the changing nature of the government If major changes occur it is likely to have an impact on the required expenditure. The Council has not mitigated the effect of this.
Land purchase and access.	That the Council will be able to secure land and/or access to enable completion of projects.	The risk of delays to project timing or changes in scope is high due to the possibility of delays in obtaining land. Where possible the Council undertakes land negotiations well in advance of construction to minimise delays. If delays do occur, it may influence the level of service the Council can provide.
Resource consents.	That there will be no material change in the need to secure consents for construction activities and that consent costs for future projects will be broadly in line with the cost of consents in the past.	The risk of material change in the resource consent process is low.
Resource consent monitoring.	That the costs identified in this AMP for the monitoring of resource consents is sufficient.	Until CMPs have been developed and resource consents applied for, the conditions requiring monitoring are unknown. Once this information is understood, Council may need to allocate additional costs for monitoring compliance against consent conditions.
Network capacity.	That Council's knowledge of network capacity is sufficient to accurately programme capital works.	If the network capacity is lower than assumed,the Council may be required to advance capital works projects to address congestion. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is greater than assumed, the Council may be able to defer works. The risk of this occurring is low and is likely to have little impacts.
Disaster fund	That the level of funding held in Council's disaster fund	The risk of inadequate reserves and insurance cover would mean deferral of

Assumption Type	Assumption	Discussion
reserves.	reserves and available from insurance cover will be adequate to cover reinstatement following emergency events.	future capital projects to provide any financial shortfall required to cover reinstatement costs.
Stormwater discharge quality	The budget allocation for water quality improvements is sufficient.	Until CMPs have been prepared, the quality of the receiving environment is unclear. The quality required of stormwater discharges to at least maintain the existing conditions is therefore also unknown. Funding has been allocated for retrofitting stormwater quality devices however, the quantity and spread of the programme will need to be reassessed as the CMPs are completed.

9.6 Risk Management

The Council's risk management approach is described in detail in Appendix Q.

This approach includes risk management at an organisational level (Level 1). The treatment measures and outcomes of the organisational level risk management are included within the Long Term Plan.

At an asset group level (Level 2), Council has identified 17 high or very high risks and planned mitigations measures to reduce these risks to nine high risks. Council has planned controls for the remaining nine high risks but even with the controls, they remain high. Council has decided to accept these risks. These are listed in Table 9-4.

Table 9-4: Significant Risks and Control Measures

Risk Event	Mitigation measures
Extreme weather events overloading the network.	**Current** • routine maintenance and pre-event checks and removal of any blockage; • preparation of Catchment Management Plans. **Proposed** • creation and protection of more secondary flow paths; • increased community education as to flow paths and how to minimise potential impact.
Catastrophic failure of a network structure.	**Current** • routine maintenance and inspections are included in the network maintenance contract and asset management systems eg CCTV inspections; • detailed inspections are completed for the entire bridge network every two years under the Transportation AMP'; • reactive inspection precede and following extreme weather events. **Proposed** • additional key assets are brought under the Council's ownership or maintenance control.

Risk Event	Mitigation measures
Premature deterioration or obsolescence of an asset	**Current** • maintenance performance measures included in the maintenance contract; • routine inspections. **Proposed** • improved asset data coupled with life prediction analysis to foresee issues.
Sub-optimal design and/or construction practices or materials	**Current** • Engineering Standards and Policies and construction inspections; • contract quality plans; • professional services and construction contract specifications; • third party reviews. **Proposed** • ongoing staff training.
Ineffective stakeholder engagement e.g. iwi, Heritage New Zealand, community groups	Current • the Council holds regular meetings with iwi; • the Council's GIS software includes layers identifying cultural heritage sites and precincts. Council staff apply for Heritage New Zealand authority when these known sites are at risk of damage or destruction. • project management processes and Council's consultation guidelines are followed.
Failure to gain property access	**Current** • stakeholder management; • works and entry agreements; • use of the Council's property team to undertake land purchase. negotiations. • Public Works Act.

The Council has also identified and assessed critical assets (Level 3), the physical risks to these assets and the measures in place to address the risks to the asset. This has led to a list of projects to mitigate the risks to acceptable levels as detailed in Appendix Q.

By undertaking the specific projects and asset management activities, the Council plans to reduce its risk profile. The specific risk mitigation measures that have been planned within the 30 year stormwater programme include:

Asset Management Activity

- Test Emergency Management Plan.
- Change TRMP to control earthworks better.
- Improved integration with planning for future land zoning.
- Design to give more consideration to access requirements.
- Improve HAZOPs.

Operational Project

- Increase monitoring.
- Proactive maintenance ahead of bad weather.

- Improve manhole and storm drain security.
- Improved education of landowners.
- Ongoing Iwi liaison.

Strategic Study

- Catchment modelling.
- New sub-divisions to be assessed for secondary flow paths.
- Stormwater dam break failure assessments.
- Stormwater bylaw.

9.7 Improvement Plan

This Activity Management Plan document was subject to a peer review in its draft format by Waugh Infrastructure Management Ltd in February 2015. The document was reviewed for compliance with the requirements of the LGA 2002. The findings and suggestions will be assessed and prioritised by the asset management team and either implemented in the final version of this document or added to the Improvement Plan.

The Improvement Plan is currently under development and will be included in Appendix V in the final version of this document.

10 Summary of Cost for Activity

The following figures have been generated from the Funding Impact Statement held in Appendix L and the Public Debt and Loan Servicing Cost information held in Appendix K. Further detail is held in Appendix E, F and I for operating and maintenance, new capital and renewal costs respectively. All of the following graphs include inflation.

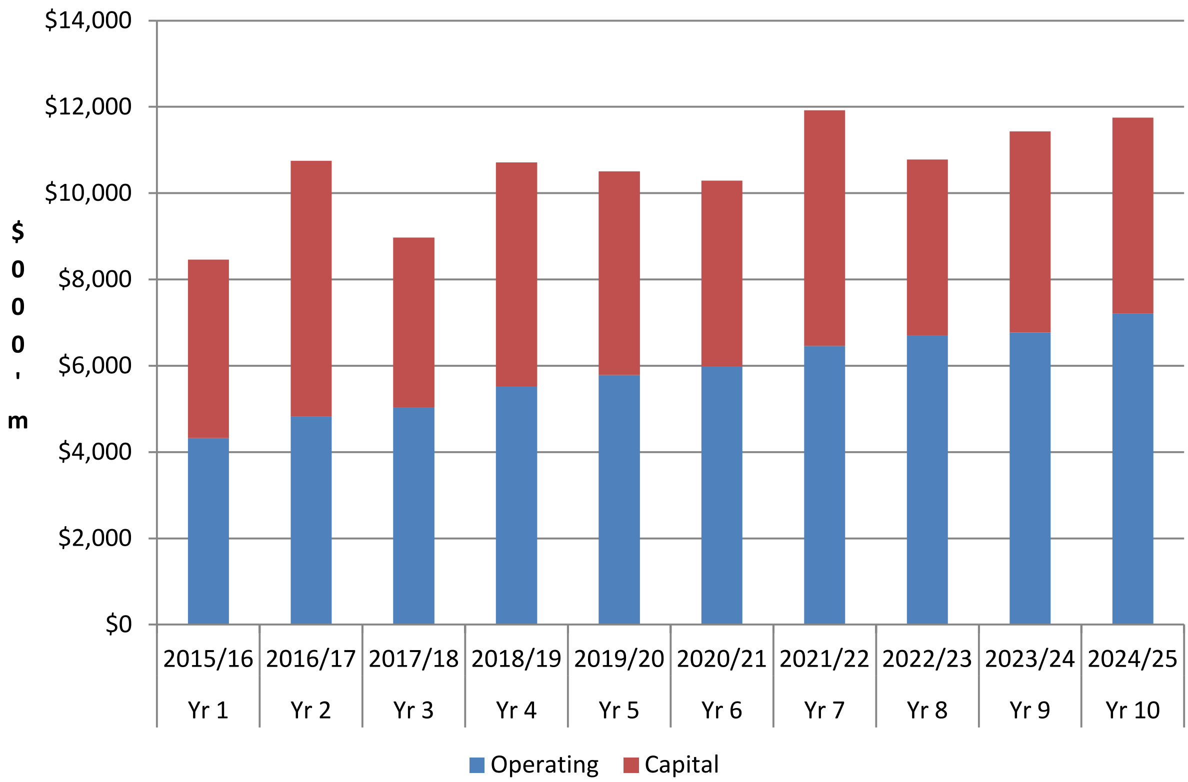


Figure 10-1: Total Expenditure

- Operating expenditure increases from $4 million to $7 million over the 10 year period. This is due to inflation, increase loan servicing costs and network growth.

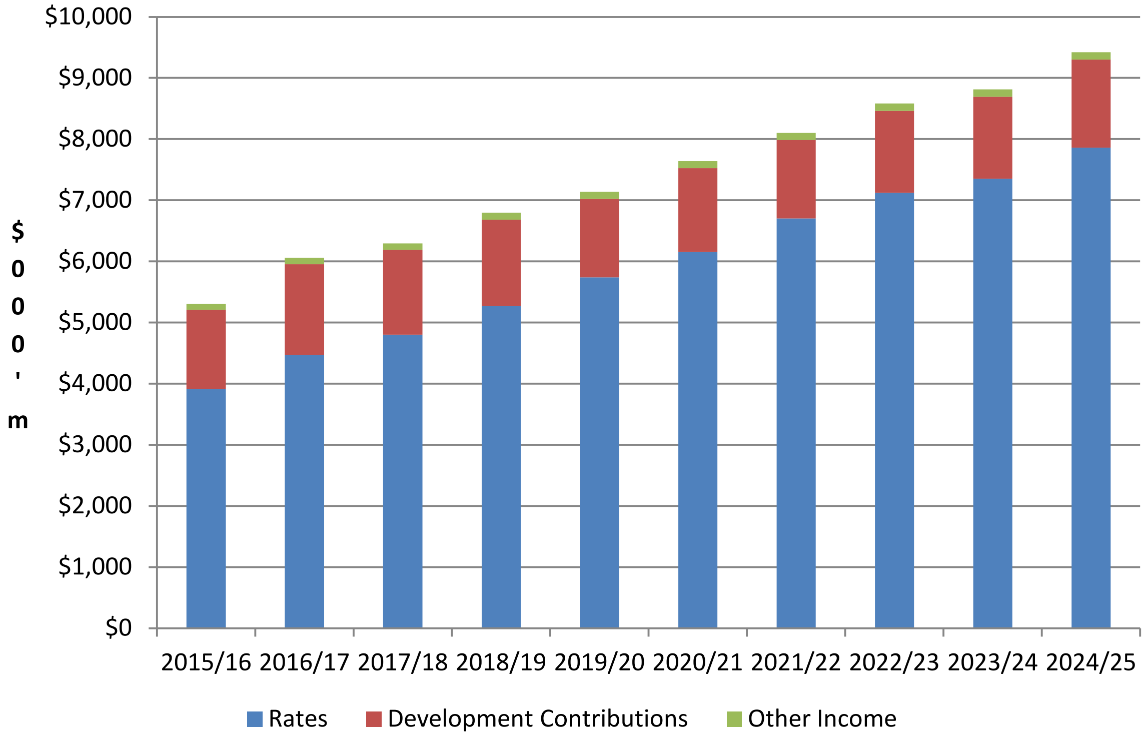


Figure 10-2: Total Income

The income proposed for the next 10 years corresponds with the proposed expenditure in Figure 10-1.

Rate increases account for the majority of the increase in income. Debt increases are in conjunction with major capital projects.

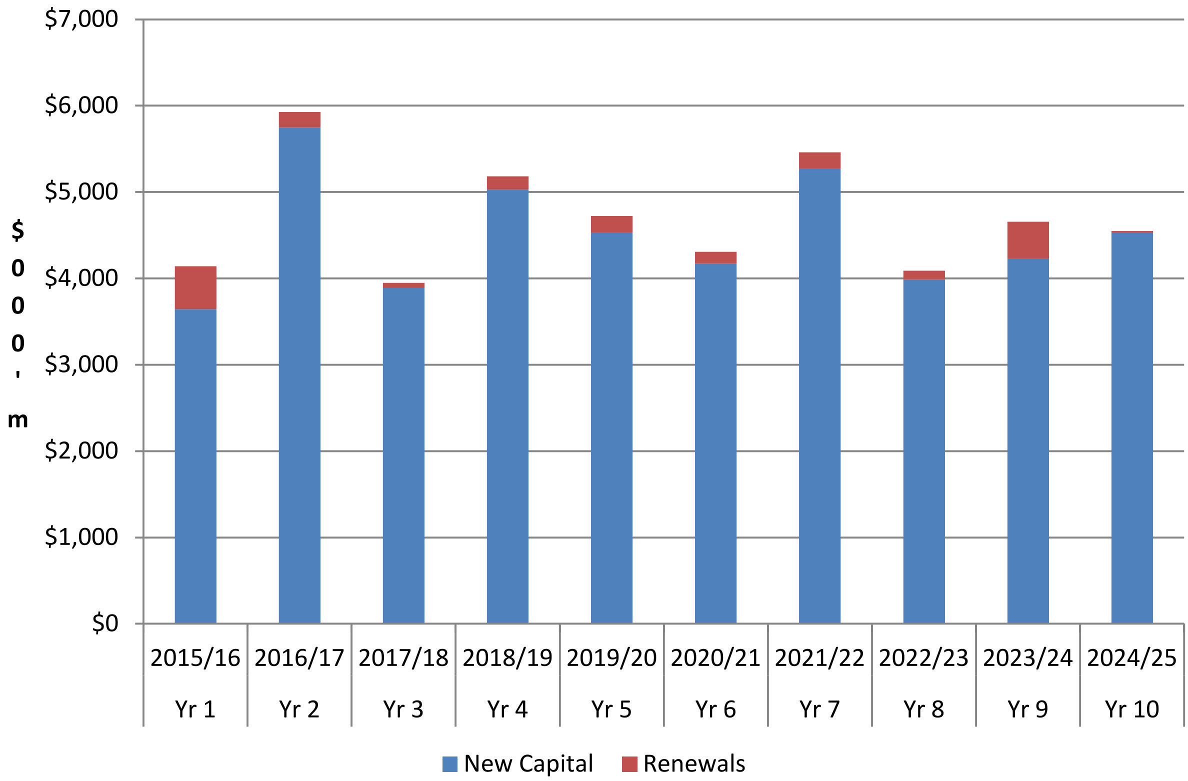


Figure 10-3: Capital Expenditure

The majority of the capital expenditure is targeted at improving the level of service of existing systems.

The peak in expenditure in 2014/2015 is primarily accounted for by the construction of the Poutama Drain upgrade in Richmond. Other significant projects in this ten year period are detailed in Table 8-1.

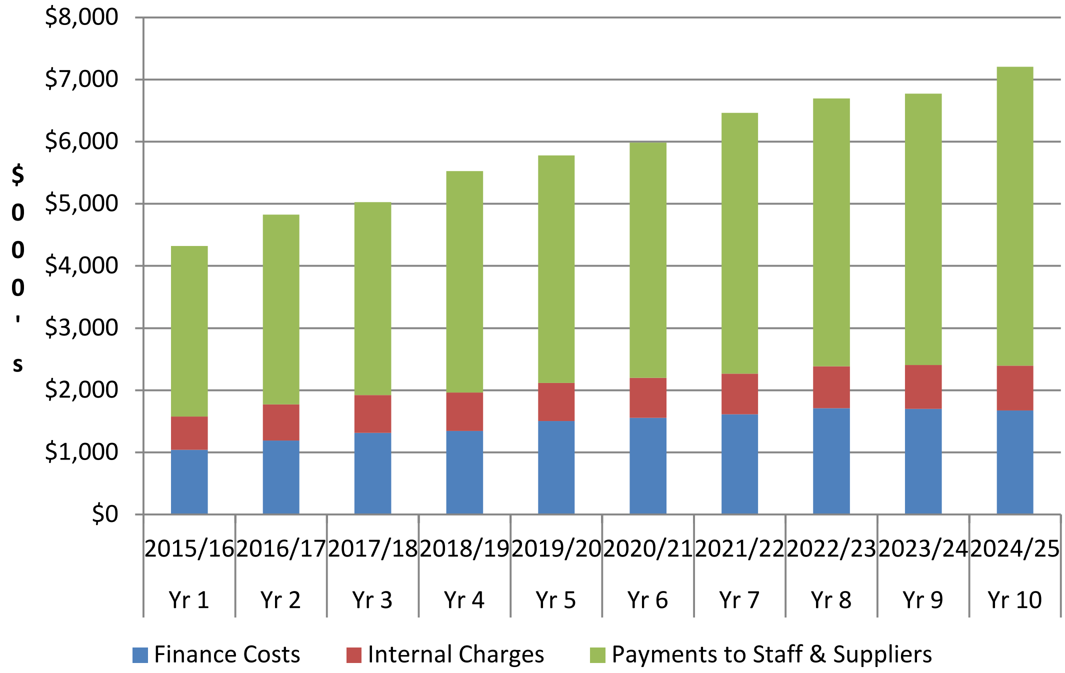


Figure 10-4: Operating Expenditure

The payments to staff and suppliers include maintenance contract costs and professional service fees.

Finance costs increase over the next 10 years due to an increase in the level of debt shown in Figure 10-5.

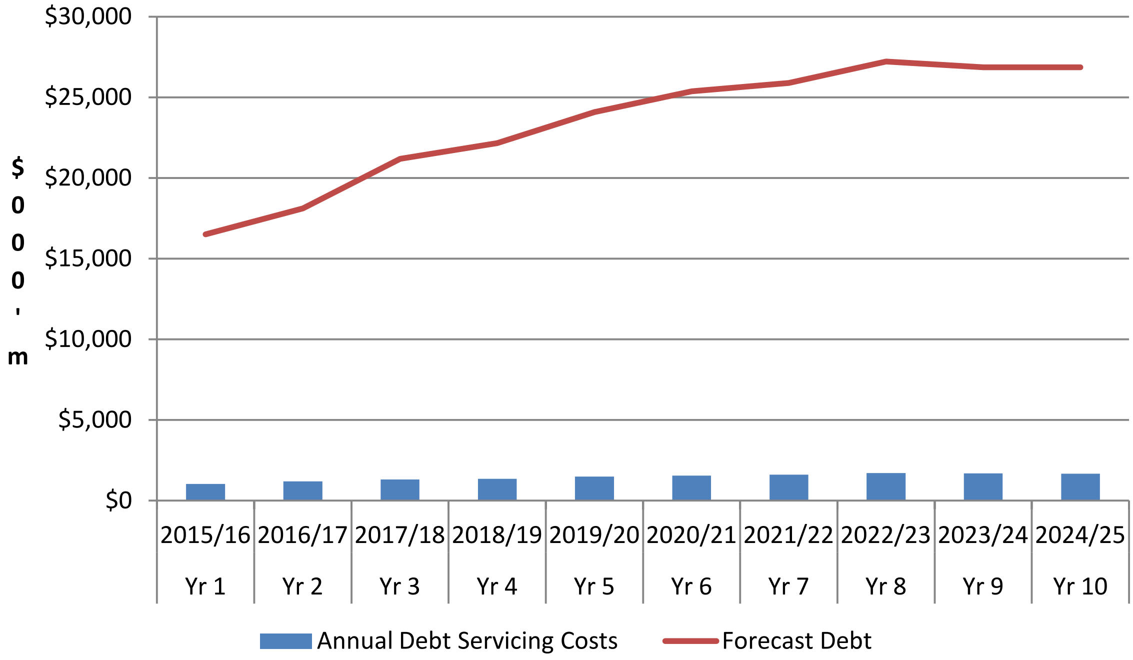


Figure 10-5: Debt

The Council's debt associated with the stormwater activity is forecast to increase from $16 million to $27 million over the next 10 years. This will also increase the debt servicing costs as shown.

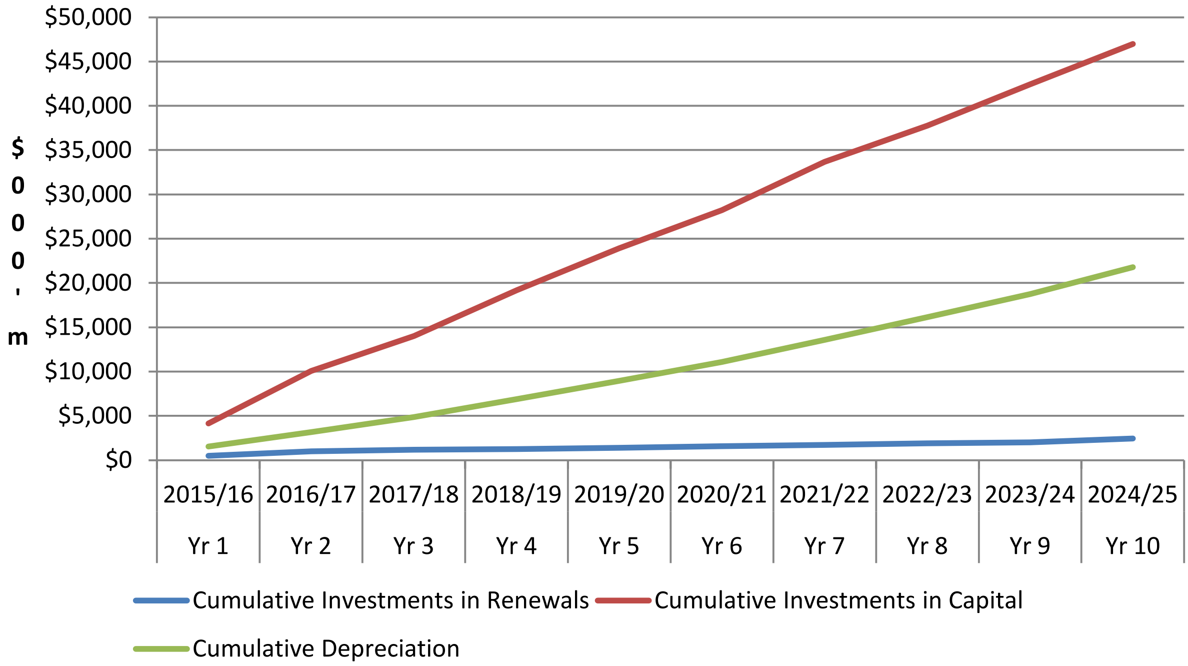


Figure 10-6: Investment in Renewals

The investment in renewals appears light for the next 10 years. This is primarily due to the young age and long life of the stormwater assets as discussed in further detail in Appendix I.

The above figure covers a relatively short time period when compared with the useful life span of the stormwater assets. The apparent lack of renewals will be further investigated when the Council reviews its renewals strategy.

APPENDIX A LEGISLATIVE AND OTHER REQUIREMENTS AND RELATIONSHIPS WITH OTHER PLANNING DOCUMENTS AND ORGANISATIONS

A.1 Introduction

The purpose of this activity management plan (AMP) is to outline and to summarise in one place, the Council's strategic and management long-term approach for the provision and maintenance of its stormwater network.

The AMP demonstrates responsible management of the district's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the levels of service required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

The provision of stormwater drainage to urban areas is something that the Council has always provided. The service provides many public benefits and it is considered necessary and beneficial to the community that the Council undertakes the planning, implementation and maintenance of the stormwater services within the urban areas.

The Council has no statutory obligation to provide for private stormwater runoff, just as it has no obligation to provide protection against wind or other natural events. This is clear in the Local Government Act (LGA) 2002 where it states that councils do not have to take responsibility for stormwater systems which service only private properties.

However, the Council does have a duty of care to ensure that any runoff from its own properties is remedied or mitigated. Because most of its property is mainly in the form of impermeable roads in developed areas, this generally means that some level of reticulation system is constructed. The presence of this system then becomes the logical network for private stormwater disposal.

The target audience of this AMP is the Tasman District community, Tasman District Councillors and Council staff. The appendices provide more in depth information for the management of the activity and are therefore targeted at the Activity Managers. The document is publicly available on the Council's website.

In preparing this AMP the project team has taken account of:

National Drivers – for example the drivers for improving asset management through the Local Government Act 2002, and drivers for improving stormwater quality through the Resource Management Act (RMA) 1991

Regional and Local Drivers – for example the community outcomes determined through consultation with the public and recent flood events.

Industry Guidelines and Standards

Linkages – the need to ensure this AMP is consistent with all other relevant plans and policies

Constraints – the legal constraints and obligations the Council has to comply with in undertaking this activity

The main drivers, linkages and constraints are described in the following sections.

A.2 Key Legislation and Industry Standards and Statutory Planning Documents

A.2.1. Acts of Parliament

The Acts below are listed by their original title for simplicity, however all Amendment Acts shall be considered in conjunction with the original Act, these have not been detailed in this document.

- Building Act 2004
- Civil Emergency Management Act 2002
- Climate Change Response Act 2002
- Construction Contracts Act 2002
- Fencing Act 1978
- Hazardous Substances and New Organisms Act 1996
- Health Act 1956
- Health and Safety in Employment Act 1992
- Litter Act 1979
- Land Drainage Act 1908
- Land Transfer Act 1952
- Local Government Act 1974
- Local Government Act 2002
- Local Government (Rating) Act 2002
- Public Bodies Contracts Act 1959
- Public Works Act 1981
- Resource Management Act 1991
- Rivers Board Act 1908
- Soil Conservation and Rivers Control Act 1941
- Utilities Access Act 2010
- Waste Minimisation Act 2008.

For the latest Act information refer to http://www.legislation.govt.nz/

A number of these key legislative drivers have been summarised in more detail below.

A.2.1.1 Local Government Act

Part 7 and Section 285 of the Local Government Act 2002 required every local authority to complete an approved Water and Sanitary Services Assessments (WSSA) of all stormwater drainage in its district before 30 June 2005 and this was undertaken (refer to Appendix C).

The Local Government Act empowers district councils to provide public drains. It also empowers the Council to cleanse, repair and maintain their drainage infrastructure as necessary for effective drainage. The Council also has powers under the Land Drainage Act (1908), Rivers Boards Act (1908), and Soil Conservation and Rivers Control Act (1941). The Engineering Services Department takes on the service provider roles enabled through these Acts.

Note these statutes empower, but do not require, the Council to provide drainage works. However, once the Council does provide or take over control of systems, which enable and protect developments, there is an ongoing duty to continue this protection.

A.2.1.2 Resource Management Act

In relation to stormwater, the Resource Management Act (RMA) 1991 deals with:

- the control of the use of land for the purpose of the maintenance and enhancement of the quality of water in water bodies and coastal water;
- discharges of contaminants into water and discharges of water into water;
- the control of the taking, use, damming and diversion of water, including:
  - the setting of any maximum or minimum levels or flows of water;
  - the control of the range, or rate of change, of levels or flows of water.

The RMA requires the Council to sustain the potential of natural and physical resources to meet the reasonable foreseeable needs of future generations.

The Environment and Planning Department is responsible for the regulatory functions of a regional council to control the use, development and protection of land, discharges etc, and they do this through provisions and rules in the Tasman Resource Management Plan.

The Engineering Services Department is responsible for complying with those rules in the management of public stormwater systems.

The RMA also requires the Council to take into account the principles of the Treaty of Waitangi.

A.2.1.3 Building Act

This Act requires that buildings and site works are constructed to protect people and other property from the adverse effects of surface water. The Environment and Planning Department is responsible for the enforcement of the Building Code which is enabled through the Building Act.

The ***Building Code*** requires that:

- urban runoff from a Q_{10} rain event is disposed of in such a way as to avoid likelihood of damage or nuisance to other property;
- surface water from a Q_{50} event does not enter residential and communal buildings;
- secondary flow paths are taken into account.

A.2.2. National Policies, Regulations, Standards and Strategies

In addition to the legislation provided above, the Ministry for the Environment has also released the following documents:

- The National Environmental Standard for Sources of Human Drinking Water - intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater by requiring regional councils to consider the effects of activities on drinking water sources in their decision making.

A.2.3. Industry Guidelines and Standards New Zealand (refer to http://www.standards.co.nz)

The following Guidelines and Standards apply to this activity:

- NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999
- NAMS International Infrastructure Management Manual 2006

- NZ Pipe Inspection Manual 2006
- Rawlinsons NZ Construction Handbook.
- NZS 4404:2010 Land Development and Subdivision Infrastructure – suggests minimum water supply pressures and flows (for both service delivery and fire fighting).
- AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines
- SNZ HB 4360:2000 Risk Management for Local Government
- AS/NZS ISO 9001:2008 Quality Management Systems
- AS/NZS 4801:2001 Occupational Health and Safety Management Systems
- AS/NZS 2032:2006 Installation of PVC Pipe Systems
- AS/NZS 2280:2004 Ductile Iron Pressure Pipes and Fittings
- AS/NZS 3725:2007 Design for Installation of Buried Concrete Pipes
- AS/NZS 2566.1:1998 Buried Flexible Pipe Design
- AS/NZS 2566.2:2002 Buried Flexible Pipe Installation
- NZS 3101.1&2:2006 Concrete Structures Standard
- NZS 3910:2003 Conditions of Contract for Building and Civil Engineering Construction

A.2.4. Regional and Local Policies, Regulations and Strategies

The Council also has several planning policy and/or management documents detailing its responsibilities under the legislative drivers listed above. Those which impact on the provision of the Council's stormwater activity are:

- Tasman District Council's Long-Term Plan/Annual Plans/Annual Reports;
- Stormwater Activity Management Plan (previous versions);
- Tasman District Council Engineering Standards and Policies 2013 www.tasman.govt.nz – which sets out standards for the design of engineering works associated with the development of urban networks eg, material types, capacity of pipes;
- Council's Procurement Strategy;
- Project Stormwater (see below);
- Tasman-Nelson Regional Pest Management Strategy 2007-2012;
- Riparian Land Management Strategy 2001;
- Waimea Inlet Management Strategy 2010;
- any existing established strategies and policies of the Council (outside those contained in this Activity Management Plan itself) regarding this activity;
- Tasman Erosion and Sediment Control Guidelines 2014 - www.tasman.govt.nz/link/erosion-sediment-guidelines

Studies and plans relating to specific sites are listed as Strategic Studies in the relevant section of Appendix B. Proposed new strategic studies are detailed in Appendix E.

The Council has two key statutory planning documents implementing its responsibilities under the Resource Management Act 1991 being:

- Tasman Regional Policy Statement (TRPS) operative 2001

  An overview of significant resource management issues with general policies and methods to address these.

- Tasman Resource Management Plan (TRMP)

  A combined regional and district plan with statements of issues, objectives, policies, methods and rules addressing the use of land, water, coastal marine area and discharges into the environment.

These documents guide the processing of resource consent applications for stormwater discharge to land and water bodies, and land disturbance or waterway interferences that may be associated with stormwater reticulation. They may impact on the location and method of stormwater disposal including quality requirements and the location, design and construction of reticulation networks. The plan also specifies requirements for onsite disposal.

A.2.4.1 Project Stormwater

Project Stormwater is a cross-council project incorporating Engineering, Planning, and Environmental Science disciplines.

Project Stormwater is focused on improving the Council's management of stormwater to achieve better stormwater values, including quality, quantity and ecological aspects. It covers many departments, affects multiple council processes and represents a fundamental change to the Council's philosophy regarding stormwater and associated land and activity management.

The scope of the project has progressively widened to encompass a low impact philosophy and to include various aspects of land and activity management, for example, subdivision development, that impact either directly or indirectly on stormwater values.

The term 'stormwater' in this project has been taken to mean all aspects of surface and ground water across both rural and urban land uses. However, the initial work undertaken has focused primarily on urban stormwater management and in particular those areas where the Council has direct management responsibilities.

It is envisaged that as the Council achieves their own stormwater goals, we will be in a better position to lead by example and direct other groups to achieve better stormwater management also.

The key goals/objectives of Project Stormwater are:

- Council-wide adoption of a low impact, multi-value philosophy towards stormwater management and associated land/activity management;
- reflection of the low impact, multi-value philosophy in all council documents, processes and activities associated with stormwater;
- obtaining relevant consents for all Council-managed stormwater outfalls and discharges.
- identifying and initiating improved Council stormwater management practices within each Urban Drainage Area (UDA) starting with Richmond;
- a programme of enhancement projects to improve stormwater values within natural, modified and reticulated stormwater systems within the UDAs;
- better information on stormwater assets within UDAs including existing and potential stormwater values and GIS data;
- improved management of stormwater assets including better integration of Engineering and Parks and Reserves responsibilities and outcomes, including lifecycle management of LID devices eg, rain gardens and naturalised streams (as assets);
- an increasing voluntary uptake of low impact approaches and successful design and implementation of these developments amongst local developers.;
- consistent consideration by all parties of stormwater projects within a catchment context, including upstream and downstream, as well as temporal issues;

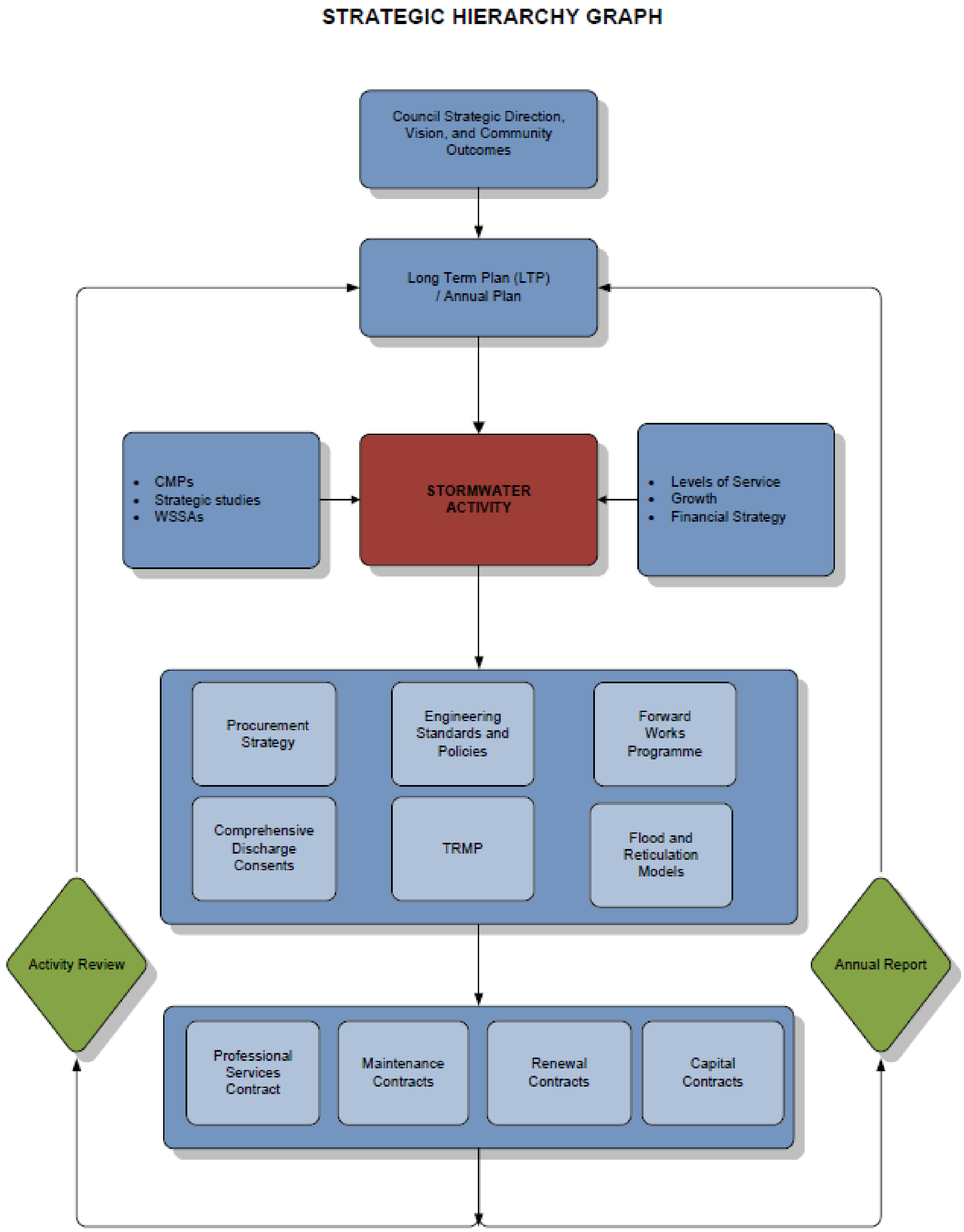
- an improvement in the riparian biodiversity and functioning within the region, starting within the UDAs;
- an increased awareness amongst residents and businesses, both urban and rural of stormwater values, issues, solutions and opportunities for improvement.

A.3 Links with Other Documents

This AMP is a key component in the Council's strategic planning function. Among other things, this Plan supports and justifies the financial forecasts and the objectives laid out in the Long Term Plan (LTP). It also provides a guide for the preparation of each Annual Plan and other forward work programmes.

Figure A-1 depicts the links between the Council's asset management plans to other corporate plans and documents.

Figure A-1



A.4 Strategic Direction

The Council's strategic direction is outlined in the Vision, Mission and Community Outcomes.

Vision: Thriving communities enjoying the Tasman lifestyle.

Mission: To enhance community well-being and quality of life.

Community Outcomes:

Table A-1 shows the community outcomes and how the stormwater activity relates to them.

Table A1: How the Stormwater Activity Contributes to Community Outcomes

Community Outcomes	How Our Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	Stormwater arising within urban development areas is controlled, collected, conveyed and discharged safely to the receiving environment. This activity can be managed so the impact of the discharges does not adversely effect the health and cleanliness of the receiving environment.
Our urban and rural environments are people-friendly, well-planned and sustainably managed.	The stormwater activity ensures our built urban and rural environments are functional, pleasant and safe by ensuring stormwater is conveyed without putting the public at risk or damaging property, businesses or essential infrastructure.
Our infrastructure is efficient, cost effective and meets current and future needs.	The stormwater activity is considered an essential service that should be provided to all properties within urban drainage areas in sufficient size and capacity. This service should also be efficient and sustainably managed.
Our communities are healthy, safe, inclusive and resilient.	The stormwater activity provides for the transfer of runoff through urban areas to minimise risk to life and propoerty damage.
Our communities have opportunities to celebrate and explore their heritage, identity and creativity.	The stormwater activity incorporates natural waterways that have extensive areas of high cultural, recreational and biodiversity.
Our communities have access to a range of social, educational and recreational facilities and activities.	The stormwater activity provides for runoff management to minimise disruption of access to community facilities due to storm events.
Our Council provides leadership and fosters partnerships, a regional perspective and community engagement.	The stormwater activity provides for runoff management across the territorial boundary with Nelson City. Schools, Iwi and other groups are engaged with the natural waterways elements of the network.
Our region is supported by an innovative and sustainable economy.	The stormwater activity underpins the economy by minimising risk and damage from flooding. Allowance for climate change in design provides for future sustainability.

Table A-2 outlines the strategic documents utilised by the Council as part of the planning process.

Table A-2: Strategic Documents Used in the Planning Process

Long Term Plan (LTP)	The LTP is the Council's 10-year planning document. It sets out the broad strategic direction and priorities for the long term development of the District; identifies the desired community outcomes; describes the activities the Council will undertake to support those outcomes; and outlines the means of measuring progress.
Activity Management Plan (AMP)	AMPs describe the infrastructural assets and the activities undertaken by the Council and outline the financial, management and technical practices to ensure the assets are maintained and developed to meet the requirements of the community over the long term. AMPs focus on the service that is delivered as well as the planned maintenance and replacement of physical assets.
Annual Plan	A detailed action plan on the Council's projects and finances for each financial year. The works identified in the AMP form the basis on which annual plans are prepared. With the adoption of the LTP, the Annual Plan mainly updates the budget

	and sources of funding for the year.
Financial and Business Plans	The financial and business plans requirement by the Local Government Amendment Act. The expenditure projections will be taken directly from the financial forecasts in the AMP.
Contracts and agreements	The service levels, strategies and information requirements contained in the AMP are the basis for performance standards in the current Maintenance and Professional Service Contracts for commercial arrangements and in less formal "agreements" for community or voluntary groups.
Operational plans	Operating and maintenance guidelines to ensure that the asset operates reliably and is maintained in a condition that will maximise useful service life of assets within the network.
Corporate information	Quality asset management is dependent on suitable information and data and the availability of sophisticated asset management systems which are fully integrated with the wider corporate information systems (eg. financial, property, GIS, customer service, etc). The Council's goal is to work towards such a fully integrated system.

A.4.1. Our Goal

The Council aims to provide and maintain stormwater systems to communities in a manner that meets the levels of service.

APPENDIX B OVERVIEW OF COUNCIL OWNED STORMWATER NETWORKS IN THE DISTRICT

Plans illustrating the extent of Council's stormwater system in each Urban Drainage Area (UDA) are enclosed in Appendix Y, Stormwater UDA Boundaries.

There are 15 stormwater UDAs within the Tasman district and the residual non-urban area.

B1 Richmond UDA

B2 Brightwater UDA

B3 Wakefield UDA

B4 Murchison UDA

B5 St Arnaud UDA

B6 Tapawera UDA

B7 Motueka UDA

B8 Mapua / Ruby Bay UDA

B9 Tasman UDA

B10 Kaiteriteri UDA

B11 Takaka UDA

B12 Pohara UDA

B13 Ligar Bay / Tata Beach UDA

B14 Collingwood UDA

B15 Patons Rock UDA

B16 Non-Urban Areas

B.1 Richmond UDA

B.1.1. System Overview

The Richmond UDA is the most developed and densely populated UDA in the Tasman District. Much of the stormwater flows originate from the Richmond foothills, which slope up from the developed areas towards an elevation of approximately 600m. Much of the foothills area is forested but is subject to periodic harvesting. There are a number of gullies which route through stormwater flows into the urban area.

The UDA has three major drainage catchments:

1. South Richmond and Borck Creek
2. Jimmy Lee Creek (CBD) draining into Beach Road Drain
3. Reservoir Creek.

and minor catchments going directly to Waimea Estuary and also Saxton Creek that crosses into Nelson City. These major catchments are shown in Figure B.1-1

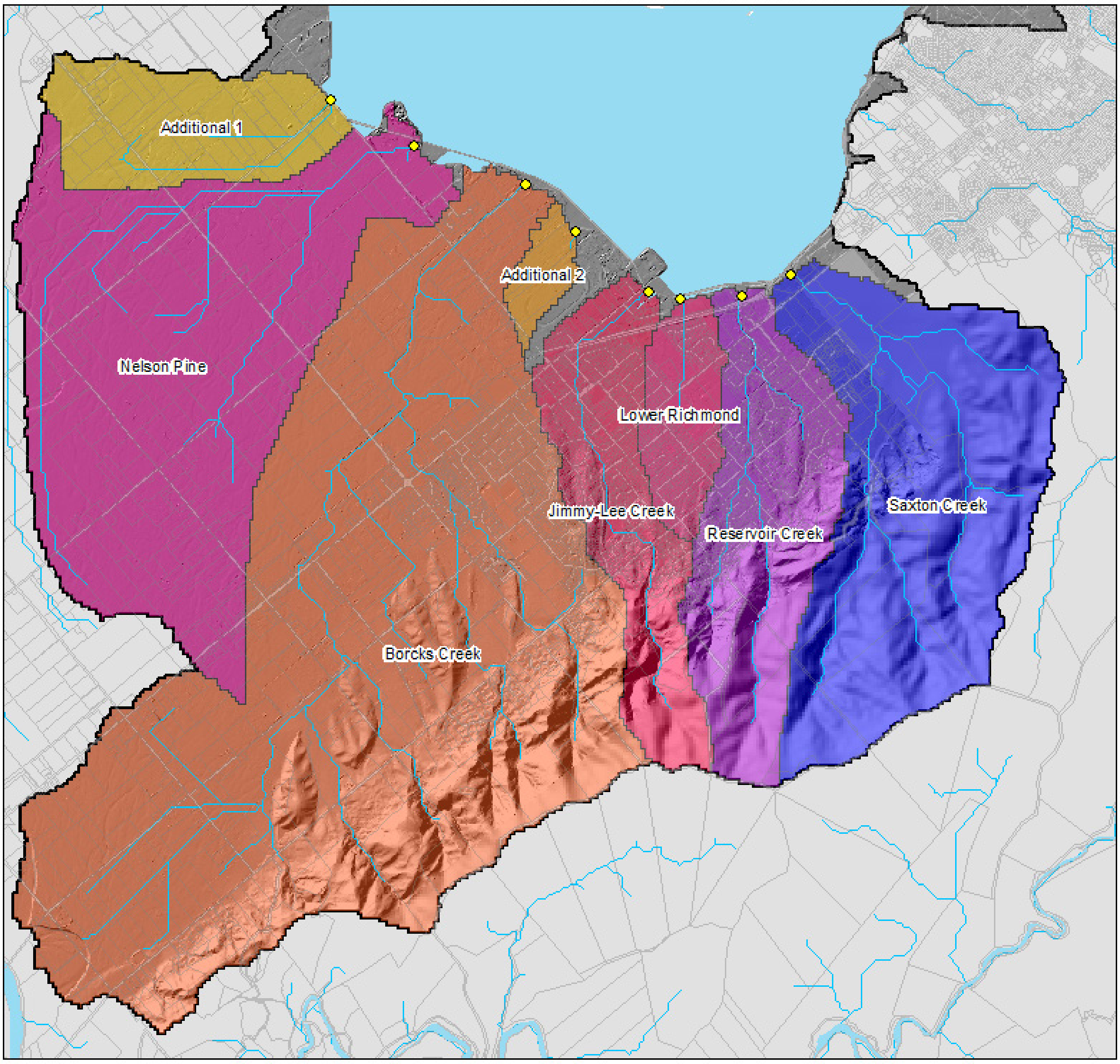


Figure B.1-1 Main Richmond Catchments

The stormwater systems outside the built up developed areas are predominantly open channels/private drains with culvert crossings under roads and other services.

In some places, detention dams have been constructed to 'control' stormwater flows in strategic places to reduce peak flows and the severity/likelihood of flooding risk further downstream. In Richmond, there are eight such structures:

- Olympus Way Detention Pond
- Cemetery Dam Detention Pond
- Blair Terrace Detention Pond
- Washbourn Gardens Detention Pond
- Bill Wilkes Reserve Detention Pond
- Lodestone Road Detention Pond
- Reservoir Creek Detention Pond
- Hart Creek Detention Pond.

Since these control peak flows reaching the lower parts of the catchments, the maintenance of the inlets and outlets of these structures is a high priority.

Much of the stormwater system within the developed area is piped. The major piped stormwater systems convey stormwater along Oxford Street, Queen Street, Salisbury Road and Gladstone Road. These link up and intercept and convey stormwater from major open drain systems originating from Reservoir Creek, Jimmy Lee Creek and the Hart Drain.

Much of the stormwater flows in a northerly direction from its source of origin into the CBD area. In many places the existing piped stormwater system is under capacity, a problem, which has been compounded as a result of the continuous development of Richmond originating from the CBD outwards towards the foothills.

Eight sub catchments were identified during the construction of the Richmond Stormwater Model in 2007[1]:

- Reservoir Creek sub-catchment
- Churchills sub-catchment
- Williams sub-catchment
- Lower Richmond sub-catchment
- Jimmy Lee Creek sub-catchment
- Upper Richmond sub-catchment
- Poutama sub-catchment
- Borck Creek and Eastern Hills catchments

Water Quality

A trial coarse debris screen on the outlet into Jimmy Lee Creek (Beach Road Drain) showed that little man made debris was entering the stream. Beyond the effect of sumps, swales and creeks there is no treatment in place.

Stormwater Assets

Table B-3 shows the stormwater assets in Richmond.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Resource Consents:

Richmond currently has the following resource consents[2].

[1] Richmond Stormwater Analysis Model Build and System Performance Analysis (MWH, August 2007)

[2] Subset of Table H-1: Schedule of Current Resource Consents Relating to the Stormwater Activity

- RM080291: Designation for Proposed works involve provision of a new open stormwater drain (Poutama Drain) between Railway Reserve (north-west of Poutama Street) and Borck Creek (Poutama Drain) (expires 28/09/2029)

Location	Consent No.	Consent Type	Effective Date	Expiry Date
Jimmy Lee Creek (Bill Wilkes), Richmond	RM090901 RM090902	Water – Dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Jimmy Lee Creek (Washbourn), Richmond	RM100059 RM100060	Water – Dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Jimmy Lee Creek (Beach Road), Richmond	RM100662	Land Use watercourse (debris screen on outfall structure)	21/10/2010	21/10/2045
Lodestone Road (Dellside), Richmond	RM100061 RM100062	Water – Dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Reservoir Creek (Champion Road), Richmond	RM100464V1 RM100465V1 RM100466V1	Water – Dam (detention) Land use – dam (structure) Land disturbance (alter dam)	22/07/2013 22/07/2013 22/07/2013	1/09/2045 1/09/2045 1/09/2045
Bramley Estate, Richmond	RM130749	Land use – watercourse (upgrade & structures)	6/11/2013	6/11/2048
Washbourn Gardens, Richmond	RM130558	Land use – watercourse (upgrade & structures)	19/08/2013	19/08/2048
Hill Street, Richmond	NN960404	Discharge to water (ex subdivision)	24/03/1998	30/12/2030
Otia Estates, Richmond	NN980246	Discharge to water (ex subdivision)	9/10/1998	4/09/2033
Borck Creek – Poutama Drain, Richmond	RM080291 RM130743 RM050860 RM060893 RM140690 RM140691 RM140692	Poutama Creek Designation Outline Plan – D247 (widening) Land use – watercourse (culvert) Land use – watercourse (culvert) Land use – watercourse (upgrade) Water – take (dewatering) Discharge (dewatering)	Commenced 28/11/2013 18/11/2005 23/01/2007 Granted Granted Granted	28/09/2029 N/A 26/10/2041 5/12/2041
Hart Drain, Richmond	RM070889	Land use – watercourse (culvert)	29/10/2007	3/10/2042
Wensley Road (cemetery), Richmond	RM030012 RM030084	Discharge (from detention) Land use – dam (structure)	6/03/2003 6/03/2003	12/02/2038 12/02/2038

The characteristic of each sub catchment is described in more detail below. Refer to the Richmond Stormwater Analysis Report 2007 for catchment maps.

B.1.1.1 Reservoir Creek Sub-catchment

Reservoir Creek drains the Richmond foothills located on the south eastern side of Richmond and measures about 224ha. The upper reaches are in the Barnicoat Range and are steep and partly forested. Most of the drainage network is in the form of open drains. Immediately above Hill Street the area is zoned rural residential and between Hill Street and Salisbury Road is residential. Below Salisbury Road the stream collects runoff from a small area of mixed use land before discharging to the Tasman Bay.

A reservoir, previously used for water supply for Richmond, was located in the upper reaches of Reservoir Creek and was decommissioned in 2014 such that it would not detain any significant volume of water.

B.1.1.2 Churchills Sub-catchment

The Churchills sub-catchment, which measures about 94ha, is located to the west of Upper Reservoir Creek sub-catchment. The drainage system comprises open drains in the upper undeveloped reaches and comprises pipe sections in the urbanised middle and lower reaches of the catchment.

A detention dam is located on Churchills drain, south of Hill Street, immediately above Lodestone Road. This feature is believed not to have overtoped in the April 2013 1 in 500 year storm event although significant quantities of gravel accumulated within the structure.

B.1.1.3 Williams Sub-catchment

Williams is a small urban sub-catchment located essentially between Hill Street and Salisbury Road, and east of Queen Street. This catchment measures about 58ha and the drainage network is almost all piped. The catchment gradient is relatively flat and land use comprises medium density housing and two schools.

B.1.1.4 Lower Richmond Sub-catchment

The Lower Richmond catchment lies between Queen Street, Salisbury Road and the Richmond Deviation, and is predominantly residential with a small amount of commercial development toward Queen Street. The catchment measures about 81ha and the drainage network comprises extensively developed pipe network.

B.1.1.5 Jimmy Lee Creek Sub-catchment

The Jimmy Lee Creek catchment drains the steep valleys of Richmond Hill on the Barnicoat Range upstream of Hill Street as well as an urban area between Hill Street and Salisbury Road to the west of Queen Street. The drainage network comprises of a system of piped sections which discharge into the main creek. The two main tributaries pass through residential zoned land and combine at the detention pond in the Bill Wilkes Reserve. From there the channel passes through Washbourn Gardens (which acts as a second detention pond) and into the reticulation that joins Queen Street.

B.1.1.6 Upper Richmond Sub-catchment

The Upper Richmond catchment measures about 220ha and contains the Queen Street stormwater system. This system drains the residential areas west of Queen Street from about Hill Street including the commercial shopping centre and the area down to the Gladstone Road/Beach Road trunk main. The stormwater is collected and conveyed through an extensive network of stormwater pipes.

Stormwater from Jimmy Lee Creek enters the Queen Street catchment at Oxford Street in the vicinity of Washbourn Gardens and is conveyed in the stormwater pipe network to the Gladstone Road/Beach Road trunk main.

B.1.1.7 Poutama Sub-catchment

The Poutama catchment measures about 184ha and is partly semi-rural to rural land use located adjacent to the urban Richmond area. The Poutama catchment is urbanizing.

The Poutama catchment drains the steep slopes of the Barnicoat Range down to Hill Street and from there it drains the relatively flat areas to discharge into the upstream end of the trunk main along Gladstone Road.

B.1.1.8 Borck Creek and Eastern Hills Sub-catchments

The Borck Creek system drains a total catchment area of 1440ha located west of urban Richmond, and comprises of 800ha of hill country, 410ha of intermediate terraces and 230ha of floodplain. The catchment area includes the Poutama sub-catchment. The catchment drainage system rises at the watershed of the Barnicoat Range, west of Richmond. The topography falls steeply to the flat Waimea Plains located northwest of Haycocks Road/ Hill Street. In the hills the waterways follow the natural topography. Borck Creek discharges into Waimea Inlet and the lower 500m of Borck Creek is impacted by tidal effects.

Borck Creek and its major tributaries, including Eastern Hills Drain (also called Bateup Drain) and Whites Drain, were excavated through swamp lands in west Richmond in the 1970s by the Nelson Catchment Board. The drains divert floodwater away from the Gladstone Road system and the main town area to ultimately discharge into the Waimea Inlet in the vicinity of Headingly Lane.

Under natural, pre-settlement conditions, floods in Borck Creek would probably have spread out over the floodplain. After settlement for farming, the first development of the creek would have been to realign the natural channels as agricultural drains. Indications are that the design capacity of the original agricultural drains was small and therefore flood flows would still have spread out over the floodplain. Later, with more development on the floodplain, some reaches of Borck Creek have been improved to have adequate capacity to handle the design flood flow, but other reaches still have grossly inadequate capacity.

The waterway system has multiple culvert and bridge crossings of the road network and of private roads or driveways. The major crossings are in Lower Queen Street, State Highway 6 (SH6) or Main Road Hope (three crossings), State Highway 60 (SH60), and Ranzau Road. There are a number of smaller crossings of significance in Ranzau Road and Patons Road.

Under a master plan for the creek and associated designations the majority of the main channel elements are being progressively upgraded to cope with the 100 year design storm. Works in 2015-18 will double most of the lower section to a capacity to $35m^3/s$. This limit is based on the Lower Queen Street Bridge which will be a major project to upgrade. The current modelling indicates that the required 100 year flood capacity at this point is $62m^3/s$. However, further 2-D modelling is proposed in 2015/16 to refine this.

Other channel improvements such as Poutama Drain are being upgraded significantly to facilitate future subdivision but the full 100 year standard will be implemented later.

B.1.2. Asset Capacity and Performance

B.1.2.1 Primary Flow Paths

The Richmond Stormwater Analysis Report 2007 identified six areas that were under capacity, ie. existing capacity was less than the required 1 in 5 year flood event. Borck Creek was also found to be under capacity, ie. existing capacity was less than the required 1 in 50 year flood event. Further modelling has commenced associated with the Town centre upgrade project and this will be expanded to the full catchment in 2015/2016. This information will refine the system understanding.

B.1.2.1.1 Reservoir Creek Sub-catchment

Hydraulic analysis shows that under present and anticipated future land use conditions, the pipe network capacity generally exceeds the 5-year flood flow capacity, except along Selbourne Avenue, south of Hill Street, a short section along Ridings Grove, south of Hill Street, near Templemore Drive, between Hill Street and Salisbury Road, and at the corner of Champion Road and Salisbury Road.

B.1.2.1.2 Churchills Sub-catchment

Hydraulic analysis shows that much of this pipe network has insufficient capacity to convey the 5-year flood event, particularly under future land use conditions.

B.1.2.1.3 Williams Sub-catchment

Hydraulic analysis shows that most of this pipe network has insufficient capacity to convey the 5-year flood event, particularly under future land use conditions.

B.1.2.1.4 Lower Richmond Sub-catchment

Under present land use conditions, much of the pipe network can handle the 5-year flood peak. Pipes in the area around McPherson Street are however under sized and flooding occurs in this area (see Figure 5.1). Under future land use conditions, significant flooding has been experienced particularly in the areas around Croucher Street, Birds Street and Doran Street. This is due to large storm events in Decemeber 2011 and April 2013 generating runoff that exceeded the 1 in 50 year capacity of culverts under the Richmond Deviation.

B.1.2.1.5 Jimmy Lee Sub-catchment

The Washbourn Gardens detention dam overflowed during the June 2003, Dec 2011, and April 2013 flood events. Hydraulic analysis has confirmed this situation and the analysis has shown that the pipe network upstream of Hill Street and in the vicinity of Kihilla Road, Washbourn Drive and Farnham Drive cannot handle the 5-year flow. Several of the pipe reaches however have a capacity better than 10-year flood flow.

B.1.2.1.6 Upper Richmond (including Queen Street) Sub-catchment

This catchment also has a detention pond located at Olympus Way, but has a relatively small capacity. The inflow peak flow is about 1.2m^3/sec and the estimated outflow peak is about 0.8m^3/sec. The efficacy of the detention pond is therefore minor in view of its relatively small capacity.

B.1.2.1.7 Poutama Sub-catchment

Hydraulic analysis showed that the network is adequate to handle the 5-year storm runoff under present land use conditions. Most parts of the network also have adequate capacity to handle at least the 5-year storm runoff under possible future land use conditions.

B.1.2.2 Borck Creek and Eastern Hills Sub-catchments

The predicted peak flows in various key sections along Borck Creek and its tributaries are shown in

Table B-1. These are compared to the assessed channel capacities and constrictions imposed by bridges and culverts.

Table B-1: Design Flows and Channel Capacities of Borck Creek

Reach	Location Description (from downstream to upstream)	Peak Flow Predictions at various Return Periods (m^3/s)				Channel Capacity (m^3/s)
		1 in 5	1 in 10	1 in 20	1 in 50	
1	Borck Creek to Queen Street	19	22	28	34	12
2-4	Borck Creek from Queen Street to gauge site	18	21	28	34	17
5	Borck Creek from gauge site to Reed Andrews Drain	10	14	18	22	21
12	Eastern Hills Drain (also known as Bateup Drain)	4	5	6	8	14
11	Reed Andrews Drain (also known as Whites Drain)	1.9	2.8	3.5	5	7
6-7	Borck Creek from Reed Andrews Drain to SH6	8	10	13	18	13
9	Borck Creek from SH6 to Ranzau Road	7.4	10.9	10.7	13	13
10	From Patons Road along north side of Ranzau Road	0.6	0.7	0.7	0.8	0.5
10	From Patons Road along south side of Ranzau Road	1.8	2.1	2.4	2.8	2
	Borck Creek from Ranzau Road to Aniseed Valley Road.	3.2	4.1	4.6	6	3

Source: Richmond Stormwater Analysis Model Build and System Performance Analysis (MWH New Zealand Ltd (MWH), August 2007)

Borck Creek preferred design standard is the 100-year flood event. Much of Borck Creek is under capacity and flooding extending onto the floodplain occurs regularly with widespread ponding. Critical areas include:

- essentially the full length of Borck Creek
- lower reaches of Whites Drain
- lower reaches of Eastern Hills Drain (Bateup Drain).

Refer to the Richmond Stormwater Analysis Report 2007 for detailed analysis of each area along Borck Creek up to the 50 year event. Stormwater planning and capital works have been programmed to address these capacity issues. Further modelling in 2015/16 will address the 100 year capacity in more detail.

B.1.2.3 Secondary Flow Paths

Secondary flow paths assessment has commenced and the example at Figure B.1-1 shows the numerous flow paths that cross private property. Further work is underway to refine the accuracy of this information and determine appropriate responses.

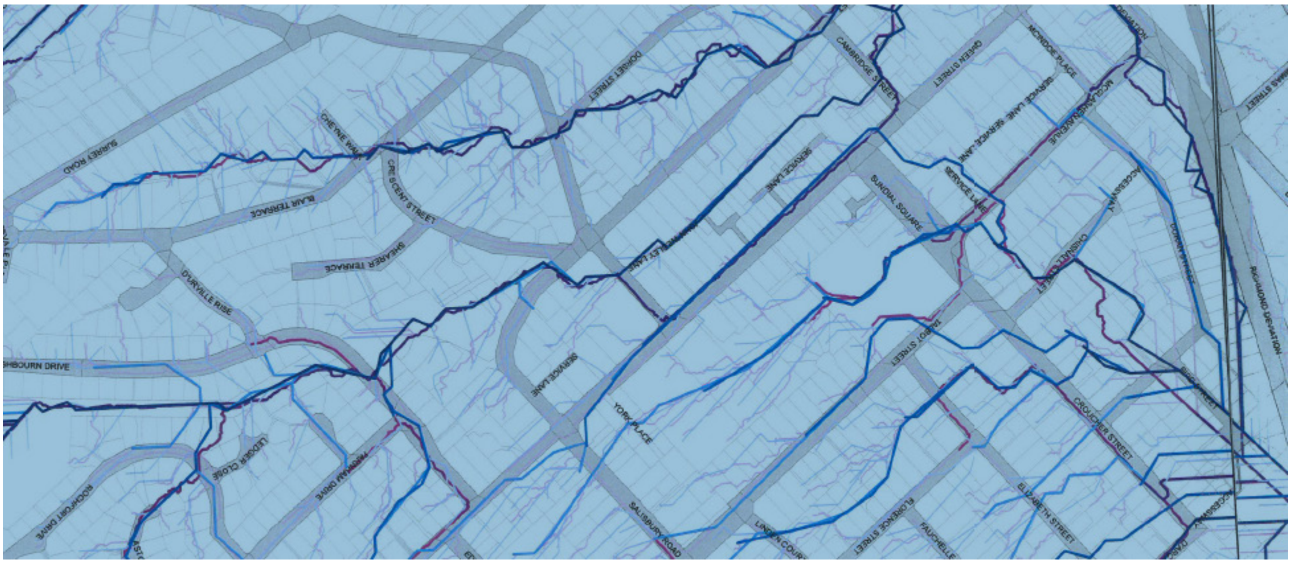


Figure B.1-1 Example of Richmond Secondary flow path mapping

B.1.2.4 Performance

Confirm has Customer Service Request (CSD) records of the following issues from the period 2012-2014

Row Labels	Flooding	Health Nuisance	Manhole Cover Missing	New Stormwater Connection	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Richmond	35	2	17	5	21	54	21	155

Source: Confirm

Other performance issues for Richmond UDA are.

- Significant higher density development is planned around the central dense residential developed area, with potential to further increase stormwater flows through the piped and open channel stormwater systems. Many piped systems in the central area were originally designed to accommodate flows from the immediate central areas. However, with recent, significant developments in many areas, most of the system does not provide the proposed piped level of service. Therefore greater emphasis is to be placed on secondary systems. There are significant weaknesses in this network as well.
- The natural pathway for stormwater flows is in a northerly direction, against many of the main infrastructure routes and road layout on a north west to south east grid. As development takes place this is leading to an increase in peak stormwater flows which naturally pass into the more densely populated areas.
- Significant development (residential, commercial and light industrial) took place around a number of key open drains such as the Reed/Andrews and the Eastern Hills Drains and now provides a constraint against drain widening.
- There are a number of significant areas of land allocated for future residential development to the north west of State Highway 6, within the Reed/ Andrews and Eastern Hills catchments and east of central Richmond, all which will increase future stormwater flow peak levels and volumes.
- The Reed/ Andrews Drain and Borck Creek have crossings under State Highway 6 and 60 (Appleby Highway) through box culverts, and proposals to increase the size of any culvert crossing will require the approval of NZ Transport Agency.

- The Council's Engineering Standards require all new conventional pipe systems to have a 1 in 20 year capacity for the primary system, refer to table 7-2 of the Engineering Standards 2013 for further information on requirements of new infrastructure.

B.1.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1950 and 2015.

Generally the assets in the Richmond UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, the following asset renewals are planned for the period of this AMP.

- Lodestone Park - Replace existing inlet structure with new inlet structure for Lodestone Park temporary storage pond.
- Detention Dam Resource Consent Renewals - Consents expire 31 May 2030 (Bill Wilkes, Washbourn, Lodestone, Eden).
- Richmond Renewals - CCTV shows areas in McGlashen, Doran, Waverley, Salisbury. Manhole to manhole renewal.

B.1.4. Compliance with Level of Service

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired levels of service.

A Catchment Management Plan CMP is currently being developed to improve Council's understanding of and improvement plans for:

- the catchment operations and management,
- bio-diversity, amenity and connectivity,
- the expected impacts of climate change,
- the nature of the receiving environment,
- the quality of the stormwater discharge, and
- options to manage any potential flooding.

This Plan will be followed by a resource consent application for discharge in accordance with the TRMP.

B.1.5. Growth and Demand

Growth from new dwellings in Richmond township is expected to increase by 23% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.1.6. Operations and Maintenance

The primary operating and maintenance activity for Richmond is to ensure the open drainage channels are kept to a reasonable standard of repair. There have been some problems with the state of the drains in recent years so the Council, in association with the operations and maintenance contractor developed an appropriate regime of works. The 2011-14 flood events have added significant gravel to the systems which has decreased channel capacity and increased maintenance to maintain open culvert. Significant quantities of gravel has been extracted in but further removal would be beneficial for flood management.

The inlet and outlet structures of all the detention dams are maintained so that these remain fully functional. Details of the operation and maintenance regime are included in Appendix E.

B.1.7. Strategic Studies

Table B-2 below lists key existing strategic studies and models within the UDA:

Table B-2: Existing Strategic Studies and Models for the Richmond UDA

Title	Month	Year	Author	Purpose
Flood Hazard at the Wairoa Bridge, Nelson	January	1986	E. Verstappen	Records observations of 1986 flood event that affected Richmond and Brightwater.
Eastern Hills Drain Study	May	1995	Sanders, Lane and Page Ltd	Catchment assessment of Borck Creek and Eastern Hills Drain.
Borck Creek Improvement Strategy	March	2000	MWH	Objective of strategy is to determine the most cost effective and affordable improvements necessary to discharge the 1 in 50 year flood without flooding buildings.
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Richmond Urban Drainage Area Development Impact Levy for Stormwater	April	2004	MWH	Investigates proportion of upgrade costs due to growth in Richmond, development contributions.
South Richmond Development Area Study	January	2006	MWH	Review of existing system and recommendations to provide a satisfactory level of service.
Borck Creek Upgrade, Creek Mouth to Ranzau Road	January	2006	MWH	Reviews extent of existing development in Borck Creek catchment and determines the 50 and 100 year storm events.
Richmond and Motueka Design Rainfall	March	2007	Opus	Review and upgrade of design rainfall tables.
Richmond Stormwater Analysis Model Build and System Performance Analysis	August	2007	MWH	Describes appropriate hydrologic and hydraulic models including data collection, calibration and verification and analysis of existing drainage network under present and anticipated future land use conditions.
Richmond Stormwater Modelling Options Analysis	June	2008	MWH	Area wide assessment of Richmond system capacity and performance.
Richmond Detention Dam Modelling Assessment	November	2009	MWH	Improve the way existing detention basins are modelled in the Richmond UDA
Dam Safety Inspections for Detention Dams	November	2009	MWH	Safety inspection and assessment of Bill Wilkes Reserve, Washbourn Gardens, Lodestone Road-Dellside Reserve for retrospective resource

Title	Month	Year	Author	Purpose
				consent application.
Future Proofing Richmond's Stormwater Infrastructure		2010	MWH	Presentation to Stormwater Conference 2010 - Denis O'Brien and Jeff Cuthbertson.
Borck Creek Cultural Health Indicators Report	February	2014	Tiakina te Taiao	Report pre stream widening works to determine baseline for effects upon manu whenua iwi values.
Borck Creek and Poutama Drain Design		2014	MWH	Detailed design of interim upgrading works for tendered works 2015-2016
Richmond Town Centre Design		2015	MWH	Modelling of flood potential and design of alternative solutions.

B.1.8. Key Issues

The key issues for Richmond are:

- some assets such as Queen Street pipework are in poor condition and need to be replaced.
- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection and 95% is below the 2013 standard of 1:20 year.
- the existing system reticulated will not be able to maintain service levels at predicted levels of growth and secondary flow management is also difficult.
- The harvesting of the production forest in the steep hills above Richmond will generate increased sediment and runoff until forest is significantly re-established.

B.1.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-3: Richmond Stormwater Assets

Richmond Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	102
SW-Culvert	1,375
SW-Extent of feature	428
SW-Pipe	94,160
Grand Total	**96,065**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	**102**
0	102
SW-Culvert	**1,375**
0	852
300	107
375	48
450	78
600	12
900	54
1050	71
1200	18
1500	36
1800	100
SW-Extent of feature	**428**
0	428
SW-Pipe	**94,160**
0	46
40	22
90	80
100	5,814
110	9
150	7,300
160	34
200	712
225	16,453
250	764
300	19,757
375	7,708
450	10,684
525	3,389
600	5,852
675	1,028
700	2
750	3,420
825	402
900	3,906
1050	2,157
1200	3,286
1220	172
1350	98
1400	165
1500	609
1600	41
1650	123
1800	127
Grand Total	**96,065**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	**102**
Concrete	102
SW-Culvert	**1,375**
Concrete	963
Field Tile	43
RCFJ	119
RCRRJ	122
RCRRJ Class Z	66
Unknown	62
SW-Extent of feature	**428**
Concrete	58
(blank)	370
SW-Pipe	**94,160**
Aluflo Aluminium Corrugated	167
Asbestos Cement	391
Cast Iron	2
Concrete	35,947
Glazed Earthenware	94
Novaflow	80
PVC	3,004
PVC Class B	29
RCFJ	1,672
RCFJ Class X	1,559
RCRRJ	29,831
RCRRJ Class X	7,464
RCRRJ Class Y	2,157
RCRRJ Class Z	408
Steel	171
Unknown	3,641
uPVC	7,543
Grand Total	**96,065**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Sum of Length
SW-Channel	22,902
Grand Total	**22,902**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Richmond

Row Labels	Count of ASSETID
SW-Chamber	39
SW-Cleaning eye	65
SW-Detention dam	4
SW-Inlet	39
SW-Inlet structure	40
SW-Inspection point	33
SW-Manhole	1,040
SW-Miscellaneous item	1
SW-Node	371
SW-Outlet	99
SW-Outlet structure	32
SW-Pump	1
SW-Soakpit	21
SW-Sump	1,878
SW-Valve	3
Grand Total	**3,666**

B.2 Brightwater UDA

B.2.1. System Overview

The Brightwater settlement is positioned between the Wai-iti and Wairoa Rivers, three kilometres upstream from their confluence. It is situated on a very flat floodplain with a number of old, shallow river and stream channels crossing it.

There are four catchments immediately above Brightwater; from east to west these are the Mt Heslington catchment (395ha), Rutherford catchment (13ha), Jeffries catchment (141ha), and the Pitfure catchment (2,500ha). Brightwater's urban stormwater network is positioned in the centre of these surrounding rivers and catchments and covers an area of about 70ha. Refer to Appendix Y for a map of the UDA boundary.

The streams originating from the Pitfure, Jeffries, and Rutherford catchments generally pass around the western side of Brightwater then up towards the Wai-iti River. The Mt Heslington Stream passes through the Brightwater School then turns eastward to join the Wairoa River via the Railway Diversion. The Wai-iti and Wairoa Rivers that flank Brightwater have their own associated flooding problems. The assessment of the flood hazard resulting from these rivers falls outside the scope of this investigation, which is primarily concerned with localised stormwater flooding.

The Mt Heslington Stream and Jeffries Creek arise from steep hillside catchments to the south. They both cross through parts of the Brightwater UDA. Mt Heslington Stream crosses through the southeast through the stockyards, under the deviation (SH6) across the primary school, under Ellis Street and into a diversion channel that takes stream away from its 'natural channel' direct to the Wairoa.

Jeffries Creek cuts across the far southwest end of the UDA around Lord Rutherford Road before draining into the Pitfure Stream. The Pitfure Stream is a long flat meandering stream that drains the floodplain between Wakefield and Brightwater. It passes to the west of Brightwater UDA.

The main urban areas of Brightwater discharge in piped systems either into one of the three streams or into the old river channels that lead into the Wairoa or Wai-iti Rivers.

Through observing the floods of 29 June 2003 (Tomkinson and Burridge, 2003), the stormwater flooding problems at Brightwater are believed to have been caused by runoff flows from a combination of the four catchments immediately above the township.

There is currently no stormwater treatment in place.

Table B-5 shows the stormwater assets in Brightwater.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Brightwater currently has no resource consents.

B.2.2. Asset Capacity and Performance

B.2.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.2.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.2.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Brightwater	5	3	8	4	20

Source: Confirm

Other performance issues for Brightwater UDA are.

- It is flat with very little hydraulic gradient to get good drainage.
- It has three streams fed by reasonably large rural catchments (outside the UDA) that run through or around the outskirts of the UDA.
- Flooding issues in southwest Brightwater are inter-related. The main issue is the relatively flat topography of the valley floor which is primarily a flood plain for the Wai-iti River and is naturally graded towards the urban areas of south west Brightwater, which combined with the lack of existing drainage capacity leads to widespread overland flow and flooding.

B.2.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1964 and 2015. A small stormwater pumping station was installed in the Brightwater Underpass in 2004/05 to alleviate flooding.

Generally the assets in the Brightwater UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. However, the mechanical and electrical assets at the pumping station have been programmed for regular renewal as they reach the end of their expected design life.

B.2.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service has also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 30% of the network is not yet capable of containing a 1 in 5 year storm event. The flood event of 29 June 2003 provided recent knowledge.

Generally all of the streams are flood prone and experience frequent ‘out-of-channel’ flows. This causes problems where they come into or up against the UDA, specifically:

- Mt Heslington Stream – flooding experienced where stream passes through private property south of Ellis Street
- Pitfure Stream – the Pitfure Stream floods frequently and threatens the on-going subdivision development to the northwest. Subdivisions have been protected by the construction of low flood banks and property raising.

Jeffries Creek was upgraded to Q50 in 2009/10.
It is estimated that the existing system provides levels of service in the region of:

- Pitfure Stream - Q_{10} - 1 in 10 year return period
- Mt Heslington Stream - Q_2 - 1 in 2 year return period.

Generally the remainder of the stormwater system appears adequate, or has adequate secondary flow paths so as not to cause undue flooding when the system capacity is exceeded. The exceptions to this are:

- Rintoul Place which suffered extensive surface flooding when the primary drainage system capacity was exceeded in the 29 June 2003 event.
- Fairfield Street where a stormwater soak pit does not provide sufficient drainage in severe events.
- Mt Heslington Stream overtops in the school and the industrial area downstream of the Ellis Street Culvert.

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.2.5. Growth and Demand

Growth from new dwellings in Brightwater township is expected to increase by 20% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.2.6. Operations and Maintenance

The primary operating and maintenance activity for Brightwater is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operation and maintenance regime are included in Appendix E.

B.2.7. Strategic Studies

Table B-4 below lists key existing strategic studies and models within the UDA:

Table B-4: Existing Strategic Studies and Models for the Brightwater UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event.	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
South West Brightwater, Mt Heslington Stream Stormwater Concept Design.	January	2010	MWH	Investigates improvement works to prevent flooding in Brightwater in 1 in 20 year storm.
Brightwater- Wakefield Flood Hazard Mapping	December	2013	SKM	Model of river flooding for Wairoa, Wai-iti Rivers that shows flooding overlapping with the UDA boundaries but did not include co-incident rainfall within the UDA.

Table B-5: Brightwater Stormwater Assets

Brightwater Stormwater Assets
Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	31
SW-Extent of featur	263
SW-Pipe	10,400
Grand Total	**10,694**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	**31**
0	14
1200	17
SW-Extent of feature	**263**
0	263
SW-Pipe	**10,400**
40	7
100	1,191
150	515
160	37
200	87
225	1,392
240	1
250	1
300	2,393
375	1,094
450	1,454
500	10
525	295
600	1,304
750	551
900	31
1200	38
Grand Total	**10,694**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Culvert	**31**
Concrete	31
SW-Extent of feature	**263**
(blank)	263
SW-Pipe	**10,400**
Aluflo Aluminium Corrugated	245
Concrete	3,040
Corrugated steel	202
MDPE	7
Novaflow	120
Polyethylene	7
PVC	232
RCFJ	150
RCRRJ	3,945
RCRRJ Class X	79
RCRRJ Class Z	73
Unknown	540
uPVC	1,761
Grand Total	**10,694**

Summary of Channel Assets

TDC Ownershi	(Multiple Items)
UDA Name	Brightwater

Row Labels	Sum of Length
SW-Channel	7,242
Grand Total	**7,242**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Brightwater

Row Labels	Count of ASSETID
SW-Cleaning eye	15
SW-Collection ponc	3
SW-Control cabinet	1
SW-Inlet	22
SW-Inlet structure	4
SW-Inspection poir	1
SW-Manhole	124
SW-Node	31
SW-Outlet	23
SW-Outlet structur	6
SW-Pump	1
SW-Pump station	1
SW-Soakpit	7
SW-Sump	157
SW-Telemetry	1
Grand Total	**397**

B.3 Wakefield UDA

B.3.1. System Overview

The Wakefield UDA is a mixture of rural and urban development. To the west of the State Highway the land is flat, and to the east it is undulating. Recent subdivision development has incorporated stormwater systems but these ultimately discharge to open drains which in the east discharge to the Pitfure Stream which flows from Wakefield to Brightwater before it joins the Wai-iti River. The southern area discharges to 88 Valley Stream and several areas lead directly to the Wai-iti River.

Wakefield lies between two waterways; the Wai-iti River and the Pitfure Stream. All the drainage systems in Wakefield eventually drain to one of these rivers. Most of the stormwater system was built during the late 1980s. Refer to Appendix Y for a map of the catchments and UDA boundary.

There is currently no stormwater treatment in place.

Table 6 shows the stormwater assets in Wakefield.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Wakefield currently has no resource consents.

B.3.2. Asset Capacity and Performance

B.3.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.3.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.3.2.3 Performance

There is little historical data available concerning the performance of either pipe systems and/or the open drains in this area, however it should be noted that there was serious flooding to the surrounding area from the Wai-iti River during the July 1983 floods in that area.

Confirm has CSR records of the following issues from the period 2012-2014

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Wakefield	4	3	3	1	11

Source: Confirm

Other performance issues for Wakefield UDA are.

- the settlement is located on a flood plain, close to the Wai-iti River to one side and to the Pitfure Stream on the other side (a tributary of the Wai-iti River)
- a formal review of the condition of the stormwater system and assessment of the current system performance and review to accommodate future population growth has not been completed but is recommended.
- Backing up of the Pitfure Stream causes surface flooding at the SH6 and Pitfure Road junction. The state highway was blocked twice in 2014 and minor property flooding also occurred.

B.3.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1958 and 2015.

Generally the assets in the Wakefield UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, renewal is required due to poor condition of the existing stormwater pipe from SH6 and Pitfure Road intersection out to an open drain into Pitfure Stream.

B.3.4. Compliance with Level of Service

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.3.5. Growth and Demand

Growth from new dwellings in Wakefield township is expected to increase by 28% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.3.6. Operations and Maintenance

The open drains are maintained to allow the passage of stormwater through the open channels without causing either blockages or scouring of banks.

Details of the operation and maintenance regime are included in Appendix E.

B.3.7. Strategic Studies

Title	Month	Year	Author	Purpose
Brightwater- Wakefield Flood Hazard Mapping	December	2013	SKM	Model of river flooding for Wairoa, Wai-iti Rivers that shows flooding overlapping with the UDA boundaries but did not include co-incident rainfall within the UDA.

B.3.8. Key Issues

The key issues for Wakefield are.

- some assets are of insufficient capacity and need to be upgraded.
- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection and 95% is below the 2013 standard of 1:20 year.
- the existing system will not be able to maintain service levels at predicted levels of growth.
- Flooding in the Pitfure impedes urban drainage to the point of causing flooding within the town.

B.3.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-6: Wakefield Stormwater Assets

Wakefield Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	99
SW-Pipe	8,532
Grand Total	**8,631**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	**99**
0	8
375	91
SW-Pipe	**8,532**
100	472
150	133
160	71
200	162
225	692
300	3,203
375	516
450	1,549
525	233
600	734
650	38
675	79
750	540
900	109
Grand Total	**8,631**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Culvert	**99**
Concrete	8
RCRRJ	18
RCRRJ Class Z	72
SW-Pipe	**8,532**
Asbestos Cement	11
Concrete	129
Glazed Earthenware	56
Nexus Hi-way	71
PVC	13
RCRRJ	4,123
RCRRJ Class X	419
RCRRJ Class Y	85
RCRRJ Class Z	68
Unknown	2,617
uPVC	940
Grand Total	**8,631**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Sum of Length
SW-Channel	6,153
Grand Total	**6,153**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Wakefield

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	23
SW-Inlet structure	2
SW-Manhole	82
SW-Node	49
SW-Outlet	32
SW-Outlet structure	1
SW-Soakpit	12
SW-Sump	157
Grand Total	**361**

B.4 Murchison UDA

B.4.1. System Overview

The primary drainage system in Murchison is the network of open creeks that drain to the Matakitaki River just south of Murchison. These creeks drain over 600ha of predominantly rural catchment through Murchison, picking up the urban runoff as they pass through the town. The creek network is quite extensive throughout the town and the area of piped stormwater systems is restricted to drainage from Waller Street, the central part of town.

The catchment area has not been assessed, refer to Appendix Y for a map of the UDA boundary.

There are numerous culvert crossings under a number of streets as a result of the six open channels passing into the Murchison UDA.

Within the UDA, the majority of stormwater from residential dwellings is to ground soakage. From highways stormwater runoff is to open channels (Ned's Creek) or to soakaways.

The reticulated stormwater system comprises of a number of small piped systems that collect highway drainage, most discharging into Ned's Creek. Grey Street runoff drains into a series of soakaways.

The remainder of the Murchison area drains into a series of open ditches and waterways. The ditches are highly modified from their natural state (to improve drainage capacity) and the riparian areas are a variety of grassed, landscaped and bush verges depending on the land use and landowner preference.

There is currently no stormwater treatment in place.

Table 7 shows the stormwater assets in Murchison.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Murchison currently has no resource consents.

B.4.2. Asset Capacity and Performance

B.4.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.4.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.4.2.3 Performance

There is little data available but there have been recent problems with single sumps and pipes in Fairfax Street becoming blocked. New double sumps and larger pipes have been installed and this should resolve these problems. A new stormwater system in Milton Street discharges to Ned's Creek and maintenance work in that creek is done on an 'as and when' required basis. The performance of the deep sump manholes, which discharge into river gravels in Grey and Fairfax Streets, has been satisfactory.

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Open Drains (non-roading)	Other	Grand Total
Murchison	2	1	2	5

Source: Confirm

Other performance issues for Murchison UDA are.

- The network of stormwater ditches pass through the UDA in close proximity to a number of dwellings and access is very restricted in places where ditches pass through various subdivisions.
- Many lengths of ditch suffer from excessive weed growth and accumulated silts washed down from further upstream in the catchment.
- The Murchison Environmental Care Group (MECG) has been maintaining and provided environmental enhancements to a section of open drain within the Murchison UDA, through agreement with the Council. The aim of the MECG is to return stormwater ditches to their natural state, supportive of native flora and fauna species. Overall this has been successful, however, the capacity has been reduced and because a number of properties may be prone to flooding, Council has been asked to clear a section.
- A number of culvert crossings in upstream locations of the UDA severely restrict continuation stormwater flows, with estimated levels of service providing a capacity possibly less than a Q1 storm event.
- Murchison stormwater catchment is a dendritic non-linear catchment where there are four main sub catchments, which drain into one central point located in the centre of Murchison. At this point, storm flows are likely to converge at a particular time of concentration.

B.4.3. Asset Age and Condition

All pipe assets and non-piped assets were installed between 1970 and 2015.

Generally the assets in the Murchison UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. However, early renewals and upgrade projects are programmed Fairfax Street to improve LOS..

B.4.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 60% of the network is not yet capable of containing a 1 in 5 year storm event.

Flooding events from Neds Creek occurred in April and June 2012. This caused floor level flooding of at least 5 properties and significant surface flooding. Whilst, some minor works have completed, generally the risk to this area has not yet been mitigated.

A particular deficient level of service is upstream of Fairfax Street to the intersection with the ditch network from Hotham Street and further upstream to the next intersection towards Hotham Street.

The majority of property owners maintain the streams on their property, however Council involvement is required where streams pass through reserves and other Council owned property and where property owners fail to carry out maintenance.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.4.5. Growth and Demand

Growth from new dwellings in Murchison township is expected to increase by 8% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.4.6. Operations and Maintenance

The primary operating and maintenance activity for Murchison is to ensure the open drainage channels are kept to a reasonable standard of repair.

A number of sections of ditch have had environmental improvement work, completed by the Murchison Environmental Care Group, which has included the planting of native plants and grasses, removing accumulated silts and debris to ditch base level, and removing weeds and plant growth. There is an agreement between the Council and the MECG for these enhancements to be made. The MECG was highly commended by the Council in the community group category for the Environmental Awards 2005.

The ditch network requires work in a number of areas to maintain the ditch banks, remove accumulation of weed growth, reinstate ditch beds and cut down vegetative growth restricting the flow path.

The operation and maintenance regime is included in Appendix E.

B.4.7. Strategic Studies

Title	Month	Year	Author	Purpose
Neds Creek Flood Modeling - Murchison	November	2013	MWH	Model of flooding area which determines existing creek capacity and proposed remedial works to raise capacity to 1:100 year.

B.4.8. Key Issues

The key issues for Murchison are:

- Neds Creek has a low level of service and flooding potential has not been mitigated. Some assets which contribute to flooding are privately owned.
- 60% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection and 95% is below the 2013 standard of 1:20 year.

B.4.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-7: Murchison Stormwater Assets

Murchison Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	154
SW-Extent of feature	38
SW-Pipe	1,391
Grand Total	**1,584**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	**154**
0	37
300	39
375	11
600	17
675	28
1200	24
SW-Extent of feature	**38**
0	38
SW-Pipe	**1,391**
150	218
200	317
225	166
300	314
450	300
500	33
600	15
1500	27
Grand Total	**1,584**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Culvert	**154**
Concrete	144
RCRRJ	11
SW-Extent of feature	**38**
(blank)	38
SW-Pipe	**1,391**
Concrete	456
Glazed Earthenware	140
PVC	4
RCRRJ	169
RCRRJ Class X	91
RCRRJ Class Y	11
Unknown	70
uPVC	449
Grand Total	**1,584**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Sum of Length
SW-Channel	10,899
Grand Total	**10,899**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Murchison

Row Labels	Count of ASSETID
SW-Inlet	11
SW-Inlet structure	1
SW-Manhole	4
SW-Node	18
SW-Outlet	17
SW-Outlet structure	1
SW-Soakpit	9
SW-Sump	58
Grand Total	**119**

B.5 St Arnaud

B.5.1. Stormwater Overview

The St Arnaud settlement is surrounded by the Nelson Lakes National Park and located on the shores of Lake Rotoiti. The steep, glacial terrain surrounding St Arnaud has high run off flows. The catchment area is divided into seven sub-catchments, refer to Appendix Y for a map of the UDA boundary.

St Arnaud has very few piped systems in the more established developments with predominant systems being runoff to open drains. While the majority of drainage within the built up area consists of small streams and roadside type open channels, the more recent sub divisions have been developed with piped stormwater systems.

A number of culvert crossings of the open drains under Main Road St Arnaud are the strategic parts of the stormwater system and are the responsibility of NZ Transport Agency to maintain.

In the past there have been problems with erosion in the open channel behind the footpath that goes down to the lake foreshore, and flooding to St Arnaud Hall and the Alpine Lodge, arising from the Black Valley Stream.

There is currently no stormwater treatment in place.

Table 10 shows the stormwater assets in St Arnaud.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

St Arnaud currently has no resource consents.

B.5.2. Asset Capacity and Performance

B.5.2.1 Primary Flow Paths

The Stormwater Catchment Study for St Arnaud (MWH New Zealand Ltd (MWH), November 2005) assessed catchment capacity as follows in Table B-8.

Table B-8: Assessment of St Arnaud Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Runoff (m^3/s)
A: Black Valley 1	Channel	*	89	98
B: Black Valley 2	Channel	*	85	98
C: Black Valley 3	Channel	*	590	98
D: Brookvale Drive	Channel	*	20	18
E: NZTA Catchment 1	Culvert	*	6.8	6
F: NZTA Catchment 2	Culvert	*	13	23
G: NZTA Catchment 3	Culvert	*	12	19

Source: Stormwater Catchment Study for St Arnaud (MWH New Zealand Ltd, November 2005)

* Not assessed

Table B-8 above shows that culverts in catchments A, B, F and G have insufficient capacity.

B.5.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.5.2.3 Performance

No CSR records have been recorded in Confirm for the period 2012-2014.

Performance issues for St Arnaud UDA are.

- This is located within a National Park and therefore any development work or modification work to the existing stormwater system is subject to National Park regulations.
- Future residential development is likely to be very limited and restricted by National Park regulations.
- The Black Valley Stream drains a large area of land and passes in close proximity to a number of residential properties and the Alpine Lodge and St Arnaud Hall. The stream is prone to debris accumulation and fallen trees, which cause flow restrictions.
- The Black Valley Stream culverts crossing Bridge Street and State Highway 63 suffer from regular blockages from debris accumulation.
- Local flooding in Brookvale Drive from access way construction.

B.5.3. Asset Age and Condition

All pipe assets were installed between 2000 and 2015. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

The assets in the St Arnaud UDA are very young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. Therefore there are no asset renewals planned for the period of this AMP.

B.5.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.5.5. Growth and Demand

Growth from new dwellings in St Arnaud township is expected to increase by 10% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.5.6. Operations and Maintenance

Regular maintenance of the culverts is required and liaison with DoC regarding stream bed clearance, and with NZ Transport Agency regarding maintenance of culverts on the State Highway.

Utiliites Team and contractors doe not undertake any pro-active maintenance in St Arnaud.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.5.7. Strategic Studies

Table B-9 following lists key existing strategic studies and models within the UDA:

Table B-9: **Existing Strategic Studies and Models for the St Arnaud UDA**

Title	Month	Year	Author	Purpose
St Arnaud Stormwater Catchment Study	November	2005	MWH	Investigates potential long and short term options to control flooding in St Arnaud area.

B.5.8. Key Issues

The key issues for St Arnaud are:

- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection and 95% is below the 2013 standard of 1:20 year.

B.5.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-10: St Arnaud Stormwater Assets

St Arnaud Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	124
SW-Pipe	1,412
Grand Total	**1,536**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	**124**
225	22
300	28
450	20
1050	53
SW-Pipe	**1,412**
100	181
150	40
225	157
300	295
375	98
450	113
525	254
675	156
750	91
825	28
Grand Total	**1,536**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Culvert	**124**
Concrete	36
RCRRJ	66
Unknown	22
SW-Pipe	**1,412**
Concrete	15
RCRRJ	1,061
Unknown	78
uPVC	258
Grand Total	**1,536**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Sum of Length
SW-Channel	1,033
Grand Total	**1,033**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	St Arnaud

Row Labels	Count of ASSETID
SW-Inlet structure	3
SW-Manhole	24
SW-Node	7
SW-Sump	30
Grand Total	**64**

B.6 Tapawera UDA

B.6.1. Stormwater Overview

Tapawera was constructed by NZ Forest Service as a forestry headquarters village.

There are a limited number of piped stormwater systems within the urban drainage area that discharge into a series of open channels which flow into the Motueka River.

The catchment area is divided into four sub catchments totalling 254ha, refer to Appendix Y for a map of the UDA boundary.

A gravel fan outflows from steep hillside country that defines the Motueka River Valley, situated behind the east side of the township. During the village construction, groundwater issues in the residential area became significant and a substantial drainage cut off system was constructed to the east of the village at the foot of the gravel fan. Any failure of this system would presents a risk to the township area of surface flooding and very wet ground conditions. This is unlikely to cause rapid inundation of building and hence does not justify capital investment.

A stream intercepts flows from a large area to the south of Tapawera which drains an area of flood plain between the gravel fans and Motueka River. This stream passes through the UDA, crossing Main Road Tapawera and Tadmor Valley Road, before leaving the UDA and discharging into the Motueka River. This is the keystone of the Tapawera stormwater system which collects stormwater flows from open drain and the piped stormwater systems.

There is currently no stormwater treatment in place.

Table B-13 shows the stormwater assets in Tapawera.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Tapawera currently has no resource consents.

B.6.2. Asset Capacity and Performance

B.6.2.1 Primary Flow Paths

The Stormwater Catchment Study for Tapawera (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-11.

Table B-11: Assessment of Tapawera Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1500 dia	4.78	Q_{35}	6.00	> Q_{100}	5.05
B: Twin 900 dia	1.83	Q_{50}	4.58	> Q_{100}	1.83
C: Twin 750 dia	2.46	> Q_{100}	2.91	> Q_{100}	1.58
D: Twin 750 dia	2.20	Q_5	3.45	Q_{50}	3.48
E: 550 dia..	0.56	Q_2	0.69	Q_3	1.29

Source: Stormwater Catchment Study for Tapawera (MWH New Zealand Ltd, May 2008)

Table B-11 above shows that Culvert E is potentially undersized..

B.6.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.6.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Open Drains (non roading)	Grand Total
Tapawera	1	1

Source: Confirm

Other performance issues for the Tapawera UDA are.

- The settlement is small and self-contained but vulnerable to surface flows from outside the UDA.
- A key interception drainage ditch was constructed by the forestry board but is now maintained by Council.
- A number of properties on Matai Crescent are vulnerable to flooding from surface flows arising from the stream/ open channel to the south of Tapawera, particularly in the event of a blockage or overwhelming of the twin 750mm dia. culvert crossing on the Motueka Valley Highway (which may only offer a level of service for a 1 in 5 year storm event).
- Both the road drainage and property runoff is collected by a piped stormwater system within the Tapawera UDA and much of this system discharges into a swale type open water channel in the centre of the UDA.
- The culvert crossings for the network of streams and drains are estimated to provide a level of service to cope with between a 1 in 10 and 20 storm return period.

B.6.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1973 and 2015.

Generally the assets in the Tapawera UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

However, the Forestry Board Drain and Matai Crescent Drain require regular reshaping and gravel extraction to return them to their original design. Renewal projects are programmed to address this on an ongoing basis as Council has made a commitment to do so.

B.6.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 10% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.6.5. Growth and Demand

Growth from new dwellings in Tapawera township is not expected to be significant.

B.6.6. Operations and Maintenance

Regular maintenance of the culverts is required. Details of the operations and maintenance schedule are enclosed in Appendix E.

B.6.7. Strategic Studies

Table B-12 below lists key existing strategic studies and models within the UDA

Table B-12: Existing Strategic Studies and Models the Tapawera UDA

Title	Month	Year	Author	Purpose
Tapawera Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Tapawera area.

B.6.8. Key Issues

The key issues for Tapawera are.

- 10% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.

B.6.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-13: Tapawera Stormwater Assets

Tapawera Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	137
SW-Pipe	3,399
Grand Total	**3,537**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	**137**
750	36
900	75
1500	27
SW-Pipe	**3,399**
100	34
150	179
225	102
230	202
300	2,060
375	399
450	91
455	95
525	137
600	101
Grand Total	**3,537**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Culvert	**137**
Concrete	118
Unknown	19
SW-Pipe	**3,399**
Asbestos Cement	596
Concrete	2,141
PVC	13
RCRRJ	473
RCRRJ Class X	50
Unknown	126
Grand Total	**3,537**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Sum of Length
SW-Channel	362
Grand Total	**362**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Tapawera

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	4
SW-Manhole	36
SW-Node	9
SW-Outlet	8
SW-Soakpit	9
SW-Sump	53
Grand Total	**122**

B.7 Motueka UDA

B.7.1. System Overview

Motueka has a long history of flooding problems because of its low lying nature, flat terrain, and alluvial gravels with high water table, proximity to the Motueka River and Tasman Bay.

The catchment area is divided into nine sub catchments, refer to Appendix Y for a map of the UDA boundary.

The Motueka UDA is mostly developed less densely than Richmond due to the size of the properties, mostly quarter-acre sections. A considerable amount of stormwater drainage is by soakage to the underlying soils and gravels.

The UDA drains to three main areas:

- into the Motueka River in the north west via Staples Drain
- into a small enclosed tidal lagoon through the Lammas Drains in the north east
- into a small enclosed tidal lagoon in the south, through the Thorp and Woodlands Drains.

Both tidal lagoons are protected by tidal gates, to control against high tidal surge / flooding into lower areas of the Motueka township, the former discharges into Tasman Bay, the latter into the Moutere Inlet.

The dominant piped drainage direction is from west to east. To the north of Motueka the drainage infrastructure is largely informal with a large reliance on discharge to groundwater and/or shallow swales. The ultimate outlet is via two small surface drains, Staples Drain and Lammas Drain.

The bulk of the central area drains to either the Thorp or Woodlands Drains which run north to south between High Street and Thorp Street. Originally all drainage flowed east until it met the coastal ridge that Thorp Street runs along. This turned the flow south into the Moutere Inlet, a large tidal estuary, via Thorp Drain. Frequent flooding of the upper end of Thorp Drain led to the construction of Woodlands Drain and Wilkinson Drain, a parallel drain slightly further west. The aim of this was to cut off the main flows from the west and discharge them earlier to the estuary. A further extension of this philosophy saw the construction of a new system in High Street to prevent flooding in the commercial and retail centre of Motueka.

The remainder of Motueka is drained via small piped stormwater systems discharging directly to sea or adjacent open channels.

Very few parts of the stormwater reticulation were designed in accordance with former performance standards, providing a 1 in 5 year level of service. The former Motueka Borough Council standard was for pipes to pass 1 in 2 year storm flow events.

Recent developments between Thorp Street and Motueka Quay have included the construction of detention ponds to enable piped coastal outlets to operate against high tidal levels. In addition, other recent developments have seen the use of soak pits as the primary stormwater discharge system, returning storm flows to ground.

Three substantial stormwater outlet structures exist in the system:

- Wharf Road culvert tidal gates (draining the southern tidal lagoon, controlling Woodlands and Thorp Drain discharges)
- Old Wharf Road tidal gates (secondary tidal gates, controlling flows from the Woodlands Drain)
- Staple Street tidal gates (draining the northern tidal lagoon, controlling Lammas Drain discharges).

The operation of control gates on Wharf Road and Old Wharf Road are controlled via Council's telemetry system.

Four open stormwater channels discharge collected stormwater from the township:

- Lammas Drain
- Staples Drain
- Woodlands Drain
- Thorp Drain.

There is currently no stormwater treatment in place.

Table B1.6 shows the stormwater assets in Motueka.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Motueka currently has the following resource consents.

RM110089: To locate, operate and maintain a utility and to undertake earthworks in High Street and Eginton Street, Motueka (expires 15 February 2012).

RM110090: To take and divert groundwater by dewatering and discharge to either the stormwater or sewerage system in High Street and Eginton Street, Motueka (expires 15 February 2012).

B.7.2. Asset Capacity and Performance

B.7.2.1 Primary Flow Paths

The Motueka UDA Development Impact Levy for Stormwater (MWH New Zealand Ltd, 2004) assessed catchment capacity as follows in Table B-14.

Table B-14: Assessment of Motueka Catchment Capacity

Catchment	Current Capacity (m^3/s)	Q_5 Storm Flow (m^3/s)	Q_{50} Storm Flow (m^3/s)
A: Central	*	7.1	12.9
B: Woodlands	*	5.6	10.2
C: King Edward	*	5.7	10.3
D: Courtney	*	3.3	5.9
E: Thorpes	*	3.1	5.7
E: Motueka Quay	*	2.9	5.3
E: East Motueka	*	2.2	4.1
E: Staples	*	1.5	2.7
E: North Motueka	*	2.9	5.2

Source: Motueka UDA Development Impact Levy for Stormwater (MWH New Zealand Ltd, 2004)

* Not assessed

There is a stormwater model for the Motueka UDA but it is very old. The hydraulic model is currently being updated by MWH New Zealand Ltd.

B.7.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.7.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Health Nuisance	Manhole Cover Missing	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Motueka	36	1	6	16	29	13	101

Source: Confirm

Other performance issues for Motueka UDA are:

- it is flat with very little hydraulic gradient to get good drainage
- drainage from ditches is subject to tidal influences

- the stormwater system in the town centre lacks a number of stormwater collection sumps along the High Street and the system in this area is already overloaded
- the system has been assessed as being unable to cope with Q_5 return period storm flows in a number of areas
- many secondary flow paths are wide given the flat gradients and often follow streets and roads
- there are several locations where roads or natural topographical features block the overland flow paths, therefore increasing the risk of flooding
- the road network and the housing development make it very difficult to restore an overland flow path that directs overland flows away from houses.

B.7.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1962 and 2015.

While the stormwater systems in Motueka are older than many in the district, there is not a great deal of knowledge about the system's condition. From inspections carried out under the maintenance contract and local knowledge, it is thought likely that the condition of a number of the older assets is poor. Renewal work is typically preceded by CCTV investigations to identify works that need repair and to scope the severity and extent of the problems.

Renewals projects are programmed for the following assets due to them meeting the end of their design life:

- flap gates
- tidal gates
- Pah/Atkins Streets
- Parker Street.

B.7.4. Compliance with Level of Service

MWH New Zealand Ltd NZ Limited investigated the performance of the stormwater system using hydraulic modelling and issued a report[3] making recommendations to upgrade the stormwater system. In 1999/2000 a Motueka Stormwater Strategy was developed which used hydraulic modelling to assess system performance. The outcomes of this investigation are reported in depth in Motueka Stormwater Strategy, April 2000.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended that Council prepare a Catchment Management Plan to improve understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

[3] MWH NZ Ltd report "Motueka Stormwater Strategy, April 2000

Workshops were held with the Council staff in 2011 to discuss gaps in existing Levels of Service. The following projects were identified.

- A Catchment Management Plan and Resource Consent have been programmed for Motueka in Operations and Capital budgets (respectively) to meet the Levels of Service.
- Jocelyn Avenue upgrade to reduce flooding.
- Develop a strategy subject to recommendations of the Stormwater Model 2011/12. Maybe Boyce/Clay Streets (identified in the last AMP) to reduce flooding.
- Flap Gates Renewal, Pah/Atkins Street Upgrade, Parker Street Upgrade, and New Development Areas. Network upgrade to accommodate new development and upgrade existing system from the area north of King Edward Street and connecting to the Woodland Drain are partially required to meet levels of service.

B.7.5. Growth and Demand

Growth from new dwellings in Motueka township is expected to increase by 14% over the next 20 years (Source: Volume 2 of the Growth Model - 2014).

B.7.6. Operations and Maintenance

The primary operating and maintenance activities for Motueka is to ensure the open drainage channels are kept to a reasonable standard of repair, and that tidal gates and flaps are functional.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.7.7. Strategic Studies

Table B-15 below lists key existing strategic studies and models within the UDA.

Table B-15: Existing Strategic Studies and Models for the Motueka UDA

Title	Month	Year	Author	Purpose
Motueka Urban Drainage Area Development Impact Levy for Stormwater		2004	MWH	Investigates proportion of upgrade costs due to growth in Motueka, development contributions.
Te Maatu Subdivision, Motueka	May	2005	TCB	Investigates options to manage stormwater from subdivision and surrounding residential areas.
System Performance Report Motueka Stormwater modelling	May	2012	MWH	Investigate existing conditions in preparation for catchment management plan
System Performance Report Motueka Stormwater modelling Appendices A-E	Septemb er	2012	MWH	Supporting information to above
Motueka costal inundation study	In prep	2015	Metocean	Sea inundation Study

B.7.8. Key Issues

The key issues for Motueka are:

- The tide gates are in need of renewal and the state of many other assets is not known.

- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.
- the existing system will not be able to maintain service levels at predicted levels of growth.
- The flat nature of area and the combined risk from coastal inundation and river flooding threatens significant areas of the town.

B.7.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-16: Motueka Stormwater Assets

Motueka Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
SW-Extent of feature	79
SW-Pipe	41,941
Grand Total	42,176

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
0	82
300	76
SW-Extent of feature	79
0	79
SW-Pipe	41,941
0	300
100	2,049
150	874
160	215
200	281
225	4,317
230	125
300	9,338
375	4,395
380	122
450	5,980
460	67
525	1,432
575	10
600	5,551
675	213
750	2,176
825	967
900	1,263
1050	289
1075	271
1078	61
1200	1,324
1350	319
Grand Total	42,176

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Culvert	157
Concrete	85
RCRRJ	16
Unknown	56
SW-Extent of feature	79
Not known	79
SW-Pipe	41,941
Aluflo Aluminium Corrugated	159
Concrete	12,922
Galvanized Iron	7
Glazed Earthenware	12
Novaflow	215
PVC	717
RCFJ	828
RCRRJ	9,089
RCRRJ Class X	5,807
RCRRJ Class Y	1,242
RCRRJ Class Z	697
Steel	11
Unknown	7,833
uPVC	2,402
Grand Total	42,176

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Sum of Length
SW-Channel	42,071
Grand Total	42,071

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Motueka

Row Labels	Count of ASSETID
SW-Chamber	3
SW-Cleaning eye	11
SW-Collection pond	1
SW-Control cabinet	2
SW-Floodgate	4
SW-Inlet	18
SW-Inlet structure	3
SW-Inspection point	5
SW-Manhole	456
SW-Miscellaneous item	4
SW-Node	164
SW-Outlet	56
SW-Outlet structure	11
SW-Soakpit	50
SW-Sump	792
SW-Telemetry	2
SW-Valve	2
Grand Total	1,584

B.8 Mapua and Ruby Bay UDA

B.8.1. System Overview

The Mapua/Ruby Bay UDA is an urban/coastal development. The Ruby Bay area is a coastal strip with recently developed land being controlled by stormwater detention systems. Mapua is a mixture of urban and semi-urban development with the majority of stormwater from earlier developments going to soakage. Only recent development has included piped stormwater systems, which most discharge into open drains and then into the Mapua estuary. The major piped stormwater system on Aranui Road picks up much of the new piped systems and discharges into the estuary by the Mapua wharf.

The catchment area is divided into 22 sub catchments totalling 1,075. 3 Ha, refer to Appendix Y for a map of the UDA boundary.

The Toru Street Causeway acts as a tidal barrier to high tidal flows entering into the inner estuary and protects a large part of Mapua from flooding. A tidal gate on the end of the Aranui Road stormwater pipe protects the reticulated piped system from high tidal level intrusion.

A significant land area forms the upper part of the Mapua UDA, currently undeveloped and located inland from the Coastal Highway and Stafford Drive. Parts of this area are low lying and are unlikely to be developed, particularly the area immediately adjacent to the Coastal Highway and Seaton Valley Drain which is an old swamp, now drained and protected with a tidal flood bank by the current landowner.

The catchment upstream of the Coastal Highway and Stafford Drive drains out through an open waterway, the Seaton Valley Stream. This passes through a culvert under Stafford Drive and discharges into the Toru Street inner estuary further downstream.

The causeway has a major influence on the level of service provided by the Seaton Valley Stream. The area draining into the Seaton Valley Stream accounts for 65% of the Mapua/Ruby Bay drainage area.

There are two other distinct stormwater systems draining the Mapua UDA, the Broadsea and Pinehill Heights areas. Both drain directly to the Tasman Sea through a number of stormwater culverts.

In 2003/04, a desk-based study[4] of the stormwater system was done for the purposes of assessing financial contributions from developers. This was a high level study of the catchment and it concluded that:

- the existing reticulation does not comply with required levels of service
- further development in the area will increase the problem.

Following on from this report, a hydraulic model was constructed of the Mapua township and drainage area of the Seaton Valley Stream and upgrade options to improve the level of service of the open drains in the area were assessed. The modelling study was completed by MWH New Zealand Ltd and issued to Council in June 2006 and later updated in August 2007[5].

The report recommended modifying the Causeway tidal outlets, widening the Seaton Valley Stream including upgrading a number of road crossings and some upgrade work to other open channels, namely the School Road Drain and drainage improvement work around Aranui Road. The report took into account planned development, and current predicted sea level rises. The outcomes of the modelling report have helped to form Councils policy on future sub division development within the UDA.

Toru Street Causeway and School Road culverts have been upgraded. The widening of the Seaton Valley Stream between Stafford Drive and School Road will be completed in 2015.

There is currently no stormwater treatment in place.

Table 9 shows the stormwater assets in Mapua and Ruby Bay.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

[4] Refer Mapua Stormwater DILs, MWH report, March 2004
[5] Refer Mapua Causeway and Seaton Valley Drain Floodplain Hydraulics Analysis, August 2007

Mapua currently has the following resource consents.

- RM080112 to undertake work in Seaton Valley Stream (lapses in 29 July 2019, expires 29 July 2044).
- RM080113 to discharge water containing contaminants (lapses in 29 July 2019, expires 29 July 2044).
- RM080260 to undertake earthworks (lapses in 29 July 2019, expires 29 July 2044).
- RM080261 to dam water upstream of causeway (lapses in 29 July 2019, expires 29 July 2044).
- RM080262 to construct new flap gates at causeway (lapses in 29 July 2019, expires 29 July 2044).
- RM061006 Pinehill Stream maintenance - Disturbance of the coastal marine area resulting from the on-going maintenance of the mouth of Pinehill Stream at Ruby Bay for a period of 35 years. The disturbance involves the clearance of the mouth of the stream where it emerges onto the Ruby Bay foreshore (typically twice a year) using mechanical diggers or excavators and the placement of the excavated beach gravel at the head of the beach fronting the neighbouring properties. (expires 12 December 2041).

B.8.2. Asset Capacity and Performance

B.8.2.1 Primary Flow Paths

The Mapua Stormwater DILs Study (MWH New Zealand Ltd, March 2004) assessed pipe capacity as follows in Table B-17.

Table B-17: Assessment of Mapua and Ruby bay Pipe Capacity

Culvert	Size	Estimated Capacity (L/s)	Q_5 Discharge (L/s)	Q_{50} Discharge (L/s)
A: Seaton Valley 1	3m Armco	8500 if 1 in 500	4059	12615
B: Seaton Valley 2	900	1300	1251	3888
C: Seaton Valley 3	300	70	97	302
D: Seaton Valley 4	750	750	1112	3456
E: Aranui Park 1	450	140	121	345
F: Aranui Park 2	450	140	286	811
G: Aranui Park 3	550	250	201	571
H: Aranui Park 4	450	140	201	570
I: Aranui Park 5	900	850	733	2082
J: Jessie 1	300	120	317	751
K: Jessie 2	300	50	224	506
L: Jessie 3	750	550	691	1636
M: Causeway	Twin 900	1060	4633	14536
N: Moreland	450	140	455	979
O: Toru	Two 300	100	445	956
P: Smokehouse 1	600	300	693	1490
Q: Smokehouse 2	525	210	317	575
R: Higgs 1	600	300	534	1207
S: Higgs 2	300	70	129	292
T: Higgs 3	225	33	129	292
U: Langford 1	375	85	259	584
V: Langford 2	750	550	1012	2274
W: Langford 3	225	50	86	195

Culvert	Size	Estimated Capacity (L/s)	Q_5 Discharge (L/s)	Q_{50} Discharge (L/s)
X: Langford 4	750	550	1254	2762
Y: Langford 5	300	70	134	289
Z: Langford 6	375	130	207	467
AA: Broadsea 1	375	85	207	607
AB: Broadsea 2	400	85	227	665
AC: Broadsea 3	450	140	673	1973
AD: Tait	300	50	259	556
AE: Pomona	400	85	282	666
AF: Ruby Bay 1	1800	5300	2994	9541
AG: Ruby Bay 2	300	50	83	200
AH: Brabant 1	300	50	645	1548
AI: Brabant 2	300	70	124	300
AJ: Brabant 3	300	70	124	300
AK: Brabant 4	225	33	76	183
AL: Brabant 5	225	33	207	500
AM: Brabant 6	600	825	145	350
AN: Brabant 7	300	50	867	2052

Source: Mapua Stormwater DILs Study (MWH New Zealand Ltd, March 2004)

Table B-17 above shows that the majority of pipes are potentially undersized.

B.8.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.8.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Manhole Cover Missing	Open Drains (non roading)	Other	Pipe Break/ Blockage	Grand Total
Mapua	3	1		3	3	10
Ruby Bay	9		5	8	7	29

Source: Confirm

Other performance issues for Mapua/ Ruby Bay UDA are:

- lack of gradient in the main channels and pipe systems
- low lying flat areas which are susceptible to ponding and flooding
- major tidal influences on all the outlets with significant effects at the causeway

- lack of capacity in major sections of the reticulated system
- maintenance problems with the outfalls blocking with shingle and debris from high tides/storms.
- Failing soak pits.

B.8.3. Asset Age and Condition

All pipe assets and non-pipe assets were installed between 1971 and 2015.

Generally the assets in the Mapua/Ruby Bay UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.8.4. Compliance with Level of Service

The Mapua DIL Study and the recent modelling work highlighted a significant lack of capacity in the existing stormwater systems.

The model was calibrated with the last major storm event in June 2003, when large parts of Mapua were under water. This showed that many areas adjacent to the Seaton Valley Stream would flood with a storm event in the order of 1 in 50 year return period. Climate change and sea level rises have also been factored into the modelling which recommends urgent upgrade work to be completed for further development to take place.

The level of service for the open drain system for future upgrades is a 1 in 100 year storm event. For the reticulated piped stormwater system, capacity will be provided for a 1 in 20 year storm.

Significant upgrade work has recently been competed in Mapua on the piped stormwater system in Aranui Road and Higgs Road to improve the existing level of service.

As described above the performance and capacity of some parts of the network within the UDA are under capacity and cause flooding to some areas.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 10% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also well in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.8.5. Growth and Demand

Growth from new dwellings in the Mapua and Ruby Bay townships is expected to increase by 27% (collectively) over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.8.6. Operations and Maintenance

The primary operating and maintenance activity for Mapua is to ensure the open drainage channels are kept to a reasonable standard of repair and the beach outfalls are clear.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.8.7. Strategic Studies

Table B-18 below lists key existing strategic studies and models within the UDA.

Table B-18: Existing Strategy Studies and Models for the Mapua/Ruby Bay UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Mapua Stormwater DILs	March	2004	MWH	Investigates proportion of upgrade costs due to growth in Mapua development contributions.
Mapua Stormwater Investigations Higgs Road	May	2005	MWH	Investigates current level of service provided to Higgs Road and Langford Drive areas and options to prevent flooding.
Mapua Causeway and Seaton Valley Stream Flood Capacity Upgrade		2008-2014	MWH	Resource Consent Application and AEE and subsequently detailed design and tender documents.

B.8.8. Key Issues

The key issues for Mapua/Ruby Bay are:

- 10% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.
- The existing system will not be able to maintain service levels at predicted levels of growth.
- There are a number of outfalls that are prone to blocking with tidal debris and gravel.

B.8.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-19: Mapua and Ruby Bay Stormwater Assets

Mapua Ruby Bay Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
SW-Pipe	8,651
Grand Total	8,789

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
225	13
300	12
375	79
450	26
920	10
SW-Pipe	8,651
0	25
100	513
150	737
200	99
225	1,773
250	87
300	2,696
375	828
380	30
400	97
450	500
525	152
600	518
675	116
750	116
900	29
1050	132
1200	175
1800	17
2500	13
Grand Total	8,789

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	139
RCRRJ	111
Unknown	28
SW-Pipe	8,651
Concrete	1,503
Galvanized Iron	4
HDPE	32
PVC	459
RCFJ	96
RCFJ Class X	6
RCRRJ	2,472
RCRRJ Class X	970
RCRRJ Class Y	324
RCRRJ Class Z	369
Unknown	1,310
uPVC	1,105
Grand Total	8,789

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Channel	15,612
SW-Extent of feature	93
Grand Total	15,705

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Cleaning eye	5
SW-Floodgate	1
SW-Inlet	15
SW-Inlet structure	6
SW-Manhole	112
SW-Node	41
SW-Outlet	33
SW-Outlet structure	7
SW-Pump	1
SW-Soakpit	4
SW-Sump	174
Grand Total	399

B.9 Tasman UDA

B.9.1. System Overview

Tasman is a small settlement with approximately150 people, situated close to the edge of the Moutere Inlet and on State Highway 60 (Coastal Highway). The settlement is within an area between Dicker Road and Baldwin Road on land rising away from the State Highway which is rural and mostly pasture land.

The catchment area is divided into three sub catchments totalling 1,150ha, refer to Appendix Y for a map of the UDA boundary.

Surface flows drain from south to north, discharging through the Marriages Stream, into the Moutere Inlet. The stream drains much of the catchment area and picks up open drains from rural land use, including the road drainage off State Highway 60.

Some areas of recent rural subdivisions and lifestyle block type developments have been completed around the Tasman settlement in recent years. However, much of this development is spread out and does not contribute to stormwater flows entering into the settlement.

The stormwater system in the settlement is limited to some small piped systems although is predominantly open drained.

A serious flooding problem occurred as a result of a storm in May 2006. This resulted in flooding a number of buildings by the corner of Baldwin Road and the Coastal Highway as well as flooding parts of the State Highway.

State Highway 60 effectively forms a barrier for the natural drainage of the Tasman urban area to flow into the Moutere Inlet. The Marriages Stream passes along the other side of the Coastal Highway from the Tasman settlement, while along the other runs a smaller open drain, intercepting drainage from various smaller drainage areas to the south, draining areas along Baldwin Road, William Road, Orion Road, etc. However, the Coastal Highway has formed a barrier to natural drainage flows passing straight into the Marriages Stream and as a result flows are only able to pass under the highway in a small number of strategic locations.

In the event of the under capacity of the highway culverts or open channel on the same side as Tasman settlement, flows continue towards Tasman where they eventually pass into the centre of the settlement and cause flooding of properties and roads. This is what happened in May 2006 during the last major flood event.

There is currently no stormwater treatment in place.

Table B-22 shows the stormwater assets in Tasman.

The confidence of this data is reliable (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Tasman currently has no resource consents.

B.9.2. Asset Capacity and Performance

B.9.2.1 Primary Flow Paths

The Stormwater Catchment Study for Tasman (MWH New Zealand Ltd, July 2006) catchment capacity as follows in Table B-20.

Table B-20: Assessment of Tasman Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Q_{50} (m^3/s)
A: Golf Course	Channel	31	2. 00	3. 15
B: Baldwin Road	Channel	62	4. 00	5. 93
C: Marriages Stream	Channel	1100	25-40*	31. 00

Source: Stormwater Catchment Study for Tasman (MWH New Zealand Ltd, July 2006)

* Tidal influence

Table above shows that all channels in the catchments have insufficient capacity.

B.9.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.9.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Open Drains (non roading)	Grand Total
Tasman	3	3

Source: Confirm

Other performance issues for Tasman UDA are.

- the susceptibility to flooding from flows arising outside the UDA
- the culvert crossings under main road are critical assets to maintain
- there is little scope / opportunity to improve the hydraulic capacity of the culverted section of open drain passing under buildings on Baldwin Road.

B.9.3. Asset Age and Condition

All pipe assets were installed between 1980 and 2006. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Tasman UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.9.4. Compliance with Level of Service

A Stormwater Catchment Study was completed in July 2006 and assessed the impact/ causes of the 2006 flood event, including investigating solutions to improve the level of service of the local stormwater system. The report indicated that while the small piped stormwater system was severely restricted in capacity in a culverted section over which the shop and art gallery had been built over, the capacity of the culverts passing under the State Highway further upstream was also a major contributing factor to the flooding event

Flooding issues at the junction of Baldwin Road and the State Highway required work in 2012-13 to transfer increased flows across the State Highway to join the Marriages Stream, south of the settlement.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.9.5. Growth and Demand

Growth from new dwellings in Tasman township is expected to increase by 16% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.9.6. Operations and Maintenance

The primary operating and maintenance activity for Tasman is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operations and maintenance schedule are enclosed in Appendix E.

B.9.7. Strategic Studies

Table B-21 below lists key existing strategic studies and models within the UDA.

Table B-21: Existing Strategic Studies and Models for the Tasman UDA

Title	Month	Year	Author	Purpose
Tasman Stormwater Catchment Study	July	2006	MWH	Investigates potential long and short term options to control flooding in Tasman area.

B.9.8. Key Issues

The key issues for Tasman are:

- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.9.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-22: Tasman Stormwater Assets

Tasman Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
SW-Pipe	339
Grand Total	357

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
300	17
SW-Pipe	339
225	20
300	194
375	125
Grand Total	357

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Culvert	17
RCRRJ	17
SW-Pipe	339
Concrete	23
RCRRJ	157
Unknown	159
Grand Total	357

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Sum of Length
SW-Channel	283
Grand Total	283

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Tasman

Row Labels	Count of ASSETID
SW-Manhole	6
SW-Outlet	2
SW-Sump	4
Grand Total	12

B.10 Kaiteriteri

B.10.1. System Overview

The Kaiteriteri stormwater area contains mostly residential and holiday type home development with two significant motor camps. The steep hilly nature of the Kaiteriteri area provides high run off to the stormwater system. Discharges either from pipe systems or small drains are direct to the sea or the Kaiteriteri Inlet.

The catchment area is divided into 12 sub catchments, refer to Appendix Y for a map of the UDA boundary.

A small wetland area is situated at the lower point of Rowling Road in Little Kaiteriteri. Open drains within the area present significant problems with the decomposed granite sandy material being easily scoured by relatively small flows.

Much of the catchment is forested and could be at risk of increased runoff flows from logging activities. Much of the catchment runoff is intercepted by drains, which discharge to sea in the Kaiteriteri Inlet. These drains converge on Martins Farm Road.

There is currently no stormwater treatment in place.

Table B-25 shows the stormwater assets in Kaiteriteri.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Kaiteriteri currently has two resource consents:

- RM070348 to occupy the coastal marine area (expires 29 June 2042).
- RM070349 to disturb the coastal marine area for the placement of culverts on the Martin Farm Road (expires 29 June 2012) – this project was completed in 2009/10.

B.10.2. Asset Capacity and Performance

B.10.2.1 Primary Flow Paths

The Stormwater Catchment Study for Kaiteriteri (MWH New Zealand Ltd, November 2005) assessed catchment capacity as follows in Table B-23.

Table B-23: Assessment of Kaiteriteri Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Runoff (m^3/s)
A: Martins Farm 1	Channel	*	7. 50	11. 40**
B: Martins Farm 1A	Channel	*	0. 95	0. 64
C: Martins Farm 2	Channel	*	0. 42	2. 40**
D: Wetland and Estuary	Culvert	*	0. 75	*
E: Martins Farm 3	Channel	*	1. 40	0. 80
F: Martins Farm 3A	Culvert	*	1. 50	0. 84
G: Stephens Bay	Channel	*	4. 50	2. 70
H: Little Kaiteriteri	Channel	*	1. 55	1. 10
I: Tapu Bay South	Culvert	*	0. 35	0. 27
J: Tapu Bay North	Culvert	*	0. 50	0. 21
K: Tapu Bay 600	Pipe	*	1. 40	0. 47
L: Motorcamp	Pipe	*	1. 28	1. 24

Source: Stormwater Catchment Study for Kaiteriteri (MWH New Zealand Ltd, November 2005)

* Not assessed
** There was a project completed in 2009/10 to upsize the Martins Farm capacity.

Table B-23 above shows that all infrastructure in the catchments have sufficient capacity.

B.10.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.10.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Other	Pipe Break/Blockage	Grand Total
Kaiteriteri	1	1	1	3

Source: Confirm

Other performance issues for Kaiteriteri UDA are.

- This is a high profile tourist area in an area of outstanding natural beauty.
- Stormwater outfalls discharge across the beach and due to the location, are subject to sand infiltration.
- There have been a number of stormwater problems along the beach frontage as private property has either developed or has been redeveloped. However, this was mostly resolved with improvement work to the main beach frontage area.
- Kaiteriteri UDA has a number of stormwater outfalls, around Stephens Bay, Tapu Bay, Little Kaiteriteri and Kaiteriteri Bay, most which are prone to blockage with sand.
- Recent development has compounded capacity issues with the reticulated pipe systems particularly around the area of Little Kaiteriteri. At times this area suffers from system overloads. The problem arises from additional stormwater flows arriving from development behind existing densely developed areas. The ground rises steeply away from the coastline and there is still a significant area to be developed between Talisman Heights and Kotare Place on steeply rising ground.

B.10.3. Asset Age and Condition

All pipe assets were installed between 1963 and 2015. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Kaiteriteri UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure. Therefore there are no asset renewals planned for the period of this AMP.

B.10.4. Compliance with Level of Service

MWH New Zealand Ltd completed a review of the stormwater system and issued a report in September 2005[6], making recommendations to address maintenance issues and to accommodate future development, in order to provide a satisfactory level of service.

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 20% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

[6] MWH Report, Kaiteriteri Stormwater Catchment Study, September 2005

B.10.5. Growth and Demand

Growth from new dwellings in Kaiteriteri township is expected to increase by 16% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.10.6. Operations and Maintenance

Regular maintenance of the outfalls to remove sand infiltration is required. Details of the operations and maintenance regime are included in Appendix E.

B.10.7. Strategic Studies

Table B-24 below lists key existing strategic studies and models within the UDA.

Table B-24: Existing Strategic Studies and Models for the Kaiteriteri UDA

Title	Month	Year	Author	Purpose
Kaiteriteri Stormwater Catchment Study	November	2005	MWH	Investigates potential long and short term options to control flooding in Kaiteriteri area.

B.10.8. Key Issues

The key issues for Kaiteriteri are:

- 20% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.

B.10.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-25: Kaiteriteri Stormwater Assets

Kaiteriteri Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	393
SW-Pipe	5,938
Grand Total	**6,331**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	**393**
300	7
375	264
450	28
600	67
900	14
1200	13
SW-Pipe	**5,938**
0	71
100	510
150	633
200	24
225	2,304
300	1,503
375	425
450	182
600	256
900	29
Grand Total	**6,331**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Culvert	**393**
RCRRJ	393
SW-Pipe	**5,938**
Concrete	319
PVC	279
RCRRJ	2,911
RCRRJ Class X	958
RCRRJ Class Z	54
Unknown	403
uPVC	1,016
Grand Total	**6,331**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Sum of Length
SW-Channel	228
Grand Total	**228**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Kaiteriteri

Row Labels	Count of ASSETID
SW-Cleaning eye	10
SW-Inlet	16
SW-Inlet structure	3
SW-Manhole	122
SW-Node	11
SW-Outlet	20
SW-Outlet structure	5
SW-Soakpit	1
SW-Sump	133
Grand Total	**321**

B.11 Takaka UDA

B.11.1. System Overview

The Takaka UDA consists mostly of developed flat land and is situated in the flood plain of the Takaka River. In July 1983 the township was largely flooded with water from the Takaka River. Large events in December 2011, April 2013 and April 2014 also caused flooding.

The catchment area is divided into ten sub catchments totalling 73. 8ha, refer to Appendix Y for a map of the UDA boundary.

The stormwater systems in Takaka have been developed in conjunction with kerb and channel projects. The Takaka Stormwater Plan shows the general arrangement of the stormwater system. Stormwater runoff from the township on the Takaka River side of Commercial Street is piped to the Te Kakau Stream. The areas around Motupipi Street and Abel Tasman Drive drain into the Upper Motupipi River.

A large number of residential properties rely on soakage through to river gravels for their stormwater disposal and fluctuating groundwater levels control their effectiveness. Generally the existing township area is low lying in relationship to the adjacent Takaka River. This presents potential flooding throughout the urban area as there are no stop bank controls on the river flooding plains.

The UDA closely covers the built up area around Meihana Street, Motupipi Street and Commercial Street. The town's stormwater systems drain into the Motupipi River to the south, the Te Kakau Stream to the west (a local drainage spur in the floodplain, adjacent to the Takaka River), and into a series of natural drainage swales to the north. Much of the town overlies silty gravels with high water tables and artesian groundwater flows. Lake Killarney is located within the centre of Takaka and the water level is controlled by surrounding groundwater levels. A number of stormwater pipes drain small areas into Lake Killarney.

A formal assessment of system capacity was carried out in 1997. This investigation looked into areas of reported historical flooding and assessed the system upgrades required for pipes in those problem areas to pass a 1 in 5 year storm event.

There is currently no stormwater treatment in place.

Table B-28 shows the stormwater assets in Takaka.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Takaka currently has no resource consents.

B.11.2. Asset Capacity and Performance

B.11.2.1 Primary Flow Paths

The Stormwater Catchment Study for Takaka (MWH New Zealand Ltd, July 2006) assessed catchment capacity as follows in Table B-26.

Table B-26: Assessment of Takaka Catchment Capacity

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Return Period (years)	Proposed Return Period (years)
A: Orange Drain	Channel	14. 40	0. 717	1. 5	5
B: Reillys	Pipes/ Channel	8. 17	0. 086	<1	5
C: Meihana/Waitapu	Pipes	19. 11	0. 044	<1	5
D: Lake Killarney	Pipes	1. 42	*	*	*
E: Edinburgh	Pipes	0. 55	*	*	*

Catchment	Asset Type	Catchment Area (Ha)	Current Capacity (m^3/s)	Current Return Period (years)	Proposed Return Period (years)
F: Waitapu	Pipes	2. 14	0. 040	<1	5
G: Rose	Pipes	0. 99	0. 045	2. 5	5
H: Commercial/Hiawatha	Pipes	0. 99	0. 108	4. 5	5
I: Hiawatha	Pipes	12. 43	*	*	*
J: Tasman Milk Products	Channel	13. 6	*	*	*

Source: Stormwater Catchment Study for Takaka (MWH New Zealand Ltd, July 2006)

* Not assessed

Table B-26 shows that the majority of catchments have infrastructure that is potentially undersized.

B.11.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.11.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Takaka	10	1	4	6	21

Source: Confirm

Other performance issues for Takaka UDA are:

- it is flat with very little hydraulic gradient to get good drainage and has high groundwater levels
- it is at high risk from significant flood damage from the Takaka River.
- There are growing concerns community regarding water quality in Lake Killarney.

B.11.3. Asset Age and Condition

All pipe assets were installed between 1970 and 2015. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Takaka UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.11.4. Operations and Maintenance

The majority of the stormwater drainage is by soakage to river gravels and the performance is affected by high ground water levels. In addition, there are some pipes along the main commercial area that discharge into open drains to the west and east of the town. High groundwater levels also impact on the capacity of the ditches. The primary operating and maintenance activity for Takaka is to ensure the open drainage channels are kept to a reasonable standard of repair.

Details of the operation and maintenance regime are included in Appendix E.

B.11.5. Strategic Studies

Table B-27 below lists key existing strategic studies and models within the UDA.

Table B-27: Existing Strategic Studies and Models for the Takaka UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Takaka Stormwater Catchment Study	July	2006	MWH	Investigates potential long and short term options to control flooding in Takaka area.
Takaka South Stormwater Issues and Options	September	2009	MWH	Investigates issues and options for the Takaka South Outline Development Area.

B.11.6. Key Issues

The key issues for Takaka are:

- 30% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.

B.11.7. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-28: Takaka Stormwater Assets

Takaka Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	190
SW-Pipe	5,574
Grand Total	**5,764**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	**190**
0	19
150	11
300	35
375	46
450	12
600	42
1500	25
SW-Pipe	**5,574**
100	328
150	200
225	732
300	2,929
315	62
375	813
450	224
600	164
750	17
850	56
900	36
1200	13
Grand Total	**5,764**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Culvert	**190**
Concrete	48
RCRRJ	50
RCRRJ Class X	81
Unknown	11
SW-Pipe	**5,574**
Concrete	327
Novaflow	126
PVC	192
RCRRJ	1,424
RCRRJ Class X	353
Unknown	2,771
uPVC	381
Grand Total	**5,764**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Sum of Length
SW-Channel	4,120
Grand Total	**4,120**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Takaka

Row Labels	Count of ASSETID
SW-Inlet	7
SW-Manhole	42
SW-Node	19
SW-Outlet	23
SW-Outlet structure	1
SW-Soakpit	5
SW-Sump	127
Grand Total	**224**

B.12 Pohara UDA

B.12.1. System Overview

Pohara UDA consists of two parts, the main Pohara settlement area and the Pohara Valley area. Both areas have been subject to much significant recent development. Much of the main Pohara settlement is made up of traditional beach frontage property but the core of recent development has focused away from the coast, inland, off Richmond Road. Pohara Valley is a settlement predominantly set back from the coast, within a gently rising valley with development off Pohara Valley Road and Haile Lane.

The catchment area is divided into five sub catchments, refer to Appendix Y for a map of the UDA boundary.

Development in both areas began close to the sea and continued into the hilly areas behind. As development has been made, a series of piped stormwater systems have been installed and with each new wave of development further additions to extend the existing stormwater systems have been made. Many of the stormwater piped systems offer a very poor level of service as a result. This is particularly the case with development that has taken place in Pohara Valley.

Road drainage is mostly open drains in both parts of the UDA and combined with piped stormwater systems.

In addition, there have been flooding problems caused by the proximity of developments over or close to existing stream channels draining the large areas of hills behind Pohara. In the main settlement of Pohara there are three major stream channels converging on the settlement from outside the UDA. One of these channels passes close-by to properties and through an area of residential development parallel to Richmond Road. In the Pohara Valley settlement two open channels both pass through areas of residential development. Each of these open channels also cross under Abel Tasman Drive before discharging into Tasman Bay.

Major Flooding of the Pohara Valley occurred during the extreme (1 in 500 year) storm event of December 2011. Significant debris flow damaged many properties. Also inundation of properties on Abel Tasman Drive as a result of flooding in Ellis Creek. Problems of flooding from blockages and incapacity are exacerbated through many privately owned bridge crossings and foot access crossings providing artificial restrictions to the hydraulic capacity of the streams.

MWH New Zealand Ltd completed a Stormwater Catchment Study in May 2008 which identified current flooding issues and solutions to upgrade the system.

There is currently no stormwater treatment in place.

Table B-32 shows the stormwater assets in Pohara.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Pohara currently has no resource consents.

B.12.2. Asset Capacity and Performance

B.12.2.1 Primary Flow Paths

The Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-29 and Table B-30.

Table B-29: Assessment of the Pohara Settlement Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1. 2x4m	30. 5	> Q_{100}	50. 4	> Q_{100}	5. 84
B: 1. 35m dia	3. 3	Q_{10}	4. 2	Q_{35}	2. 79
C: 1. 060m dia	2. 1	Q_2	2. 5	$Q_{2.3}$	3. 17
D: unknown	*	*	*	*	*
E: 1. 35 dia	3. 3	Q_{25}	4. 2	> Q_{50}	3. 17

Source: Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008)

* Not assessed

The table above shows that Culvert C is potentially undersized.

Table B-30: Assessment of the Pohara Valley Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 1. 8x2. 45	12. 2	Q_{15}	15. 0	Q_{50}	9. 58
B: 1. 2m dia	3. 8	Q_2	4. 9	Q_4	5. 56
C: 1. 2m dia	3. 8	$Q_{2.3}$	4. 9	Q_5	5. 56
D: 1. 2m dia	3. 8	$Q_{2.3}$	4. 9	Q_5	5. 56
E: 1. 2m dia	3. 8	$Q_{2.3}$	4. 9	Q_5	5. 56
F: 0. 9m dia	1. 6	$Q_{<1}$	2. 33	$Q_{1.5}$	4. 00
G: 0. 9m dia	1. 6	$Q_{<1}$	2. 33	$Q_{1.5}$	4. 00
H: 0. 9m dia	1. 6	$Q_{<1}$	2. 33	$Q_{1.5}$	4. 00

Source: Stormwater Catchment Study for Pohara (MWH New Zealand Ltd, May 2008)

Table B-30 above shows that Culverts B, C, D, E, F, G, H are potentially undersized.

B.12.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.12.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Other	Grand Total
Pohara	3	7	10

Source: Confirm

Other performance issues for Pohara UDA are.

- The main settlement (on Richmond Road) has major issues relating to the piped reticulated stormwater system in place. The underlying ground conditions may form part of the final solution for improved groundwater soakage. Parts of the drainage area overlay limestone in which there are a number of sinkholes/tomos. This offers opportunities to make use of these as soak pits but this would require stormwater quality controls before discharging to ground. Water draining through this limestone bedrock will eventually drain out to sea from a number of resurgences.
- In the Pohara Valley area, the issue is the low level of service offered by both open water channels and the numerous restrictions to flow capacity from bridge crossings and culverts, many privately owned.
- There have been a number of flooding incidents reported in this settlement area in recent years. This was put down to possible blockages and the general lack of capacity of a number of restrictions on the channels, some which are 900mm diameter and thought to offer a level of service of around a 1 in 1 year storm event.
- In the main Pohara settlement, the level of service of Council owned culvert crossings is greater than a 1 in 20 year storm event, however two privately owned culvert crossings around Bay Vista Drive are more restrictive to flows and thought to only be able to offer a level of service less than a 1 in 5 year storm event.

B.12.3. Asset Age and Condition

All pipe assets were installed between 1990 and 2015. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Pohara UDA are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.12.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 60% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.12.5. Growth and Demand

Growth from new dwellings in Pohara/Tata Beach/Ligar Bay/Tarakohe townships is expected to increase by 20% over the next 20 years (Source: Volume 2 of the Growth Model - 2014).

B.12.6. Operations and Maintenance

The open water channels in both the main Pohara settlement and Pohara Valley discharge into Tasman Bay onto beach frontage through culvert crossings which pass under Abel Tasman Drive. There is no problem with the discharge point at Pohara Valley, but the culvert crossing Abel Tasman Drive in the main Pohara settlement is partly blocked with sand, significantly reducing its hydraulic capacity. There is little that can be done to clear this pipe since its invert level is below the beach level. This would need to be addressed in an overall solution to upgrade the stormwater system.

Many of the culvert crossings over the open channels require regular checking to ensure they are free from blockages.

Details of the operation and maintenance regime are included in Appendix E.

B.12.7. Strategic Studies

Table B-31 below lists key existing strategic studies and models within the UDA.

Table B-31: Existing Strategic Studies and Models for the Pohara UDA

Title	Month	Year	Author	Purpose
Pohara Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Pohara area.
Pohara Valley Stormwater	March	2009	MWH	Review of Pohara Valley catchment.
Pohara Subdivision Flooding Investigation	July	2009	MWH	Investigation regarding increased flooding since Kohikiko Place subdivision occurred.
Ellis Creek Modelling Model build and flood hazard mapping	Feburary	2014	T&T	Hydrologic and hydraulic model of the Ellis Creek catchments and floodplain.

B.12.8. Key Issues

The key issues for Pohara are:

- 60% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.
- the existing system will not be able to maintain service levels at predicted levels of growth.

B.12.9. Capital Works

The full upgrade and development programme is included in Appendix F

Table B-32: Pohara Stormwater Assets

Pohara Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	163
SW-Pipe	3,914
Grand Total	**4,077**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	**163**
225	4
300	44
375	10
450	39
600	20
900	26
1200	21
SW-Pipe	**3,914**
0	13
100	433
150	165
200	192
225	1,226
250	50
300	1,390
375	250
450	78
525	34
900	36
1050	14
1200	15
1350	17
Grand Total	**4,077**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Culvert	**163**
Concrete	25
RCFJ Class X	47
RCRRJ	28
RCRRJ Class X	63
SW-Pipe	**3,914**
Concrete	173
Farm Tuff	57
HDPE	28
Nexus Hi-way	176
PVC	16
RCFJ	65
RCRRJ	2,192
RCRRJ Class X	578
Steel	15
Unknown	84
uPVC	530
Grand Total	**4,077**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Sum of Length
SW-Channel	685
Grand Total	**685**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Pohara

Row Labels	Count of ASSETID
SW-Cleaning eye	4
SW-Inlet	3
SW-Inlet structure	9
SW-Manhole	66
SW-Node	44
SW-Outlet	14
SW-Outlet structure	6
SW-Soakpit	1
SW-Sump	130
Grand Total	**277**

B.13 Ligar Bay / Tata Beach UDA

B.13.1. System Overview

Ligar Bay and Tata Beach are similar settlements, separated by a short distance of coastline. Both are popular holiday retreats and have grown considerably in recent years. The catchments are both covered by forestry and native bush and are steep with numerous gullies, rising to approximately 300m on the ridgeline.

The catchment area for Ligar Bay is divided into four sub catchments totalling 251. 49ha, refer to Appendix Y for a map of the UDA boundary. The catchment area for Tata Beach is divided into five sub catchments totalling 75. 86ha, refer to Appendix Y for a map of the UDA boundary.

The original bach style properties were built close to beach frontage and development has progressed further inland and onto steeper ground. The surrounding land is predominantly native bush and these settlements lie on the edge of the Abel Tasman National Park.

There are a number of small self-contained stormwater systems (many piped) and serving various developments which have taken place of the last number of years.

Until December 2011 there were no major issues in these settlements; however major flooding occurred during the extreme (1 in 500 year) storm event of December 2011. Significant debris flow damaged many properties

Local flooding issues relating to poor road drainage have been observed in Tata Beach. A stormwater pipe renewal and improvement has recently been completed in Tata Beach behind Cornwall Place. Poor drainage from Tata heights has been caused by restrictions in the pipes and open channels which were remediated in 2014. Tidal influences inhibit drainage.

In Ligar Bay, the properties are self-draining into open road drains with a small number of piped systems in place. The main stormwater flows come from the catchment behind the UDA with an open watercourse crossing Abel Tasman Drive on the UDA boundary.

There is currently no stormwater treatment in place.

Table B-36 shows the stormwater assets in Ligar Bay and Tata Beach.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Ligar Bay and Tata Beach currently has the following resource consents.

- RM080228: Works and structures being placed in a watercourse at 39 Cornwall Place (expires 25 August 2043).
- RM080230: Water diversion at 39 Cornwall Place (expires 25 August 2043).
- R080746: Earthworks in Land Disturbance Area 2 and Coastal Environmental Area at 39 Cornwall Place (expires 25 August 2043).

B.13.2. Strategy Asset Capacity and Performance

B.13.2.1 Primary Flow Paths

The Stormwater Catchment Study for Ligar Bay (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-33.

Table B-33: Assessment of Ligar Bay Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: Twin 900 dia	2. 75	Q_2	4. 40	Q_{10}	5. 99
B: 900 dia	1. 52	> Q_{100}	2. 25	> Q_{100}	0. 22
C: 1200 dia	2. 26	Q_2	4. 54	Q_{50}	4. 53
D: Twin 900 dia	4. 24	Q_{20}	5. 22	> Q_{50}	4. 53

Source: Stormwater Catchment Study for Ligar Bay (MWH New Zealand Ltd, May 2008)

The Stormwater Catchment Study for Tata Beach (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-34.

Table B-34: Assessment of Tata Beach Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: 900 dia	1. 80	Q_{20}	2. 00	Q_{35}	2. 29
B: 900 dia	1. 80	Q_{20}	2. 00	Q_{35}	2. 29
C: 520 dia	0. 50	Q_5	0. 68	Q_{35}	0. 72
D: 600 dia	0. 69	Q_2	1. 11	Q_5	2. 00

Source: Stormwater Catchment Study for Tata Beach (MWH New Zealand Ltd, May 2008)

Table B-33 and Table B-34 above show that in Ligar Bay Culvert A is potentially undersized, and in Tata Beach Culvert D is potentially undersized.

B.13.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.13.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Health Nuisance	Other	Pipe Break/Blockage	Grand Total
Ligar Bay			1		1
Tata Beach	1	1		1	3

Source: Confirm

Other performance issues for Ligar Bay/Tata Beach UDA are:

- this is popular holiday location and an area of outstanding beauty
- the extent of flooding and flooding mechanisms is relatively unknown from historical flooding records.
- tidal influences
- steep catchment accelerates run-off and contributes high sediment load.

B.13.3. Asset Age and Condition

All pipe assets were installed between 1986 and 2015. The installation date of non-pipe assets is not recorded in Confirm but assumed to be of the same age.

Generally the assets in the Ligar Bay and Tata Beach are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.13.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 30% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.13.5. Growth and Demand

Growth from new dwellings in Pohara/Tata Beach/Ligar Bay/Tarakohe townships is expected to increase by 20% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.13.6. Operations and Maintenance

Complete regular maintenance to clear culvert crossings over open channels, particularly to the storm channel passing through Tata Beach.

Details of the operation and maintenance regime are included in Appendix E.

B.13.7. Strategic Studies

Table B-35 below lists key existing strategic studies and models within the UDA.

Table B-35: Existing Strategic Studies and Models for the Ligar Bay and Tata Beach UDA

Title	Month	Year	Author	Purpose
Ligar Bay Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Ligar Bay area.
Tata Beach Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Tata Beach area.

B.13.8. Key Issues

The key issues for Ligar Bay and Tata Beach are:

- 30% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.

B.13.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-36: Ligar Bay and Tata Beach Stormwater Assets

Ligar Bay/Tata BeachPohara Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
SW-Extent of feature	13
SW-Pipe	2,221
Grand Total	2,614

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
375	143
450	23
525	29
600	60
750	19
900	68
1050	37
SW-Extent of feature	13
0	13
SW-Pipe	2,221
100	167
150	52
225	198
300	627
375	387
450	49
525	198
600	245
750	94
825	150
900	49
1500	5
Grand Total	2,614

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	379
Concrete	53
Corrugated steel	17
RCFJ	2
RCRRJ	307
SW-Extent of feature	13
(blank)	13
SW-Pipe	2,221
Concrete	67
Corrugated steel	142
Novaflow	3
RCRRJ	961
RCRRJ Class X	518
Unknown	127
uPVC	403
Grand Total	2,614

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Inlet structure	2
SW-Manhole	24
SW-Node	13
SW-Outlet	1
SW-Outlet structure	2
SW-Soakpit	2
SW-Sump	28
Grand Total	72

B.14 Collingwood

B.14.1. System Overview

Collingwood UDA consists of a north facing high ridge bounded on the west by the Aorere River and the tidal inlet and on the east by the Tasman Bay. This steep sided ridge discharges stormwater to both the east and west sides. Most of the discharge off the high ground is through small road drains and minor open ditches.

The catchment area has not yet been defined, refer to Appendix Y for a map of the UDA boundary.

A small peninsula at the northern end of the high ground accommodates the commercial area of Collingwood and the public motor camp on the northern tip. This area is low lying and several small pipe systems discharge to the east and west sides of the peninsula. On the Tasman Bay side a large sandy section of land has effectively blocked several of the outlet systems. These have been extended in open drains and constructed pits to allow some drainage.

Works in 2013 have reduced the blockage of the coastal outfalls; however the low lying nature of some properties in relation to the high tides will continue to create issues.

The catchment is mostly residential and stormwater flows are intercepted by a combination of open drains and piped stormwater systems. The main open drain passes down Gibbs Road before discharging to sea. A number of piped systems discharge into this ditch. The remainder of the catchment is mostly served by piped stormwater systems. Along Beach Road a number of open drains, which collect stormwater from the steep sub catchment, pass through a number of culverts to discharge to sea.

There is currently no stormwater treatment in place.

Table B-38 shows the stormwater assets in Collingwood.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Collingwood currently has the following resource consent.

- RM090204 - Works and Structures being placed in a watercourse in Lewis Street (expires 04 May 2044).

B.14.2. Asset Capacity and Performance

B.14.2.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.14.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.14.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Other	Pipe Break/Blockage	Grand Total
Collingwood	4	5	4	13

Source: Confirm

Other performance issues for Collingwood UDA are:

- this is high profile tourist area in an area of outstanding beauty
- issues with blockages of Beach Road culverts from sand intrusion and accumulation of vegetative growth.

B.14.3. Asset Age and Condition

All pipe assets were installed between 1980 and 2015. The majority of installation dates for non-pipe assets are not recorded in Confirm but assumed to be of the same age.

Much of the residential developed area has piped stormwater systems. The condition of the existing stormwater infrastructure is not known. Large areas of the piped stormwater system are not mapped onto the Council's GIS system.

B.14.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 40% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a Resource Consent application for discharge in accordance with the TRMP.

B.14.5. Growth and Demand

Growth from new dwellings in Collingwood township is expected to increase by 19% over the next 20 years (Source: Volume 2 of the Growth Model – 2014).

B.14.6. Operations and Maintenance

There are problems maintaining stormwater outfalls along the western end of Beach Road, where the gravity outfalls through the fore dune are constantly affected by tidal movement of sand. Regular maintenance of the Beach Road outfalls to remove sand infiltration and vegetation is required.

Details of the operation and maintenance regime are included in Appendix E.

B.14.7. Strategic Studies

Table B-37 below lists key existing strategic studies and models within the UDA:

Table B-37: Existing Strategic Studies and Models for the Collingwood UDA

Title	Month	Year	Author	Purpose
Flood Report for 29 June 2003 Event	July	2003	MWH	Records observations of 2003 flood event that affected Richmond, Brightwater, Mapua, and Golden Bay.
Collingwood Stormwater Catchment Study	September	2005	MWH	Investigates potential long and short term options to control flooding in Collingwood area.

B.14.8. Key Issues

The key issues for Collingwood are:

- 40% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.
- The existing system will not be able to maintain service levels at predicted levels of growth.
- The proximity of the Aorere River and tidal influence.

B.14.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-38: Collingwood Stormwater Assets

Collingwood Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	119
SW-Pipe	3,286
Grand Total	**3,405**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	**119**
0	28
225	5
450	34
600	14
750	38
SW-Pipe	**3,286**
0	20
32	12
100	398
150	157
200	238
225	358
250	15
300	944
375	296
450	348
525	97
600	211
675	69
750	123
Grand Total	**3,405**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Sum of Length
SW-Culvert	**119**
Concrete	10
RCRRJ	91
Unknown	18
SW-Pipe	**3,286**
Concrete	163
Glazed Earthenware	16
Polyethylene	12
PVC	296
RCRRJ	1,218
RCRRJ Class X	125
RCRRJ Class Y	8
RCRRJ Class Z	226
Unknown	664
uPVC	559
Grand Total	**3,405**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Collingwood

Row Labels	Count of ASSETID
SW-Cleaning eye	3
SW-Inlet	3
SW-Inlet structure	6
SW-Manhole	32
SW-Node	9
SW-Outlet	12
SW-Outlet structure	7
SW-Pump	1
SW-Sump	55
Grand Total	**128**

B.15 Patons Rock UDA

B.15.1. System Overview

The main Patons Rock settlement area has a stormwater system that is more or less self-contained and independent from storm flows draining the larger catchment area.

The catchment area is divided into five sub catchments totalling 213. 70ha, refer to Appendix Y for a map of the UDA boundary.

Open channel flows from the larger catchment areas discharge to sea either side of the settlement area. There are four culverts draining runoff flows from the road. Each of the culverts discharges onto the head of the sandy beach which are vulnerable to blockage. Recent alterations to these outfalls include fitting of duckbill valves and high level overflow outfalls that should improve performance.

There is currently no stormwater treatment in place.

Table B-41 shows the stormwater assets in Patons Rock.

The confidence of this data is **reliable** (based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

Patons Rock currently has the following resource consents.

- RM060706: The occupation of the costal marine area for the continued use of three existing stormwater outfall structures for a period of 31 years (expires 15 September 2037).

B.15.2. Asset Capacity and Performance

B.15.2.1 Primary Flow Paths

The Stormwater Catchment Study for Patons Rock (MWH New Zealand Ltd, May 2008) assessed culvert capacity as follows in Table B-39.

Table B-39: Assessment of Patons Rock Catchment Capacity

Culvert	Safe Level of Service (surcharge to 200mm above soffit level)		Maximum Level of Service (surcharge to ground/road level)		Q_{50} Storm Flow
	Discharge (m^3/s)	Storm Return Period	Discharge (m^3/s)	Storm Return Period	Peak Discharge (m^3/s)
A: Twin 1200 dia	5. 8	> Q_{50}	7. 9	> Q_{100}	5. 36
B: 250 dia	0. 08	approx. Q_2	0. 10	< Q_5	0. 22
C: 250 dia	0. 08	approx. Q_2	0. 10	< Q_5	0. 15
D: 250 dia	0. 08	Q_{20}	0. 10	Q_{50}	0. 10
E: 250 dia	0. 08	Q_{20}	0. 10	Q_{50}	0. 10

Source: Stormwater Catchment Study for Patons Rock (MWH, May 2008)

Table B-39 above shows that Culverts B and C are not up to the LOS standard.

B.15.2.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.15.2.3 Performance

Confirm has CSR records of the following issues from the period 2012-2014:

UDA	Flooding	Open Drains (non roading)	Other	Pipe Break/Blockage	Grand Total
Patons Rock	2	1	3	2	8

Source: Confirm

Other performance issues for Patons Rock UDA are:

- this is a popular holiday location and an area of outstanding beauty
- the extent of flooding and flooding mechanisms is relatively unknown from historical flooding records.

B.15.3. Asset Age and Condition

All pipe assets were installed in 1970. The installation date of non-pipe assets is not recorded in Confirm but assumed to be 1970.

Generally the assets in the Patons Rock UDA are in the early half of their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.15.4. Compliance with Level of Service

The level of service of the stormwater drainage assets was assessed during the development of the 2009 AMP. The assessment of an appropriate level of service was also been backed up from observations and knowledge of the staff involved in managing and maintaining the assets. Engineering judgement was used (based on results of the catchment study) to determine that 70% of the network is not yet capable of containing a 1 in 5 year storm event.

Customer complaints regarding flooding are also in excess of the desired Levels of Service.

It is intended to prepare a Catchment Management Plan to improve Council's understanding of the catchment, any impacts of climate change, the nature of the receiving environment, the nature of the stormwater discharge, and options to manage any potential flooding. This Plan would be followed by a resource consent application for discharge in accordance with the TRMP.

B.15.5. Growth and Demand

Growth from new dwellings in Patons Rock township was not modelled. (Source: Volume 2 of the Growth Model - 2014).

B.15.6. Operations and Maintenance

Problems experienced in the past are normally related to the low coastal strip between the main road and the sea coast. This is low lying land and drainage systems are affected by coastal tidal conditions. Regular maintenance of the outfalls is required, to remove sand accumulation in front of the discharge points.

Details of the operation and maintenance regime are included in Appendix E.

B.15.7. Strategic Studies

Table B-40 following lists key existing strategic studies and models within the UDA.

Table B-40: Existing Strategic Studies and Models for Patons Rock UDA

Title	Month	Year	Author	Purpose
Patons Rock Stormwater Catchment Study	May	2008	MWH	Investigates potential long and short term options to control flooding in Patons Rock area.

B.15.8. Key Issues

The key issues for Patons Rock are:

70% of the network does not meet Levels of Service to provide the desired 1 in 5 year flood protection, and 95% is below the 2013 standard of 1:20 year.

B.15.9. Capital Works

The full upgrade and development programme is included in Appendix F.

Table B-41: Patons Rock Stormwater Assets

Patons Rock Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	204
Grand Total	**204**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	**204**
250	172
300	32
Grand Total	**204**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Sum of Length
SW-Pipe	**204**
Concrete	32
HDPE	172
Grand Total	**204**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(blank)

Row Labels	Sum of Length
(blank)	
Grand Total	

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	Patons Rock

Row Labels	Count of ASSETID
SW-Manhole	1
SW-Outlet	4
SW-Sump	8
Grand Total	**13**

B.16 Non-Urban Areas

B.16.1. System Overview

Non-urban areas consist of all areas that do not fall within a UDA. Assets in these areas include culverts, pipes, and channels. There is currently no stormwater treatment in place. Table B-42 shows the stormwater assets in non-urban Areas. Non-urban areas currently have no resource consents.

The confidence of this data is **reliable** (based on NZ infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system). This statement was taken from the 2009 Asset Revaluations.

There are also a lot of private drainage channels and roadside drains which are not considered part of this activity.

B.16.1.1 Primary Flow Paths

Primary flow paths have not been assessed.

B.16.1.2 Secondary Flow Paths

Secondary flow paths have not been assessed.

B.16.1.3 Performance

Performance has not been assessed.

B.16.2. Asset Age and Condition

All assets were installed between 1960 and 2014. Generally the assets in the non-urban areas are relatively young in their asset life expectancy and there are no major condition problems that signal the need for renewal expenditure.

Therefore there are no asset renewals planned for the period of this AMP.

B.16.3. Compliance with Level of Service

Non-urban areas have not been assessed.

B.16.4. Growth and Demand

Growth from new dwellings in the Tasman district is expected to increase but not significantly in the non-urbvan areas. Refer to Appendix F for more information.

B.16.5. Operations and Maintenance

Not assessed for non-urban Areas.

Details of the operation and maintenance regime are included in Appendix E.

B.16.6. Strategic Studies

There are no existing strategic studies and models within the non-urban areas.

B.16.7. Key Issues

The key issues for non-urban Areas are:

- Desired levels of service in non-urban areas has not been assessed.
- In Marahau assets have been handed over to Council as a result of subdivision activities and is now a candidate for being a UDA. This will be assessed before the 2018 AMP. The indicative outline of the UDA would be based on the residential zoning; shown pink in figure B16-1.

Figure B.16-1 Marahau residential zoned land and potential UDA boundary

B.16.8. Capital Works

The full upgrade and development programme is included in Appendix F.

tasman district council

Table B-42: Non-Urban Stormwater Assets

Non Urban Stormwater Assets

Source: Confirm Asset Data 8 June 2011

Summary of Pipe Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	672
SW-Pipe	3,936
Grand Total	**4,608**

Summary of Pipe Diameter

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	**672**
150	6
200	16
225	44
300	62
375	425
450	11
600	9
750	56
900	9
1050	17
1350	16
SW-Pipe	**3,936**
0	26
100	17
150	183
200	2
225	242
250	71
300	1,521
375	741
450	501
525	62
600	258
750	161
900	89
1200	48
1600	14
Grand Total	**4,608**

Summary of Pipe Material

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Culvert	**672**
Concrete	53
PVC	6
RCRRJ	216
RCRRJ Class Y	136
RCRRJ Class Z	229
Unknown	16
uPVC	16
SW-Pipe	**3,936**
Concrete	739
HDPE	43
PVC	37
RCRRJ	1,804
RCRRJ Class X	5
RCRRJ Class Y	19
Unknown	1,240
uPVC	49
Grand Total	**4,608**

Summary of Channel Assets

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Sum of Length
SW-Channel	749
Grand Total	**749**

Summary of Surface Feature

TDC Ownership	(Multiple Items)
UDA Name	(Multiple Items)

Row Labels	Count of ASSETID
SW-Cleaning eye	4
SW-Collection pond	1
SW-Electrical	1
SW-Inlet	19
SW-Inlet structure	17
SW-Manhole	37
SW-Miscellaneous item	4
SW-Node	77
SW-Outlet	31
SW-Outlet structure	25
SW-Pump	2
SW-Soakpit	21
SW-Sump	95
SW-Valve	2
Grand Total	**336**

APPENDIX C ASSESSMENT OF STORMWATER SYSTEMS IN THE DISTRICT

Tasman District Council carried out the Water and Sanitary Services Assessments (WSSA) in 2005 and evaluated all stormwater drainage in its district. The WSSA documents consist of two volumes:

Volume 1: An overview of the water and sanitary services in Tasman district with recommendations and priority rankings for future improvements.

Volume 2: The detailed assessments.

The WSSA documents were made available to the public for consultation purposes and a special meeting was held in June 2005 to review public submissions.

The Council approved the WSSA documents in June 2005 in compliance with the Local Government Act 2002.

Recent changes to the Local Government Act 2002 now require the Council to identify in the Long Term Plan any significant variation between the proposals in that plan and the Council's assessment of water and sanitary services and its waste management and minimisation plan (clause 6 of Schedule 10 of the Act).

Sections 126 – 129 of the Local Government Act have been repealed. This means that while the Council still need to undertake water and sanitary services assessments within the district, the process for undertaking the assessments and the extent of information required are no longer dictated.

An amendment to Section 125 of the Act now means that an assessment may be included in the Council’s long-term plan, but, if it is not, the Council must adopt the assessment using the special consultative procedure. The majority of information in the WSSA, in respect of Council-owned and operated services, is now included in Appendix B of this Activity Management Plan. The Council is obliged to assess privately owned services from time to time. There is no guidance to the timelines associated with these assessments, however, the Council has made financial provision in to carry out the next assessment in 2024/2025 after all the Catchment Management Plans (CMPs) are completed and each 15 years after that most aspects are covered by the AMP and CMPs.

Key variations since the adoption of the WSSA in 2005 are noted below:

- the designation of the Borck Creek floodway alignment;
- modelling of flooding in parts of Pohara, Wakefield, Brightwater, Richmond, Takaka and Motueka;
- a programme of CMPs has been developed.

APPENDIX D ASSET VALUATIONS

D.1 Background

The Local Government Act 1974 and subsequent amendments contain a general requirement for local authorities to comply with Generally Accepted Accounting Practice ("GAAP").

The Financial Reporting Act 1993 sets out a process by which GAAP is established for all reporting entities and groups, the Crown and all departments, Offices of Parliament and Crown entities and all local authorities. Compliance with the New Zealand International Public Sector Accounting Standard 17; Property, Plant and Equipment (PBE IPSAS 17) and PBE IPSAS 21 (Impairment of Non Cash Generating Assets) is the one of the current requirements of meeting GAAP.

The purpose of the valuations is for reporting asset values in the financial statements of Tasman District Council.

Council requires its infrastructure asset register and valuation to be updated in accordance with Financial Reporting Standards and the AMP improvement plan.

The valuations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ending June 2012.

- NAMS Group Infrastructure Asset Valuation Guidelines – Edition 2.0.
- New Zealand International Public Sector Accounting Standard 17; Property, Plant and Equipment (PBE IPSAS 17) and PBE IPSAS 21 (Impairment of Non Cash Generating Assets)

D.1.1. Depreciation

Depreciation of assets must be charged over their useful life.

- *Depreciated Replacement Cost* is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity. The *Depreciated Replacement Cost* has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times \text{Replacement cost}$$

- *Depreciation* is a measure of the consumption of the economic benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Straight-line depreciation is used in this valuation.
- *Total Depreciation to Date* is the total amount of the asset's economic benefits consumed since the asset was constructed or installed.
- The *Annual Depreciation* is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated total useful life for the asset.
- The *Minimum Remaining Useful Life* is applied to assets which are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value.

D.1.2. Revaluation

The revaluations are based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives.

- The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2. In specific cases these have been modified where in our, and the Council's opinion a different life is appropriate. The changes are justified in the valuation report.
- The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

D.2 2012 Valuation - Stormwater

Assets are valued every three years. The stormwater assets were last re-valued in June 2012 and are reported under separate cover[1]. Key assumptions in assessing the asset valuations are described in detail in the valuation report.

D.2.1. Asset Data

The majority of information for valuing the assets was obtained from Council's Confirm database. This is the first time the database has been used to revalue Councils assets. In the past, asset registers based on excel spreadsheets have been used. The data confidence is detailed in Table D-1 below.

Table D-1: Data Confidence

Asset Description	Confidence	Comments
Stormwater Assets	B - Reliable	The asset registers provide all the physical assets that make up each scheme. However attribute information could be more detailed such as pipe and manhole depths, surface types etc.

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system.

D.2.2. Asset Lives

The *Base Useful Lives* for each asset type as published in the NZIAVDG Manual were used as a guideline for the lives of the assets in the valuation. Generally lives are taken as from the mid-range of the typical lives indicated in the Valuation Manual where no better information is available. Lives used in the valuation are presented in Table D-2 below.

[1] Utilities Asset Revaluation, August 2012 – MWH New Zealand Ltd report for Tasman District Council

Table D-2: Asset Lives

Item	Life (years)	Minimum Remaining Life (years)
Pipelines		
AC, Cu pipe, unknown pipe	60	5
Concrete pipe (stormwater)	120	5
Concrete pipe (wastewater)	80	5
EW pipe	60	5
PVC pipe	80	5
PE pipe	80	5
DI, CI Steel pipe	80	5
Miscellaneous pipework & fittings associated with treatment plants and pump stations	50	5
Valves, hydrants	50	5
Manholes	80	5
Water meters, restrictors	15	2
Non Pipeline Civil Assets		
Borewells	60	5
Civil pump chambers	80	5
Civil concrete structures	80	5
Civil buildings (all materials)	50	5
Civil pipework and fittings	50	5
Soakpit	80	5
Reservoirs (all materials)	80	5
Tanks (concrete, plastic, fibreglass)	50	5
Landscaping/fencing	20	5
Stormwater channel (open drain)	Not depreciated	
Mechanical Assets		
Small plant – pumps, blowers, chlorinating/UV equipment, aerators, screens	20	2
Electrical and Telemetry Assets		
Electrical/Controls	20	2
Telemetry/SCADA	20	2

D.2.3. 2012 Valuation

The optimised replacement value, annual depreciation and optimised depreciated replacement value for stormwater assets is compared to the 2009 valuation summary in Table D-3 and Table D-4 below.

Table D-3: Stormwater Asset Valuation Summary 30 June 2012

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Stormwater Pipes	108,929,248	87,241,450	21,687,797	986,413
Stormwater Channels	4,625,216	4,618,676	6,539	4,909
Stormwater Surface features	26,961,417	21,638,397	5,323,020	306,395
Total	**140,515,883**	**113,498,525**	**27,017,357**	**1,297,717**

Table D-4: 2009 / 2012 Stormwater Valuation Comparison

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Stormwater 2009	109,280,681	88,597,886	20,682,794	1,023,851
Stormwater 2012	140,515,883	113,498,525	27,017,357	1,297,717
% Increase	**28.58%**	**28.11%**	**30.63%**	**26.75%**

Overall the stormwater assets have increased in optimised replacement value by 28.58% value since the 2009 revaluation. The increases are due to the following reasons:

- inflation over the three year period (ie, % as calculated by the construction fluctuation adjustment);
- an average unit cost increase of 20% for small bore (under 200mm diameter) PVC pipes. Pipes make up 77% of the total stormwater valuation, so even small increases to the unit costs can have a large impact on the overall value for the asset group;
- an increase of 8.7% in the length of pipeline valued. Similarly, there has been an increase of 55% in the number of cleaning eyes valued, a 37% increase in the number of soak pits and a 15% increase in the number of sumps valued;
- the 2012 report did not update the assets by drainage area so table D-5 has not been updated.

Table D-5 shows the asset value by Urban Drainage Area.

Table D-5: 2009 Asset Valuation by Urban Drainage Area

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Richmond	53,163,788	42,909,476	10,254,312	488,434
Brightwater	5,247,681	4,173,080	1,074,601	53,841
Wakefield	4,349,551	3,443,114	906,437	44,795
Murchison	673,932	516,813	157,119	6,921
St Arnaud	106,427	103,481	2,945	937
Tapawera	1,687,121	1,153,978	533,143	17,095
Motueka	25,051,577	19,709,527	5,342,050	246,277

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Mapua / Ruby Bay	4,667,796	3,964,612	703,184	48,856
Kaiteriteri	2,789,821	2,457,650	332,171	27,705
Takaka	2,466,500	1,905,461	561,039	26,796
Pohara	728,568	685,788	42,780	8,009
Ligar Bay / Tata Beach	2,248,543	2,066,459	182,084	21,054
Collingwood	1,323,334	1,161,284	162,049	14,226
Patons Rock	84,730	45,658	39,071	1,014
Non-Urban Areas	1,767,393	1,377,584	389,809	17,893
Not identified	2,923,919	2,923,919	-	-

APPENDIX E MAINTENANCE AND OPERATIONS

E.1 Maintenance Contract

E.1.1. C688 for Stormwater Utilities Operation and Maintenance

The operation and maintenance of the stormwater systems has been incorporated into a single performance based contract, Contract 688. The current maintenance contract was awarded to Downer in 2007 and extended in 2013. It may extend to 2017 if they meet the performance requirements. Some of the key aspects of this contract are:

- performance based;
- emphasis on proactive maintenance;
- programme management;
- quality management;
- detailed schedule of works;
- measurement of performance;
- team approach to problem solving.

The routine proactive maintenance work is managed in the following ways:

The contractor prepares an annual maintenance programme that consists of a variety of programmes of all routine proactive maintenance and reporting deadlines. For details on routine maintenance activities and maintenance frequency please refer to Contract 688.

The Engineer to the contract (Council's consultant) in conjunction with Council staff reviews the programme against the budgets and then negotiates with the contractor to agree any deferrals or amendments.

The contractor then implements the work according to the schedules.

Plans illustrating the sections of drains/open water courses in each UDA are the Council's responsibility to maintain, are included in Appendix Y. All drains highlighted as being the Council's responsibility are included in the proactive maintenance schedule (Table E-1) issued to the Councils maintenance contractor.

There are two other areas of maintenance, 'non routine proactive maintenance' and 'reactive maintenance'. Budgets for these have been based on historical spending and projected future system maintenance requirements.

Non-routine proactive maintenance covers maintenance such as mains flushing and checks on mechanical equipment. These are programmed and carried out annually with a report submitted to the Engineer on completion.

Reactive maintenance covers all stormwater reticulation repairs including pipes and pump stations, some open channels, inlets, outlets and detention dams.

The maintenance contract also covers works related to new facilities. These new facilities are usually related to minor system improvements and extensions.

Table E-1: Tasman District Council Stormwater Asset Maintenance List

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
Maint. ID	**Richmond**							
RD001	Borcks Creek	Headingly Lane to Queen Street	Engineering	0	880	880	Tractor boom mowing	4 times yearly
RD002	Borcks Creek	Queen Street to Humes Drain	Engineering	880	2540	1660	Currently not maintained	
RD003	Borcks Creek	Humes Drain to SH 60	Engineering	2540	2840	300	Tractor boom mowing	4 times yearly
RD004	Borcks Creek	SH 60 to Andrews Drain	Engineering	2840	3520	680	Not maintained	
RD005	Borcks Creek	Andrews Drain to SH 6	Engineering	3520	4480	960	Mechanical hand clearing	4 times yearly
RD006	Borcks Creek	SH 6 to Ranzau Road	Engineering	4480	5300	820	Mechanical hand clearing	4 times yearly
RD007	Humes Drain	Borck Creed to end of Railway Reserve	Engineering	2540	2980	440	Tractor boom mowing	4 times yearly
RD008	Humes Drain	Railway Reserve to SH 6 Bridge	Engineering	2980	3180	200	Mechanical hand clearing	4 times yearly
RD009	Humes Drain	SH 6 Bridge to eastern Hills Drain	Engineering	3180	3710	530	Tractor boom mowing	6 times yearly
RD010	Eastern Hills Drain	Alongside Bateup Road	Engineering	3710	4095	385	Tractor boom mowing	4 times yearly
RD011	Andrews Drain	Borck Creek to SH6	Engineering	3520	3750	230	Mechanical hand clearing	4 times yearly
RD012	Reservoir Creek	Waimea inlet to Salisbury Road	Engineering	0	460	460	Mechanical hand clearing	4 times yearly
RD013	Reservoir Creek	Salisbury Road to Kareti Drive	P & R	460	830	370	Not maintained	
RD014	Reservoir Creek	Kareti Drive to Templemore Drive Culvert.	Engineering	830	1050	220	Chemical Spray	2 times yearly
RD015	Reservoir Creek	Templemore Drive Culvert to Hill Street	Engineering	1050	1650	600	Mechanical hand clearing	4 times yearly
RD016	Jimmy Lee Creek	Washbourn Drive to Bill Wilkes Reserve	Engineering	0	370	370	Desilt and mechanical hand clearing	2 times yearly
RD017	Jimmy Lee Creek	Bill Wilkes Reserve to Hunter Avenue	Engineering	370	578	208	Desilt and mechanical hand clearing	2 times yearly
RD018	Beach Rd Drain	Waimea Inlet to Lammas Street	Engineering	0	890	890	Desilt and chemical spray	2 times yearly
RD019	Cemetery Dam	Otia Drive	Engineering				Maintain and clear grates. Mow	12 times yearly
RD020	Blair Terrace Detention area	Blair Terrace	Engineering				Maintain and clear grates	12 times yearly
RD021	Blair Tce Inlet Structure	21B Blair Terrace	Engineering				Maintain and clear grates	12 times yearly
RD022	Lodestone Road Detention Dam	14 Lodestone Road	Engineering				Maintain and clear grates	12 times yearly
RD023	Bill Wilkes Reserve Inlet Structures	20 Washbourn Drive	Engineering				Maintain and clear grates	12 times yearly
RD024	Marlborough Crescent Inlet Structure	Tasman District Council Reserve Easby Park	Engineering				Maintain and clear grates	12 times yearly
RD025	Olympus Way Detention Dam	43 Olympus Way	Engineering				Maintain and clear grates	12 times yearly
RD026	Railway Yard Drain	Railway Reserve to Queen St behind McDonalds	Engineering	0	436	436	Desilt and Mechanical hand clearing	4 times yearly
RD027	Bramley Estate – Hart Creek	McAuley Street to Hart Road	Engineering	0	300	300	Mechanical hand clearing	4 times yearly
					TOTAL	**10939**		
	Motueka							
MOT001	Thorps Drain	Tudor Street to 136 Thorp Street	Engineering	0	140	140	Mechanical hand clearing	2 times yearly
MOT002	Woodlands Drain	Supermarket to end of Thorps Bush	Engineering	0	410	410	Mechanical hand clearing	2 times yearly
MOT003	Woodlands Drain	Thorps Bush to Old Wharf Road	Engineering	410	1360	950	Tractor boom mowing	2 times yearly
MOT004	Woodlands Drain	Old Wharf Road to detention estuary	Engineering	1360	1620	260	Mechanical hand clearing	2 times yearly
MOT005	Queen Victoria Drain	Between Whakarewa Street and Pah Street	Engineering	0	290	290	Tractor boom mowing	4 times yearly
MOT006	Lammas drain 2		Engineering	0	390	390	Mechanical hand clearing	2 times yearly

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
MOT007	14 Outfalls		Engineering				Inspect inlet and keep clear	12 times yearly
MOT008	Wharf Road Flood Gate	Wharf Road	Engineering				Inspect and carry out regular maintenance	4 times yearly
MOT009	Old Wharf Road Flood Gate	Old Wharf Road	Engineering				Inspect and carry out regular maintenance	4 times yearly
MOT010	Glenaven Avenue Motueka	Glenaven Avenue Motueka	Engineering				Maintain and clear grates.	12 times yearly
					TOTAL	**2440**		
	Brightwater							
BGW001	Jeffries Creek	Eder Property Lord Rutherford Rd South	Private	0	130	130	Mechanical hand clearing if required	2 times yearly
BGW002	Jeffries Creek	Hill Property Lord Rutherford Road South	Private	130	280	150	Mechanical hand clearing if required	2 times yearly
BGW003	Jeffries Creek	Bashford property to Lord Rutherford Road South	Private	300	440	140	Mechanical hand clearing if required	2 times yearly
BGW004	Ellis Street Drain	96 Ellis Street to School		0	50	50	Hand clear or excavator clean	2 times yearly
BGW005	Ellis Street Drain	Ellis Street to Brightwater Engineers	Engineering	50	265	215	Hand clear or excavator clean	2 times yearly
BGW006	Railway Reserve Drain	Brightwater Engineers to Wairoa River	Engineering	265	765	500	Mow	2 times yearly
					TOTAL	**1185**		
	Wakefield							
WK001	Eighty Eight Valley drain	72A Eighty Eight Valley Road to 88 Valley Stream	Engineering	0	240	240	Mechanical hand clearing	2 times yearly
WK002	Domain Drain (Faulkners Bush to 39 Eighty Eight Valley Road		Engineering	390	1020	630	Hand clear or excavator clean	2 times yearly
WK003	88 Valley Dam	Eden property 88 Valley Road	Engineering				Maintain and clear grates	12 times yearly
					TOTAL	**870**		
	Mapua							
MAP001	Morley Drain	To Mapua inlet	Engineering	0	410	410	Hand clear or excavator clean	2 times yearly
MAP002	Crusader Drive Dam	21 Crusader Drive Dam	Engineering				Maintain and clear grates	12 times yearly
					TOTAL	**410**		
	Ruby Bay							
RUB001	Brabant Drive/Pine Hill Road	Culvert outlet to beach	Engineering				Inspect outlet and keep clear	6 times yearly
RUB002	4 Crusader Drive	Culvert inlet and outlet drain to detention area	Engineering				Inspect inlet and keep clear	4 times yearly
RUB003	Tait Street outlet	Culvert outlet to beach	Engineering				Inspect inlet and keep clear	12 times yearly
RUB004	Broadsea Avenue outlet	Culvert outlet to beach	Engineering				Inspect inlet and keep clear	12 times yearly
	Kaiteriteri							
KAI001	Little Kaiteriteri Reserve Drain	Rowling Road opposite Kotare Place	Engineering	0	200	200	Hand clear or excavator clean	4 times yearly
KAI002	Little Kaiteriteri outlet	Rowling Road	Engineering				Maintain and clear grates	4 times yearly
KAI003	Camp Beach outlet pipe	Kaiteriteri Sandy Bay Road alongside boat ramp	Engineering				Inspect and clear culvert	12 times yearly
					TOTAL	**200**		
	Takaka							
TAK001	Reilly	Reilly Road to Te Kaka Stream	Engineering	0	170	170	Hand clear or excavator clean	2 times yearly
TAK002	Orange and others	Motupipi Street to Motupipi River	Engineering	0	330	330	Hand clear or excavator clean	2 times yearly
					TOTAL	**500**		

	Waterway Name	Reach	Ownership	Start Co-ord	End Co-ord	Length	Required Routine Maintenance	Maintenance Frequency
	Pohara							
POH001	Watino Place	Picks up new subdivision and runs to Richmond Road behind properties.	Engineering	0	178	178	Hand clear or axcavator clean	2 times yearly
					TOTAL	**178**		
	Tata Beach							
TAT001	Abel Tasman Drive	Tata Heights to Peterson Road	Engineering	0	325	325	Hand clear or excavator clean	2 times yearly
TAT002	Cornwall Place	Inlet/culvert and open drain	Engineering	0	160	160	Inspect, clear vegetation	2 times yearly
					TOTAL	**485**		
	Murchison							
MUR001	Neds Creek	70m north and south of Cromwell Street	Engineering	1070	1210	140	Mechanical hand clearing	2 times yearly
MUR002	Neds Creek	Cromwell Street 70m south toward George Street	Engineering	1140	1210	70	Mechanical hand clearing	2 times yearly
					TOTAL	**210**		
	Collingwood							
COL001	Ruataniwha Drive	Open drain between 34 and 38	Engineering	0	85	85	Spray, hand clear and maintain rock	2 times yearly
COL002	Lewis Street Drain		Engineering	0	115	115	Mechanical hand clearing	1 times yearly
COL003	Beach Road	Five stormwater outlets to beach	Engineering					6 times yearly
COL004	Gibbs Road	Open drain Gibbs Road North	Engineering	0	195	195	Spray or desilt drain	2 times yearly
					TOTAL	**395**		
	Tapawera							
TAP001	Cut off drain	Diversion drain above Tapawera to western side of the township	Engineering	0	1860	1860	Inspect, hand clear and excavator clean/rock repairs.	2 times yearly
TAP002	Grass swale	Motueka Highway to Kowhai Street	P & R	0	380	380	Clear road crossing screens	4 times yearly
TAP003	Matai Crescent inlets	Four culvert inlets at the rear of Matai Crescent	Engineering				Inspect, clear vegetation	6 times yearly
					TOTAL	**2240**		
	Patons Rock							
PAT001	Patons Rock Road	Four culvert outlets to beach	Engineering				Inspect, clear vegetation and sand	12 times yearly
	General District							
					TOTAL	**20052**		

The contractor also carries out pre-storm checks on the following assets (Table E-2) to ensure the risk of flooding is minimised.

Table E-2: Flood Inspection Locations

Met Service Warning Checks	Waterway Name	Location	Asset Type	Ownership	Inspection Activity
Richmond					
Y	Blair Terrace	21B Blair Terrace	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Marlborough Crescent	Easby Park - Tasman District Council Reserve	Inlet Structure	Engineering	Inspect and clear debris
Y	Cemetery Dam	Otia Drive	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Lodestone Road	14 Lodestone Road	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Bill Wilkes Reserve	20 Washbourn Drive	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Jimmy Lee Creek under Washbourn Drive	20 Washbourn Drive	Culvert Inlet Structure	Engineering	Inspect and clear debris
Y	Washbourn Dam	15 Washbourn Drive in Washbourn Gardens	Detention Dam, Spillway and Inlet Structure	P & R	Inspect and clear debris
Y	Olympus Way	43 Olympus Way	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Brightwater					
Y	Brightwater sale yards	Sale yards to school grounds	Inlet Structure	Engineering	Inspect and clear debris
Wakefield					
Y	88 Valley Dam	Eden property, 88 Valley Road	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Motueka					
Y	Glenaven Avenue Motueka	Glenaven Avenue Motueka	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Wharf Road	Wharf Road	Floodgate	Engineering	Inspect and

Met Service Warning Checks	Waterway Name	Location	Asset Type	Ownership	Inspection Activity
	Flood Gate				clear debris
Y	Old Wharf Road Floodgate	Old Wharf Road	Floodgate	Engineering	Inspect and clear debris
Ruby Bay/Mapua					
Y	Aranui Road	Outlet by ex Fruitgrowers Chemical site	Outlet Flapgate	Engineering	Inspect and clear debris
Y	Crusader Drive Dam	21 Crusader Drive Dam	Detention Dam and Inlet Structure	Engineering	Inspect and clear debris
Y	Broadsea Avenue outlet	Culvert outlet to beach	Outlet Flapgate in Manhole	Engineering	Inspect and clear debris
	Pohara				
Y	Paradise Way	Pohara	Detention area and Culvert inlet	P & R	Inspect and clear debris
Tata Beach					
Y	Cornwall Place	39 Cornwall Place system inlet grate (walk-on access only)	Inlet Structure	Engineering	Inspect and clear debris
Patons Rock					
Y	Patons Rock Road	4 culvert outlets to beach	Beach Outlets	Engineering	Inspect and clear sand build up
Collingwood					
Y	Elizabeth Street, Gibbs Road	System and grates from the bottom section of Gibbs Road through to the outlet on Elizabeth Street	Inlet, Sumps and Beach Outlet	Engineering	Inspect and clear debris
Y	Gibbs Road	New inlet structure outside 45 and 53 Gibbs Road	SW system Inlet	Engineering	Inspect and clear debris
Y	Swiftsure Street	System grate and culverts on Swiftsure Street	Culverts and Grate	Engineering	Inspect and clear debris
18 Sites					

E.1.2. Transportation Contracts

Some sumps and culverts are transportation assets and do not fall under the stormwater operations and maintenance contract.

There are four transportation contracts that operate in the district.

- Golden Bay Roading Maintenance Contract.
- Tasman Rural Maintenance Contract.
- Tasman Urban Maintenance Contract.
- Murchison Roading Maintenance Contract.

The road maintenance contracts allow for sump and culvert cleaning in order to protect transportation assets from flooding. Refer to the Transportation Activity Management Plan for more information.

E.2 Maintenance Standards

All work is performed, and materials used to comply with the latest edition of industry standards and the following:

- this Activity Management Plan;
- Contract 688 – Water Utilities Operations and Maintenance;
- Tasman District Council Engineering Standards and Policies.

The maintenance and operation standards for all work activities are specified in the maintenance contract, with performance measures including response times. The Asset Manager may vary these depending on changes to the level of service or budgeting constraints.

E.2.1. Deferred Maintenance

Deferred maintenance is defined as follows:

- the shortfall in rehabilitation or refurbishment work required to maintain the service potential of the asset;
- maintenance and renewal work that was not performed when it should have been, or when it was scheduled to be and which has therefore been put off or delayed for a future period.

The current budget levels are believed to be sufficient to provide the intended level of service and therefore no maintenance work has been deferred. However this is subject to the changes in Levels of Service and expectations of customers.

E.2.2. Increase in Network Size through Development

When new developments such as subdivisions are constructed, any new stormwater assets built by the developer must be accepted as being built to the Council's standards. Once vested as Council assets they are included in the stormwater network and routine maintenance is undertaken through the operations contract. The maintenance budgets have some allowance for network growth where applicable.

E.2.3. Database

MWH New Zealand Ltd (the Council's Professional Services consultant) manages Contract 688 on behalf of the Council. Customer Service Requests (CSR) and Work Orders (WO) are sent to the contractor via the Confirm database.

Local operators receive WOs via laptops and mobile handheld devices. WOs are loaded against individual assets (where possible) and processed for payment with the monthly progress claim. All CSRs and WOs are time stamped depending on the contract timeframe. Contractor performance regarding response and resolution times are monitored as part of their monthly claim.

E.3 Engineering Studies

A number of studies requiring engineering consultancy professional services have been allocated to the operations and maintenance budget. These are summarised in the Table E-3 below. A detailed financial forecast is shown in Table E-4.

Table E-3: Summary of Engineering Studies included in this AMP

Study Name	Brief Description
AMP Review and Update	Allowance two of three years (30 year forecast).
Assessments of Water and Sanitary Services	LGA 2002 requirement (stormwater component), review from time to time.
Land Acquisition Project	Land acquisition strategy and agreements for long term maintenance of open channels, in particular the Thorpe Drain.
Receiving Environment Baseline Study	Detail of study to be defined by CMPs, but to establish existing in-stream and coastal values of receiving environments. Richmond done, Year 1 Motueka, Year 2 Takaka, Mapua, Year 3 Brightwater and Wakefield,
Resource Consent monitoring	Resource consent monitoring.
Stormwater Bylaw	Develop Stormwater Bylaw in conjunction with next Bylaw Review due by 1 July 2018.
Valuations	Three yearly reviews.

E.4 Forecast Operations and Maintenance Expenditure

Downer NZ Ltd staff were consulted during the update of this AmP. They provided input to the identification of operational trends incorporated in these forecasts.

The 20 year forecasts for operations and maintenance costs are shown in Figures E-1 and E2 and Table E-5.

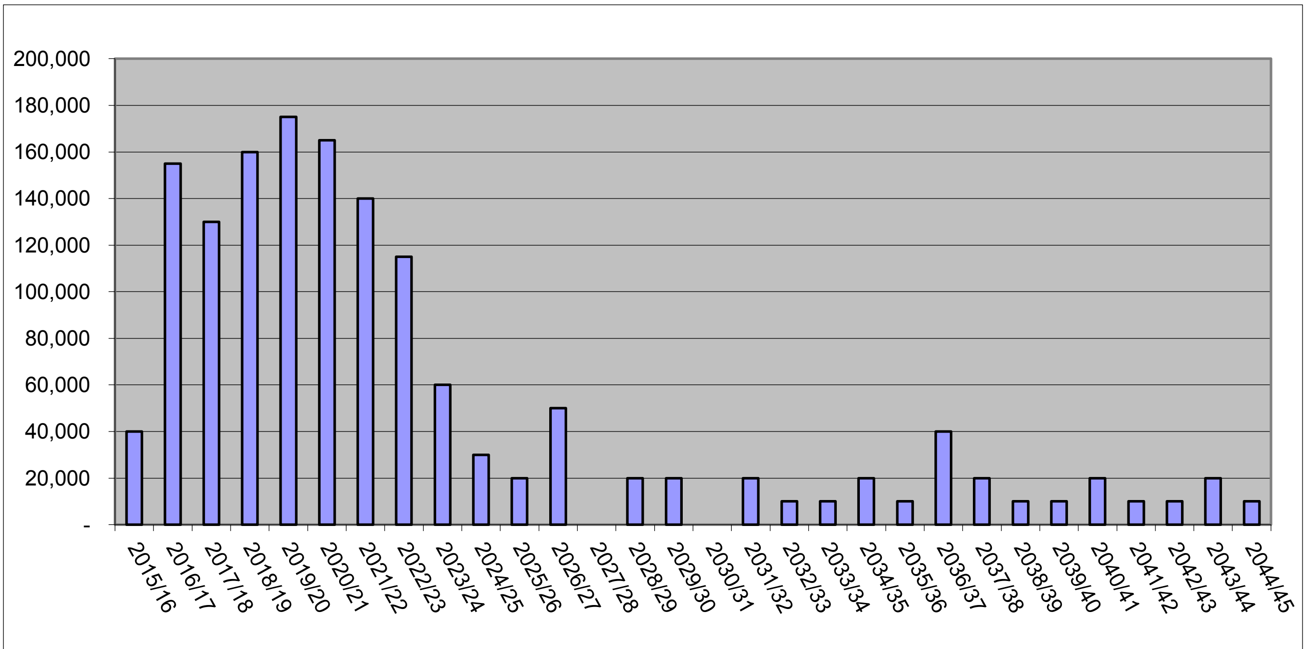


Figure E-1: 2015-2045 Stormwater Engineering Strategic Studies Expenditure

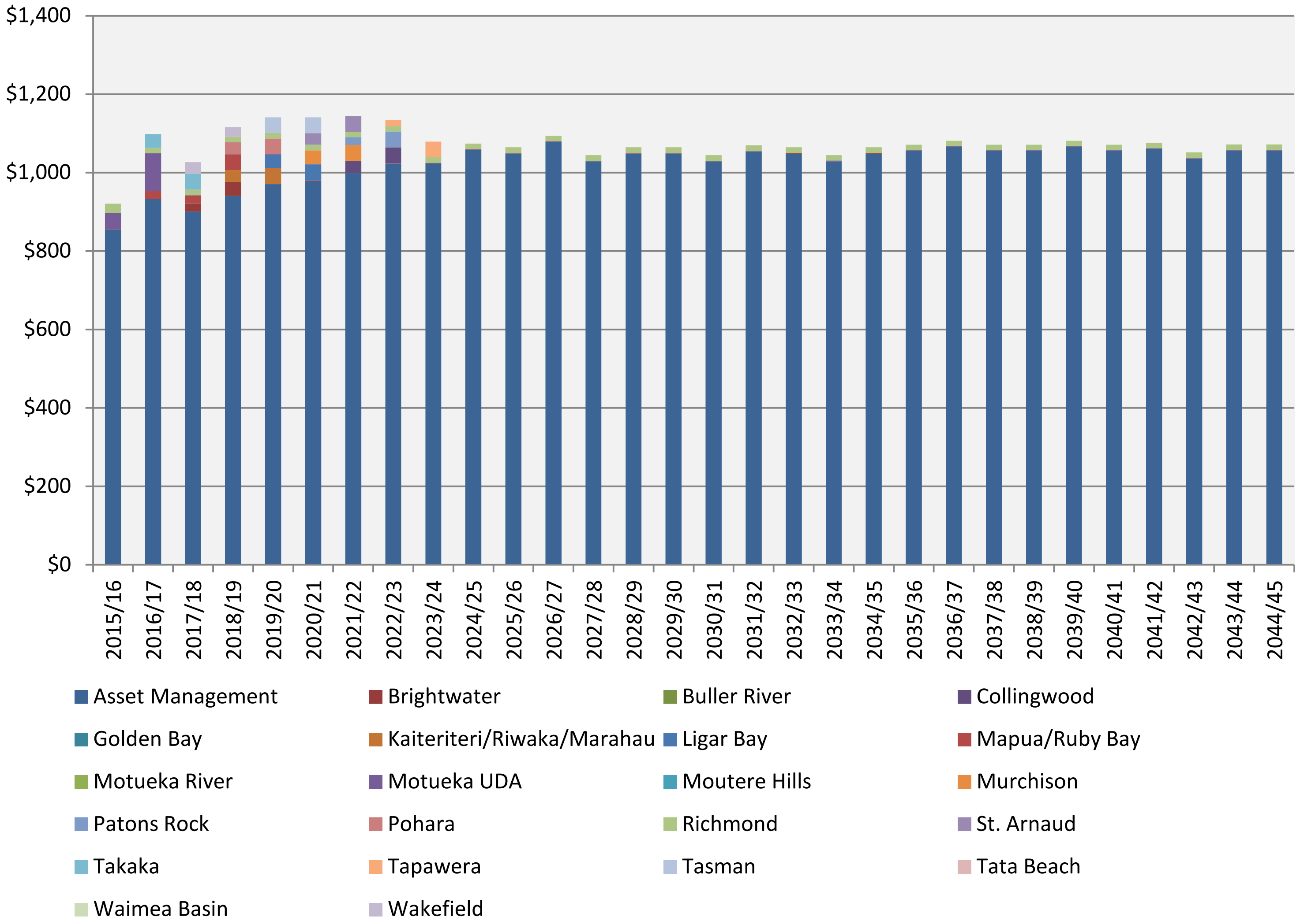


Figure E-2: 2015-2045 Stormwater Operational and Maintenance Expenditure by location

Table E-4: 2015-2045 Stormwater Operation and Maintenance Expenditure

ID	Project Name	Project Description	Category	GL Code	% O&M	O&M Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30	Beyond Year 30
160079	Discharge Consent	Discharge Consent	Richmond	06146216033	100%	10	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160081	Stormwater Bylaw	Develop Stormwater Bylaw building upon new definitions and before next Bylaw Review due by 1/7/2018	Asset Management	06002203016	100%	25	25	-	10	-	-	-	-	5	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-
160087	Land Acquisition Study	Land acquisition strategy and agreements for long term maintenance of open channels, in particular the Thorpe Drain	Asset Management	06002203015	100%	11	11	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160095	Assessments of Water and Sanitary Services	As per LGA 2002 requirement	Asset Management	06002203002	100%	60	60	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	30	-
160096	AMP Review and Update	3 yearly reviews	Asset Management	0601220310	100%	300	300	-	10	20	-	10	20	-	10	20	-	10	20	-	10	20	-	10	20	-	10	110	-
160098	O&M Contract Tender	Retender allowance	Asset Management	06002203006	100%	90	90	-	30	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	30	-
160099	Valuations	3 yearly reviews	Asset Management	06002205	100%	100	100	-	10	-	-	10	-	-	10	-	-	10	-	-	10	-	-	10	-	-	10	30	-
160102	Motueka Upgrade Strategy	Develop strategy subject to recommendations of Stormwater Model 2011/12. Maybe Boyce/Clay Street (identified last AMP)	Motueka UDA	0602220306	100%	55	55	-	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160147	Non UDA Maintenance	General Maintenance	Asset Management	06102401	100%	2,187	2,187	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	729	-
160148	MOTUEKA ELECTRICITY	Electricity Bill	Motueka UDA	06022505	100%	38	38	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	-
160149	BRIGHTWATER UNDERPASS	Electricity Bill	Brightwater	06042505	100%	23	23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	-
160150	UDA CONSULTANTS	Professional services	Richmond	06012203	100%	420	420	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	140	-
160151	Non UDA CONSULTANTS	Professional services	Asset Management	06102203	100%	180	180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	60	-
160173	Stormwater LAPP insurance	Annual allowance	Asset Management	06012506	100%	2,439	2,439	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	813	-
160174	Emergency works provision	reactive maintenance	Asset Management	0600240102	100%	3,000	3,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	1,000	-
160176	Motueka CMP Baseline	Catchment Management Plan Baseline environmental study	Motueka UDA	0629220301	100%	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160177	Motueka CMP Data	Catchment Management Plan data capture	Motueka UDA	0629220301	100%	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160178	Motueka CMP Modelling	Catchment Management Plan modelling	Motueka UDA	0629220301	100%	40	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160179	Mapua/Ruby CMP Baseline	Catchment Management Plan Baseline environmental study	Mapua/Ruby Bay	0629220301	100%	20	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160180	Mapua/Ruby Bay CMP Data	Catchment Management Plan data capture	Mapua/Ruby Bay	0629220301	100%	20	20	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160181	Mapua/Ruby Bay CMP Modelling	Catchment Management Plan modelling	Mapua/Ruby Bay	0629220301	100%	40	40	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160182	Takaka CMP Baseline	Catchment Management Plan Baseline environmental study	Takaka	0629220301	100%	20	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160183	Takaka CMP Data	Catchment Management Plan data capture	Takaka	0629220301	100%	15	15	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160184	Takaka CMP Modelling	Catchment Management Plan modelling	Takaka	0629220301	100%	40	40	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160185	Brightwater CMP Baseline	Catchment Management Plan Baseline environmental study	Brightwater	0629220301	100%	20	20	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160186	Brightwater CMP Data	Catchment Management Plan data capture	Brightwater	0629220301	100%	10	10	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160187	Brightwater CMP Modelling	Catchment Management Plan modelling	Brightwater	0629220301	100%	25	25	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160188	Wakefield CMP Baseline	Catchment Management Plan Baseline environmental study	Wakefield	0629220301	100%	20	20	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160189	Wakefield CMP Data	Catchment Management Plan data capture	Wakefield	0629220301	100%	10	10	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160190	Wakefield CMP Modelling	Catchment Management Plan modelling	Wakefield	0629220301	100%	25	25	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160191	Pohara CMP Baseline	Catchment Management Plan Baseline environmental study	Pohara	0629220301	100%	20	20	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160192	Pohara CMP Data	Catchment Management Plan data capture	Pohara	0629220301	100%	10	10	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160193	Pohara CMP Modelling	Catchment Management Plan modelling	Pohara	0629220301	100%	40	40	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160194	Kaiteriteri CMP Baseline	Catchment Management Plan Baseline environmental study	Kaiteriteri/Riwaka/Marahau	0629220301	100%	20	20	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160195	Kaiteriteri CMP Data	Catchment Management Plan data capture	Kaiteriteri/Riwaka/Marahau	0629220301	100%	10	10	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160196	Kaiteriteri CMP Modelling	Catchment Management Plan modelling	Kaiteriteri/Riwaka/Marahau	0629220301	100%	40	40	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160197	Tasman CMP Baseline	Catchment Management Plan Baseline environmental study	Tasman	0629220301	100%	20	20	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160198	Tasman CMP Data	Catchment Management Plan data capture	Tasman	0629220301	100%	20	20	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160199	Tasman CMP Modelling	Catchment Management Plan modelling	Tasman	0629220301	100%	40	40	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160200	Ligar Bay/Tata Beach CMP Baseline	Catchment Management Plan Baseline environmental study	Ligar Bay	0629220301	100%	20	20	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160201	Ligar Bay/Tata Beach CMP Data	Catchment Management Plan data capture	Ligar Bay	0629220301	100%	15	15	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160202	Ligar Bay/Tata Beach CMP Modelling	Catchment Management Plan modelling	Ligar Bay	0629220301	100%	40	40	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160203	Murchison CMP Baseline	Catchment Management Plan Baseline environmental study	Murchison	0629220301	100%	20	20	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160204	Murchison CMP Data	Catchment Management Plan data capture	Murchison	0629220301	100%	15	15	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160205	Murchison CMP Modelling	Catchment Management Plan modelling	Murchison	0629220301	100%	40	40	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160206	St Arnaud CMP Baseline	Catchment Management Plan Baseline environmental study	St. Arnaud	0629220301	100%	20	20	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160207	St Arnaud CMP Data	Catchment Management Plan data capture	St. Arnaud	0629220301	100%	10	10	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160208	St Arnaud CMP Modelling	Catchment Management Plan modelling	St. Arnaud	0629220301	100%	40	40	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160209	Collingwood CMP Baseline	Catchment Management Plan Baseline environmental study	Collingwood	0629220301	100%	20	20	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160210	Collingwood CMP Data	Catchment Management Plan data capture	Collingwood	0629220301	100%	10	10	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160211	Collingwood CMP Modelling	Catchment Management Plan modelling	Collingwood	0629220301	100%	40	40	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160212	Patons Rock CMP Baseline	Catchment Management Plan Baseline environmental study	Patons Rock	0629220301	100%	15	15	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160213	Patons Rock CMP Data	Catchment Management Plan data capture	Patons Rock	0629220301	100%	5	5	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160214	Patons Rock CMP Modelling	Catchment Management Plan modelling	Patons Rock	0629220301	100%	40	40	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160215	Tapawera CMP Baseline	Catchment Management Plan Baseline environmental study	Tapawera	0629220301	100%	10	10	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160216	Tapawera CMP Data	Catchment Management Plan data capture	Tapawera	0629220301	100%	5	5	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160217	Tapawera CMP Modelling	Catchment Management Plan modelling	Tapawera	0629220301	100%	40	40	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-
160218	Discharge Consent Monitoring Programme	Consent Monitoring	Asset Management	06002401	100%	1,999	1,999	3	10	29	38	48	58	66	76	76	76	76	76	76	76	76	76	76	76	76	76	760	-
160219	UDA General Maintenance	District Wide UDA Maintenance	Asset Management	0600240104	100%	14,341	14,341	393	393	393	443	443	443	468	468	468	493	493	493	493	493	493	493	493	493	493	493	5,000	-
160222	Utilities rates	District Wide	Asset Management	06002508	100%	5,964	5,964	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	199	1,988	-
	TOTALS						91,918	921	1,098	1,027	1,116	1,141	1,141	1,144	1,134	1,079	1,074	1,064	1,094	1,044	1,064	1,064	1,044	1,069	1,064	1,044	1,064	10,718	#N/A

APPENDIX F DEMAND AND NEW FUTURE CAPITAL REQUIREMENTS

F.1 Growth Supply and Demand Model

F.1.1 Model Summary

A comprehensive Growth Demand and Supply Model (GDSM or growth model) has been developed for Tasman District. The growth model is a long term planning tool, providing population and economic projections district wide. The supply potential is assessed as well as demand, and a development rollout for each settlement is then examined. The development rollout from the Growth Model informs capital budgets (new growth causes a demand for network services) which feed into the AMPs and in turn underpin the Long Term Plan and supporting policies e.g. Development Contributions Policy.

The 2014 growth model is a fourth generation growth model with previous versions being completed in 2005, 2008 and 2011. In order to understand how and where growth will occur, the growth model is built up of a series of Settlement Areas which contain Development Areas. A Settlement Area (SA) is defined for each of the main towns and communities in the district. There are 17 Settlement Areas for the present version of the growth model. Each Settlement Area is sub-divided into a number of Development Areas. Each Development Area is defined as one continuous polygon within a Settlement Area that if assessed as developable, is expected to contain a common end-use and density for built development.

The growth model organises and integrates the assessments of demand and supply of built development. The development is categorised as residential or business demand and supply, with business including all industrial, commercial and retail uses.

For residential demand and supply:

- the ‘demand’ for residential buildings (dwellings) is assessed from population and household growth forecasts based on Statistics New Zealand’s latest release;
- the ‘supply’ of lots for future dwellings is assessed from analysis of the Development Areas in each Settlement Area and how many lots could feasibly be developed for residential end use over a 20 year time period, after accounting for a number of existing characteristics of the Development Area.

For business demand and supply:

- the ‘demand’ for business premises is assessed from economic and employment growth forecasts, and associated land requirements;
- the ‘supply’ of lots for future business premises is assessed from analysis of the Development Areas in each Settlement Area over time in a similar way as that for future dwellings.

The Development Areas and Settlement Areas are the building blocks that allow the growth model to spread demand for new dwellings and business premises, and assess where there is capacity to supply that demand.

The growth model is not just an isolated tool that calculates a development forecast. It is a number of linked processes that involve assessment of base data, expert interpretation and assessment, calculation and forecasting. The key input data, assessment and computational processes, and outputs of the growth model are captured in a database called the Growth Model Database.

The outputs of the growth model are located on a shared browser site that all Council staff have access to. The browser contains:

- all the various input data sets and calculated outputs;
- maps defining the Settlement Areas and Development Areas within those; and
- an updated model description describing the model working in detail, assumptions and planned improvements.

The review process is also mapped in ProMapp.

F.1.2 Overall Population Growth and Trends

Richmond is the largest and fastest growing town in the District with an estimated 13,606 residents, as at 2014. Motueka is the next largest town, with 6,687 residents. Another five settlements are relatively small, with populations ranging from 1239 in Takaka up to 2,498 in the Coastal Tasman area. Nine have populations of less than 500 people.

Tasman District is a popular destination for older age group or “retirees”. A high proportion of population growth results from people moving to the Tasman District from elsewhere, rather than from current residents having children. The growth modelling shows that older people moving to the Tasman district are choosing to live in larger centres with easier access to services, hence the larger settlements are growing and the smaller ones are not. As shown in Table F-1, Richmond, Brightwater and Wakefield are predicted to grow by 500 people or more over the next 25 years. Overall, Tasman’s population is expected to increase by 7,700 people by 2039. The Council’s planning also takes into consideration the decrease in the number of persons per household and provides for an increase in the number of holiday homes. The latter is particularly important for holiday settlements such as Kaiteriteri and Pohara/Ligar Bay.

The population projection in the growth model has been taken from Statistics New Zealand population projections derived from the 2013 census data, using a “medium” growth rate projection for all settlement areas (refer Table F-1). The population projections are used to determine a demand for new dwellings in each settlement area.

Table F-1: Population Projections Used in the Growth Model

Settlement Area	Population in 2014	Population projection for 2039	Increase or decrease in people by 2039
Brightwater	1835	2412	577
Coastal Tasman Area	2498	2903	405
Collingwood	232	250	18
Kaiteriteri	377	382	5
Mapua/Ruby Bay	2028	2506	478
Marahau	119	120	1
Motueka	6687	6810	123

Settlement Area	Population in 2014	Population projection for 2039	Increase or decrease in people by 2039
Murchison	413	365	-48
Pohara/Ligar/Tata	543	583	40
Richmond	13606	16396	2790
Riwaka	591	636	45
St Arnaud	101	93	-8
Takaka	1239	1056	-183
Tapawera	284	320	36
Tasman	189	210	21
Upper Moutere	148	177	29
Wakefield	1939	2471	532
Ward Remainder (Area Outside Ward Balance)	282	303	19
Ward Remainder Golden Bay	3023	3248	225
Ward Remainder Lakes Murchison	2418	2722	304
Ward Remainder Motueka	3096	3597	501
Ward Remainder Moutere Waimea	4248	4937	689
Ward Remainder Richmond	1612	2704	1092
Total for District	**47508**	**55201**	**7693**

Projected Population data derived from Statistics NZ 2013 Census Data (adjusted for Growth Model). Base projection series applied = medium

Table F-2 summarises some key statistics for Tasman's population, based on Statistics New Zealand medium growth projections (2006 base, updated in June 2013).

Table F-2: Population Change in Tasman District

Key Statistics	2006	2013	2031
Population	45,800	48,800	53,900
Median age (years)	40.3	44.2	47.3
Proportion of population aged over 65	13.6%	17.9%	29.1%
Number of households	17,900	18,261	23,500
Working age population	29,810	30,500	29,170

Additional information from the 2013 census about Tasman District:

- Tasman's population is 1.1% of New Zealand's total population;
- 93.1% of the population is European;
- 7.6% of the population is Māori;
- 20% of the population aged under 15 years;
- 75% of households in occupied private dwellings owned the dwelling or held it in a family trust (this is the highest rate of home ownership in New Zealand).

As shown in Table F-2, Tasman's population is expected to be about 53,900 by 2031. Like the rest of New Zealand, the median age of Tasman's population is also increasing. The first of the baby boomers (those born between 1946 and 1964) commenced retiring in 2011 and fertility rates have also decreased over the last 20 years. The median age is projected to increase from 44.2 in 2013 to 47.3 in 2031. By 2031, the number of people aged over 65 in Tasman is projected to comprise 29.1 percent of the population, compared to 17.9 percent in 2013. Twenty years ago the figure was less than 10 percent. These demographic changes raise a number of challenges for the Council.

As Tasman's population increases, the Council needs to provide more services. However, many of the retired population will be on fixed incomes and unable to pay for increases in services (rates are a tax on property, not income, and if a property value is high the rates can take a significant portion of this fixed income payment). The Council's Growth Strategy considers whether our community can afford to support growth in all 17 settlements and what form this growth will take.

Communities with an older population are likely to have different aspirations to the communities with a younger median age. This may include:

- where they wish to live, possibly closer to main settlement areas where medical and social services are more readily available;
- an increase in the demand for smaller properties and a decrease in the demand for lifestyle or larger properties, particularly given the projected increase in the number of single households;
- the type of facilities and the levels of service requested, including more informal recreation facilities and the increased demand for "free" or low cost services such as libraries;
- their ability and willingness to pay for services and facilities may be lower, given that incomes are expected to be lower.

The Council has taken these factors into account in the development of this AMP and the LTP.

F.1.1. Business Forecast

The last major review of business demand was undertaken as part of the 2008 growth model. Three economic demand assessments were used to build a quantitative picture of business growth in terms of employment growth and linked growth in demand for business space. Each study provided different datasets, but an aggregate picture of estimated business land demand in the Tasman district, including, Motueka and Environs, Golden Bay, and Tasman district balance (including Richmond).

For the 2011 and 2014 growth models, a high level consideration of business growth opportunities showed that in the two main demand areas (Richmond as part of the eastern sub regional demand catchment of Nelson-Tasman, and at Motueka as the centre of the western sub regional demand catchment), there is a large business land supply capacity becoming available for business development. This includes the current deferred business zonings in both the Richmond West Development Area, and draft deferred zonings in Motueka West Development Area. It was considered this amount of supply capacity will meet the expected needs of business growth for at least 50 years (well beyond the 20 year projection). On this basis, the 2014 review of the growth model simply adopted the data and assumptions in the 2008 growth model, but updated the datasets by extrapolation for a further three years (2032 to 2035).

Looking ahead, there are three main difficulties with relying on the historical demand assessments as the basis for business growth demand forecasts:

- the economic modelling by the consultants' assessments used two different sets of now-dated census data for economic and employment growth;
- the demand assessment methods have yielded results of limited reliability at the level of individual settlement areas, as the areas assessed yielded aggregate results from an undisclosed simulation economic modelling routine, that have then been apportioned and subject to a number of simplifying assumptions;
- the consultant work done is not in a Council-managed information system and does not provide a confident results in a regional (Nelson-Tasman) context especially for future Nelson-Richmond urban area forecasting.

Notwithstanding that the last study is now six years old, the information used for business demand is considered sufficient as for part of this time the Global Financial Crisis also reduced local demand for new business land, and since this time many "new" businesses have been established on current business properties (brown fields development). What is required is the development of a regional (Nelson-Tasman) economic simulation model capable of yielding results at the settlement area level, and suitably populated with current data, to yield more reliable segmented business land demand estimates, for each settlement area. This is a strategic priority for further work after the completion of the 2014 growth model review.

F.1.2. Rollout Assessment

Once the analysis of demand for residential dwellings and buildings in each settlement area has been completed, and when the supply potential for new subdivision and dwelling/building construction has been assessed for each development area, the rollout analysis is done. This seeks to forecast when and if the demand for dwelling and business premises will be met and, if so, where and when. This results in a forecast for each development area of:

- the number of new residential dwellings that will be created through subdivision or building on vacant lots;
- the number of new business buildings that will be created through subdivision or building on vacant lots.

This information is then used to plan how and where network infrastructure needs to be developed and to what capacity.

F.2 Projection of Demand for Stormwater Services

F.2.1. Forecast Growth in Demand from GDSM

The forecast growth in demand from the GDSM growth forecasts is shown in Table F-3.

F.2.2. Effects of Population Growth on Stormwater Flows

The link between population growth and stormwater flows is not as direct as it is for other activities, however generally population growth leads to intensification of development (infill housing), new subdivisions, and urban development.

Development work usually leads to quicker and higher runoff from rainfall as impervious surfaces increase. Projections for future increases in stormwater flows must take into account additional flows not only from new developments but also from existing developed areas.

Potential effects from increased population growth on the stormwater systems are:

- increased flooding due to urbanisation; faster and larger runoff flows which exceed system capacities;
- deteriorating stormwater quality due to increasing urbanisation is strongly linked to adverse effects on the receiving environment.

F.2.3. Implications of Changes in Community Expectations

Increasing demand for higher levels of flood protection and decreasing tolerance of flooding has become a topical issue in some areas due to the occurrence of several large storms in recent years. The Richmond CBD has been badly impacted and areas on the outskirts of UDAs (which do not contribute financially to the upkeep of the UDA) are demanding flood protection. Focused community consultation and network capacity assessments will be required prior to extending UDA boundaries further or allowing private assets to be vested in the Council. An alternative approach is to be considered under the Catchment Management Plan (CMP) framework of a zone of contribution or discharge where residents are influenced by urban stormwater but will not be provided with a full urban level of service. In these cases a stormwater rate in between the urban and rural rate is being considered for the 2018-2028 LTP.

Higher environmental standards and greater community awareness are likely to require continued reductions in the environmental related effects of the operation of stormwater systems. This is expected to necessitate ongoing capital and operational expenditure to improve catchment management practices.

Table F-3: Summary Forecast Stormwater Connections inside Urban Drainage Areas

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Brightwater	692	706	722	737	748	758	769	779	790	801
Collingwood	652	654	658	660	662	663	664	665	666	667
Kaiteriteri	475	481	489	495	498	500	502	504	506	508
Ligar Bay	96	98	100	102	104	106	108	110	112	114
Mapua Ruby Bay	940	956	973	989	1007	1023	1040	1056	1073	1090
Motueka	3,301	3338	3377	3415	3447	3479	3511	3543	3575	3607
Murchison	262	264	268	270	273	273	274	274	274	274
Patons Rock	63	63	63	63	63	63	63	63	63	63
Pohara	343	350	357	362	363	364	365	366	367	368
Richmond	5,635	5705	5779	5850	5950	6050	6150	6250	6350	6450
St Arnaud	366	368	371	374	377	378	380	381	383	385
Takaka	449	455	462	469	470	470	471	471	471	471
Tapawera	143	146	149	152	155	155	158	158	160	162
Tasman	57	57	58	59	60	61	62	63	64	65
Tata Beach	153	153	153	153	153	153	153	153	153	153
Wakefield	696	710	728	746	760	772	786	798	812	826
Total	**14,323**	**14,504**	**14,707**	**14,896**	**15,090**	**15,268**	**15,456**	**15,634**	**15,819**	**16,004**
General district	9,429	9514	9602	9687	9803	9914	10028	10139	10253	10366

The following initiatives are currently being implemented (or considered) by the Council:

- sediment management plans for construction projects (silt pond requirements for developers);
- management of contaminants associated with urban runoff in the urban areas (sump filters, ponds and wetlands, and routine monitoring of receiving waters);
- management of point source contamination risk from commercial and industrial areas;
- public education programmes.

Levels of service are reviewed every three years in association with the review of this Activity Management Plan and the Council's LTP. Community expectations are taken into account and undergo community consultation in association with the LTP.

Capital works identified to meet the levels of service are summarised in the Capital Works Programme below. Refer to Appendix R for further information on levels of service.

F.2.4. Implications of Technological Change

Technological change can reduce or increase the demand for stormwater services. It has been assumed that the predicted technological changes will not have a significant effect on the assets in the medium term. However, relevant examples are:

- new or more sustainable urban drainage design in subdivision development;
- new or different treatment processes that provide a higher quality and more reliable discharge quality;
- better technology to measure flood flows and analyse system performance;
- better technology to rehabilitate pipelines (trenchless technology etc).

F.2.5. Implications of Legislative Change

In the past three years there have not been any significant changes to legislation impacting on this activity.

F.3 Assessment of New Capital Works

Input from Asset Managers, consultants and operations and maintenance staff assisted to refine new work requirements. New works were identified by:

- reviewing levels of service and performance deficiencies;
- reviewing risk assessments and flooding history;
- reviewing previously completed investigation and design reports;
- using the collective knowledge and system understanding of the project team.

Due to the recent storm events several new works were proposed. Each project identified was developed with a high level scope and cost estimate. Common project estimating templates were updated to ensure consistent estimating practices and rates were used. This is described in Appendix Q. The project estimate template includes:

- physical works and professional fee estimates;
- consenting and land purchase estimates;
- contingencies for unknowns.

All estimates are documented and filed in the Council's electronic files. The information from the estimates is included in the Capital Forecast spreadsheet that enables listing and summarising of the Capital Costs per project, per scheme, per project driver and per year. This has been used as the source data for input into the Council's financial modelling.

F.4 Determination of Project Drivers and Programming

All expenditure is allocated against at least one of the following project drivers.

Operations:	operational activities which have no effect on asset condition but are necessary to keep the asset utilised appropriately and on-going day-to-day work required to keep assets operating at required service levels[1];
Renewals:	significant work that restores or replaces an existing asset towards its original size, condition, or capacity[2];
Increase Level of Service:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to improve the level of service provided to existing customers;
Growth:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to provide for the anticipated demands of future growth.

This is necessary for two reasons:

- Schedule 13(1) (a) of the Local Government Act, which requires the local authority to identify the total costs it expects to have to meet relating to increased demand resulting from growth when intending to introduce a Development Contributions Policy;
- Schedule 10(2)(1)(d)(I)-(iv) of the Local Government Act, which requires the local authority to identify the estimated costs of the provision of additional capacity and the division of these costs between changes to demand for, or consumption of, the service, and changes to service provision levels and standards.

All new works have been assessed against these project drivers. Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver. A guideline was prepared to ensure a consistent approach to how each project is apportioned between the drivers.

Some projects may be driven fully or partly by needs for renewal. These aspects are covered in Appendix I.

The projects have been scheduled out across the 30 year period, primarily based on their drivers. They were then loaded into GIS along with projects from all other engineering activities to allow programme managers to assess any programme clashes or optimisation opportunities.

F.5 Developer Created Assets

Generally private developers construct new subdivisions with consent from the Council. It is very seldom that the Council itself constructs subdivisions to service growth. Normally the Council is responsible for the upgrading/upsizing of existing assets to provide for increased volumes associated with growth.

The Council oversees the subdivision process, from consenting through to construction and handover to the Council. The Council's engineers inspect design plans and finished works to ensure

[1] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114

[2] ibid

the assets meet the required standards and are in an acceptable condition to be accepted as a Council-owned asset.

An understanding of developer's needs and the scheduling of their works is considering in the Council's work programming.

F.6 Project Prioritisation

During preparation of the 2012 AMP, workshops were attended by key Council staff, key members of the MWH team, and representatives from Council's contractors to review the programme. Each project identified was assigned an initial project priority of either non-discretionary or discretionary where:

A non-discretionary investment is one that relates to:

- a critical asset, that without investment is likely or almost certain to fail within the next three years, with a medium, major or extreme impact
- any asset that has a regulatory requirement to make the proposed investment.

A discretionary investment is one that relates to:

- a non-critical asset with no regulatory requirement to make the proposed investment
- a critical asset where asset failure is possible, unlikely or very unlikely to occur within the next three years with no regulatory requirement to make the proposed investment
- a critical asset where asset failure has only a negligible or minor impact with no regulatory requirement to make the proposed investment.

In addition to these guidelines the Council has developed a new formula to assist prioritisation of their work programmes. This approach seeks to emphasise remediation of flooded properties especially floors and facilitating release of flood-free sections

$$\frac{(\text{flooded section} \times 1 + \text{floor flooded once} \times 5 + \text{floor flooded again} \times 10 + \text{growth section} \times 3)}{\text{Cost of the works to achieve flood avoidance}}$$

The results of the 2014 review are stored in the Engineering Services Department AMPs directory.

Additional considerations relating to the final programme are:

- projects are that are only required to facilitate new subdivision or development will be delivered just-in-time to support the growth;
- projects that are linked to other projects are scheduled to be built in the optimal sequence;
- project expenditure is smoothed to avoid excessive peaks.

F.7 Cross Activity Projects

There are several projects that span across more than one of the Engineering Department's activities. These projects are strongly linked either because one project causes the need for another or because it makes sense to undertake the projects either sequentially or in parallel. By managing related projects as a group the Programme Delivery team will ensure that the overall cost and disruption caused by the works is minimised. Highlighting the linkages also helps to reduce the risk of a dependant project being rescheduled independently.

Table F-4 summarises cross activity projects including the predominant year of physical works and project cost.

Table F-4: Cross Activity Projects

Project ID	Activity	Project Description	Year	Project Cost $
Richmond Town Centre Projects				**8,916,490**
110077	Transportation	Upgrade of the Richmond Town Centre (Queen Street) to provide improved traffic calming and shared spaces	2016/17	4,653,000
150129	Water	Renewal of existing 300mm and 100mm diameter pipes	2016/17	1,837,000
160036	Stormwater	Renewal of existing pipes, plus additional capacity to reduce CBD flooding	2016/17	2,214,000
140035	Wastewater	Upgrade of pipes between 202 Queen Street to Sundial Square	2016/17	212,490
Oxford Street – Richmond				**3,714,268**
160033	Stormwater	Partial pipe upgrade	2022/23	1,754,924
110093	Transportation	Widening of Oxford Street between Wensley Road and Gladstone Road	2022/23	872,000
140034	Wastewater	Pipeline upgrade	2022/23	772,600
150126	Water	Replace 100mm with 150mm main Wensley Road to Gladstone Road	2022/23	314,744
Queen Street and Salisbury Road Intersection – Richmond				**1,716,055**
110096	Transportation	Upgrade intersection to improve efficiency	2019/20	1,041,000
160073	Stormwater	Rework stormwater at intersection	2016/17	432,004
150131	Water	Rework water at intersection	2019/20	243,051
Salisbury Road – Richmond				**1,240,476**
160076	Stormwater	Extend pipe to William Street	2021/22	640,476
110095	Transportation	Upgrade intersection to improve efficiency	2021/22	550,000
150246	Water	Renew old copper laterals	2021/22	50,000
Gladstone Road – Richmond				**1,983,670**
150118	Water	New 250mm main from Queen Street to Three Brothers Corner	2026/27	1,651,370
140031	Wastewater	Upgrade from WWSF-1709 to WWSF-1708	2026/27	332,300

Project ID	Activity	Project Description	Year	Project Cost $
Pipe Works – Mapua				**4,200,000**
150237	Water	Replace existing water pipe in the same trench	2027/28	3,700,000
140017	Wastewater	New rising main along Aranui Road and across channel	2027/28	500,000
Flood Mitigation Works – Brightwater				**2,535,534**
160002	Stormwater	Mt Heslington stream diversion	2020/21	2,235,534
160138	Stormwater	Drainage repair works	2020/21	300,000
130020	Rivers	Removal of the railway embankment	2020/21	80,000
Murchison Town Centre Projects				**1,344,000**
160019	Stormwater	Ned's Creek flood mitigation works	2019/20	750,000
110084	Transportation	Town centre upgrade (potential link)	2023/24	594,000
160070	Stormwater	Pipe renewals	2020/21	200,000

F.8 Forecast of New Capital Work Expenditure

The capital programme that has been forecast for this activity where the primary driver is classed as New Works (ie, growth or levels of service) is summarised in Figure F-1 and detailed in Table F-3. Figures F-2 through to F-18 detail the expenditure profile and major works by UDA[3].

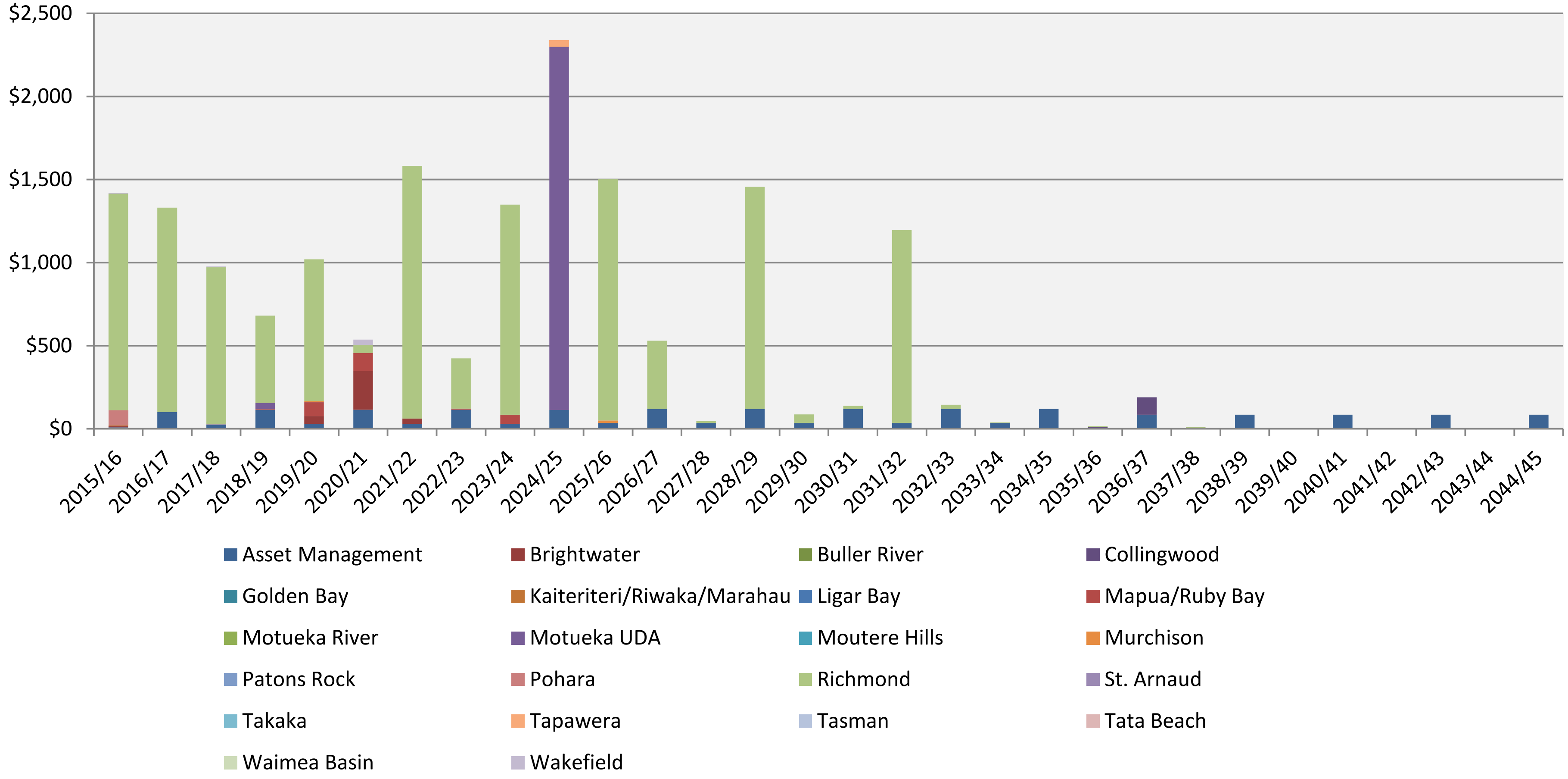


Figure F-1: 2015 – 2045 Stormwater Growth Expenditure ($000)

[3] No growth or LOS works are programmed at Patons Rock, St Arnaud and Tasman

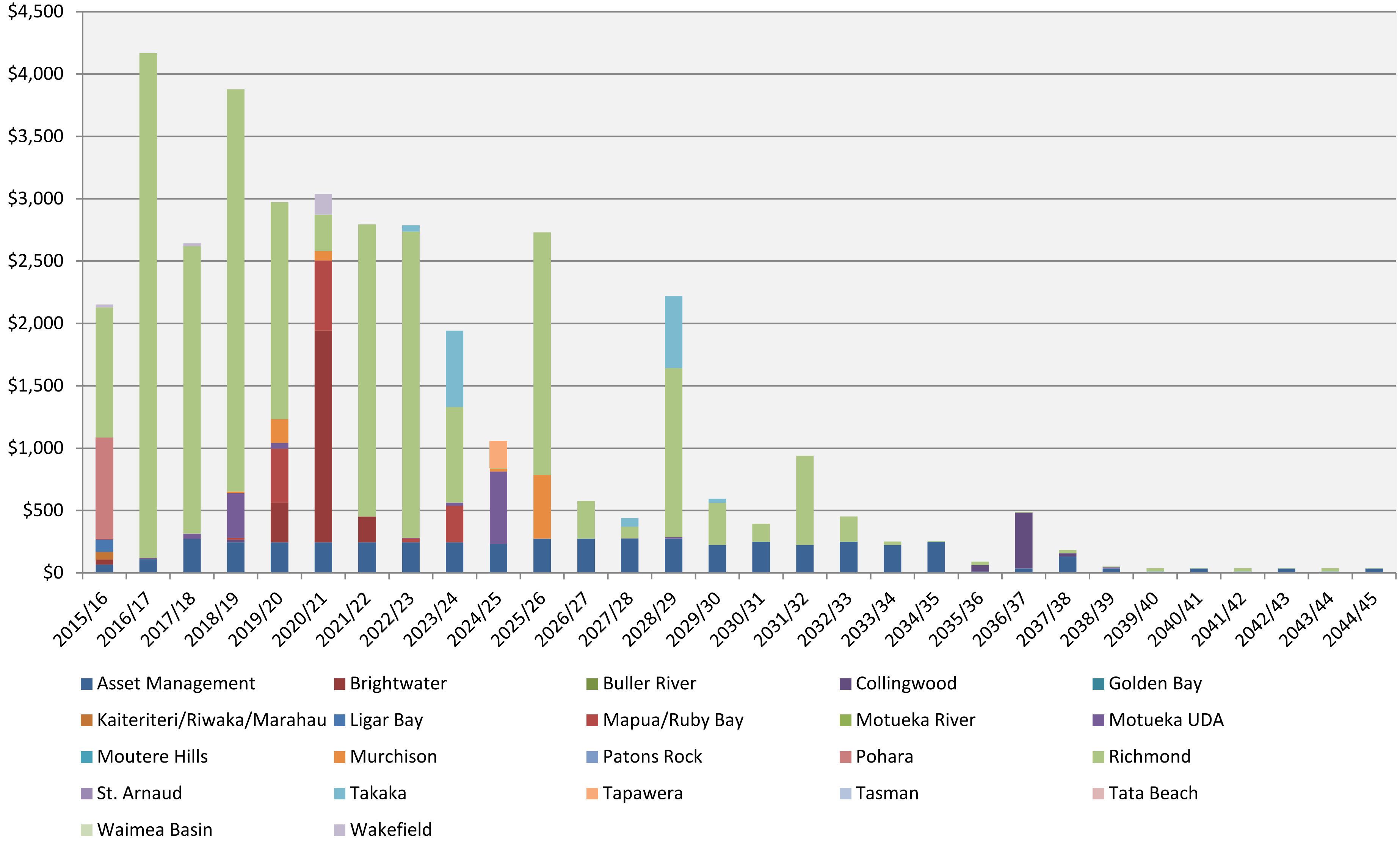


Figure F-2: 2015 – 2045 Stormwater Increased Level of Service Expenditure ($000)

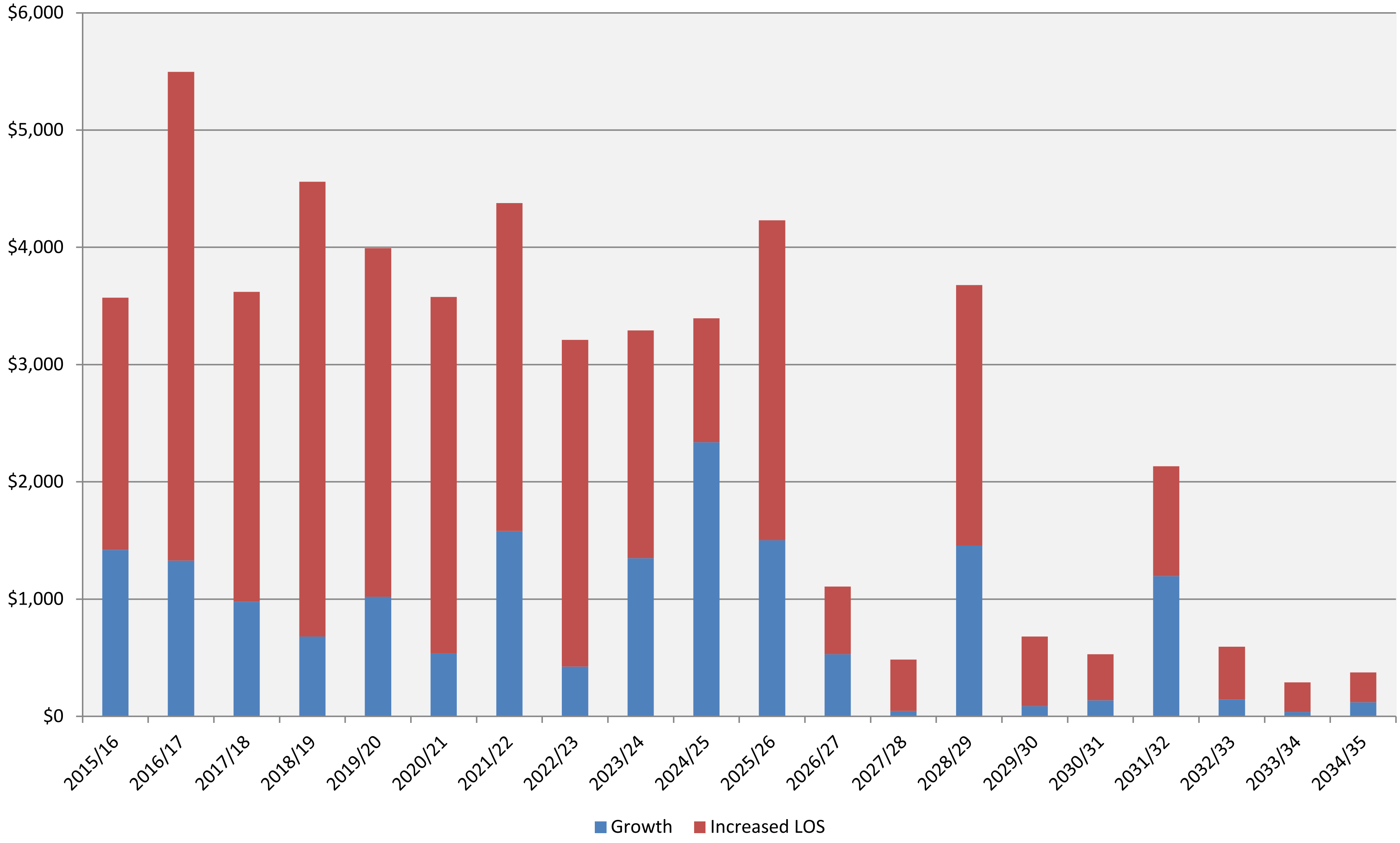
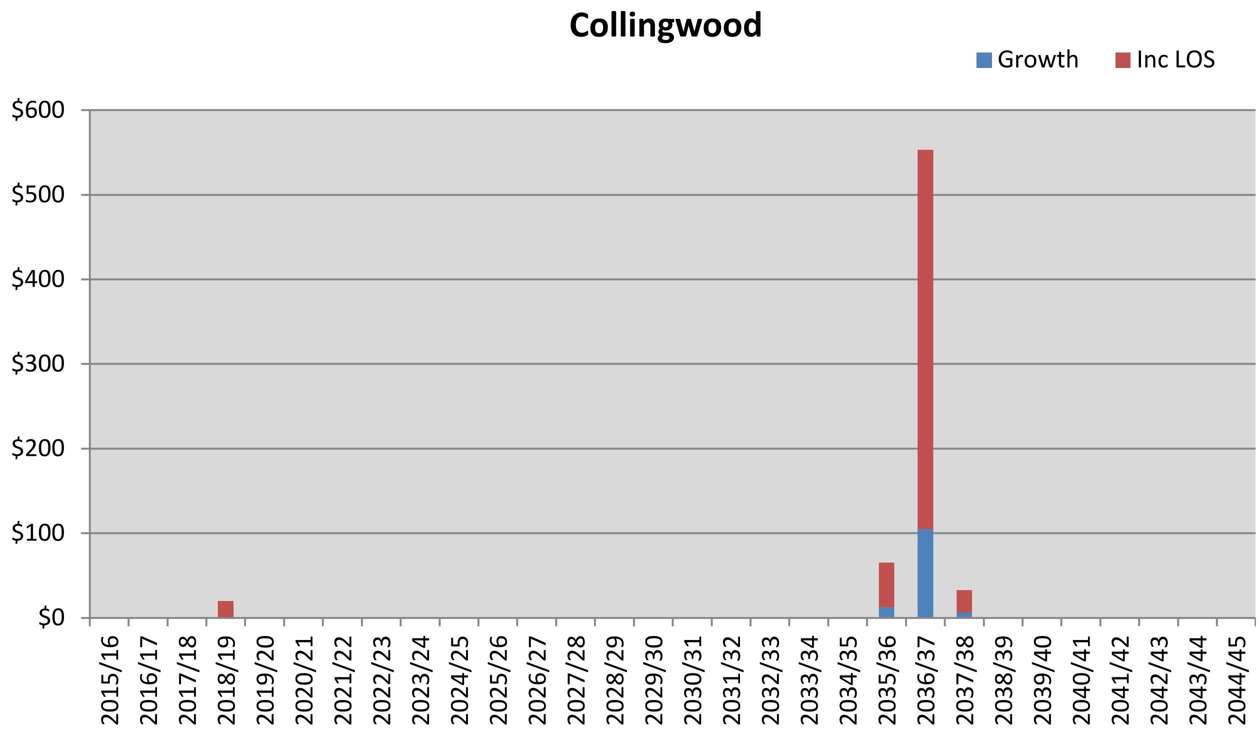
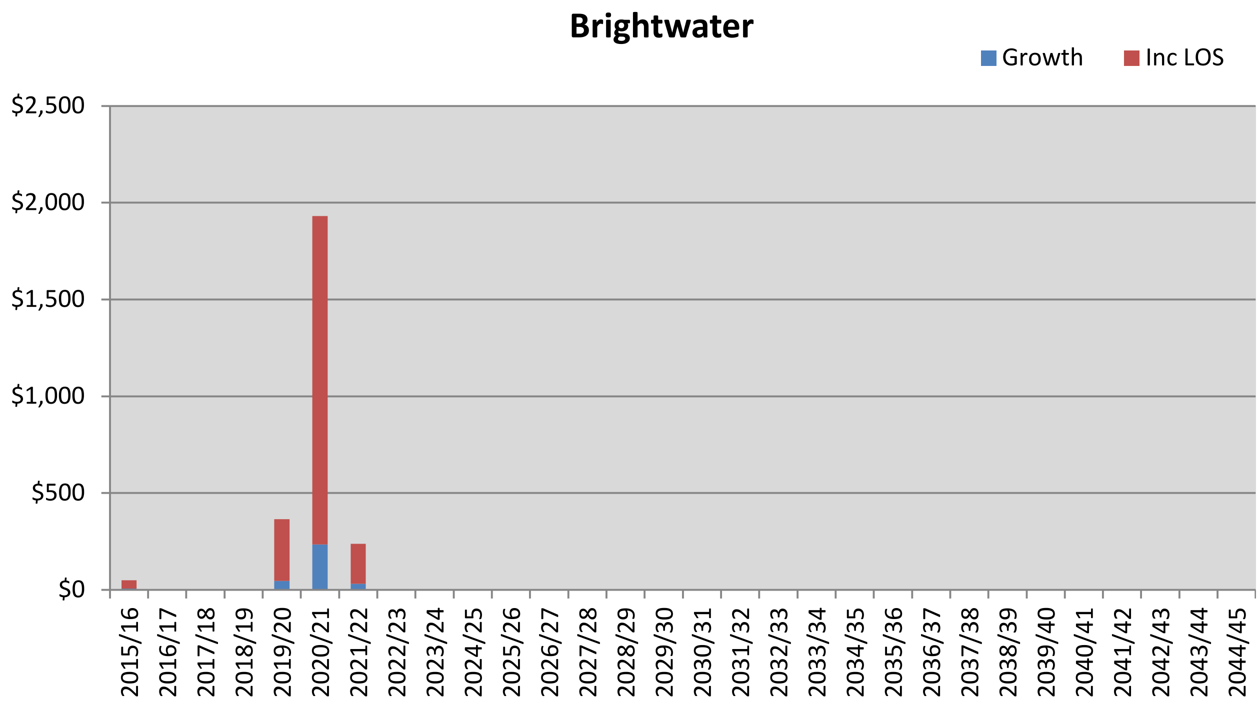


Figure F-3: 2015 – 2045 Stormwater New Capital Expenditure ($000)



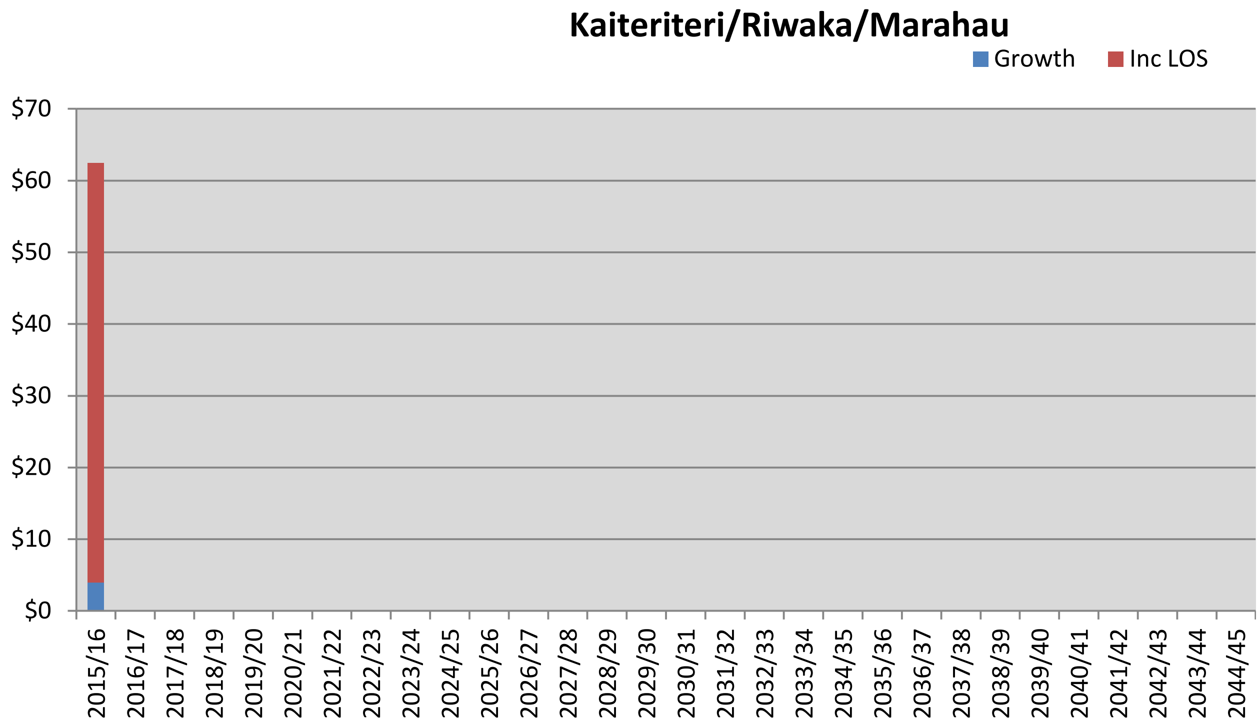
Major Capital Projects
- Gibbs Road Diversion (2024-2026)

Figure F-4: 2015 – 2044 Stormwater New Capital Expenditure – Collingwood



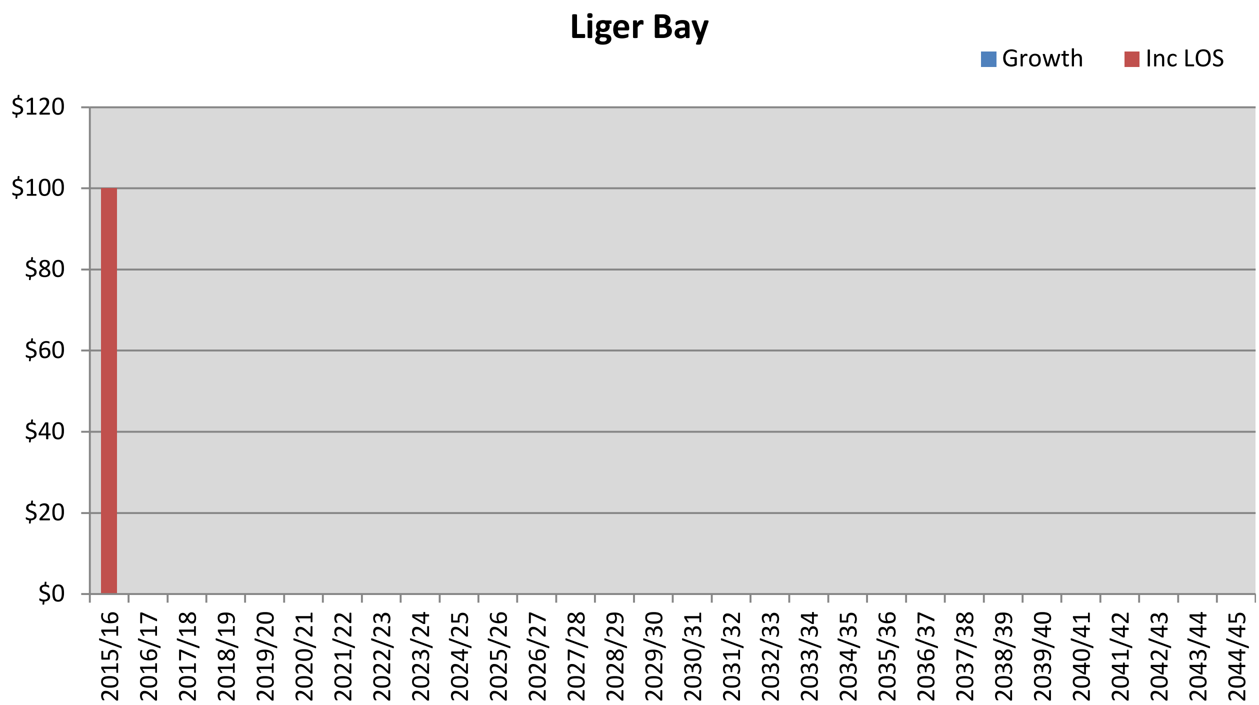
Major Capital Projects
- Mt Heslington Drain Diversion (2020-22)
- Flooding repairs (2020-2022)

Figure F-5: 2015 – 2044 Stormwater New Capital Expenditure – Brightwater



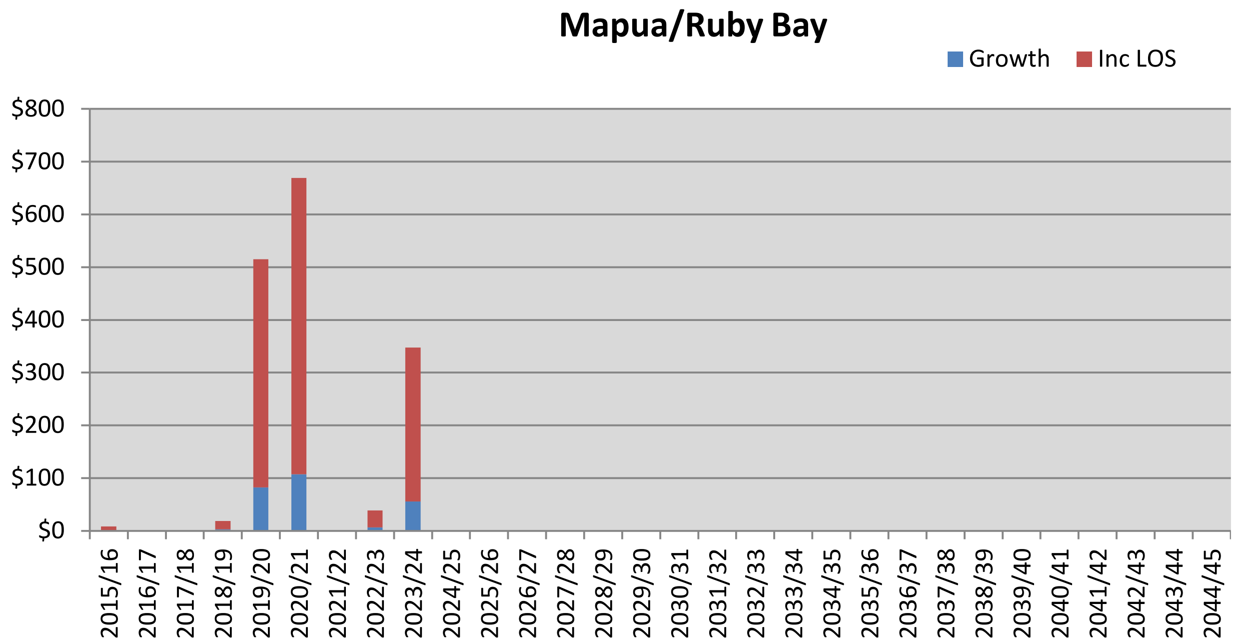
Major Capital Projects
Not Applicable

Figure F-6: 2015 – 2044 Stormwater New Capital Expenditure – Kaiteriteri/Riwaka



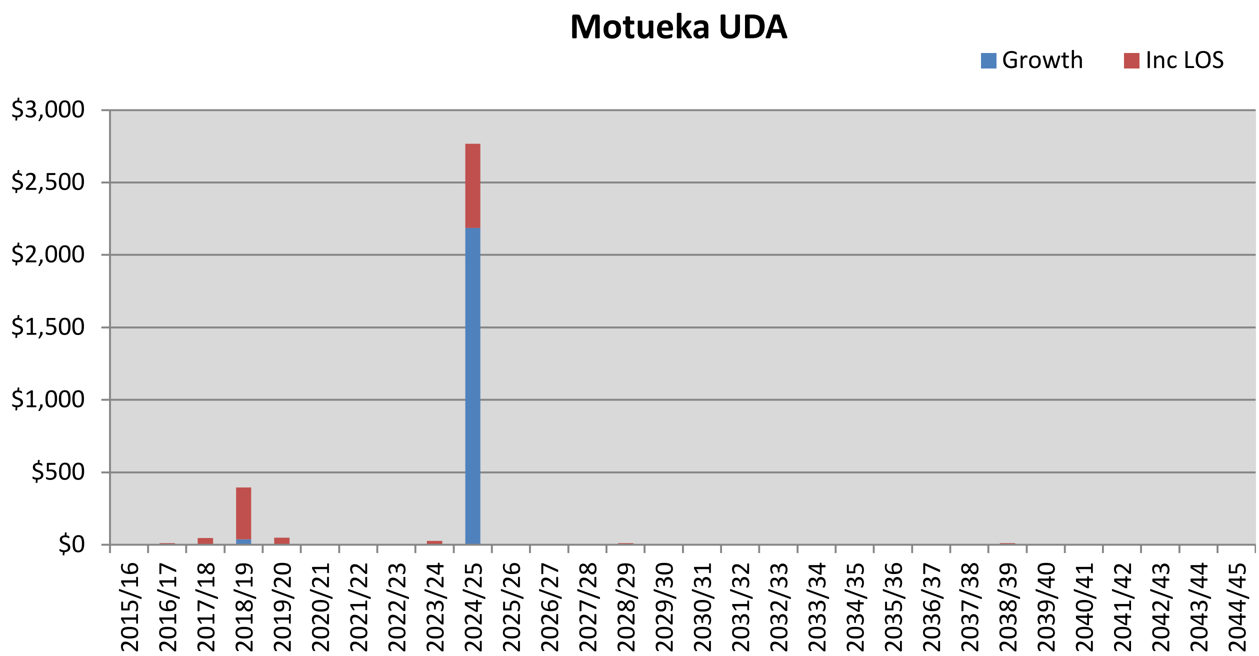
Major Capital Projects
Flood damage repairs 2015/16

Figure F-7: 2015 – 2044 Stormwater New Capital Expenditure – Ligar Bay



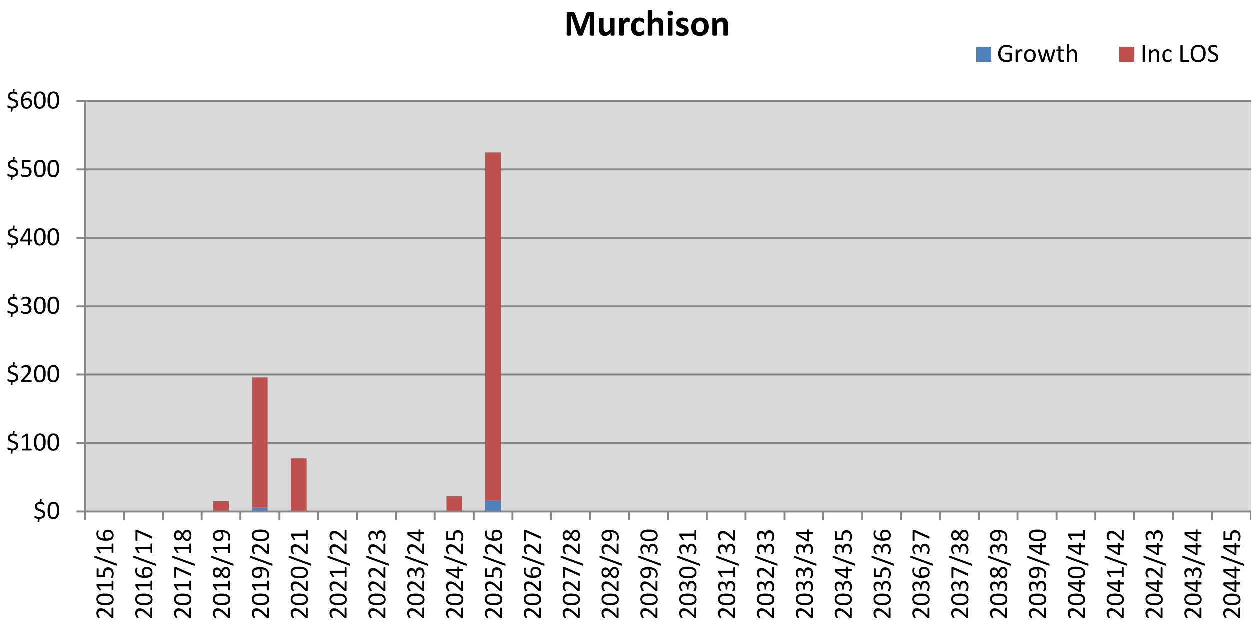
Major Capital Projects
- Seaton Valley Stage 2 (2018-21)
- Crusader Drive/ Stafford Drive/ Langford Dive (2023-24)

Figure F-8: 2015 – 2044 Stormwater New Capital Expenditure – Mapua



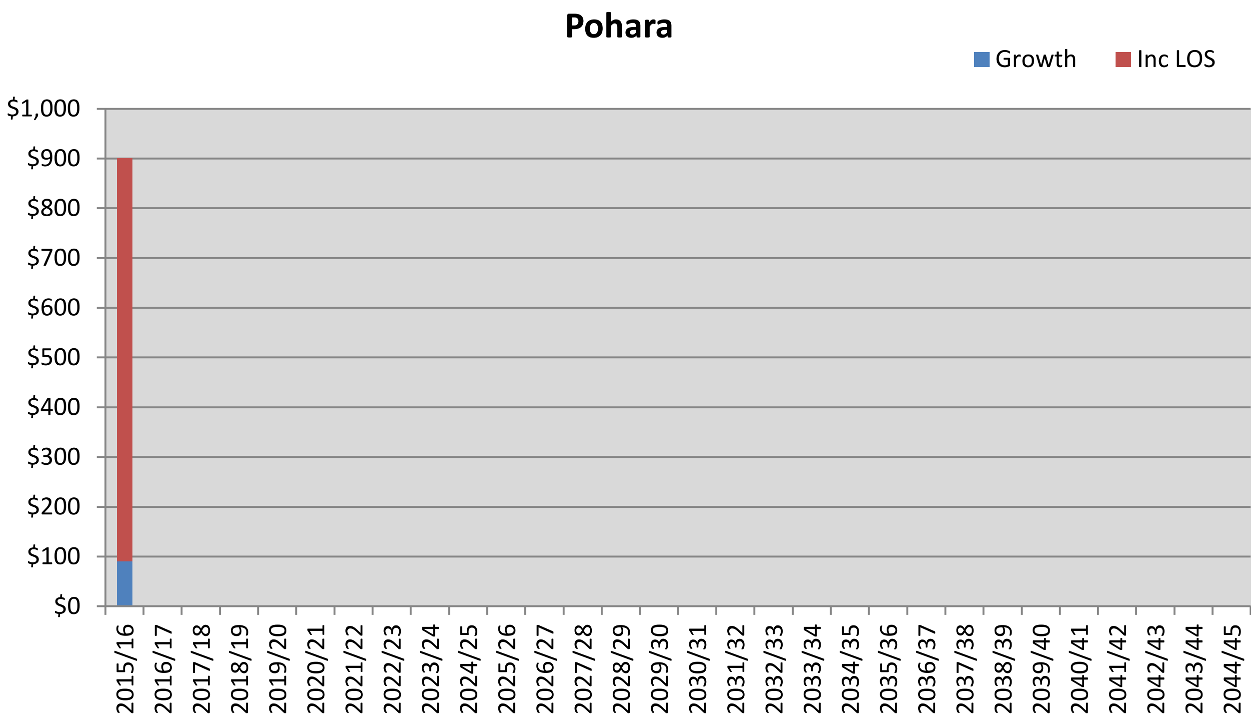
Major Capital Projects
Poole, Jocelyn, Wilki, Fry Streets pipe extension (2018-2020)
Woodland Development Areas (2024-2025)

Figure F-9: 2015 – 2044 Stormwater New Capital Expenditure – Motueka



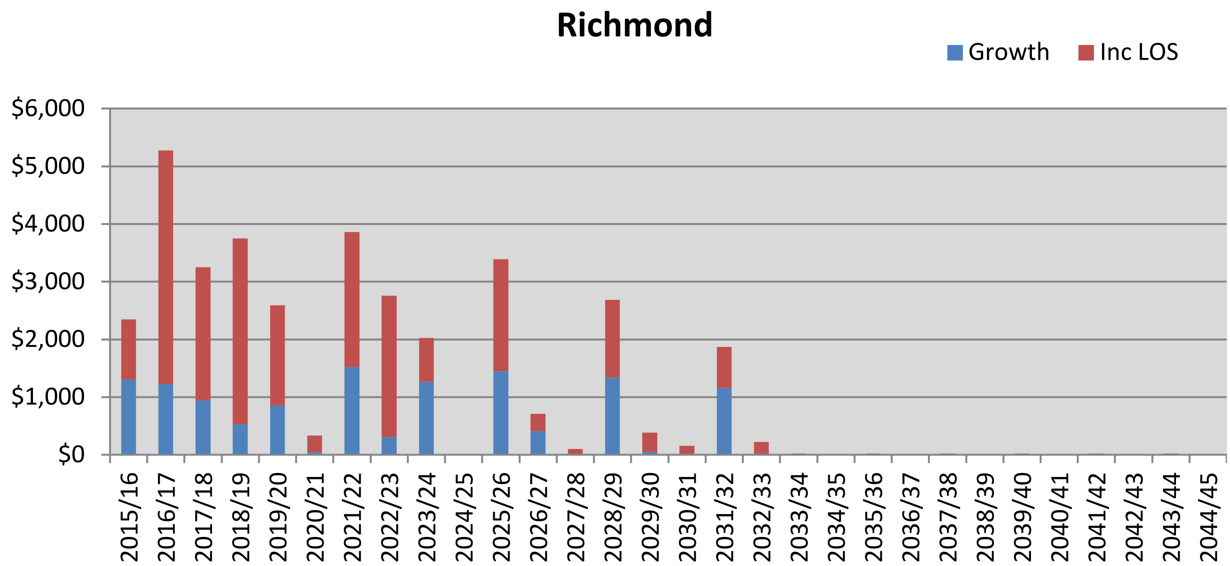
Major Capital Projects
- Flood works Neds Creek (2019/20, 2024/26)
- Pipe Renewals (2018/19)

Figure F-10: 2015 – 2044 Stormwater New Capital Expenditure – Murchison



Major Capital Projects
Pohara Main settlement upgrade and flood damage repair 2015/16

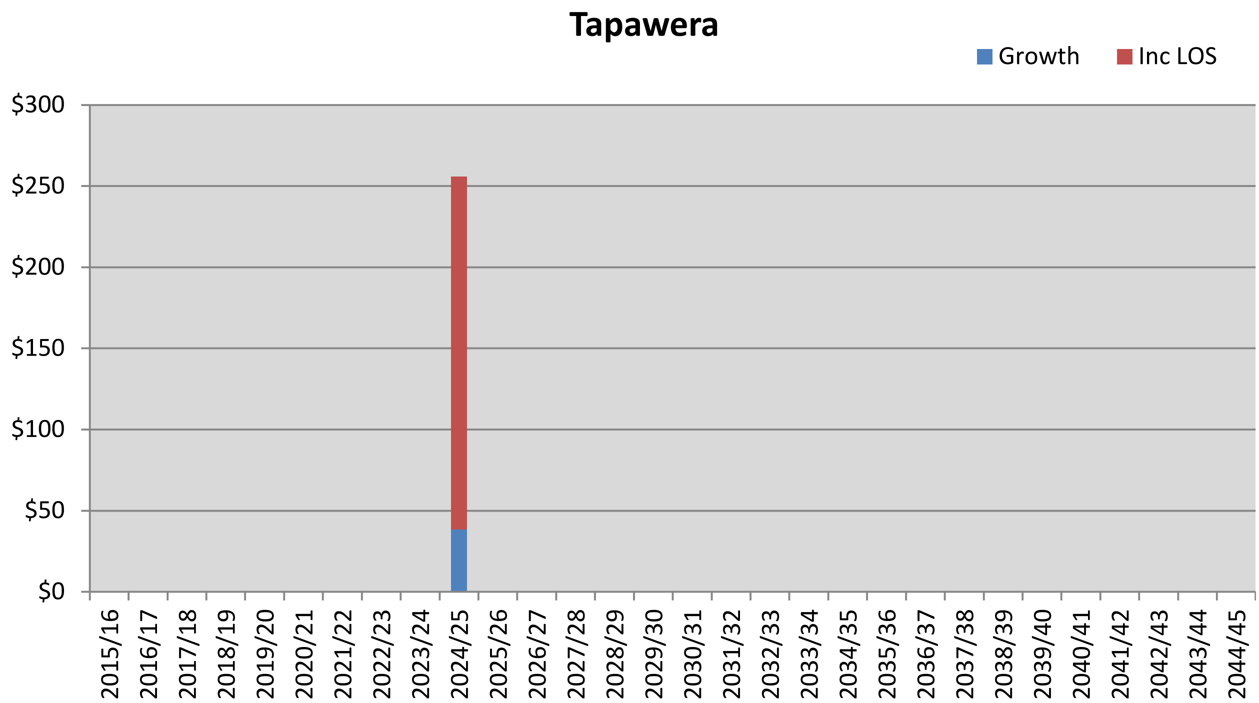
Figure F-12: 2015 – 2044 Stormwater New Capital Expenditure – Pohara



Major Capital Projects

- Hill Street (2020-2022)
- Queen Street (2015-2017)
- Beach Road (2019-2021)
- Oxford Street (2022-2023)
- Middlebank Drive (2017-2020)
- Salisbury Road (2020-2022)
- Washborne Drive (2016-2017)
- Richmond South Drains (2025-2032)
- Ranzau Rd/Paton Rd/White Rd (2015-2016)
- Park Drive (2015-20217)
- Poutama Drain (2012-2016)
- Borcks Creek SH6 to Outlet (2015-2032)
- Deviation drainage (2017-2018)

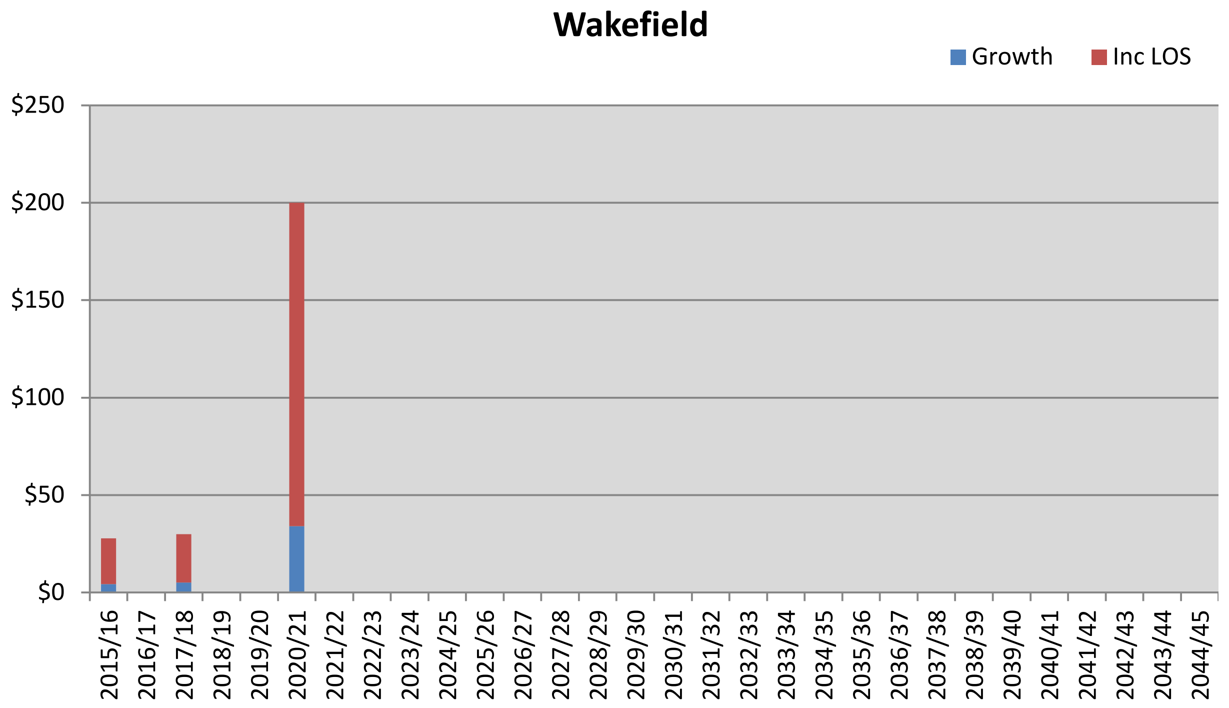
Figure F-13: 2015 – 2044 Stormwater New Capital Expenditure – Richmond



Major Capital Projects

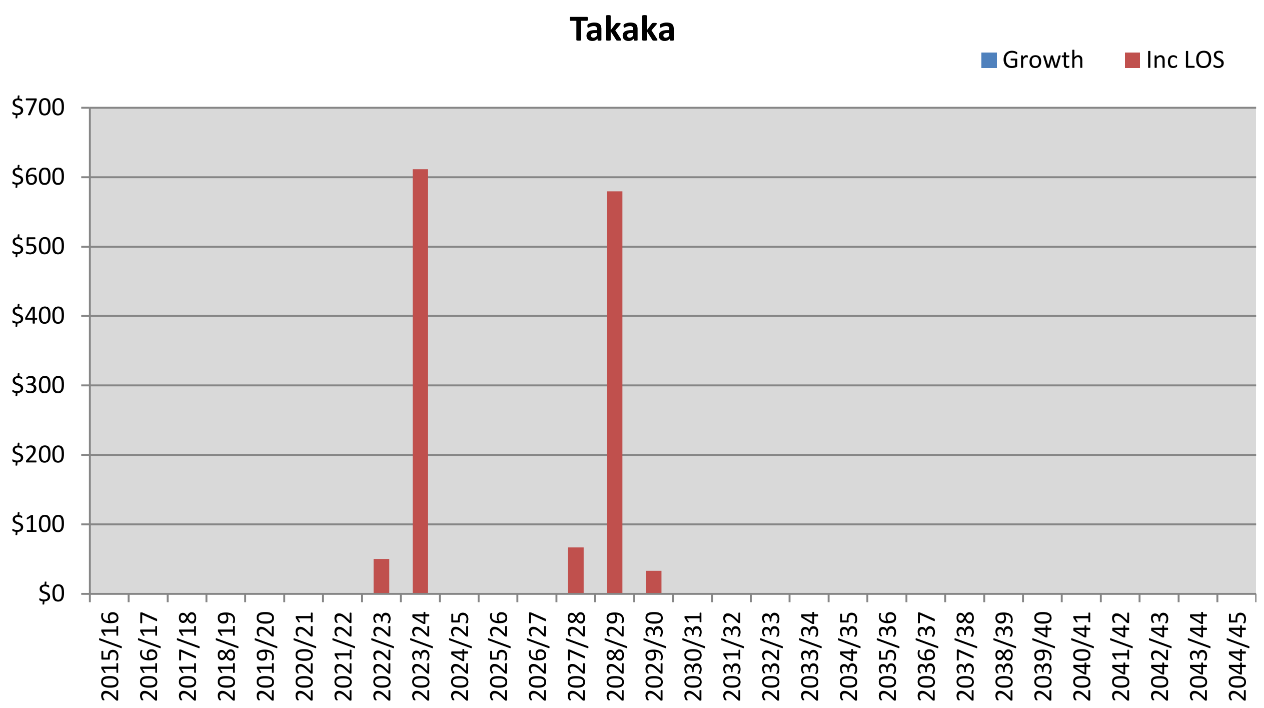
- Totara Street (2024/25)

Figure F-15: 2015 – 2044 Stormwater New Capital Expenditure – Tapawera



Major Capital Projects
- Eden Stream (2020-2021)

Figure F-17: 2015 – 2044 Stormwater New Capital Expenditure – Wakefield



Major Capital Projects
- Commercial Street Upgrade (2022-2024)
- Meihana Street Upgrade (2028-2030)

Figure F-18: 2015 – 2044 Stormwater New Capital Expenditure – Takaka

Table F-5: 2015-2045 New Capital Expenditure ($000)

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30
160002	Mt Heslington Diversion	Improve Railway Diversion drain plus new Mt Heslington stream diversion. Rintoul Place, Block off 1 No. 375 dia. culvert and ditch along SH to drain towards the stock yard. Link to Rivers Project 40 Brightwater Flood Protection Works and Brightwater repair160138 work	Brightwater	06046216002	14%	86%	2,236	2,236	-	-	-	-	335	1,677	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160003	Gibbs Road Diversion	New 600 pipe to intercept stormwater flows on Gibbs Road. Total length of new 600 dia pipe is 125m. Also construct gravel interception chamber at bottom of Gibbs road.	Collingwood	06216216001	19%	81%	651	651	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	651
160005	Beach outlet upgrade	improved outfall arrangements	Kaiteriteri/ Riwaka/ Marahau	06226216002	0%	50%	13	25	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160007	Aranui road culvert	Upgrade culvert capacity crossing Aranui Rd at top end of School Rd drain	Mapua / Ruby Bay	06036216001	16%	84%	107	107	-	-	-	-	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160008	Langford, other small areas	Project Scope, based on solutions proposed in Mapua Stormwater Investigations, Higgs Road report, but including pipework upgrades in James Cross Place, Langford Drive and Coutts Place	Mapua / Ruby Bay	06036216002	16%	84%	332	332	-	-	-	-	332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160009	Pinehill Heights	Connect to stormwater system at Brabant Drive /Pinehill Rd with 1050 pipe inc. culvert under Pinehill Road and pipe to connect to culvert further downstream. New 600 dia. pipe on Brabant Drive.	Mapua / Ruby Bay	06036216003	16%	84%	386	386	-	-	-	-	-	-	-	39	348	-	-	-	-	-	-	-	-	-	-	-	-
160012	Flap Gates	Refurbish flap gates	Motueka UDA	06026216001	0%	10%	36	358	-	-	1	11	-	-	-	-	-	-	-	-	1	11	-	-	-	-	-	-	12
160014	Woodland Development Areas	Network upgrade to accommodate new development and upgrade existing system from the area north of King Edward Street and connecting to the Woodland Drain	Motueka UDA	06026216003	79%	21%	2,767	2,767	-	-	-	-	-	-	-	-	-	2,767	-	-	-	-	-	-	-	-	-	-	-
160019	Neds Creek Flood Works	Improve existing stream behind the rec centre out past Fairfax Street to edge of development to Q50 capacity Potential link to TPT 110084	Murchison	06076216001	3%	97%	750	750	-	-	-	15	188	-	-	-	-	23	525	-	-	-	-	-	-	-	-	-	-
160021	Pohara Main Settlement	Upgrade culverts Boyle Street, Ellis Creek Abel Tasman Dr and upsize channels to mitigate flood impact and repair flood damage 2011-2014	Pohara	06316216001	10%	90%	900	900	900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160025	Lower Borcks Creek Catchment Works - SH6 to outlet including land	Borcks Creek catchment Works	Richmond	06146216003	63%	37%	13,836	13,836	1,000	1,000	1,000	-	1,000	-	2,000	-	2,000	-	2,000	-	-	2,000	-	-	1,836	-	-	-	-
160029	Henley School	Stormwater pipe to Reservoir Creek	Richmond	06146216007	11%	89%	220	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	-	-	-
160030	Hill Street	New stormwater system from Kingsley Place to Hill Street and along to Angelis Avenue.	Richmond	06146216008	14%	86%	1,349	1,349	-	-	-	-	-	135	1,214	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160032	Middlebank Drive	Installation of stormwater pipe from Gladstone Road to Olympus Drive to Middlebank Drive.	Richmond	06146216010	14%	86%	4,037	4,037	-	-	1,200	1,900	937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160033	Oxford Street CBD	Partial Upgrade Option Linked to TPT #110093 and WW #140034 and WS#150126	Richmond	06146216011	11%	89%	2,755	2,755	-	-	-	-	-	-	-	2,755	-	-	-	-	-	-	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30
160034	Park Drive	Increase capacity through Ridings Grove. Duplicate line in walkway reserve and upgrade Hill Street crossing to Q50. Do in two parts: Hill St culverts, then Riding Grove pipe.	Richmond	06146216012	14%	86%	1,062	1,062	106	956	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160035	Poutama Drain Link	New box culvert to divert stormwater from Waverly/Gladstone to Poutama.	Richmond	06146216013	14%	86%	1,900	1,900	-	-	100	1,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160036	Queen Street	Intercept flows upstream of Salisbury Rd and provide additional hydraulic capacity, by replacing existing 900 dia. pipe with twin 1050 dia. pipe (over 520m) and single 900 dia. pipe over 360m. Link to TPT #110077, WW#140035, WS#150129	Richmond	06146216014	14%	86%	2,214	2,214	100	2,114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160038	Richmond South - Reed Andrews	Reed Andrews Drain Widening	Richmond	06146216016	11%	89%	1,363	1,363	-	-	-	-	-	-	-	-	-	-	1,295	68	-	-	-	-	-	-	-	-	-
160039	Richmond South - Bateup Drain	Bateup Drain Widening	Richmond	06146216017	11%	89%	766	766	-	-	-	-	-	-	-	-	-	-	-	-	77	651	38	-	-	-	-	-	-
160040	Richmond South - Eastern Hills	Eastern Hills Drain Widening	Richmond	06146216018	11%	89%	162	162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	138	8	-	-	-	-
160041	Richmond South - Hart Drain	Hart Drain Widening	Richmond	06146216019	14%	86%	357	357	-	-	-	-	-	-	-	-	-	-	-	-	-	36	304	18	-	-	-	-	-
160043	Surrey Road (Blair Tce Drain)	Pipe 150m of open drain with 475mm plastic ribbed land drainage culvert and manage flows at bottom	Richmond	06146216021	14%	86%	107	107	-	-	-	-	-	-	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160046	Waitapu Road	New stormwater pipes	Takaka	06066216001	0%	100%	161	161	-	-	-	-	-	-	-	-	161	-	-	-	-	-	-	-	-	-	-	-	-
160047	Meihana Street Upgrade	New stormwater pipes	Takaka	06066216002	0%	100%	667	667	-	-	-	-	-	-	-	-	-	-	-	-	67	567	33	-	-	-	-	-	-
160048	Commercial Street Upgrade	New stormwater pipes from Reilly Street to Te Kaukau stream at Rose Road	Takaka	06066216003	0%	100%	500	500	-	-	-	-	-	-	-	50	450	-	-	-	-	-	-	-	-	-	-	-	-
160049	Totra Street	50m of 750 id culvert to replace 550 id culvert from Totara Street + new headwall	Tapawera	06286216001	15%	85%	256	256	-	-	-	-	-	-	-	-	-	256	-	-	-	-	-	-	-	-	-	-	-
160051	Eden Stream	Increasing size of existing channel, new direct connection to Wai-iti. capacity through 7 No. culvert crossings, Construction of 160m of channel, Construction of new box culvert to cross under SH 6	Wakefield	06056216001	17%	83%	200	200	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160053	Whitby Rd and Arrow Street corner	install soakage capacity in berms to reduce ponding, overflow to existing system	Wakefield	0605621610	17%	83%	25	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160066	Crusader Drive	Drainage improvements from Crusader Dr to Stafford Dr (SP2)	Mapua / Ruby Bay	06036216007	16%	84%	224	224	-	-	-	-	22	202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160067	Pah/Atkins Street Upgrade	Increase capacity	Motueka UDA	06026216008	0%	15%	29	195	-	-	-	3	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160068	Parker Street Upgrade	Increase culvert capacity	Motueka UDA	06026216009	0%	15%	29	195	-	-	-	-	-	-	-	3	26	-	-	-	-	-	-	-	-	-	-	-	-
160069	Stafford Drive	road drainage at 70 Stafford	Mapua / Ruby Bay	06036216008	16%	84%	163	163	-	-	-	-	16	146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160070	Pipe Renewals	Fairfax Street (Valuations 2009) link to TPT 110084	Murchison	0607621606	0%	43%	86	200	-	-	-	-	9	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160073	Queen St Salisbury Road Intersection improvements	Link to TPT 110096, WS#150131	Richmond	06146216028	14%	86%	432	432	-	432	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30
160074	Three Brothers Corner	New 750 dia pipe through Norman Andrews Place and continuing under SH6 to Collins St (Link to come after Borck Ck projects SW # 160028)	Richmond	06146216029	63%	37%	711	711	-	-	-	-	-	-	-	-	-	-	71	640	-	-	-	-	-	-	-	-	-
160075	Update hydraulic models	Update existing hydraulic model Richmond from 1D to 2D with growth	Richmond	06002203017	0%	100%	125	125	-	-	-	-	-	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	50
160076	Salisbury Rd Upgrade	Extend to William St. Link to TPT #110095, WS#150246	Richmond	06146216030	14%	86%	640	640	-	-	-	-	-	128	512	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160077	Ranzau Rd/ Paton Rd/White Rd	Upgrade to White Rd and Ranzau Rd at Paton Rd intersection.	Richmond	06146216031	63%	37%	841	841	841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160080	Quality Improvements	Quality improvements as identified in the CMP	Richmond	06146216034	14%	86%	475	475	-	50	50	50	25	-	25	-	25	-	25	-	25	-	25	-	25	-	25	-	125
160082	Pitfure Rd	Replace existing stormwater pipe from SH6 and Pitfure Rd intersection out to an open drain into Pitfure Ck.	Wakefield	06056216005	0%	33%	3	8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160083	Seaton Valley Stream - Stage 2	Stream widening at Clinton-Baker.	Mapua / Ruby Bay	06036216009	16%	84%	378	378	-	-	-	19	38	321	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160088	Seaton Valley Stream - Stage 1	Stream widening at Senior and Evans	Mapua / Ruby Bay	06036216010	16%	84%	8	8	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160091	Te Kakau Stream	Realign outlets into Te Kakau Stream	Takaka	06066216004	0%	100%	13	13	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-
160127	Comprehensive discharge consent for UDA	Discharge consent	Motueka UDA	06026216010	0%	100%	10	10	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160136	Bank enhancement project	building up 30m of embankment to stop town flooding - from flood modelling study	Wakefield	0605621603	17%	83%	30	30	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160137	Lodestone Road Upgrade	Upgrade to avoid repeat of 2011 and 2013 flooding	Richmond	06146216043	0%	50%	30	60	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160138	Brightwater Flooding repairs	Restoration due to 2011 & 2013 flood events - Bryants road - linked to Heslington Drain 160002 work	Brightwater	0604621605	0%	100%	300	300	-	-	-	-	30	255	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160139	Ligar Flooding repairs	Restoration due to flood events: - 45 Nyhane Ligar Bay Boundary Swale	Ligar Bay	0624621606	0%	100%	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160141	Reservoir Creek repairs	Rip rap enhancement 35m just above Salisbury Rd & other minor repairs	Richmond	06146216038	14%	86%	75	75	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160142	Motueka drainage improvements	Poole, Jocelyn, Wilki, Fry pipe extension to drain low points	Motueka UDA	0602621610	10%	90%	450	450	-	-	45	383	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160146	Outlets Beach Road Drain	Outlet upgrades	Collingwood	0621621601	0%	100%	20	20	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160168	Growth Allowance for pipelines	Reactive optimisation allowance to increase pipelines due to growth.	Asset Management	0601621627	100%	0%	1,275	1,275	-	85	-	85	-	85	-	85	-	85	-	85	-	85	-	85	-	85	-	85	425
160169	Beach Road Drain	Bridge replacement and safety barriers	Richmond	0601621631	14%	86%	700	700	-	-	-	-	630	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160170	Urban Flood Modelling	Reactive modelling of urban areas to support consent processes or other non-CMP uses	Asset Management	0601621629	0%	100%	300	300	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	100
160171	Hart Detention Pond	Contribution to cost to cater for future subdivision	Richmond	0601621628	95%	5%	95	95	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160172	Quality Improvement Programme	Quality improvements as identified in the CMPs except Richmond	Asset Management	0601621630	0%	100%	750	750	-	-	-	50	50	50	50	50	50	50	50	50	50	50	-	25	-	25	-	25	125
160175	Occupational health & Safety Works	OHS Capital Initiatives	Asset Management	0600621632	12%	88%	135	135	15	15	15	15	15	15	15	15	15	-	-	-	-	-	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30
160220	UDA Discharge Consent	District Wide UDA Consent	Asset Management	0601621632	0%	100%	240	240	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
160221	Secondary Flow Initiatives	District Wide	Asset Management	0601621633	14%	86%	4,200	4,200	50	100	150	200	200	200	200	200	200	200	250	250	250	250	250	250	250	250	250	250	-
160223	Deviation Bund Drainage	Bird St and Arbor-Lea	Richmond	0601621634	14%	86%	900	900	-	-	900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160224	Washborn Drive secondary flow path	box culvert under road to address lack of SFP	Richmond	0601621635	14%	86%	725	725	-	725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160225	Bill Wilkes	change outlet structure	Richmond	0601621636	14%	86%	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160226	Lord Rutherford	improve drainage capacity across Lord Rutherford and alongside Robertson	Brightwater	0604621615	14%	86%	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160227	Beach outlet upgrade	Reduce potential for sand blockage	Kaiteriteri/ Riwaka/ Marahau	0622621605	8%	92%	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS						54,807	91,918	3,571	5,497	3,621	4,560	3,992	3,576	4,377	3,211	3,291	3,395	4,231	1,108	484	3,678	681	531	2,134	595	290	375	1,608

APPENDIX G DEVELOPMENT CONTRIBUTIONS / FINANCIAL CONTRIBUTIONS

Tasman District Council's full Development Contribution Policy (The Policy) can be found on our website at www. http://www.tasman.govt.nz/policy/policies/development-contributions-policy.

The Policy was adopted in conjunction with the Council's Long Term Plan (LTP) and will come into effect on 1 July 2015.

The Policy sets out the development contributions payable by developers, how and when they are to be calculated and paid, and a summary of the methodology and rationale used in calculating the level of contributions.

The key purpose of the Development Contribution Policy is to ensure that growth, and the cost of infrastructure to meet that growth, is funded by those who cause the need for and the benefit from the new or additional infrastructure, or infrastructure of increased capacity.

There is one Stormwater Development Contribution in place (as shown in Table G-1below)

Table G-1: Current Development Contributions

Activity	Growth costs to be recovered (in GST)	Recoverable growth	Development Contribution per HUD $ (incl GST)*
Water	$7,627,839	1,514	$5,039
Wastewater	$17,062,205	1,699	$10,041
Transportation	$2,025,024	2,412	$840
Stormwater	$15,766,878	1,702	$9,264
TOTAL	$42,481,945		$25,184

HUD = Household Unit of Demand

* The value of the Development Contribution shall be adjusted on 1 July each calendar year using the annual change in the Construction Cost Index.

A forecast of the income from the Stormwater Development Contributions expected over the 10 year period of the Long Term Plan has been prepared by Council's Corporate Service based on the forecast residential and business growth projections of the Growth Demand and Supply Model (GDSM – refer Appendix F). The forecast income is included as a line item in the Cost of Service Statement included in Appendix L.

APPENDIX H RESOURCE CONSENTS

H.1 Introduction

The statutory framework defining what activities require resource consent is the Resource Management Act (RMA) 1991. The RMA is administered locally by Tasman District Council, a unitary authority, through the Tasman Resource Management Plan (TRMP).

An important aspect of the stormwater activity is to ensure that the district's natural waterways and water resources are managed responsibly.

Stormwater drainage systems have a significant role in the environment. Open channel stormwater systems can provide a buffer between the urban and rural environments and high value receiving waters such as rivers, estuaries, wetlands, lakes and coastal waters. In themselves they are potentially an important environmental asset providing habitats for native plants, birds and aquatic life. Conversely all stormwater discharges, whether open channels or reticulated systems, introduce a significant risk of quickly conveying contaminants into highly valued environments. Cumulative adverse effects of the build-up of contaminants from urban stormwater (eg, heavy metals) are important environmental considerations.

Stormwater quality is an issue that is attracting national interest and the National Policy Statement on freshwater management has introduced new baseline expectations. Progressive improvement in stormwater quality from urban discharges is expected to be achieved by a works programme that is directed by the catchment management plan investigations.

Presently, the driver for action is the need to demonstrate compliance with the TRMP and, in particular, Part VI of that Plan: Discharges, Chapter 36. In terms of those plan provisions, most discharges from Council managed stormwater systems in Tasman are considered to be 'Permitted Activities' and therefore there are few discharge permits required for the stormwater activity. However, to be a Permitted Activity, a stormwater discharge has to comply with various conditions, one being that "…. the discharge does not cause or contribute to the destruction of any habitat, plant or animal in any water body or coastal water".

In order to formulate an approach to the district's stormwater quality, the Council intends to investigate current national practices and standards in stormwater quality management; current knowledge of Richmond stormwater quality and its impacts on the environment; and possible approaches and strategies the Council could employ to better manage stormwater quality. These projects have been programmed under the catchment management plans – refer to Appendix O for further details.

Resource consents may also be required for:

- stormwater inlet and outlet structures (including tide gates) on rivers, streams, and the coast;
- for detention and ponding areas, and flood diversion bunds within stormwater systems; and
- for modifying natural streams (such as widening stream channels to increase flood flow capacity).

Subdivision developments may involve new stormwater discharges or extensions to the existing network of stormwater assets that require resource consent that the Council will become responsible for when the new stormwater assets are transferred from the developer to the Council.

Designations are a way provided by the RMA of identifying and protecting land for future public works. The Council has designated three areas in the Richmond urban area to ensure that improvements can be made to existing stormwater systems.

H.2 Resource Consents

H.2.1. Discharges and Diversions

Most discharges and diversions associated with Council-managed stormwater systems to natural waterways or the coast were established prior to September 1998 and considered ‘permitted activities’ provided that they comply with the conditions set out in Rule 36.4.2 of the TRMP.

Any new stormwater discharges or water diversions require resource consent, unless it is in rural or open space zones.

Resource consent will be required for water diversions including bunds and the situations where natural streams have been piped as part of an urban reticulation system.

H.2.2. Inlet and Outlet Structures

Structures on or extending onto or over river or stream beds, or on a shoreline, may require resource consent. Inlet structures are usually installed where natural streams flow into piped systems. The provisions of Part IV of the Tasman Resource Management Plan: Rivers and Lakes, determine what resource consents are required for structures in river and stream beds. Consents for these structures are proposed to be progressively absorbed by comprehensive consent for each UDA.

H.2.3. Detention Dams and Ponding Areas

Detention dams and ponding areas can be used to manage peak flood flows within specific stormwater catchments, especially where urban development increases the rate of run-off. The Council now has responsibility for multiple detention dams and ponding areas within urban localities around the district. These are detailed in Appendix B and where consents are held they are listed in Table H-1. The number of detention structures will increase as new development areas are established. The catchment management plans will seek to optimise the provision of these structures to minimise risk and lifecycle cost.

H.2.4. Channel Widening and Other Works in Waterways

Capital works to modify stream beds usually require resource consent. However, maintenance work is generally covered under River Protection and Maintenance Works Resource Consent (NN010109 – currently in the process of being renewed) under the jurisdiction of the Rivers activity.

H.2.5. Schedule of Resource Consents

A detailed register of stormwater resource consents is listed in Table H-1 below. It should be noted that the list is accurate at the time of compilation (December 2014) and is subject to change.

Where permits for discharges, water takes or coastal activities, or consents for river beds are required, the RMA restricts those consents to a maximum term of 35 years only. Hence there needs to be an ongoing programme of “consent renewals” for those components of the Council’s stormwater activities, as well as a monitoring programme for compliance with the conditions of permitted activities or resource consents. Consent renewals have been programmed in the Capital Works budgets, refer to Appendix I for further details.

H.3 Resource Consent Reporting and Monitoring

The Council aims to achieve minimum compliance with all consents and/or operating conditions. Use of the Council’s Napier Computer System (NCS) monitoring database allows the accurate programming of all actions required by the consents including renewal prior to expiry. Reporting and monitoring is achieved by:

H.3.1. Auditing

Regular inspections of key sites are completed to ensure the Council's maintenance contractor is operating in accordance with a number of key performance indicators aligned to any consent conditions or other legislative requirements. Inspections increase prior to significant rain events to ensure stormwater will not be obstructed.

H.3.2. Environmental Reporting and Monitoring

In addition to audit assessments, any non-compliance incidents are recorded, notified to the Council's Compliance Monitoring team and mitigation measures put in place to minimise any potential impacts.

H.3.3. Council's Annual Report

The extent to which the Council has been able to meet all of the conditions of each permit is reported in its Annual Report.

A summary of how the Council is performing against this Level of Service is also provided in Appendix R.

Table H-1: Schedule of Current Resource Consents Relating to the Stormwater Activity

Location	Consent No.	Consent Type	Effective Date	Expiry Date
Pinehill Stream, Ruby Bay	RM061006	Coastal – disturbance (clearance of river mouth)	15/02/2007	12/12/2041
Martin's Farm Road, Kaiteriteri	RM070349	Coastal - occupation/structure (culverts)	23/07/2007	29/06/2042
Lewis Street, Collingwood	RM090204	Land Use – watercourse (outfall structure)	26/05/2009	4/05/2044
Cornwell Place, Tata Beach	RM080228	Land Use – watercourse (inlet & outfall structure)	17/09/2008	25/08/2043
Patons Rock Road, Patons Rock	RM060706	Coastal disturbance (outfall structures)	2/10/2006	15/09/2037
Wensley Road (cemetery), Richmond	RM030012 RM030084	Discharge (from detention) Land use – dam (structure)	6/03/2003 6/03/2003	12/02/2038 12/02/2038
Jimmy Lee Creek (Bill Wilkes), Richmond	RM090901 RM090902	Water – dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Jimmy Lee Creek (Washbourn), Richmond	RM100059 RM100060	Water – dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Lodestone Road (Dellside), Richmond	RM100061 RM100062	Water – dam (detention) Land use – dam (structure)	22/03/2010 22/03/2010	31/05/2030 31/05/2030
Jimmy Lee Creek (Beach Road), Richmond	RM100662	Land use watercourse (debris screen on outfall structure)	21/10/2010	21/10/2045

Location	Consent No.	Consent Type	Effective Date	Expiry Date
Reservoir Creek (Champion Road), Richmond	RM100464 V1 RM100465 V1 RM100466 V1	Water – dam (detention) Land use – dam (structure) Land disturbance (alter dam)	22/07/2013 22/07/2013 22/07/2013	1/09/2045 1/09/2045 1/09/2045
88 Valley Stream, (Eden) Wakefield	RM110111 V1 RM110112 V1	Water – dam (detention) Land use – dam (structure)	15/07/2011 15/07/2011	31/05/2031 31/05/2031
Eden Dam on 88 Valley Stream (88 Valley Road), Wakefield	RM110112	Land use consent (use of the beds of lakes and rivers)	4/04/2011	31/05/2031
Thorp Drain, Motueka	RM030250	Discharge outfall (to water)	8/05/2003	11/04/2038
Tasman St, Collingwood	RM030923	Discharge outfall (to coast)	11/11/2003	17/10/2038
Abel Tasman Drive, Takaka	RM031345	Discharge outfall (to coast)	23/11/2009	23/11/2044
Hart Drain, Richmond	RM070889	Land use – watercourse (culvert)	29/10/2007	3/10/2042
Seaton Valley Stream, Mapua	RM080112 RM080113 RM080261 RM080262	Land use – watercourse (upgrade work) Discharge (during upgrade) Water – dam (during upgrade) Coastal - occupation/structure (culverts)	20/08/2009 20/08/2009 20/08/2009 20/08/2009	29/07/2044 29/07/2019 29/07/2044 29/07/2044
Wainui, Takaka	RM090088	Land use – watercourse (culverts)	18/03/2009	1/02/2044
Woodland Drain, Old Wharf Road, Motueka	RM090891	Discharge outfall	5/02/2010	5/02/2043
Ruby Bay	RM100690 RM100774 RM100775	Coastal disturbance – outfall Discharge outfall (to coast) Land use – outfall structure	20/02/2011 20/02/2011 20/02/2011	22/02/2046 22/02/2046 22/02/2046
Baldwin – Aporo Road, Tasman	RM110845 RM110849	Land use – disturbance (upgrade) Land use – watercourse (structure)	12/04/2012 12/04/2012	11/04/2047 11/04/2047
Aranui Road, Mapua	RM060171	Land use – watercourse (outfall)	3/05/2006	6/04/2041
Bramley Estate, Richmond	RM130749	Land use – watercourse (upgrade & structures)	6/11/2013	6/11/2048
Washbourn Gardens, Richmond	RM130558	Land use – watercourse (upgrade & structures)	19/08/2013	19/08/2048
Selwyn St, Pohara	NN020183 NN020226	Coastal – outfall structure Discharge (to coast)	19/08/2002 19/08/2002	26/07/2037 26/07/2037
Kaiteriteri	NN010208	Discharge (to coast)	28/08/2001	31/08/2035

Location	Consent No.	Consent Type	Effective Date	Expiry Date
Hill Street, Richmond	NN960404	Discharge to water (ex subdivision)	24/03/1998	30/12/2030
Otia Estates, Richmond	NN980246	Discharge to water (ex subdivision)	9/10/1998	4/09/2033
Borck Creek – Poutama Drain, Richmond	RM080291 RM130743 RM050860 RM060893 RM140690 RM140691 RM140692	Poutama Creek Designation Outline Plan – D247 (widening) Land use – watercourse (culvert) Land use – watercourse (culvert) Land use – watercourse (upgrade) Water – take (dewatering) Discharge (dewatering)	Commenced 28/11/2013 18/11/2005 23/01/2007 Granted Granted Granted	28/09/2029 N/A 26/10/2041 5/12/2041

H.4 Property Designations

The following (Table H.4) stormwater activity designations have a duration of 20 years (until 2034) for which to be 'given effect'. Once given effect, a designation remains valid for the life of the TRMP or until the requiring authority removes of alters the designation.

Alterations to some designations (eg, boundaries) and outline plans for proposed work may be required from time to time. Designations do not negate the ongoing need for regional type resource consents (eg, watercourse and discharge) required for the designated site or purpose (refer to section H.2 above).

Table H-4: Property Designations

ID	Location	Site Name/Function	Purpose of Designation
D247	Waimea Inlet to Main Road Hope and Hill Street St South, Richmond	Borck Creek and related drains (Eastern, Hills, Bateup, Whites, Reed/Andrews)	Stormwater management and associated recreation opportunities
D248	Richmond South	Bateup Drain detention ponds (2)	Stormwater detention
D249	Richmond West	Poutama Drain	Stormwater management

APPENDIX I CAPITAL REQUIREMENTS FOR FUTURE RENEWALS

I.1 Introduction

Renewal expenditure is major work that does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is new works expenditure.

I.2 Renewals Strategy

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of the assets is sufficiently high.

Renewal decisions are supported by the consultant's and maintenance contractor's annual report and programme of work based on their knowledge of the systems. In addition, the theoretical life expectancies of asset components have been used for the purpose of financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

- structural failure;
- repeated asset failure;
- excessive rate of infiltration;
- loss of hydraulic performance;
- repeated joint failure;
- ineffective and/ or uneconomic operation;
- inefficient energy consumption.

The renewal programme will be reviewed at least annually, with any deferred work re-prioritised alongside new renewal projects and a revised programme established.

Assets requiring renewals including all mechanical, electrical, and civil works were identified from the Confirm database and the Asset Valuations Report. Assets with anticipated failure year and replacement costs were discussed at the project identification workshops.

To smooth the expenditure profile the timing of some renewal projects have been grouped together in a logical manner to minimise the cost of the renewal.

I.3 Delivery of Renewals

Minor renewal projects are typically carried out by the relevant operation and maintenance contractor. Contracts for larger value renewal projects are tendered in accordance with the Procurement Strategy. Prior to the asset being renewed, the operations and maintenance contractor will inspect these assets to confirm whether renewal is actually necessary. In the event it does not need to be renewed, a recommended date of renewal is then entered back into the Confirm database. This new date will then be included in the next AMP update.

I.4 Renewal Standards

The work to be performed and materials to be used shall comply with the current Tasman District Council Engineering Standards and Policies.

I.5 Deferred Renewals

Deferred renewals is the shortfall in renewals required to maintain the service potential of the assets. This can include:

- renewal work that is scheduled but not performed when it should have been and which has been put off for a later date (this can often be due to cost and affordability reasons)
- an overall lack of investment in renewals that allows the asset to be consumed or run-down, causing increasing maintenance and replacement expenditure for future communities.

MWH New Zealand Ltd has prepared a draft renewals strategy for the Council which is summarised below. For further information refer to Tasman District Stormwater Renewals Strategy Draft Report – November 2011.

I.5.1. Assessment of Deferred Renewals

Figure I-1 shows a comparison of the amount being spent on renewals with the amount of depreciation recognised annually. If the renewals expenditure starts falling behind the accumulative depreciation then the asset are not being replaced or renewed at the rate at which they are being consumed. If this continues unchecked for too long, future communities will inherit a run-down asset, high maintenance costs and high capital costs to renew failing infrastructure.

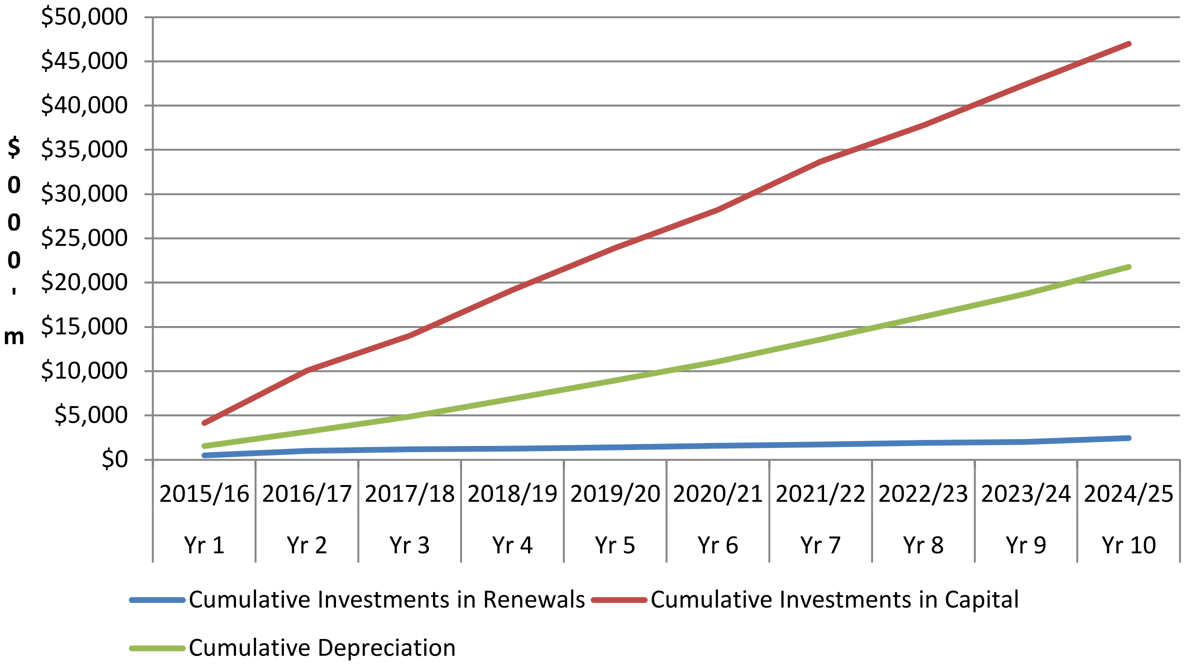


Figure I-1: Investment in Renewals

Figure I-1 shows the Council is not investing in renewals at anywhere near the level of depreciation. This would indicate that the assets are being consumed.

However, most stormwater assets are reinforced concrete with a life expectancy of 120 years. The network is also relatively new and so there is not much need for renewals. To be investing heavily in renewals now would be spending money replacing sound assets with limited real benefit. It is therefore quite appropriate for the Council to be accumulating deferred maintenance. The Council's financial policy will allow for the future expenditure.

I.5.2. Management and Mitigation of Deferred Renewals

To improve the information base for the renewals strategy and replacement programme, the Council should focus on the following improvements:

- more critically assessing remaining life of pipelines with known condition problems;
- capturing asset data to reduce the high level of "unknown" pipelines;
- using a risk based approach to identifying pipeline replacement programmes;
- improving condition knowledge of some of the "high risk" pipelines, especially to identify:
  - asset condition may be worse than expected;
  - situations where remaining life is under-estimated.

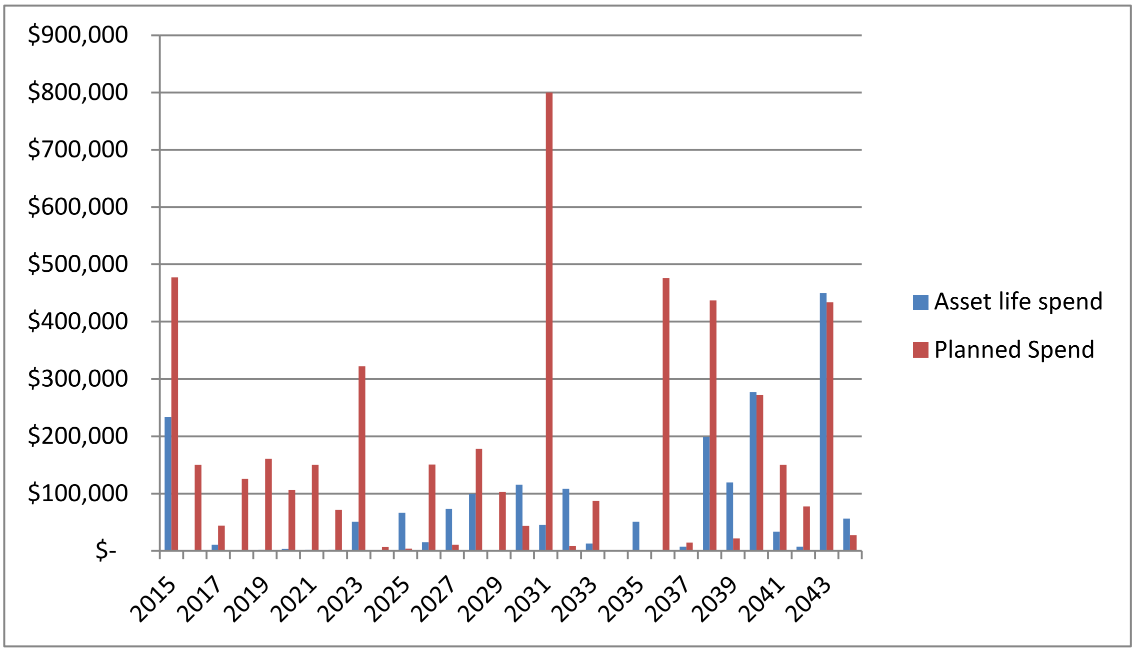


Figure I-2: 2015 – 2045 Uninflated Comparison of Annual Renewals Based on Asset Life with Planned Renewals

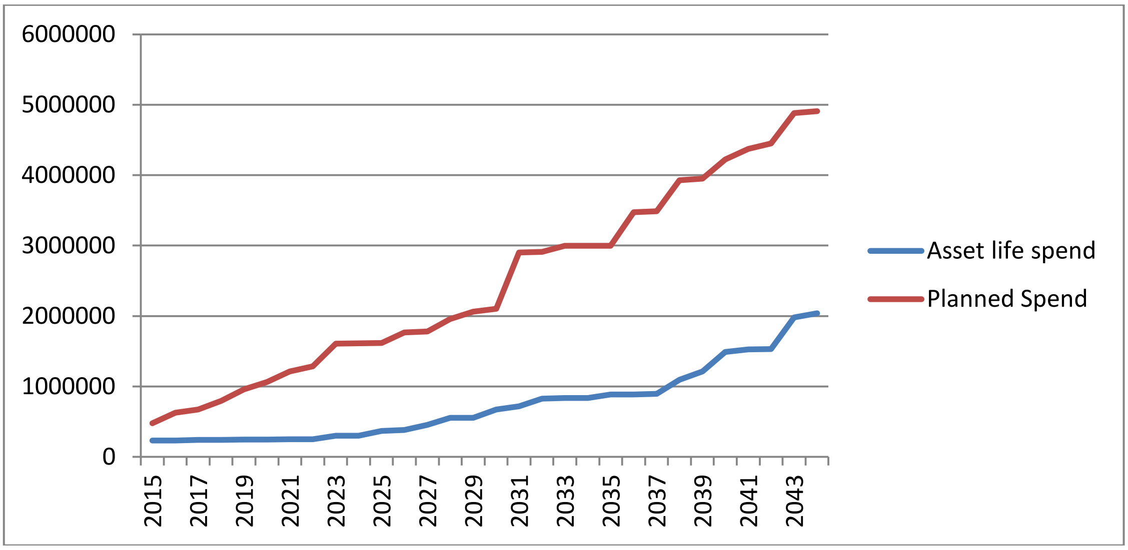


Figure I-3: 2015 - 2045 Uninflated Comparison of Renewals Based on Asset Life with Planned Renewals

This plot shows that planned renewals are significantly in excess of those predicted solely by assets life. Reasons for this discrepancy are:

- Deferred renewal spend is shown in year 1;
- Early renewal of assets due to growth or LOS improvements; and
- Failure of Confirm to record multiple assets renewals for short life assets ie electrical components thus under representing spend needed based by age.
- Error on ~$325,000 project 160017 in 2031/32 where scope of works is overstated – to be reduced to $150,000 and in year 2036/37 $326,150 to become $0.

I.6 Forecast of Renewals Expenditure

Figures I-4 and I-3 below show a summary of the expenditure forecast for renewals over the next 30 years by area whilst Table I-1 at the end of this appendix shows the full breakdown of expenditure.

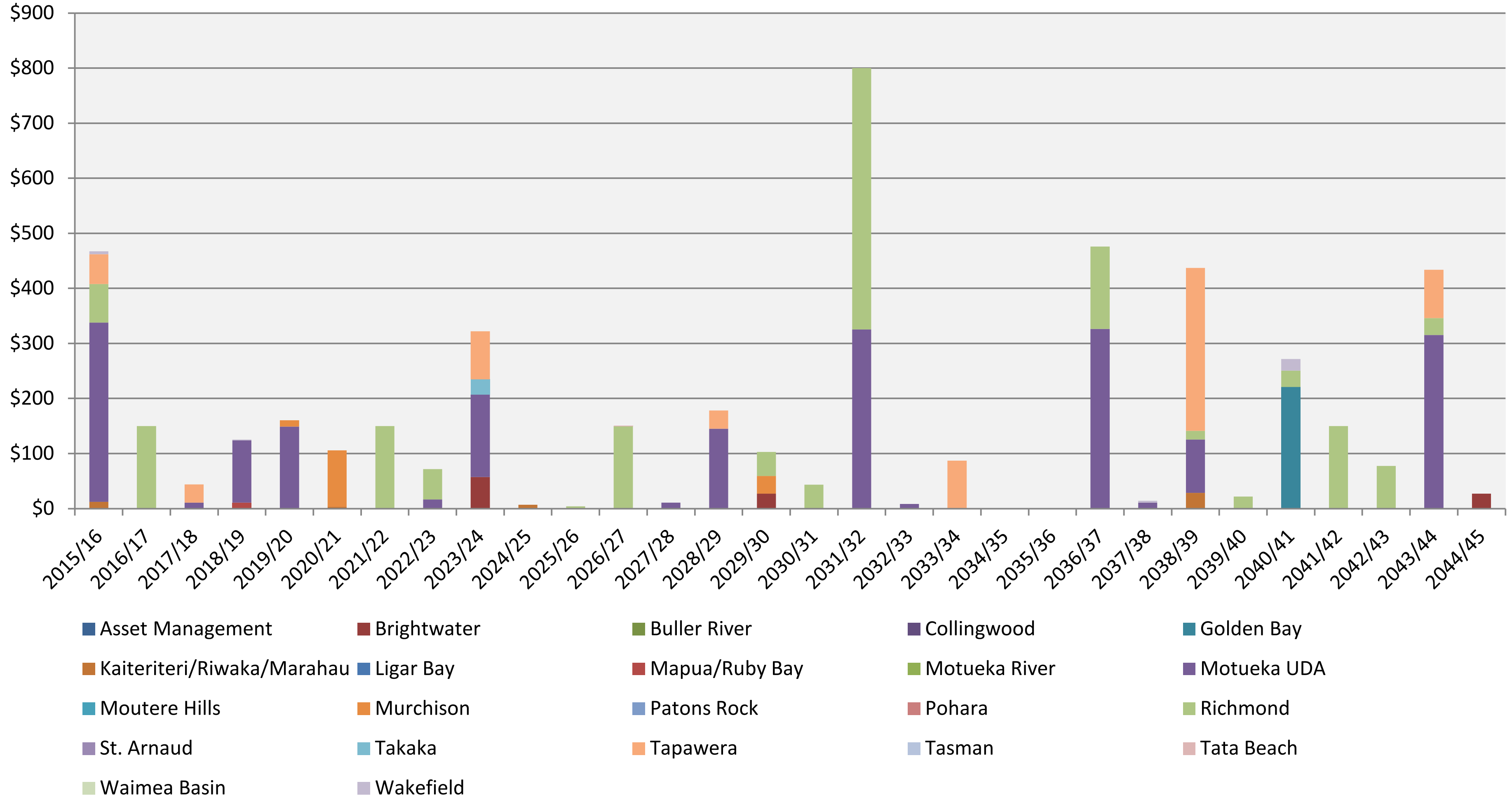
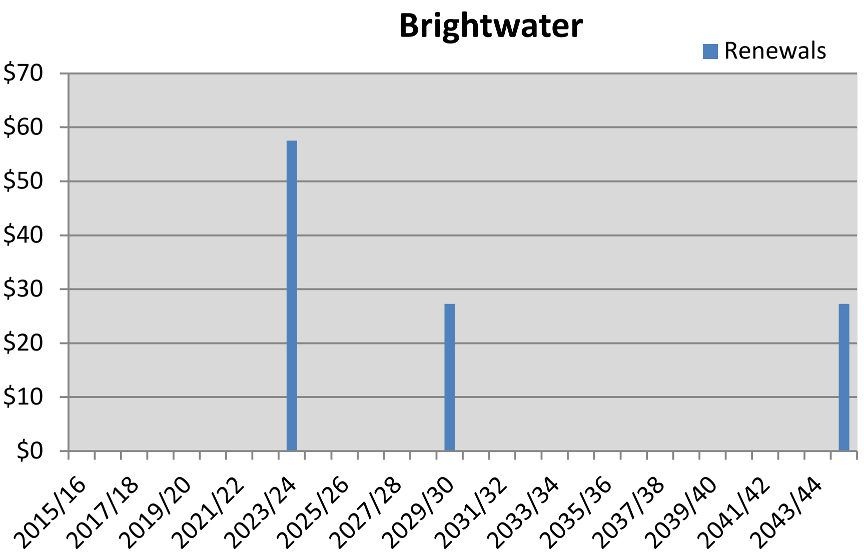
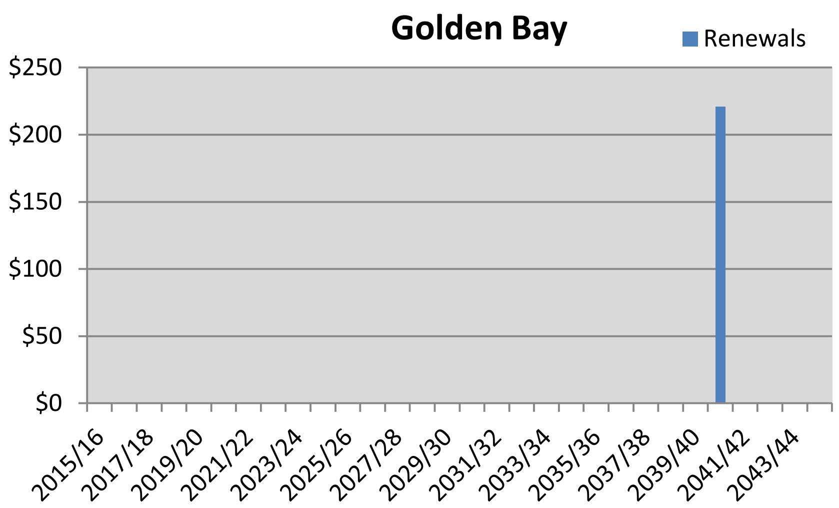


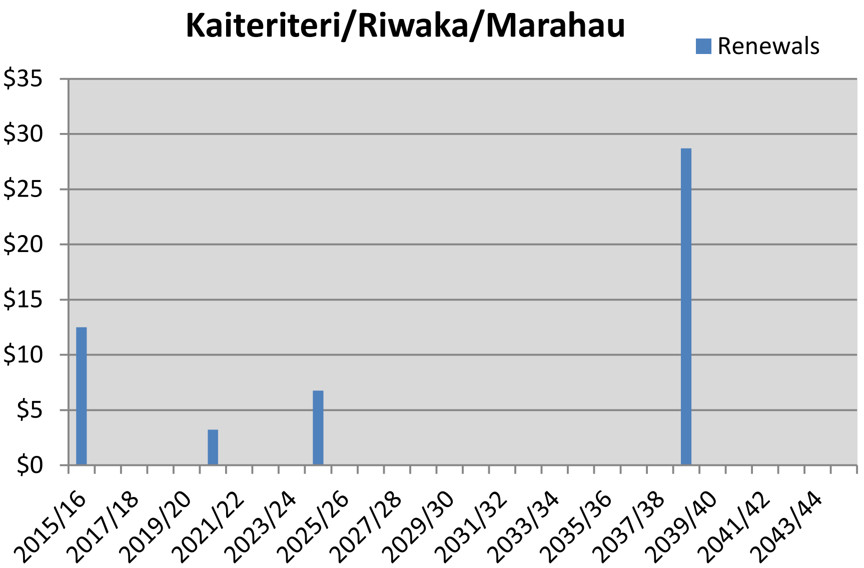
Figure I-4: 2015-2045 Stormwater Renewals Expenditure Forecast Summary



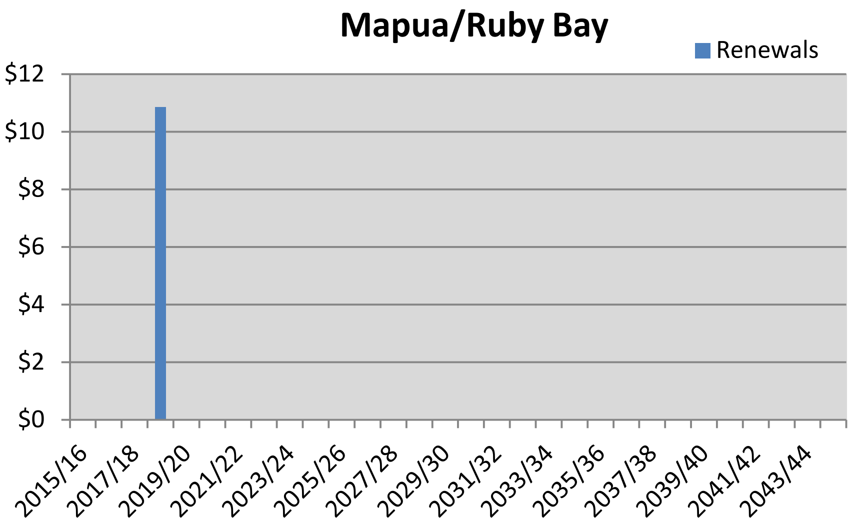
Major Projects: Nil



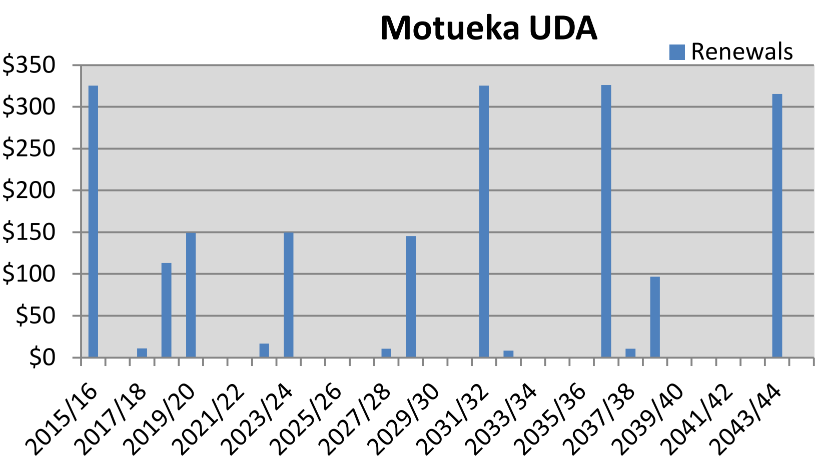
Major Projects:
-Upper Takaka pipes 2041



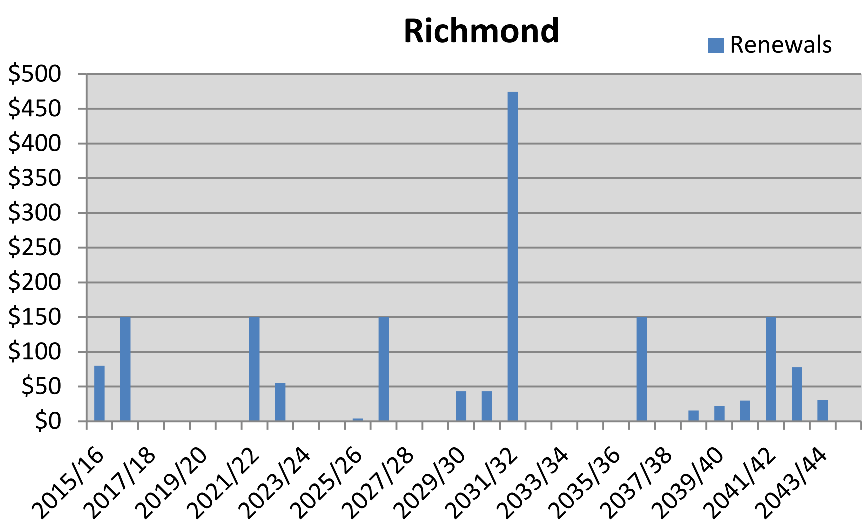
Major Projects: Nil



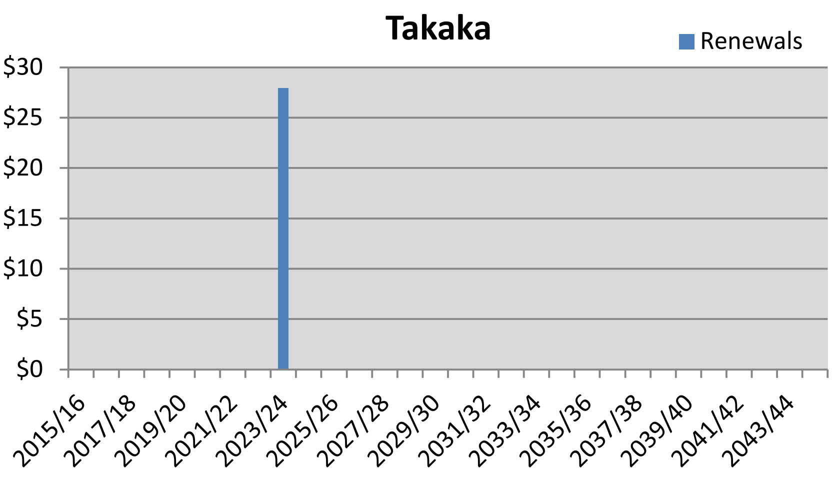
Major Projects: Nil



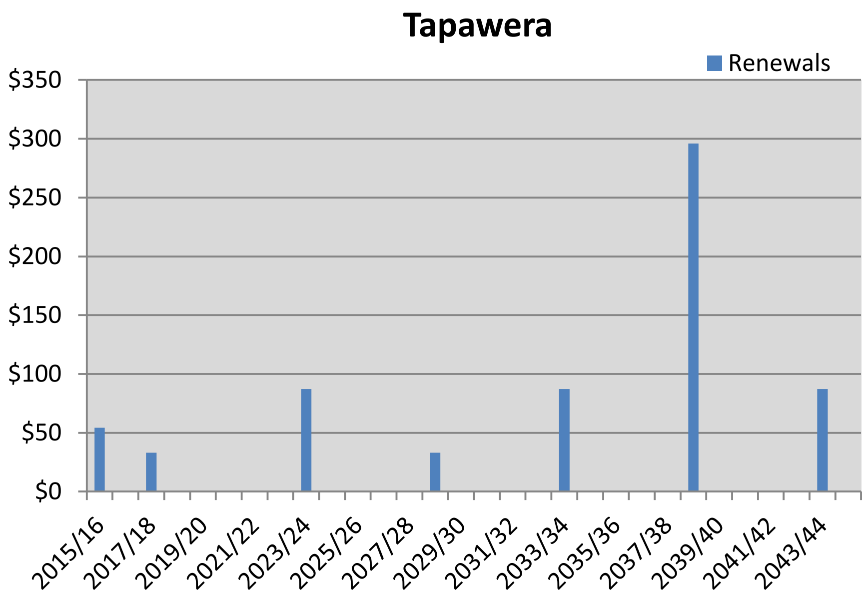
Major Projects:
- Tide Gate Renewal 2015-16, 2031-32
- Flap Gate Renewal 2028-29, 2037
- Motueka Pipes 2043-44
- Pah/Atkins 2019-20
- Parker Street 2023/24



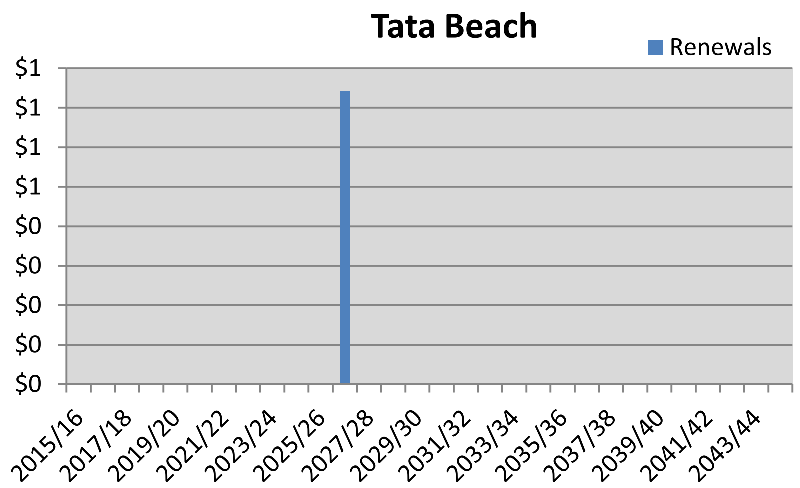
Major Projects:
- Richmond Pipes 2017-18, 2021-22, 2026-27, 2031-32, 2036-37, 2041-42
- Lodestone Park Inlet Structure 2031-32



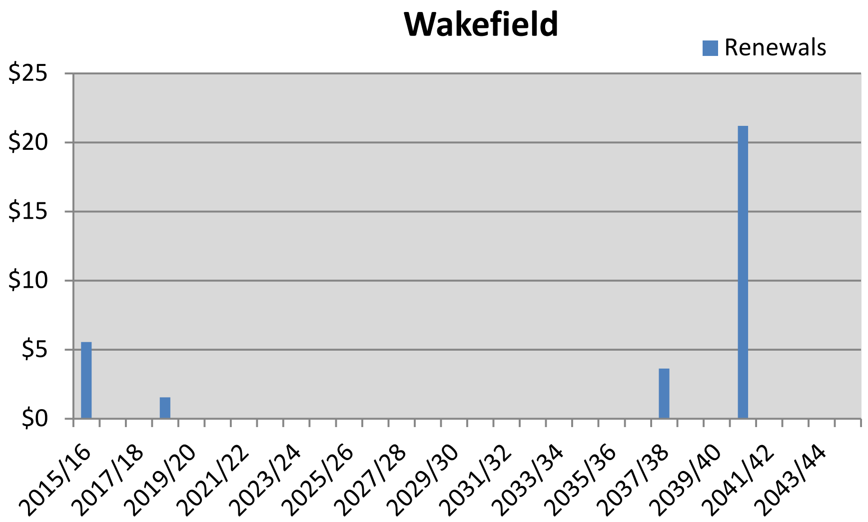
Major Projects: Nil



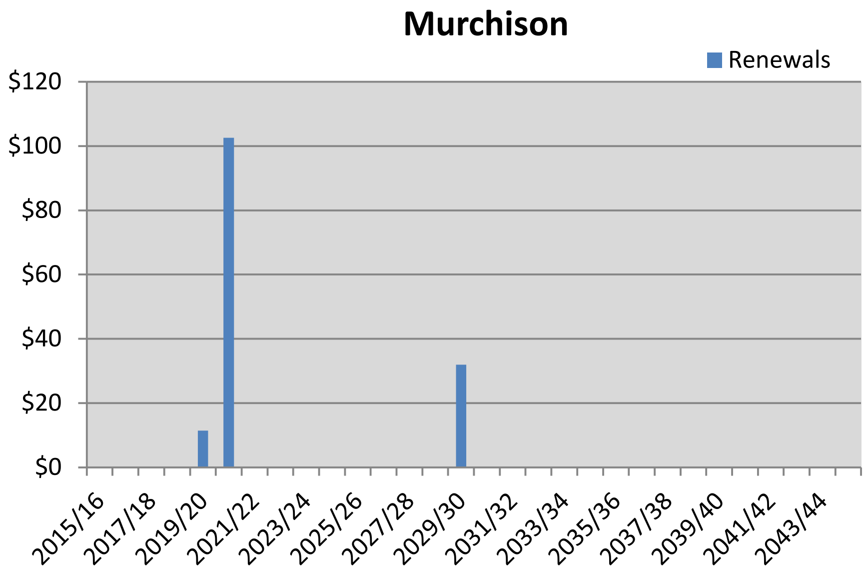
Major Projects:
-Tapawera Pipes 2039



Major Projects: Nil



Major Projects: Nil



Major Projects:
-Pipe renewals 2020-21

Figure I-5: 2015-2045 Stormwater Renewals Expenditure Forecast by Area

Table I-1: Renewal Expenditure for the Next 30 Years ($000)

ID	Project Name	Project Description	Category	GL Code	% Renewal	Renewal Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30	Beyond Year 30
160005	Beach outlet upgrade	improved outfall arrangements	Kaiteriteri/ Riwaka/ Marahau	06226216002	50%	13	25	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160012	Flap Gates	Refurbish flap gates	Motueka UDA	06026216001	90%	322	358	-	-	11	97	-	-	-	-	-	-	-	-	11	97	-	-	-	-	-	-	107	-
160017	Tidal gate renewal	Renewal of gates, hydraulics, control cabinets and telemetry at 2x Woodlands Drain Gates (Old Wharf Road at Woodlands Drain bridge) and at 1x Wharf Rd Gates (Asset Valuations 2009). Assess condition of remaining Thorp Drain Tidal Gate.	Motueka UDA	06026216006	100%	977	977	325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	325	-	-	-	326	-
160031	Lodestone Park	Replace existing inlet structure with new inlet structure for Loadstone Park temporary storage pond	Richmond	06146216009	100%	165	165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	165	-	-	-	-	-
160055	Underpass Pump station Renewals	Renewal of pump, control cabinet, telemetry (Asset Valuations 2009)	Brightwater	06046216003	100%	58	58	-	-	-	-	-	-	-	-	58	-	-	-	-	-	-	-	-	-	-	-	-	-
160062	Detention Dam Consent Renewals	Consents expire 31 May 2030 (Bill Wilkes, Washbourne, Lodestone, Eden)	Richmond	06146216025	100%	87	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	43	-	-	-	-	-	-
160064	Seaton Valley Resource Consent Renewal	Seaton Valley Drain consents expire 29 July 2019 (RM080112, RM08013, RM0800260, RM080261, RM080262, RM080113)	Mapua/Ruby Bay	06036216005	100%	11	11	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160067	Pah/Atkins Street Upgrade	Increase capacity	Motueka UDA	06026216008	85%	166	195	-	-	-	17	149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160068	Parker Street Upgrade	Increase culvert capacity	Motueka UDA	06026216009	85%	166	195	-	-	-	-	-	-	-	17	149	-	-	-	-	-	-	-	-	-	-	-	-	-
160070	Pipe Renewals	Fairfax Street (Valuations 2009) link to TPT 110084	Murchison	0607621606	57%	114	200	-	-	-	-	11	103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160078	Richmond Renewals	CCTV shows areas in McGlashen, Doran, Waverley, Salisbury. MH-MH renewal	Richmond	06146216032	100%	900	900	-	150	-	-	-	-	150	-	-	-	-	150	-	-	-	-	150	-	-	-	300	-
160082	Pitfure Rd	Replace existing stormwater pipe from SH6 and Pitfure Rd intersection out to an open drain into Pitfure Ck.	Wakefield	06056216005	67%	6	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160103	Tapawera Forestry Board Int Drain	Renew channel: clear out remove gravel, repair	Tapawera	06286216002	100%	198	198	-	-	33	-	-	-	-	-	33	-	-	-	-	33	-	-	-	-	33	-	66	-
160104	Tapawera Maitai Crescent Drain	Renew channel: clear out remove gravel, repair	Tapawera	06286216003	100%	217	217	54	-	-	-	-	-	-	-	54	-	-	-	-	-	-	-	-	-	54	-	54	-
160137	Lodestone Road Upgrade	Upgrade to avoid repeat of 2011 and 2013 flooding	Richmond	06146216043	50%	30	60	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160152	Pipe Renewals Brightwater	Pipe Renewals	Brightwater	0604621610	100%	27	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Renewal	Renewal Estimate	Total Project Estimate	Year 1 2015/ 16	Year 2 2016/ 17	Year 3 2017/ 18	Year 4 2018/ 19	Year 5 2019/ 20	Year 6 2020/ 21	Year 7 2021/ 22	Year 8 2022/ 23	Year 9 2023/ 24	Year 10 2024/ 25	Year 11 2025/ 26	Year 12 2026/ 27	Year 13 2027/ 28	Year 14 2028/ 29	Year 15 2029/ 30	Year 16 2030/ 31	Year 17 2031/ 32	Year 18 2032/ 33	Year 19 2033/ 34	Year 20 2034/ 35	Year 21 to Year 30	Beyond Year 30
160153	Surface Features Brightwater	Manholes and Sumps	Brightwater	0604621611	100%	27	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-
160154	Pipe Renewals Kaiteriteri	Stephens Bay Road pipe 71m, Sandy Bay Road	Kaiteriteri/ Riwaka/ Marahau	06226216010	100%	32	32	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	-
160155	Marahau renewals	Marahua Crescent	Kaiteriteri/ Riwaka/ Marahau	06226216011	100%	7	7	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
160156	Motueka Manholes	Renewals	Motueka UDA	0602621612	100%	61	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	-
160157	Motueka Pipes	Renewals	Motueka UDA	0602621613	100%	311	311	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	8	-	-	254	-
160158	Murchison Pipes	Renewals	Murchison	0602621614	100%	32	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	-	-	-	-	-	-	-
160159	Richmond Manholes	Renewals	Richmond	06146216040	100%	137	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	123	-
160160	Richmond Flapgate	Renewal - lower Queen Street	Richmond	06146216041	100%	55	55	-	-	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160161	Richmond Pipes	Renewals	Richmond	06146216042	100%	243	243	40	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	146	-	-	-	53	-
160162	Wakefield Manholes	Renewals	Wakefield	0605621605	100%	5	5	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
160163	Wakefield pipes	Renewals	Wakefield	0605621606	100%	21	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-
160164	Tapawera Pipes	Renewals	Tapawera	06286216005	100%	263	263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	263	-
160165	Tata Beach Pipes	Renewals	Tata Beach	0626621601	100%	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
160166	Upper Takaka Pipes	Renewals	Golden Bay	0632621601	100%	221	221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	-
160167	Takaka pipes	Renewals Waitapu Road	Takaka	0606621603	100%	28	28	-	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS					4,899	91,918	467	150	44	126	161	106	150	72	322	7	4	151	11	178	103	43	800	8	87	-	1,910	-

APPENDIX J DEPRECIATION AND DECLINE IN SERVICE POTENTIAL

J.1 Depreciation of Infrastructural Assets

Depreciation is provided on a straight line basis on all infrastructural assets at rates which will write off the cost (or valuation) of the assets to their estimated residual values, over their useful lives.

The remaining useful lives and associated rates for the stormwater infrastructure have been estimated as detailed in Appendix D – Asset Valuations.

The following stormwater asset components have not been depreciated:

- stormwater channels (open drains);
- detention Dams earthworks;
- erosion control.

J.2 Decline in Service Potential

The decline in service potential is a decline in the future economic benefits (service potential) embodied in an asset.

It is the Council's policy to operate the stormwater activity to meet a desired level of service. The Council will monitor and assess the state of the stormwater infrastructure and upgrade or replace components over time to counter the decline in service potential at the optimum times.

J.3 Council's Borrowing Policy

The Council's borrowing policy was that it only funds capital and renewal expenditure through borrowing, normally for 20 years, but shorter terms are used for some assets depending on how long they are expected to last before they need to be replaced.

The Council has now made a decision to start phasing in the funding of depreciation; effectively this will create a reserve to fund the replacement of assets. This method means that debt will not be raised to fund asset replacement. This is being phased in over ten years and is more fully explained in the Financial Strategy which is part of supporting information associated with the 2015 LTP.

APPENDIX K PUBLIC DEBT AND LOAN SERVICING COSTS

K.1 General Policy

The Council borrows as it considers prudent and appropriate and exercises its flexible and diversified funding powers pursuant to the Local Government Act 2002. The Council approves, by resolution, the borrowing requirement for each financial year during the annual planning process. The arrangement of precise terms and conditions of borrowing is delegated to the Corporate Services Manager.

The Council has significant infrastructural assets with long economic lives yielding long term benefits. The Council also has a significant strategic investment holding. The use of debt is seen as an appropriate and efficient mechanism for promoting intergenerational equity between current and future ratepayers in relation to the Council's assets and investments. Debt in the context of this policy refers to the Council's net external public debt, which is derived from the Council's gross external public debt adjusted for reserves as recorded in the Council's general ledger.

Generally, the Council's capital expenditure projects with their long term benefits are debt funded. The Council's other district responsibilities have policy and social objectives and are generally revenue funded.

The Council raises debt for the following primary purposes:

- capital to fund development of infrastructural assets;
- short term debt to manage timing differences between cash inflows and outflows and to maintain the Council's liquidity;
- debt associated with specific projects as approved in the Annual Plan or LTP. The specific debt can also result from finance which has been packaged into a particular project.

In approving new debt, the Council considers the impact on its borrowing limits as well as the size and the economic life of the asset that is being funded and its consistency with Council's long term financial strategy.

The Borrowing Policy is found in Volume 2 of Council's Long Term Plan.

K.2 Loans

Loans to fund capital works over the next 10 years add up to the following costs detailed in Table K-1.

Table K-1: Projected Capital Works Funded by Loan for Next 10 Years

Stormwater	2015/16 Year 1 $	2016/17 Year 2 $	2017/18 Year 3 $	2018/19 Year 4 $	2019/20 Year 5 $	2020/21 Year 6 $	2021/22 Year 7 $	2022/23 Year 8 $	2023/24 Year 9 $	2024/25 Year 10 $
Loans Raised	4,140	5,955	3,964	5,171	4,685	4,241	5,388	4,003	4,553	4,503
Opening loan balance	16,505	18,117	21,183	22,166	24,144	25,566	26,276	28,041	28,234	28,900

Note: Figures do not include for inflation and are in thousands of dollars (ie. x1000)

K.2.1. Cost of Loans

The Council funds the principal and interest costs of past loans and these are added to the projected loan costs for the next 10 years as shown in Table K-2. The Council is still paying off loans raised by the previous county councils and boroughs, these are called pre-amalgamation loans ie, pre 1989. All loans raised since 1989 have been by the Tasman District Council.

Table K-2: Projected Annual Loan Repayment Costs for Next 10 Years

Water Supply	2015/16 Year 1 $	2016/17 Year 2 $	2017/18 Year 3 $	2018/19 Year 4 $	2019/20 Year 5 $	2020/21 Year 6 $	2021/22 Year 7 $	2022/23 Year 8 $	2023/24 Year 9 $	2024/25 Year 10 $
Loan Interest	1,043	1,193	1,316	1,349	1,510	1,576	1,651	1,781	1,809	1,841
Principal repaid	2,529	2,889	2,981	3,193	3,263	3,531	3,623	3,810	3,887	4,096

Note: Figures do not include for inflation and are in thousands of dollars (ie. x 1000)

APPENDIX L SUMMARY OF FUTURE OVERALL FINANCIAL REQUIREMENTS

Table L-1 presents a summary of the overall future financial requirements for the Stormwater activity in the Tasman district.

Table L-1: Summary of Projected Costs and Income for the Next 10 Years

N.B. Figures do include inflation.

Tasman District Council											
Funding Impact Statement - Stormwater											
For the Long Term Plan 2015-25											
	2014/15 Budget $000	**2015/16 Budget $000**	**2016/17 Budget $000**	**2017/18 Budget $000**	**2018/19 Budget $000**	**2019/20 Budget $000**	**2020/21 Budget $000**	**2021/22 Budget $000**	**2022/23 Budget $000**	**2023/24 Budget $000**	**2024/25 Budget $000**
SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	0	0	0	0	0	0	0	0	0	0	0
Targeted rates (other than a targeted rate for water supply)	3,299	3,866	4,425	4,749	5,198	5,663	6,073	6,617	7,035	7,265	7,776
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees, charges and targeted rates for water supply	0	0	0	0	0	0	0	0	0	0	0
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees, and other receipts	83	0	0	0	0	0	0	0	0	0	0
TOTAL OPERATING FUNDING	**3,382**	**3,866**	**4,425**	**4,749**	**5,198**	**5,663**	**6,073**	**6,617**	**7,035**	**7,265**	**7,776**
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	778	1,196	1,423	1,406	1,566	1,594	1,649	1,705	1,748	1,738	1,795
Finance costs	975	995	1,138	1,256	1,271	1,421	1,473	1,526	1,622	1,611	1,588
Internal charges and overheads applied	519	444	480	508	507	504	531	541	562	592	605
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF OPERATING FUNDING	**2,272**	**2,634**	**3,042**	**3,169**	**3,343**	**3,519**	**3,652**	**3,771**	**3,932**	**3,941**	**3,988**
SURPLUS (DEFICIT) OF OPERATING FUNDING	**1,110**	**1,232**	**1,384**	**1,580**	**1,854**	**2,144**	**2,420**	**2,846**	**3,103**	**3,323**	**3,788**

	2014/15 Budget $000	2015/16 Budget $000	2016/17 Budget $000	2017/18 Budget $000	2018/19 Budget $000	2019/20 Budget $000	2020/21 Budget $000	2021/22 Budget $000	2022/23 Budget $000	2023/24 Budget $000	2024/25 Budget $000
SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	0	0	0	0	0	0	0	0	0	0	0
Development and financial contributions	422	1,305	1,486	1,392	1,421	1,291	1,378	1,291	1,349	1,349	1,450
Increase (decrease) in debt	1,864	1,604	3,057	975	1,907	1,287	508	1,323	(363)	(15)	(691)
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF CAPITAL FUNDING	**2,285**	**2,909**	**4,543**	**2,367**	**3,328**	**2,578**	**1,886**	**2,614**	**985**	**1,334**	**759**
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	737	1,981	1,139	1,077	94	1,137	100	2,415	106	2,582	3,818
- to improve the level of service	2,449	1,702	4,609	2,811	4,923	3,351	3,980	2,852	3,877	1,613	707
- to replace existing assets	44	458	178	59	165	234	226	193	106	463	22
Increase (decrease) in reserves	165	0	0	0	0	0	0	0	0	0	0
Increase (decrease) in investments	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF CAPITAL FUNDING	**3,396**	**4,141**	**5,927**	**3,947**	**5,182**	**4,721**	**4,306**	**5,460**	**4,088**	**4,657**	**4,547**
SURPLUS (DEFICIT) OF CAPITAL FUNDING	**(1,110)**	**(1,232)**	**(1,384)**	**(1,580)**	**(1,854)**	**(2,144)**	**(2,420)**	**(2,846)**	**(3,103)**	**(3,323)**	**(3,788)**
FUNDING BALANCE	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

L.1 Total Expenditure

Figure L-1 and Figure L-2 show the total expenditure for the Stormwater activity for the first 10 and 30 years respectively.

Operating expenditure increases from $4.3 to $7.2 million over the 10 year period. This is driven by inflation.

Around $4-5m per year in capital expenditure is forecast for years 1 to 10. This is dominated by Richmond works. A spike in year 2 is associated with upgrades to protect the Richmond Town Centre and in year 7 by expenditure on Borcks Creek and other areas in Richmond.

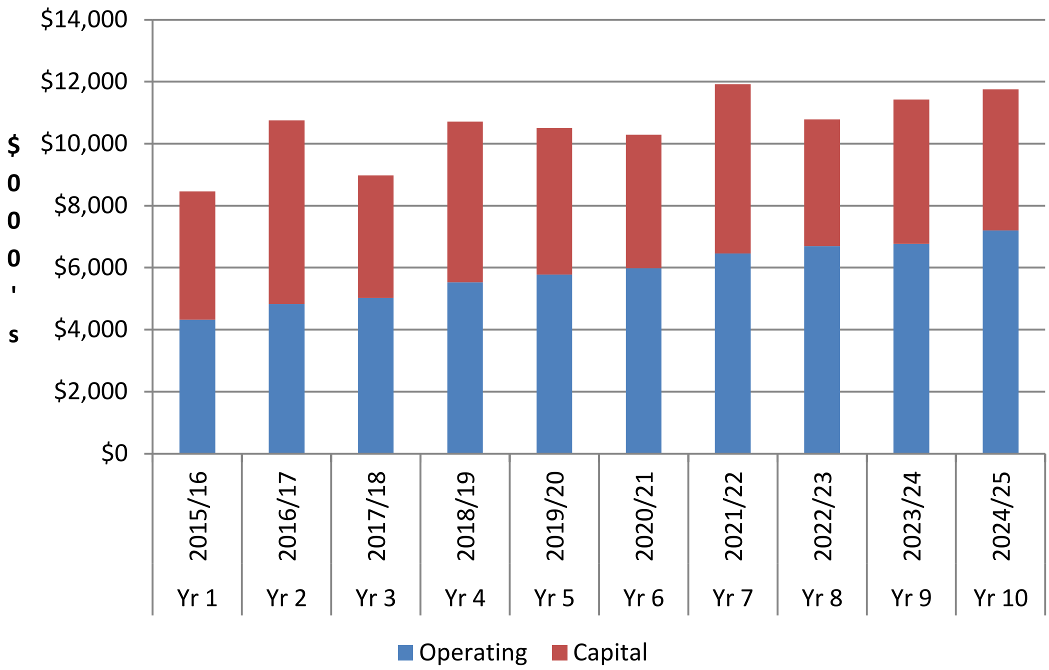
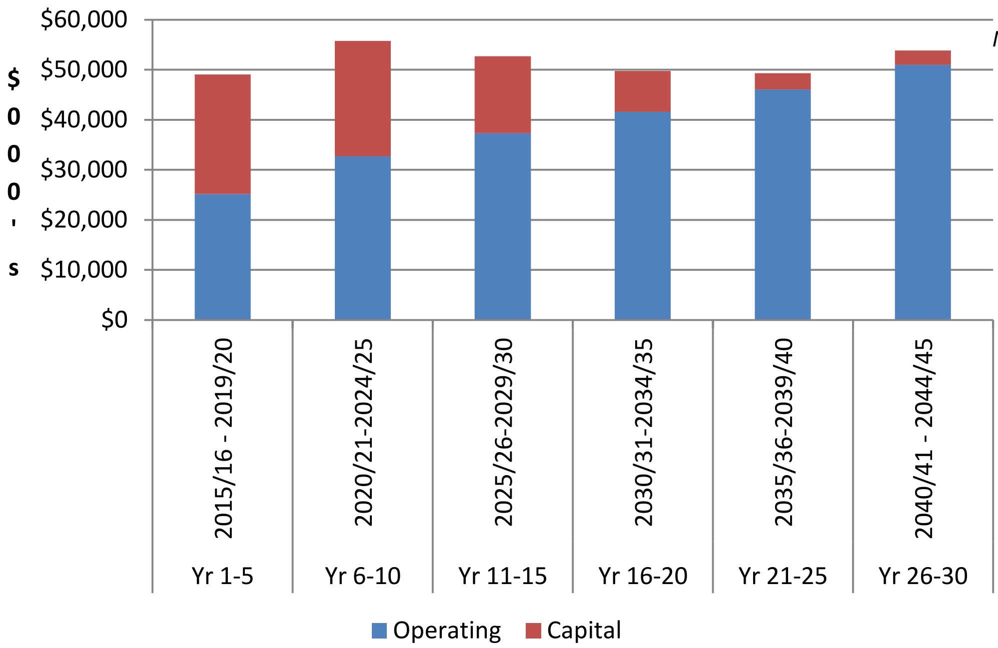


Figure L-1: Total Annual Expenditure Years 1 to 10



Note: Includes inflation

Figure L-2: Five Yearly Total Expenditure Years 1 to 30

L.2 Total Income

Figure L-3 and Figure L-4 show the total income for the Water activity for the first 10 and 30 years respectively.

Rate increases account for the majority of the increase in income and these are needed to fund the substantial works programme.

Figure L-3: Total Annual Income Years 1 to 10

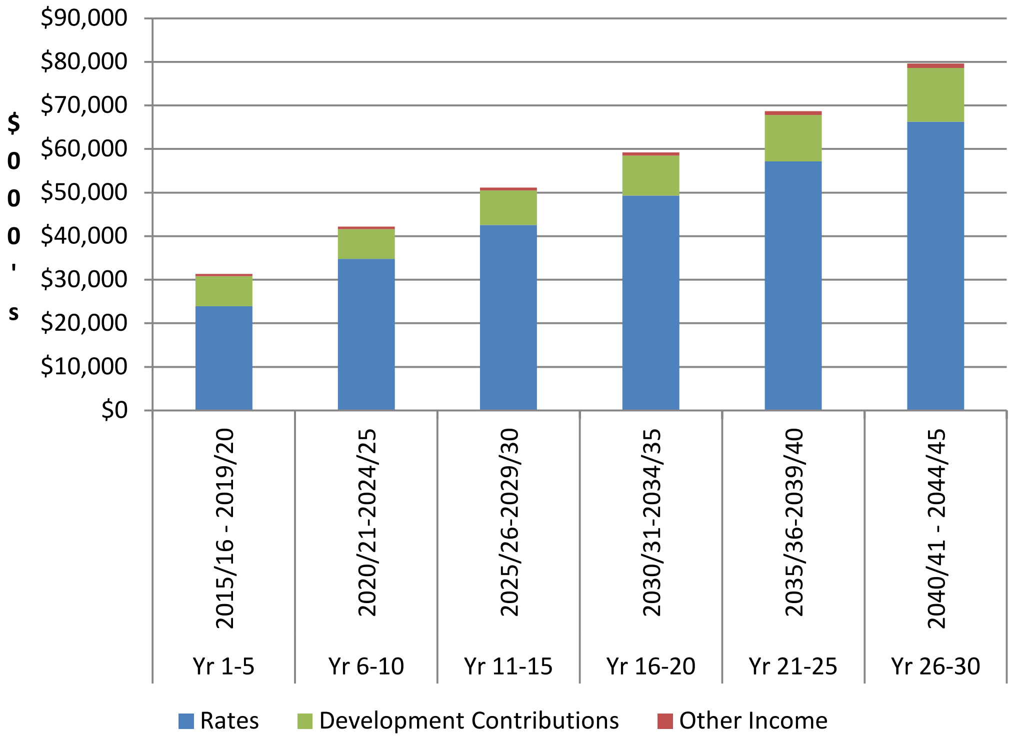


Figure L-4: Five Yearly Total Income Years 1 to 30

L.3 Operational Costs

Figure L-3 and Figure L-4 show the total operating expenditure for the Stormwater activity for the first 10 and 30 years respectively.

Operating cost rise steadily at 6% per annum on average over the next 10 years. These cost increases are largely driven by a heavy investment programme in improving stormwater assets, which pushes up depreciation and interest costs for this activity. Longer term, costs increases are more modest, at 3% per year on average.

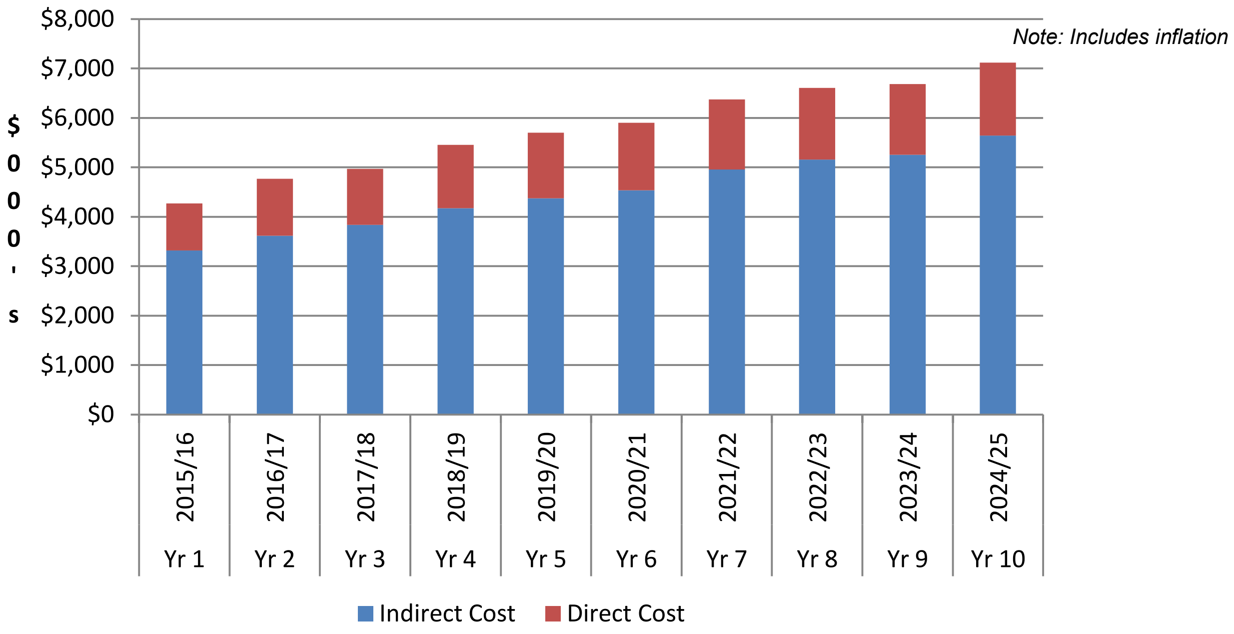


Figure L-5: Annual Operating Costs Years 1 to 10

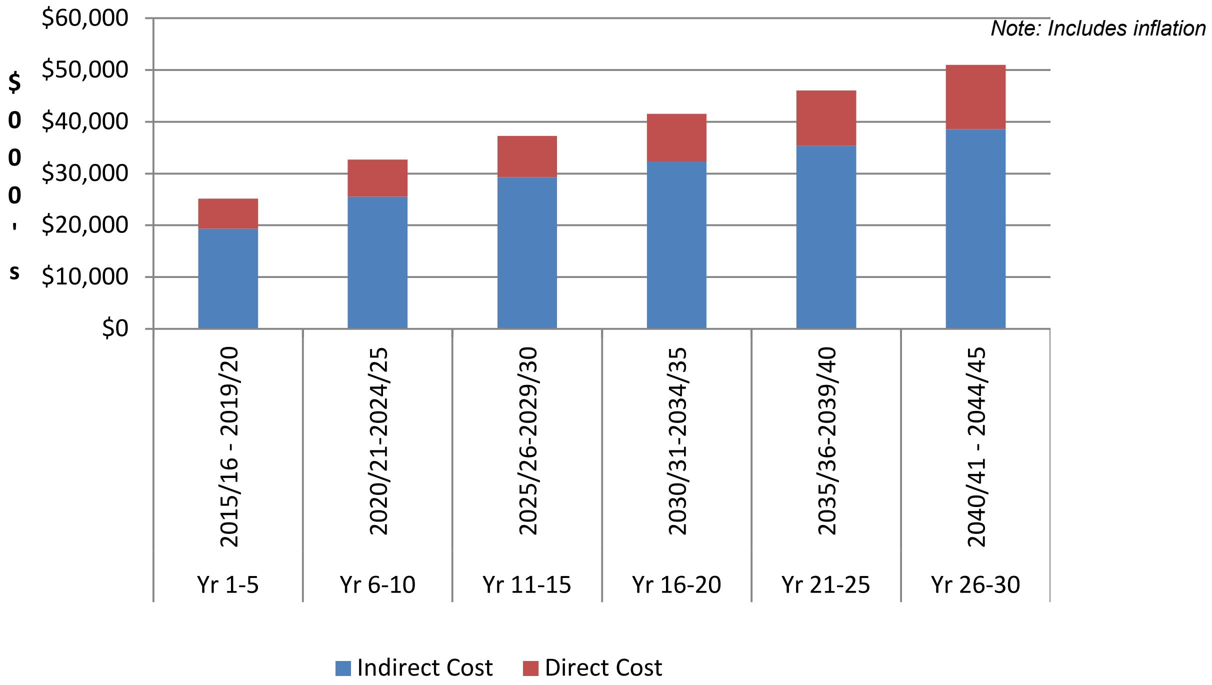


Figure L-6: Five Yearly Operating Cost Years 1 to 30

L.4 Capital Expenditure

Figure L-5 and Figure L-6 show the total capital expenditure for the Stormwater activity for the first 10 and 30 years respectively.

Capital expenditure over the next 10 years is fairly steady at between $4m – 6m per annum, totalling around $47m over this period. This expenditure is mainly in service level improvements, with improvements accounting for two thirds of total capital expenditure,

Longer term, forecast stormwater capital expenditure drops away sharply. This will change in the future as the catchment management planning process roles out across the district and improvements are identified and programmed into subsequent plans

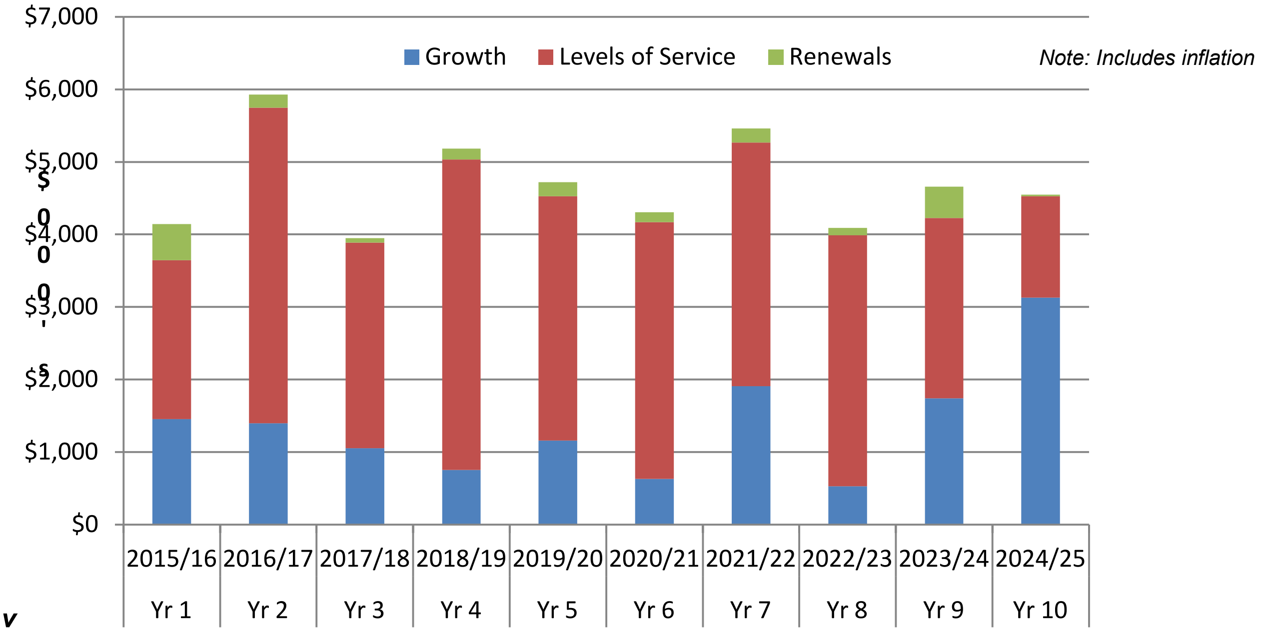


Figure L-7: Annual Capital Expenditure Years 1 to 10

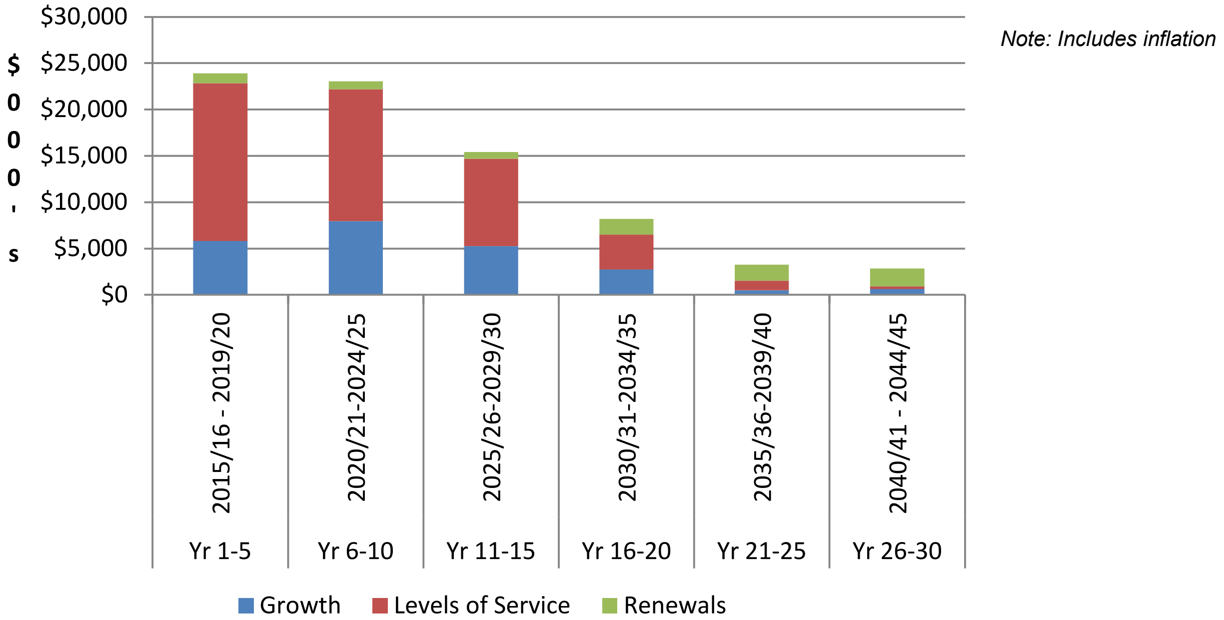


Figure L-8: Five Yearly Capital Expenditure Years 1 to 30

APPENDIX M FUNDING POLICY, FEES AND CHARGES

M.1 Funding Strategy

Stormwater expenditure is funded by:

- stormwater rates;
- loans;
- development contributions;
- sundry income (dividends etc).

The stormwater assets are funded in the main from a targeted rate called the “stormwater rate”. The stormwater services are therefore operated on a “user” or “beneficiary” pays basis and are not funded by any general rate appropriation.

The Council operates a closed group account for all Council owned urban stormwater schemes and a separate closed account for the General District Area.

Major capital projects may be loan funded. When loans are established the loan is taken out for a fixed period, usually 20-30 years, with a fixed annual principal repayment as a capital expense on the account and interest payments as an operating expense.

M.2 Schedule of Fees and Charges

The Council sets a targeted rate for the purposes of stormwater works annually for both Urban Drainage Area and the balance of the Tasman District. This rate will be based on the capital value of each rating unit.

The current version of these is available in the Funding Impact Statement.

APPENDIX N DEMAND MANAGEMENT

N.1 Introduction to Demand Management

The objective of demand management (sometimes called non-asset solutions) is to actively seek to modify customer demands for services in order to:

- optimise utilisation/performance of existing assets;
- reduce or defer the need for new assets;
- meet the Council's strategic objectives;
- deliver a more sustainable service; and
- respond to customer needs.

N.2 Council's Approach to Demand Management

There is a move within many New Zealand councils to improve the quality of stormwater discharges and to develop/ upgrade the stormwater system with sustainability issues in mind.

This has picked up momentum in recent years and is driven by the requirements embedded in the Resource Management Act 1991. Regulatory authorities have made it clear that stormwater quality improvements should be made by local councils and that the impact on discharging to the surrounding environment should be taken into consideration to determine the level of treatment required.

Many councils have started a programme of stormwater quality improvement works and it is hoped that all parties will recognise that immediate changes cannot be made, but properly planned and targeted, significant improvements can be made as part of the AMP process.

Related work is being undertaken under the banner of "Project Stormwater" which is described in Appendix A at A2.4.

N.3 Climate Change

The RMA 1991 states, in Section 7, that a local authority shall take account of the effects of climate change when developing and managing its resources. The Local Government Act 2002 also contains requirements to "to meet the current and future needs of communities for good quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses". "Good quality" means infrastructure, services, and performance that are efficient and effective and appropriate to present and anticipated future circumstances".

This appendix summarises climate change information available to Council for asset and activity planning. Key information sources include:

- Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government in NZ, MfE (2008);
- Climate Change and Variability in the Tasman District, NIWA (2008);
- Mean High Water Springs report, NIWA (2013);
- Fifth Assessment Report, IPCC (2013);
- Extreme sea-level elevations from storm-tides and waves: Tasman and Golden Bay coastlines, NIWA (2014).

N.3.1. Changing Climatic Patterns

To assist local authorities, the Ministry for the Environment (MfE) prepared a report[1] to support councils' assessing expected effects of climate change, and to help them prepare appropriate responses when necessary.

In 2008, Tasman District Council commissioned NIWA to provide local interpretation[2]. The report examined the impacts of expected climate changes for the Tasman-Nelson region.

Subsequently, the Intergovernmental Panel on Climate Change (IPCC) has produced its fifth assessment report AR5 (2013). The assessment report is a result of substantial collective international science over the past five years, and has synthesised the current physical science basis for climate change understanding. The report covers the scope and significance of expected impacts, vulnerabilities and adaptation challenges arising at an international level, and national level.

The assessment report does not fundamentally change our understanding of how global climate impacts will manifest themselves locally in Tasman, however the Council will undertake a similar exercise to that of 2008 to commission NIWA to produce a climate change and variability report specific to the Tasman district.

N.3.2. Temperature Change

Table N-1 shows that the mean annual temperatures in Tasman-Nelson are expected to increase in the future.

Table N-1: Projected Mean Temperature Change (Upper and Lower Limits) in Tasman-Nelson (in ^{0}C)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	0.2 - 2.2	0.2 - 2.3	0.2 - 2.0	0.1 - 1.18	0.2 – 2.0
Projected changes 1990-2090	0.9 – 5.6	0.6 – 5.1	0.5 – 4.9	0.3 – 4.6	0.6 – 5.0

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

It is the opinion of NIWA[3] scientists that the actual temperature increase this century is very likely to be more than the 'low' scenario given here. Under the mid-range scenario for 2090, an increase in mean temperature of 2.0°C would represent annual average temperature in coastal Tasman in 2090.

N.3.3. Rainfall Patterns

Table N-2 shows an expected increase in mean annual precipitation in Tasman-Nelson from 1990 to 2090.

Table N-2: Projected Mean Precipitation Change (Upper and Lower Limits) in Tasman-Nelson (in %)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	-14, 27	-2, 19	-4, 9	-8, 9	-3, 9
Projected changes 1990-2090	-13, 30	-4, 18	-2, 19	-20, 19	-3, 14

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

[1] Climate Change Effects and Impacts Assessment A Guidance Manual for Local Government in NZ (MfE, May 2008)
[2] Climate Change and Variability – Tasman District (NIWA, June 2008)
[3] Climate Change and Variability – Tasman District (NIWA, June 2008)

N.3.4. Heavy Rainfall

A warmer atmosphere can hold more moisture (about 8% more for every 1°C increase in temperature), so there is an obvious potential for heavier extreme rainfall under climate change. More recent climate model simulations confirm the likelihood that heavy rainfall events will become more frequent.

Table N-3 shows current rainfall depth-duration-frequency statistics for Richmond. Table N-4 shows the likely minimum equivalent rainfall statistics in 2090. Many commentators suggest that future rainfall will be more extreme than this table.

Table N-3: Current Rainfall Statistics for Richmond (in mm)

ARI (years)	Duration								
	10min	30min	1hr	2hr	6hr	12hr	24hr	48hr	72hr
2	7.5	14.4	20.7	28.3	46.5	57.2	72.8	87.4	97.9
5	1.08	19.9	28.1	37.8	61.4	74.9	95.0	114.1	128.6
10	13.6	24.2	33.8	45.0	72.3	87.7	110.7	132.7	149.6
20	16.6	28.9	39.8	52.5	83.8	100.8	126.6	151.2	170.1
30	18.6	31.9	43.7	57.2	90.8	108.7	136.1	162.2	182.1
50	21.3	36.0	48.8	63.5	100.0	119.1	148.4	176.3	197.4
100	25.6	42.0	56.4	72.6	113.3	134.0	165.7	195.8	218.4

Source: *Climate Change and Variability – Tasman District (NIWA, June 2008)*

Table N-4: Projected Rainfall Depth-Duration-Frequency Statistics for Richmond in 2090, for a mid-range temperature scenario (2.0^{0}C warming)

ARI (years)	Duration								
	10m	30m	60m	2hr	6hr	12hr	24hr	48hr	72hr
2	9	16	23	32	51	63	79	94	105
5	13	23	32	43	69	84	105	126	141
10	16	28	39	51	82	99	125	149	167
20	19	33	46	60	96	116	145	173	194
30	22	37	51	66	105	126	158	188	210
50	25	42	57	74	116	138	172	205	229
100	30	49	65	84	131	155	192	227	253

Source: *Climate Change and Variability – Tasman District (NIWA, June 2008)*

N.3.5. Evaporation, Soil Moisture and Drought

From the report, NIWA concludes that there is a risk that the frequency of drought (in terms of low soil moisture conditions) could increase as the century progresses, for the main agriculturally productive parts of Tasman district.

N.3.6. Climate Change and Sea Level

The MfE Report provides guidance for local government on coastal hazards and climate change. The report recommends:

For planning and decision timeframes out to the 2090s (2090–2099):

- a base value sea-level rise of 0.5 m relative to the 1980–1999 average should be used along with;
- an assessment of the potential consequences from a range of possible higher sea-level rises (particularly where impacts are likely to have high consequence or where additional future adaptation options are limited). At the very least, all assessments should consider the consequences of a mean sea-level rise of at least 0.8 m relative to the 1980–1999 average. Guidance on potential sea-level rise uncertainties and values at the time (2008) is provided within the Guidance Manual to aid this assessment.

For planning and decision timeframes beyond the 2090s where, as a result of the particular decision, future adaptation options will be limited, an allowance for sea-level rise of 10 mm per year beyond 2100 is recommended.

Since the MfE guidance was published in 2008, the NZ Coastal Policy Statement has been updated, requiring identification of areas in the coastal environment that are potentially affected by coastal hazards over at least 100 years, taking into account the effects of climate change (Policy 24).

The two values of sea-level rise to be considered as a minimum number of rises for assessing risk of 0.5 m and 0.8 m by the 2090s in the 2008 MfE guidance are equivalent to rises of 0.7 m and 1.0 m extended out to 2115, which is “at least 100 years” from the present. These projections are for mean sea levels.

In 2013 the Council commissioned NIWA to prepare a report on mean high water springs (MHWS) for Tasman district, and includes a range of sea level rise scenarios[4]. Ongoing sea-level rise will require updates of the MHWS levels and for projecting MHWS levels into the future, whereby the appropriate sea-level rise is simply added to the ‘present day’ MHWS levels. The report includes worked examples for sea-level rise magnitudes of 0.7 m and 1.0 m, which extend the equivalent tie-point values for the 2090s (0.5 m and 0.8 m) in the Ministry for the Environment (2008) guidance out to 2115 to cover at least a 100-year period.

Subsequently, Tasman District Council was granted an Envirolink medium advice grant (1413-TSDC99)[5] for NIWA to develop defensible coastal inundation elevations and likelihoods as a result of combinations of elevated storm-tide, wave setup and wave run-up, along the “open coast” of the Tasman Bay and Golden Bay coastlines. The study excludes inlets and the west coast of Tasman district. The report includes an interactive ‘calculator’ which allows council to accommodate various predicted sea level rise scenarios and different beach profiles.

The extent of coastal inundation in Motueka is being modelled at the time of writing this AMP (2014/15). The model is an extension of the modelling work undertaken on the movement of the Motueka Sandspit and impacts on Jackett Island. The Motueka modelling is expected to show the depth and extent of land affected by sea water inundation.

Mapua and Ruby Bay have also been subject to inundation modelling as a result of TRMP Plan Change 22.

Future urban locations for inundation modelling have yet to be determined.

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[4] NIWA Report: Mean High Water Spring (MHWS) levels including sea-level rise scenarios: Envirolink Small Advice Grant (1289-TSDC95), 4 September 2013 (revised 30 April 2014)

[5] NIWA Report: Extreme sea-level elevations from storm-tides and waves: Tasman and Golden Bay coastlines, March 2014.

A wider coastal hazard assessment project for Tasman district commenced in 2014. The project will consider options for risk mitigation and adaptation. The results will be integrated into land use and infrastructure planning.

N.3.7. Potential Impacts on Council's Infrastructure and Services

Table N-3 lists the potential impacts of climate change on Council's infrastructure and services.

Table N-3: Local Government Functions and Possible Negative Climate Change Outcomes

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
Water supply and irrigation	Infrastructure.	Reduced rainfall, extreme rainfall events and increased temperature. Sea level rise.	Reduced security of supply (depending on water source). Contamination of water supply. Saltwater intrusion into coastal wells.
Wastewater	Infrastructure.	Increased rainfall. Sea level rise.	More intense rainfall (extreme events) will cause more inflow and infiltration into the wastewater network. Wet weather overflow events will increase in frequency and volume. Longer dry spells will increase the likelihood of blockages and related dry weather overflows. Disruption of WWTPs due to coastal inundation or erosion impacts.
Stormwater	Reticulation. Stopbanks.	Increased rainfall. Sea-level rise.	Increased frequency and/or volume of system flooding. Increased peak flows in streams and related erosion. Groundwater level changes. Saltwater intrusion in coastal zones. Changing flood plains and greater likelihood of damage to properties and infrastructure.
Transportation	Road network and associated infrastructure (power, telecommunications, drainage).	Extreme rainfall events, extreme winds, high temperatures. Sea-level rise.	Disruption due to flooding, landslides, falling trees and lines. Direct effects of wind exposure on heavy vehicles. Melting of tar. Increased coastal erosion or storm induced damage.
Planning/policy	Management of	All.	Inappropriate location of

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
development	development in the private sector. Expansion of urban areas. Infrastructure and communications planning.		urban expansion areas. Inadequate or inappropriate infrastructure, costly retro-fitting of systems.
Land management	Rural land management.	Changes in rainfall, wind and temperature.	Enhanced erosion, Changes in type/distribution of pest species. Increased fire risk. Reduction in water availability for irrigation. Changes in appropriate land use. Changes in evapotranspiration. Increase in crop pests.
Water management	Management of watercourses/lakes/ wetlands.	Changes in rainfall and temperature.	More variation in water volumes possible. Reduced water quality. Sedimentation and weed growth.
Coastal management	Infrastructure. Management of coastal development.	Temperature changes leading to sea-level changes. Extreme storm events.	Coastal erosion and flooding. Disruption in roading, communications. Loss of private property and community assets. Effects on water quality.
Civil defence and emergency management.	Emergency planning and response, and recovery operations.	Extreme events	Greater risks to public safety, and resources needed to manage flood, rural fire, landslip and storm events.
Biosecurity	Pest management.	Temperature and rainfall changes	Changes in the range and density of pest species
Open space and community facilities management	Planning and management of parks, playing fields and urban open spaces.	Temperature and rainfall changes. Extreme wind and rainfall events.	Changes/reduction in water availability. Changes in biodiversity. Changes in type/distribution of pest species. Groundwater changes. Saltwater intrusion in coastal zones. Need for more shelter in urban spaces.

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
Public Transport	Management of public transport. Provision of footpaths, cycleways etc.	Changes in temperatures, wind and rainfall.	Changed maintenance needs for public transport infrastructure. Disruption due to extreme events.
Waste management	Transfer stations and landfills.	Changes in rainfall and temperature	Increased surface flooding risk. Biosecurity changes. Changes in ground water level and leaching.
Water supply and irrigation	Infrastructure.	Reduced rainfall, extreme rainfall events and increased temperature.	Reduced security of supply (depending on water source). Contamination of water supply.

Source: Climate Change Effects and Impacts Assessment (MfE, May 2008)

The Council has incorporated the potential impacts of climate change in the 2008 update of the Engineering Standards and Policies.

APPENDIX O CATCHMENT MANAGEMENT PLANS

O.1 CMP Coverage

The Catchment Management Plans (CMPs) provide a vehicle for updating and centralising important information about the state, use and development of stormwater-related assets and environments.

The scope of coverage of the CMPs is illustrated in Figure O-1.

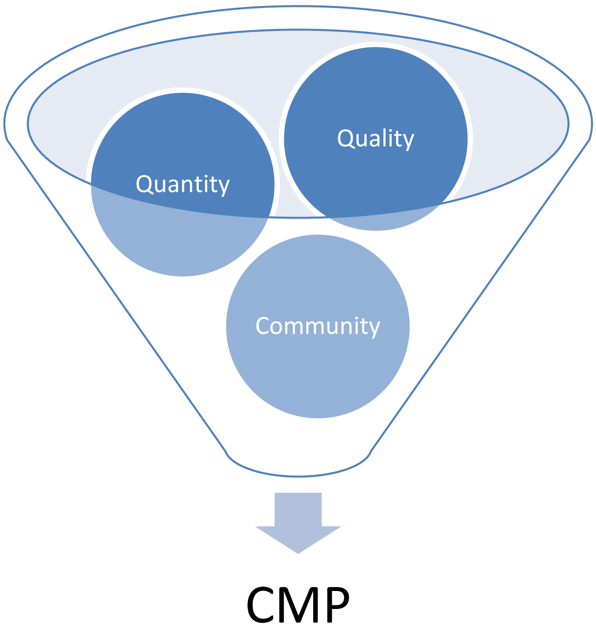


Figure O-1 Coverage of the CMPs

Quality

- Baseline study
- Discharge consent
- NPS freshwater
- Improvement needs

Quantity

- Existing assets
- Ownership and maintenance responsibility
- Overland flow paths and 1D/2D coupled flood modeling
- Flood hazard and mitigation

Community

- Urban Drainage Area boundaries
- Zone of Influence boundary
- Development contributions levy boundary
- Greenways - recreation and amenity networks

O.2 CMP Template

The Richmond CMP has been developed as a template which will allow the other CMPs to be completed in a more streamlined and complementary fashion. This approach will reduce costs and make reading the plans easier for all stakeholders.

Quality

- Baseline study
- Discharge consent
- NPS freshwater
- Improvement needs

Quantity

- Existing assets
- Ownership and maintenance responsibility
- OFP and 1D/2D coupled modeling
- Flood hazard and mitigation

Community

- UDA boundaries - Increasing demand for higher levels of flood protection and decreasing tolerance of flooding is becoming a topical issue in some areas, particularly those on the outskirts of UDAs (which do not contribute financially to the upkeep of the UDA) are demanding flood protection. Focused community consultation and network capacity assessments will be required prior to extending UDA boundaries further or allowing private assets to be vested in the Council.
- Zone of Influence Boundary - An alternative approach is to be considered under the Catchment Management Plan framework of a zone of contribution or discharge where residents are influenced by urban stormwater but will not be provided with a full urban level of service. In these cases a stormwater rate in between the urban and rural rate is being considered for the 2018-2028 Long Term Boundary.
- Development Contributions Boundary
- Greenways - Recreation and Amenity networks

O.3 CMP Preparation Programme

The Richmond CMP is being finalised in 2015. The programme for the remaining CMPs is:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Motueka CMP	x								
Takaka CMP		x							
Mapua/Ruby Bay CMP		x							
Brightwater CMP			x						
Wakefield CMP			x						
Kaiteriteri CMP				x					
Pohara CMP				x					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Tasman/Ruby Bay CMP					x				
Ligar Bay/Tata Beach CMP					x				
Murchison CMP						x			
St Arnaud CMP						x			
Collingwood CMP							x		
Patons Rock CMP							x		
Tapawera CMP								x	

APPENDIX P POTENTIAL SIGNIFICANT EFFECTS

P.1 Potential Significant Negative Effects

Schedule 10 of the Local Government Act (LGA) requires an outline of any significant negative effects that an activity may have on the social, economic, environmental, or cultural well-being. Potential negative effects associated with the stormwater activity are outlined in Table P-1.

Table P-1: Potential Significant Negative Effects

Effect	Description	Mitigation Measure
Flooding	**Social:** Localised flooding in some residential areas due to overloading of the stormwater system. **Economic:** Localised flooding in some commercial areas due to overloading of the stormwater system can have significant immediate and ongoing economic consequences. **Environmental:** Sediments, oils, greases, metals and organic material can be washed into natural water courses. **Cultural:** Flooding may have adverse effect on quality of the receiving environment.	Catchment management planning. Hydraulic modelling. Capital works.
Untreated stormwater discharges	**Environmental:** The discharge of untreated stormwater may have an adverse effect on the quality of the receiving environment, eg, stormwater runoff following a dry period often contains many contaminants including sediments, oils, greases, metals and organic material washed from roads and other impervious areas, rubbish and contaminants illegally discharged into the stormwater system. In rural areas, runoff may be contaminated with sediment, herbicides, pesticides, fertilisers and animal waste. **Cultural**: Discharges may have adverse effect on quality of receiving environment.	Catchment management planning. Resource consenting and compliance monitoring Capital works. Tasman Erosion and Sediment Control Guidelines (2014)
Untreated wastewater discharges	**Environmental:** Discharges may have an adverse effect on the quality of the receiving environment. **Cultural**: Discharges may have an adverse effect on the quality of the receiving environment.	The Council has an active programme to reduce inflow, see Wastewater AMP.
Impact to historic and wahi tapu sites.	**Cultural** - Physical works may have an adverse effect on sites. Uncontrolled stormwater may erode sites.	Consultation prior to works. Record of known heritage sites.

P.2 Potential Significant Positive Effects

Significant positive effects are described in terms of how this activity contributes to the Community Outcomes, and are outlined in Table P-2.

Table P-2: Potential Significant Positive Effects

Effect	Description
Access and Mobility	The stormwater system maximises access during and after storm events.
Amenity	The Council's engineering standards and policies promote the enhancement of recreational and environmental amenity value when developing new assets through low impact design.
Economic Development	The Council maintains stormwater collection and treatment systems to minimise damage to private and public assets and this encorages development.
Environmnetal Protection	The Council;s stormwater discharges to a receiving environment can be controlled to minimise any negative environmental impact from the discharge. Fish passage and aquatic life is considered when implementing capital projects and often improved.
Safety and Personal Security	The Council maintains stormwater collection and treatment systems to minimise disruption to normal community activities and risk to life.

APPENDIX Q SIGNIFICANT ASSUMPTIONS, UNCERTAINTIES AND RISK MANAGEMENT

Q.1 Assumptions and Uncertainties

This AMP and the financial forecasts within it have been developed from information that has varying degrees of completeness and accuracy. In order to make decisions in the face of these uncertainties, assumptions have to be made. This section documents the uncertainties and assumptions that the Council considers could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

Q.1.1. Financial Assumptions

The following assumptions have been made:

- all expenditure is stated in dollar values as at 1 July 2014, with no allowance made for inflation;
- all costs and financial projections are GST exclusive.

Q.1.2. Asset Data Knowledge

While the Council has asset registers and many digital systems, processes and records, the Council does not have complete knowledge of the assets it owns. To varying degrees the Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.

The Council considers these assumptions and uncertainties constitute only a small risk to the financial forecasts because:

- significant amounts of asset data is known;
- asset performance is well known from experience;
- there are plans to upgrade significant extents of poorly performing assets.

As more knowledge is gained, a better forecast of capital expenditure will be incorporated into future forecasts. Refer to Appendix S for more information on completeness and confidence in asset data.

Q.1.3. Growth Forecasts

Growth forecasts are inherently uncertain and involve many assumptions. The growth forecasts also have a very strong influence on the financial forecasts, especially in Tasman district where population growth is higher than the national average. The growth forecasts underpin and drive:

- the asset creation programme;
- the Council's income forecasts including rates and development contributions;
- funding strategies.

Thus the financial forecasts are sensitive to the assumptions made in the growth forecasts. The significant assumptions in the growth forecasts are covered in the explanation on method and assumptions in Appendix F: Demand and Future New Capital Requirements.

Q.1.4. Timing of Capital Projects

The timing of many capital projects can be well defined and accurately forecast because there are few limitations on the implementation other than the community approval through the LTP/Annual Plan processes. However, the timing of some projects is highly dependent on some factors which are beyond the Council's ability to fully control. These include factors like:

- obtaining resource consent, especially where community input is necessary;
- obtaining community support;
- obtaining a subsidy from central government;
- securing land purchase and/or land entry agreements;
- the timing of larger private developments;
- the rate of population growth.

Where these issues may be a factor, allowances have been made to complete the projects in a reasonable timeframe. However these plans may not always be achieved and projects may be deferred as a consequence.

Q.1.5. Funding of Capital Projects

Funding of capital projects is crucial to a successful project. When forecasting projects that will not occur for a number of years, a number of assumptions have to be made about how the scheme will be funded.

Funding assumptions are made about:

- whether projects will qualify for subsidies;
- whether major beneficiaries of the work (for example a 'wet' factory that gets a connection) will contribute to the scheme, and if so, how much will they pay;
- whether the scheme has compulsory connections or voluntary connections;
- whether and how much should be funded from development contributions;
- whether the Council will subsidise the development of the schemes.

The correctness of these assumptions has major consequences on the affordability especially of new schemes. The Council has considered each new scheme proposal individually and concluded for each a funding strategy. The funding strategy will form one part of the consultation process as these schemes are advanced toward construction. Refer to Appendix M for further information.

Q.1.6. Accuracy of Capital Project Cost Estimates

The financial forecasts contain many projects, each of which has been estimated from the best available knowledge. The level of uncertainty inherent in each project is different depending on how much work has been done in defining the problem and determining a solution. In many cases, only a rough order cost estimate is possible because little or no preliminary investigation has been carried out. It is not feasible to have all projects in the next 30 years advanced to a high level of estimate accuracy. However, it is general practice across the Engineering Services AMPs for all projects within the first three years and projects over $500,000 within the first 10 years advanced to a level that provides reasonable confidence about the accuracy of the estimate.

To get consistency and formality in cost estimating, the following has practices have been followed.

- applying financial assumptions listed in Q.1.1;

- a project estimating template has been developed that provides a consistent means of preparing estimates;
- where practical, a common set of rates has been determined;
- specific lines have been included to deal with non-construction costs like contract preliminary and general costs, engineering costs, Council staff costs, resource consenting costs and land acquisition costs;
- specific provisions have been included to deal with construction contingency, project complexity and estimate accuracy and these are described next;
- where capital items from the 2012 AMP have been retained, the estimates have not been revised in detail. Capital costs for the works have been increased by 8.5%;
- where renewal costs have been included from Confirm a 5.5% inflation factor has been applied to align equivalent values since the revaluation.

A 10% construction contingency provision has been included to get a “Base Project Estimate” to reflect the uncertainties in the unit rates used. A further provision has been added to reflect the uncertainties in the scope of the project – ie, is the adopted solution the right solution? Often detailed investigation will reveal the need for additional works over and above that initially expected. The amount added depends on the amount of work already done on the project. Each project has been assessed as being at the project lifecycle stage as detailed in Table Q-1 below, and from this an estimated accuracy assessed. The estimate accuracy is added to the Base Project Estimate to get the Total Project Estimate – the figure that is carried forward into the financial forecasts. Project complexity ratings of “simple”, “normal” or “complex” lead to different cost estimate multipliers of 0.8, 1.0 and 1.3 respectively.

Table Q-2 below shows the complexity ratings assigned for large projects. In the 2015-2025 AMP preparation cycle, contingencies were reduced to allow for the reduced risk of full cost overruns on a programme-wide basis. Individual projects are now more likely to go over budget and Council has specifically accepted this risk.

Table Q-1: Life Cycle Estimate Accuracies

Stage in Project Lifecycle	Estimate Accuracy
Concept / Feasibility	± 20%
Preliminary Design / Investigation	± 10%
Detailed Design	± 5%

The following Table Q-2 details significant uncertainties and stage for major projects in the next three years of this AMP.

Table Q-2: Major Projects (>$500K) in the First Three Years of this AMP

ID	Project	Project Stage	Un-inflated year 1-3 Project Value	Factors that could affect Estimate Accuracy
160021	Pohara main settlement, flood mitigation and damage repair	Preliminary Design	$900,000	Ground conditions, other services, consultation with key stakeholders land purchase cost.
160025	Lower Borck Creek Catchment Works - SH6 to outlet including land	Construction	$3,000,000	Ground conditions, disposal of fill, consultation with key stakeholders land

ID	Project	Project Stage	Un-inflated year 1-3 Project Value	Factors that could affect Estimate Accuracy
				purchase cost.
160032	Installation of stormwater pipe from Gladstone Road to Olympus Drive to Middlebank Drive.	Concept	$1,200,000	Underground service location and depth, cemetery connection issues
160034	Park Drive - Increase capacity through Ridings Grove and upgrade Hill Street crossing to Q_{50}	Preliminary Design	$1,061,781	Underground service location and depth, limited width of walkway
1600036	Queen Street upgrade including secondary flow management	Preliminary Design	$2,213,912	Underground service location and depth, wider stormwater solution
160077	Upgrade to White Road and Ranzau Road at Paton Road intersection.	Preliminary Design	$841,439	Stormwater solution chosen, land access
160224	Washbourn Drive secondary flow path	Concept	$725,000	Option chosen, Underground service location and depth

Q.1.7. Land Purchase and Access

The Council has made the assumption that it will be able to purchase land, and/or secure access to land to complete projects. The risk of delays to project timing is high due to possible delays in obtaining the land. The Council works to mitigate this issue by undertaking consultation with landowners sufficiently in advance of the construction phase of a project. The consequence of not securing land and/or land access for projects may require redesign which can have a moderate cost implication. If delays do occur, it may influence the level of service the Council can provide.

Q.1.8. Future Changes in Legislation and Policy

The legal and planning framework under which local government operates frequently changes. This can significantly affect the feasibility of projects, how they are designed, constructed and funded. The Council has assumed that there will be no major changes in legislation or policy. The risk of significant changes remains high owing to the nature of government policy formulation. If major changes occur it will impact on required expenditure and the Council has not provided mitigation for this effect.

Q.1.9. Resource Consents

The need to secure and comply with resource consents can materially affect asset activities and the delivery of capital projects.

Complying with resource consent conditions can affect the cost and time required to perform an activity, and in some instances determine whether or not the activity can continue. The Council has assumed that, apart from the comprehensive discharge consents, there will be no material change in operations due to consenting requirements over the period of the AMP.

There may be some risk of change in the following areas of the activity:

- the scale of monitoring required by the comprehensive discharge consents; and
- quality treatment requirements as a result of the Discharge Consents issued.

Securing resource consent is often a significant task in the successful delivery of a capital project or in the management of a particular facility. Consent applications may consume considerable time and resources, particularly in the instance of a publicly notified application or where a decision is subject to appeal.

The Council has assumed that there will be no material change in the need to secure consents for activities and that consent costs for future projects will be broadly in line with the cost of consents in the past.

The assumption has been made that the Council has sufficient knowledge of discharge quality and receiving environments to apply for resource consents and that it will be granted resource consents for key projects and stormwater discharges. CMPs will be undertaken prior to application for resource consent. Comprehensive CMPs will minimise the risk of failing to obtain resource consent

Q.1.10. Resource Consent Monitoring

The assumption has been made that the costs identified in this AMP for the monitoring of resource consents is sufficient. Until CMPs have been developed and resource consents applied for, the conditions requiring monitoring are unknown. Once this information is understood, the Council may need to allocate additional costs for monitoring compliance against consent conditions.

Q.1.11. Disaster Fund Reserves

The assumption has been made that the level of funding held in the Council's disaster fund reserves and available from insurance claims will be adequate to cover reinstatement following emergency events. The risk of inadequate reserves and insurance claims would mean deferral of future capital projects to provide any financial shortfall required to cover reinstatement costs.

Q.1.12. Network Capacity

The Council has a growing knowledge and understanding of network capacity, however, the knowledge is not complete. The Council has developed a partial model for Richmond, Motueka, Wakefield, Brightwater, Mapua, Takaka and Pohara areas, and is considering expanding these to a more comprehensive level and developing models for other areas with the CMPs.

System capacity upgrades have been planned where shortfalls are known or where growth is expected, however, the models will provide new information that may create a need for new projects and/or re-prioritisation of existing projects. If the network capacity is lower than assumed, Council may be required to advance capital works projects to address this issue. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is greater than assumed, the Council may be able to defer works. The risk of this occurring is low and is likely to have little impact.

Q.1.13. Stormwater Discharge Quality

The budget allocation for water quality improvements is sufficient. The current documentation on discharge water quality and receiving environment quality is variable and not collated. Hence until CMPs have been prepared, the quality of the receiving environment is unclear. The quality required of stormwater discharges to at least maintain the existing conditions is therefore also unknown. Money has been allocated for retrofitting stormwater quality devices however, the quantity and spread of the programme will need to be reassessed as the CMPs are completed.

Q.2 Risk Management

Q.2.1. Why do we do Risk Management

Risk management is the systematic process of identifying, analysing, evaluating, treating and monitoring risk events so that they are mitigated as far as possible, refer to Figure Q-1.

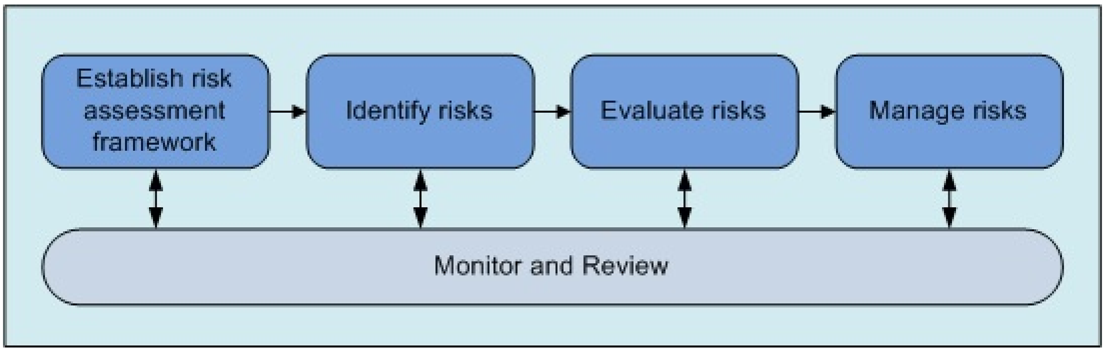


Figure Q-1: Risk Management Process

Risk management involves assessing each risk event and identifying an appropriate treatment. Treatments are identified to try and manage or reduce the risk. There are some risk events for which it is near impossible or not feasible to reduce the likelihood of the event occurring, or to mitigate the effects of the risk event if it occurs eg, extreme natural hazards. In this situation the most appropriate response may be to accept the risk as is, or prepare response plans and consider system resilience.

Well managed risks can help reduce:

- disruption to infrastructure assets and services;
- financial loss;
- damage to the environment;
- injury and harm;
- legal obligation failures.

Q.2.2. Our Approach to Risk Management

Q.2.2.1 Risk Assessment Framework

The Council's risk assessment framework was developed in 2011 to be consistent with *AS/NZS IS 4360:2004 Risk Management.* It assesses risk exposure by considering the consequence and likelihood of each risk event. Risk exposure is managed at three levels within the Council organisation, refer to Figure Q-2:

- Level 1 – Corporate Risks
- Level 2 – Activity Risks
- Level 3 – Operational Risks.

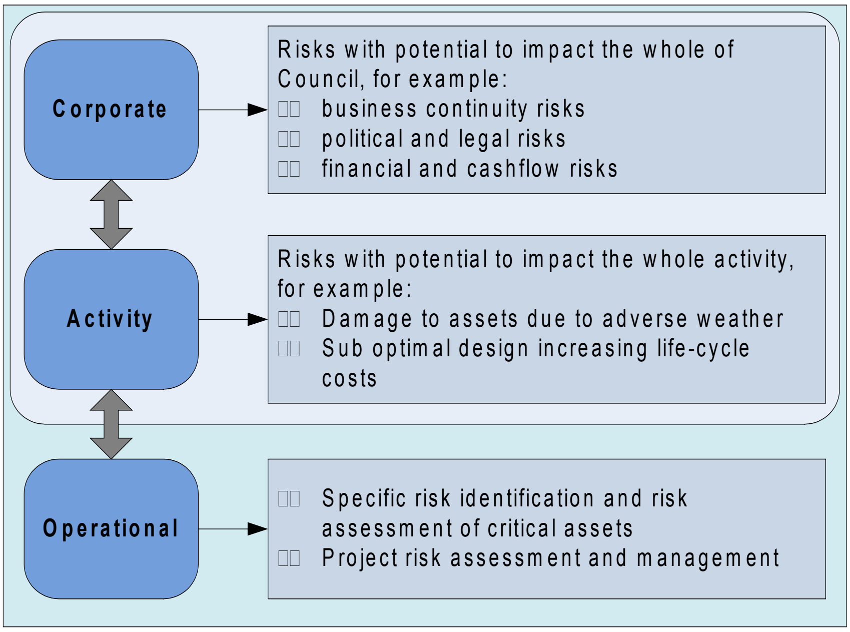


Figure Q-2: Levels of Risk Assessment

The risk assessment framework discussed in Section Q.2.2.1 and Q.2.2.2 is applied to Corporate and Activity specific risks. There are some risk events which could be interpreted as either Corporate or Activity level risks. For example, a risk event may have the potential to impact the Council organisation as a whole or many parts of the organisation if it was to occur. In the first instance this type of risk would be classified as a Corporate risk. There is however a secondary consideration that needs to be given, that is, "is the risk best managed in different ways within the separate activities?" For example, a large seismic event will likely impact the Council organisation as a whole however each activity will prepare for and manage these risks differently; eg, water reservoirs may be strengthen to minimise the risk of collapse, or corporate services may prepare a business continuity plan.

The Council is yet to implement consistent risk management processes at the operational risk level. Development of the critical asset framework is discussed in Section Q.2.5. The Council plans to develop a framework for assessing maintenance and project risks in 2015.

Q.2.2.2 Risk Identification and Evaluation

The risk management framework requires the activity management team to identify activity risks and to then assess the risk, likelihood and consequence for each individual event. The definitions of risk, likelihood and consequence are defined Figure Q-3.

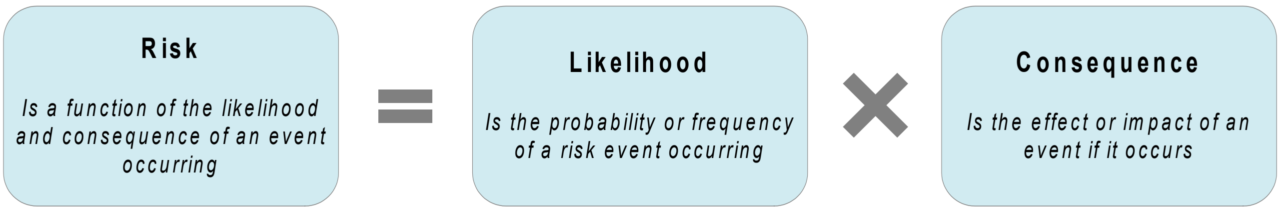


Figure Q-3: Risk Assessment Definitions

The Council has developed objective based scales to assist asset managers when determining the likelihood and consequence scores for all risk events. The consequence of each risk event is assessed on a scale of 1 to 100 for all of the consequence categories listed in Table Q-3 and the respective consequence rating score (Table Q-4) is selected. The detailed categories used to assess the consequence rating of the risk event against the risk is attached in Table Q-10.

Table Q-3: Risk Consequence Categories

	Category	Sub Category	Description
Consequence Categories	Service Delivery	N/A	Asset's compliance with Performance Measures and value in relation to outcomes and resource usage.
	Social / Cultural	Health and Safety	Impact as it relates to death, injury, illness, life expectancy and health.
		Community Safety and Security	Impact on perceived safety and reported levels of crime.
		Community / Social / Cultural	Damage and disruption to community services and structures, and effect on social quality of life and cultural relationships.
		Compliance / Governance	Effect on the Council's governance and statutory compliance.
		Reputation / Perception of Council	Public perception of the Council and media coverage in relation to the Council.
	Environment	Natural Environment	Effect on the physical and ecological environment, open space and productive land.
		Built Environment	Effect on amenity, character, heritage, cultural, and economic aspects of the built environment.
	Economic	Direct Cost	Cost to the Council.
		Indirect Cost	Cost to the wider community.

Table Q-4: Consequence Ratings

Consequence Rating					
Description	Extreme	Major	Medium	Minor	Negligible
Rating	100	70	40	10	1

Table Q-5 provides a summary of the likelihood assessment criteria.

Table Q-5: Likelihood Ratings

Likelihood Rating			
Description	**Frequency**	**Criteria**	**Rating**
Almost certain	Greater than every 2 years	The threat can be expected to occur **or** A very poor state of knowledge has been established on the threat	5
Likely	Once per 2-5 years	The threat will quite commonly occur **or** A poor state of knowledge has been established on the threat	4
Possible	Once per 5-10 years	The threat may occur occasionally **or** A moderate state of knowledge has been established on the threat	3

Likelihood Rating			
Description	**Frequency**	**Criteria**	**Rating**
Unlikely	Once per 10-50 years	The threat could infrequently occur **or** A good state of knowledge has been established on the threat	2
Very Unlikely	Less than once per 50 years	The threat may occur in exceptional circumstances **or** A very good state of knowledge has been established on the threat	1

Using the existing risk management framework summarised in Table Q-6, the risk score is calculated by multiplying the likelihood of the risk event with the highest rated individual consequence category for that risk event to generate a risk score, as shown in Figure Q-4.

Table Q-6: Risk Scores

Risk Scoring Matrix		**Consequence**				
		Negligible	Minor	Medium	Major	Extreme
Likelihood	Almost Certain	5	50	200	350	500
	Likely	4	40	160	280	400
	Possible	3	30	120	210	300
	Unlikely	2	20	80	140	200
	Very Unlikely	1	10	40	70	100

Risk Score
Extreme
Very High
High
Moderate
Low
Negligible

An example of how the risk score is calculated is below.

Risk Score Extreme (350) = **Likelihood** Almost Certain (5) × **Consequence** Major (70)

Figure Q-4: Risk Score Calculation

Risk scores are generated for inherent risk, current risk and target risk.

Inherent risk is the raw risk score without taking into consideration any current or future controls.

Current risk the level of risk to the Council after considering the effect of existing risk management controls.

Target risk is the level of risk the Council expects and wants to achieve after applying the proposed risk management controls.

In some cases it is not feasible to reduce the inherent risk and in this case the Council would accept the inherent risk level as the current and target risk levels.

Q.2.2.3 Limitations

The processes outlined above forms a conservative approach to evaluating risk and could been seen as representing the worst case scenario. It also provides limited ability to differentiate the priority of risks due to the potential to score highly in at least one of the consequence categories; this tends to create a smaller range of results. For example two events with a likelihood of "Almost Certain (5)" have been compared below:

- **Event A** – scores "Major (70)" for one consequence category and "Negligible (1)" in all the remaining consequence categories, this will generate an inherent risk score of "Extreme (350)".
- **Event B** – scores "Medium (40)" in all 10 consequence categories, this will generate an inherent risk score of "Very High (200)".
- **Event C** – scores "Major (70)" in all 10 consequence categories, this will generate an inherent risk score of "Extreme (350)".

These examples show that there are limitations for the Council when prioritising risk events, especially those that may have a wider impact on the activity eg, Event B or C. Consequently, the Council acknowledges that there are some downfalls in its existing framework and it has proposed to undertake a full review of its risk management framework during 2015.

Q.2.3. Corporate Risk Mitigation Measures

Q.2.3.1 Asset Insurance

Tasman District Council has various mechanisms to insure assets against damage. These include:

- Tasman District Council insures its above ground assets like buildings, through private insurance which is arranged as a shared service with Nelson City and Marlborough District Councils ;
- Tasman District Council is a member of the Local Authority Protection Programme (LAPP) which is a mutual pool created by local authorities to cater for the replacement of some types of infrastructure assets following catastrophic damage by natural disasters like earthquake, storms, floods, cyclones, tornados, volcanic eruption and tsunami. These infrastructure assets are largely stopbanks along rivers and underground assets like water and wastewater pipes and stormwater drainage;
- Taman District Council has a Classified Rivers Protection Fund, which is a form of self-insurance. The fund is used to pay the excess on the LAPP insurance, when an event occurs that affects rivers and stopbank assets;
- Tasman District Council has a General Disaster Fund, which is also a form of self-insurance. Some assets, like roads and bridges, are very difficult to obtain insurance for, or it is prohibitively expensive if it can be obtained. For these reasons Council has a fund that it can tap into when events occur which damage Council assets that are not covered by other forms of insurance. Some of the cost of damage to these assets is covered by central government, for example the New Zealand Transport Agency covers around half the cost of damage to local roads and bridges (as set out in the co-investment rate/financial assistance rate).
- Refer to the Council's Financial Strategy for insurance disclosures as required under Section 31 of the Local Government Act.

Q.2.3.2 Civil Defence Emergency Management

The Civil Defence Emergency Management Act 2002 was developed to ensure that the community is in the best possible position to prepare for, deal with, and recover from local, regional and national emergencies. The Act requires that a risk management approach be taken when dealing with hazards including natural hazards. In identifying and analyzing these risks the Act dictates that consideration is given to both the likelihood of the event occurring and its consequences. The Act sets out the responsibilities for Local Authorities. These are:

- ensure you are able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency;
- plan and provide for civil defence emergency management within your own district.

Tasman District Council and Nelson City Council jointly deliver civil defence as the Nelson Tasman Civil Defence Emergency Management (CDEM) Group. The vision of the CDEM Group is to build "A resilient Nelson Tasman community".

Civil Defence services are provided by the Nelson Tasman Emergency Management Office. Other council staff are also heavily involved in preparing for and responding to civil defence events. For example, Council monitors river flows and rainfall, and has a major role in alleviating the effects of flooding.

The Nelson Tasman Civil Defence Emergency Management Group developed a Regional Plan in 2012. The Plan sets out how Civil Defence is organised in the region and describes how the region prepares for, responds to and recovers from emergency events. A review is scheduled for 2016/2017.

Q.2.3.3 Engineering Lifelines

The Nelson Tasman Engineering Lifelines (NTEL) project commenced in 2002. The NTEL Group formed in 2003. Its report *Limiting the Impact* was reviewed in 2009. The purpose of the report was:

- to help the Nelson Tasman region reduce its infrastructure vulnerability and improve resilience through working collaboratively;
- to assist Lifeline Utilities with their risk reduction programmes and in their preparedness for response and recovery;
- to provide a mechanism for information flow during and after an emergency event.

The NTEL Group is in the process of applying for funding to hold a further review to begin in 2015.

The project was supported and funded by the two controlling authorities, Nelson City Council and Tasman District Council. Following the initial start-up forum in 2002, a Project Steering Group was formed and initial project work was completed. The initial work to investigate risks and assess vulnerabilities from natural hazard disaster events was divided amongst five task groups:

- Hazards Task Group;
- Civil Task Group;
- Communications Task Group;
- Energy Task Group;
- Transportation Task Group.

These groups were then tasked with assessing the risk and vulnerability of segments of their own networks against the impacts of major natural hazard disaster events. These natural hazards included:

- earthquake;
- landslide;
- coastal/flooding.

The Nelson Tasman region is geotechnically complex with high probabilities of earthquake, river flooding and landslides. By identifying impacts that these hazards may have on the local communities, the NTEL group aims to have processes in place to allow the community to return to normal functionality as quickly as possible after a major natural disaster event.

To date the project has identified the impacts of natural hazards and the critical lifelines of the regions service networks including communication, transportation, power and fuel supply, water, sewerage, and stormwater networks. The initial NTEL assessment work is the first stage of an on-going process to gain a more comprehensive understanding of the impacts of natural hazards in the Nelson Tasman region.

Q.2.3.4 Recovery Plans

These plans are designed to come into effect in the aftermath of an event causing widespread damage and guide the restoration of full service.

The Recovery Plan for the Nelson Tasman Civil Defence and Emergency Management Group (June 2008) identifies recovery principles and key tasks, defines recovery organisation, specifies the role of the Recovery Manager, and outlines specific resources and how funds are to be managed.

Information about welfare provision in the Nelson-Tasman region is contained in a Welfare Plan (December 2005), which gives an overview of how welfare will be delivered during the response and recovery phases of an emergency.

The plan is a coordinated approach to welfare services for both people and animals in the Nelson Tasman region following an emergency event.

Q.2.3.5 Business Continuance

The Council has a number of processes and procedures in place to ensure minimum impact to stormwater services in the event of a major emergency or natural hazard event.

The Council has limited business continuity plans that were developed around influenza pandemic planning in 2014.

The Council's contractors have up to date Health and Safety Plans in place.

Q.2.4. Stormwater Risks

In order to identify the key activity risks the asset management team have applied a secondary filter to the outcomes of the risk management framework. This is necessary to overcome the limitations of the framework. To apply this secondary filter the asset management team have used their network knowledge and engineering judgement to identify the key activity risks. The key risks relevant to the stormwater activity are summarised in Table Q-7.

Table Q-7: Key Risks

Risk Event	Mitigation Measures
Extreme weather events overloading network	**Current** • routine maintenance and pre-event checks and removal of any for blockage; • preparation of CMPs. **Proposed** • creation and protection of more secondary flow paths; • increased community education as to flow paths and how to minimise potential impact.

Risk Event	Mitigation Measures
Catastrophic failure of a network structure	**Current** • routine maintenance and inspections are included in the network maintenance contract and asset management systems eg CCTV inspections; • Detailed inspections are completed for the entire bridge network every two years under the transportation AMP; • Reactive inspection preceding and following extreme weather events. **Proposed** • Additional key assets are brought under Council ownership or maintenance control.
Premature deterioration or obsolescence of an asset	**Current** • Maintenance performance measures included in the maintenance contract; • Routine inspections. **Proposed** • Improved asset data coupled with life prediction analysis to foresee issues.
Sub-optimal design and/or construction practices or materials	**Current** • Engineering Standards document and construction inspections; • Contract quality plans; • Professional services and construction contract specifications; • Third party reviews. **Proposed** • Ongoing staff training.
Ineffective stakeholder engagement e.g. iwi, Heritage New Zealand, community groups	Current • The Council holds regular meetings with iwi; • The Council's GIS software includes layers identifying cultural heritage sites and precincts. Council staff apply for Heritage New Zealand authority when these known sites are at risk of damage or destruction; • Project management processes and Council's consultation guidelines are followed.
Failure to gain property access	**Current** • Stakeholder management; • Works entry agreements; • Use of the Council's property team to undertake land purchase negotiations; • Public Works Act.

An asset management improvement item included in Appendix V is to review all inherent, current and target risk scores following the adoption of the amended framework.

Q.2.4.1 Other Risks Mitigation Measures

General risk mitigation is fostered by continual staff and system development to progressively improve the "what" and "how" we are undertaking the activity.

Q.2.5. Critical Assets

A revised critical asset framework was developed in 2014. The framework has been applied to the confirm dataset so all stormwater assets have an initial rating. It is planned to review and refine the ratings in 2015. Figure Q-5 represents the process used by the activity planning team to assess assets for criticality.

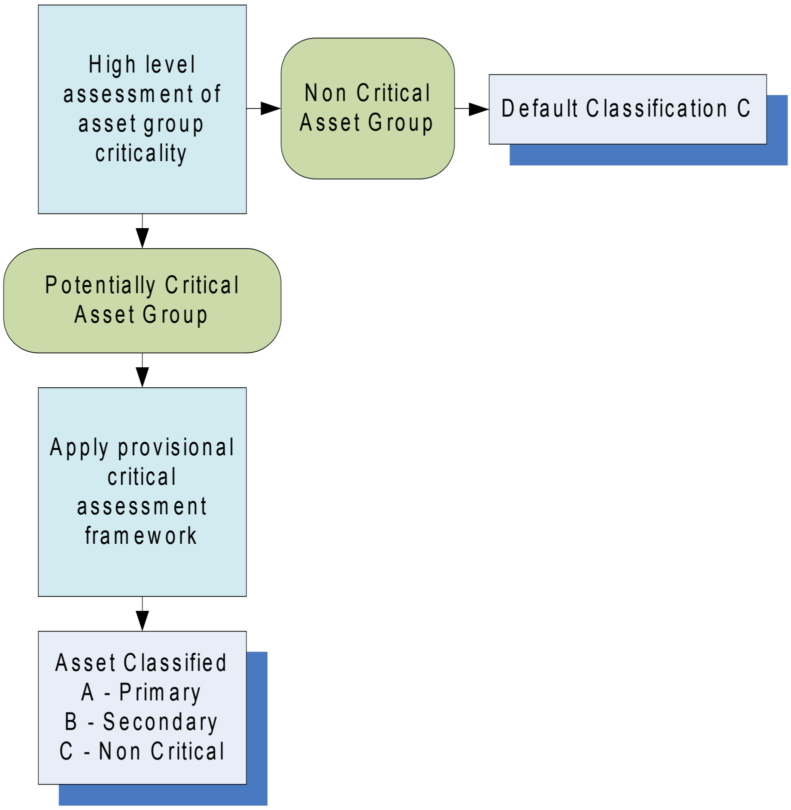


Figure Q-5: Critical Asset Assessment Process

A high level assessment was first undertaken to determine if some asset groups as a whole could be considered either critical or non-critical. This initial assessment determined that bridges, retaining structures and drainage asset groups were critical.

The following asset groups were considered non-critical:

- small pipes and culverts;
- individual manholes and inlets.

The key inputs into the framework and critical asset decision making process are:

- Nelson Tasman Engineering Lifelines report;
- the Council's traffic count data;
- water and wastewater critical assets;
- network and asset engineer's knowledge and experience.

Q.2.5.1 Critical Asset Assessment

A key issue for urban stormwater management is that much of the key infrastructure is not under council control and maintenance. Therefore, as part of the CMPs, the key infrastructure will be identified regardless of ownership and the Council will seek to gain control over its maintenance. Criticality assessments will be completed using the framework set out in Table Q-8 below.

To assess for criticality individual assets will be evaluated against all seven of the criteria categories listed below and a sub score will be selected based on the impact potential if the asset was to catastrophically fail. The sub score is then multiplied by the weighting to produce a weighted score. The final score is the total sum of the weighted scores for all seven categories.

Table Q-8: Critical Asset Framework

Criteria Category	Severity	Level	Score	Weighting	Weighted Point Score
Quality (includes health)	Safe (meets all standards)	1	0	5	0
	Safe but property flooding	2	2	5	10
	Safe but non habitable building flooding	3	3	5	15
	Safe but habitable building flooding to 300mm	4	5	5	25
	Safe but habitable building flooding >300mm	5	10	5	50
	Unsafe, >1m or >2m/s	6	15	5	75
Quantity (disruption to LOS)	Nil	1	0	4	0
	Minor	2	2	4	8
	Moderate	3	6	4	24
	Extreme	4	10	4	40
Number of properties affected	Nil	1	0	5	0
	Individual Property	2	2	5	10
	localised (2-10 properties)	3	4	5	20
	Community 11-50 properties	4	8	5	40
	Significant 51-100 properties	5	12	5	60
(Disruption to LOS)	Widespread >100	6	25	5	125
Time to repair	<1/2 day	1	1	3	3
	<1 day	2	2	3	6
	1-3 days	3	5	3	15
	>3 days	4	10	3	30
Environmental impacts	Nil	1	0	2	0
	Minor	2	2	2	4
	Moderate	3	4	2	8
	Extreme	4	10	2	20

Criteria Category	Severity	Level	Score	Weighting	Weighted Point Score
Cultural impacts	Nil	1	0	2	0
	Minor	2	2	2	4
	Moderate	3	5	2	10
	Extreme	4	10	2	20
Cost of Repair	<$1000	1	1	4	4
	$1K - $10K	2	3	4	12
	$10K - $50K	3	5	4	20
	<$50K<250K	4	10	4	40
	$250K+	5	15	4	60
Affect on Other Assets	Nil	1	0	3	0
	Minor	2	5	3	15
	Several non-critical assets	3	10	3	30
	1 critical asset or many assets	4	15	3	45
	>1 critical asset	5	20	3	60

Once the final score has been calculated the critical asset hierarchy can be determined as shown in Table Q-9. The critical asset hierarchy will be a key input that informs asset life-cycle decisions, especially when considering how much the Council should prolong the life of an asset.

Table Q-9: Critical Asset Hierarchy

Category	Description	Final Score
A	Primary	200+
B	Secondary	100-199
C	Non Critical	<100

Q.2.6. Projects to Address Risk Shortfalls

The Council plans to reduce its risk profile by undertaking the specific projects and asset management activities, The specific risk mitigation measures that have been planned within the 30 year stormwater programme include:

Asset Management Activity

- test Emergency Management Plan;
- change TRMP to control earthworks better;
- improved integration with planning for future land zoning;
- design to give more consideration to access requirements;
- improve HAZOPs.

Operational Project

- increase monitoring;

- proactive maintenance ahead of bad weather;
- improve manhole and storm drain security;
- improved education of landowners;
- ongoing Iwi liaison.

Strategic Study

- catchment modelling;
- new sub-divisions to be assessed for secondary flow paths;
- stormwater dam break failure assessments;
- Stormwater Bylaw.

Q.2.7. Critical and Significant Assets

Table Q-10 shows critical assets and associated projects.

This table has not been fully revised for the 2015 AMP but will be for the renewal of the operations contract in 2017.

Table Q-10: Critical Assets Table[1]

Key	
	Measure to be considered
	Measure in place
	No measure in place - not necessary
	No measure in place - Project needed

Catchment	Asset Type	Critical or Significant Asset	Project ID	Project Name	Containment/ Storage	Telemetry System	Buried/ Covered Asset	Spill Kits	Water Quality Improvements	Secondary Spillway / Outlet	Secondary Flowpath	Resolve land agreements	Interception	Improve Capacity	Health and Safety	Pre-flood inspections	Renewal	As Built Records	Detention Dam Certification	Call Centre	Emergency Evacuation Plans	Hydraulic Model	Stormwater CMPs	Environmental Monitoring	Regulatory Consents	Engineering Standards
District			160081	Stormwater Bylaw																						
			160087	Land Acquisition project																						
Richmond	General Catchment		160079 160080 160075	Discharge Consent Quality Improvements Hydraulic model																						
	Detention Ponds	Olympus Way																								
		Cemetry Dam																								
		Blair Terrace																								
		Washbourne Gardens																								
		Bill Wilkes Reserve																								
		Lodestone Road	160031	Lodestone Park																						
		Reservoir Creek																								
	Distribution Systems (piped)	Oxford Street	160033	Oxford Street																						
		Queen Street	160036	Queen Street																						
		Park Drive	160034	Park Drive upgrade																						
		Salisbury Road	160073/ 160076	Salisbury Rd Roundabout																						
		Gladstone Road	160035	Poutama Drain																						
	Distribution Systems (open)	Reservoir Creek																								
		Jimmy Lee Creek																								
		Blair Terrace Drain	160043	Surrey Road																						
		Poutama Drain	160035	Poutama Drain Culvert																						
		Eastern Hills Drain																								
		Whites Drain																								
		Borck Creek	160025	Borcks Creek Widening including Land Purchase																						
		Beach Road Drain	160146	Beach Road Upgrade																						
Brightwater	General Catchment		160185-187	Discharge Consent CMP																						
	Distribution Systems (open)	Jeffries Creek																								
		Railway Reserve Drain	16002	Mt Heslington Drain Diversion																						
		Ellis Street Drain																								
	Other Structures	Underpass Pump Station																								

[1] This table has not been fully revised for the 2015 AMP but will be for the renewal of the Operations and Maintenance contract C688 in 2017

Wakefield	General Catchment		160135	Discharge Consent CMP
	Detention Ponds	Eden Detention Dam		
	Distribution Systems (open)	Eighty-Eight Valley Drain		
		Domain Drain		
		Eden Stream		
Murchison	General Catchment		160203-205	Discharge Consent CMP
	Distribution Systems (open)	Neds Creek	160019	Flood mitigation upgrade
St Arnaud	General Catchment		160206-208	Discharge Consent CMP
	Distribution Systems (open)			
Tapawera	General Catchment		160215-217	Discharge Consent CMP
	Distribution Systems (open)	Totara Street	160049	Totara Street Culvert
		Cut off Drain		
	Other Structures	Culvert inlets		
Motueka	General Catchment		160178-178	Discharge Consent , CMP
	Detention Ponds	Glenavon Drive Detention Dam		
	Distribution Systems (open)	Lamas Drain		
		Staples Drain		
		Parker Street	160068	Parker Street Upgrade
		Woodlands Drain		
		Thorpe Drain	160087	Land Acquisition Project
	Other Structures	Wharf Road Tide Gate	160017	Tidal Gate Renewal
		Old Wharf Road Tide Gates	160017	Tidal Gate Renewal
		Various Outlet Structures	160012	Flap Gates Refurbish
Mapua/ Ruby Bay	General Catchment		160126 160114	Discharge Consent CMP
	Detention Ponds	Crusader Drive Dam		
	Distribution Systems (open)	Morley Drain		
		Toru Street Drain		
		Seaton Valley Drain	160083	Seaton Valley Stream Widening
		Crusader Drive	160066	Crusader Drive Drainage improvem ents
	Other Structures	outlets		
Tasman	General Catchment		160197-199	Discharge Consent CMP
	Distribution Systems (open)	Main Road Ditch		
Kaiteriteri	General Catchment		160194-196	Discharge Consent CMP

	Distribution Systems (piped)	Camp beach outlet pipe	160005	Upgrade
	Distribution Systems (open)	Rowling Road drain		

Takaka	General Catchment		160183-185	Discharge Consent CMP
	Distribution Systems (open)	Various	160046/47/48	New Stormwater Pipes
		Motupipi Street - Motupipi river		

Pohara	General Catchment		160021 160191-193	Pohara Main Settlement upsizing Discharge Consent CMP
	Distribution Systems (open)	Watino Place		

Ligar Bay/Tata Beach	General Catchment		160200-202	Discharge Consent CMP
	Distribution Systems (piped)	Cornwell Place		
	Distribution Systems (open)	Abel Tasman Drive		

Collingwood	General Catchment		160210-212	Discharge Consent CMP
	Distribution Systems (piped)	Beach Road outlets		
	Distribution Systems (open)	Ruataniwha Drive		
		Lewis St Drain		
		Swiftsure Street		
		Gibbs Road	160003	Gibbs Road Diversion

Patons Rock	General Catchment		160212-214	Discharge Consent CMP
	Other Structures	Outlets to beach		

APPENDIX R LEVELS OF SERVICE, PERFORMANCE MEASURES, AND RELATIONSHIP TO COMMUNITY OUTCOMES

R.1 Introduction

A key objective of this AMP is to match the level of service provided by the stormwater activity with agreed expectations of customers and their willingness to pay for that level of service. The levels of service provide the basis for the life cycle management strategies and work programmes identified in the AMP.

The levels of service for stormwater have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community, but taking into account:

- the Council's statutory and legal obligations;
- the Council's policies and objectives;
- the Council's understanding of what the community is able to fund.

R.2 How Do Our Stormwater Activities Contribute to the Community Outcomes?

Through consultation, the Council identified eight Community Outcomes. Table A-1 in Appendix A summarises how the stormwater activity contributes to the achievement of the Council's Community Outcomes.

R.3 Level of Service

Levels of service are attributes that Tasman District Council expects of its assets to deliver the required services to stakeholders.

A key objective of this plan is to clarify and define the levels of service for the stormwater assets and then identify and cost future operations, maintenance, renewal and development works required of these assets to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Levels of service can be strategic, tactical, operational or implementation and should reflect the current industry standards and be based on:

- **Customer Research and Expectations:** nformation gained from stakeholders on expected types and quality of service provided.
- **Statutory Requirements:** Legislation, regulations, environmental standards and Council bylaws that impact on the way assets are managed (eg, resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.
- **Strategic and Corporate Goals:** Provide guidelines for the scope of current and future services offered and manner of service delivery, and define specific levels of service, which the organisation wishes to achieve.
- **Best Practices and Standards**: Specify the design and construction requirements to meet the levels of service and needs of stakeholders.

R.3.1. Industry Standards and Best Practice

The AMP acknowledges the Council's responsibility to act in accordance with the legislative requirements that impact on the Council's stormwater activity. A variety of legislation affects the operation of these assets, as detailed in Appendix A.

R.3.2. Prioritisation Related to Available Resources

With stormwater assets, there are often higher levels of maintenance and renewal requirements proposed (increased levels of service etc) than the resources allow for. For example the 2014 community survey rated stormwater services as the second highest in the dissatisfaction list. In response to recent storm events and community desires the level of funding for routine maintenance and the relative total budget for stormwater services increased. Tradeoffs then have to be made as to what impacts on the ability of an asset to provide a service against the nice to have aspects. To assist this prioritisation the Council has adopted this formula to give weight to remedial works to protect properties that have had floor flooded or that will protect new sections from flooding.

$$\frac{(\text{flooded section} \times 1 + \text{floor flooded once} \times 5 + \text{floor flooded again} \times 10 + \text{growth section} \times 3)}{\text{Cost of the works to achieve flood avoidance}}$$

Additional flooding information was gathered from the community in 2014 to assist use of this formula for the 2015-25 LTP.

For renewal versus operational cost expenditure tradeoffs a ratio of 10:1 has been adopted meaning that if maintenance costs are greater than 10% of the renewal cost in any year then renewal would be programmed.

R.4 Aim of Stormwater Services

Our stormwater systems collect and convey stormwater from common events safely through urban environments, reducing the adverse effects of flooding on people and residential and commercial buildings.

R.5 Mandatory Reporting Measures

The new national Non-financial Performance Measures Rules 2013 require ongoing recording of relevant data to report against the following four performance measures.

R.5.1. Performance Measure One (System and Adequacy):

- The number of flooding events that occur in a territorial authority district.
- For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)

R.5.2. Performance Measure Two (Management of Environmental Impacts):

Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of:

- abatement notices;
- infringement notices;
- enforcement orders;

- successful prosecutions, received by the territorial authority in relation those resource consents.

R.5.3. Performance Measure Three (Response to Stormwater System Issues):

The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

R.5.4. Performance Measure Four (Customer Satisfaction):

The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.

R.6 What Level of Service Do We Seek to Achieve?

There are many factors that need to be considered when deciding what level of service the Council will aim to provide. These factors include:

- The Council needs to aim to understand and meet the needs and expectations of the community;
- The Council must meet its statutory obligations
- the services must be operated within the Council's policy and objectives;
- the community must be able to fund the level of service provided.

Two tiers of levels of service are outlined: Strategic and Operational.

The operational levels of service and performance measures are used to ensure the service and facilities are able to achieve the strategic levels of service and Councils objectives.

Level of services are reviewed and upgraded on a cyclic basis in line with legislative and regulatory changes and feedback from customers, consultation, internal assessments, audits and strategic objectives

The Levels of Service that the Council has adopted for this AMP have been developed from:

- the levels of service in the 2012 AMPs;
- changes to technical levels to reflect climate change and secondary flow;
- the new mandatory reporting measures;
- the community reaction to flooding events since 2012.

They also take into account feedback from various parties including Audit New Zealand, industry best practice and the ease of measuring and reporting of performance.

The Council has decided to show only the level of service measures that are considered to be customer focused in the LTP. These public levels of service and performance measures are consulted on and adopted as part of the LTP consultation process.

The AMP extends the levels of service and performance measures to include the more technical measures associated with the management of the activity.

Table R-1 details the levels of service and associated performance measures for the stormwater activity. Those shaded are the customer focused measures which are included in the LTP. The table sets out the Council's current performance and the targets they aim to achieve within the next three years and by the end of the next 10 year period.

R.7 Plans the Council Has Made to Meet The Levels of Service

The Council is making a substantial capital works investment over the next 30 year period to upgrade existing stormwater assets to improve levels of service in the stormwater system (Appendix F).

In preparing the future financial forecasts, the Council has included the following specific initiatives to meet the current or intended future levels of service:

The Council is making a substantial capital works investment over the next 30 year period to upgrade existing stormwater assets and improve levels of service (Appendix F). This includes the following specific schemes:

- Extensive upgrades in reticulation around the Richmond Town Centre;
- A long term programme of upgrading Borck Creek and its tributaries through Richmond West and South.
- Upgrading of Woodlands drain and extension of the network to support development in Motueka West.
- a programme of water quality treatment installations as identified by the CMPs.
- A programme of secondary flowpath acquisition and protection projects as identified by the CMPs.
- increasing the capacity of the reticulation in the Richmond, Brightwater, Wakefield, and Mapua areas to allow for the predicted future growth;

Please refer to Appendix F for specific projects.

In addition to the capital works, the Council has allocated a substantial budget for the operation and maintenance of its current and future stormwater assets (Appendix E). This allocation includes work and studies such as:

- increased maintenance of key urban open drainage channels; and
- production of a baseline reports, models and CMPs for each of the UDAs.

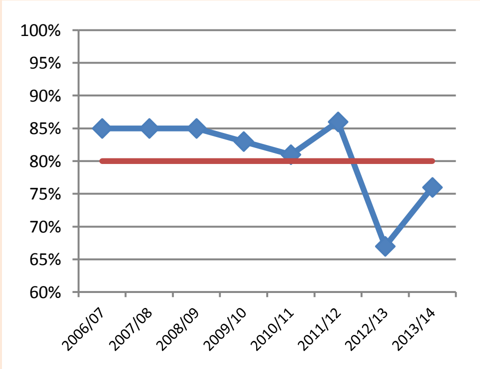
R.7.1. Levels of Service Linked to Legislation

Whilst the Council is required to comply with various legislation and regulations when managing the stormwater activity, the only specific levels of service relate to legislation are the mandatory performance measures noted discussed at section R.5 and shown in Table R-1..

Table R-1 Levels of Service Summary

Our level of service – What the Council will do and how it will measure performance over the 10 years from 2015. Shaded sections are publically reported and unshaded sections are used for self-assessment by Utilities Engineers and Engineering Services Management.

ID	Levels of Service (we provide)	Performance measure (We will know we are meeting the level of service if…)	Current Performance	Future Performance Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Future Performance (targets) in Year 10 2024/25
Community Outcome: Our unique natural environment is healthy and protected.							
1	**Our stormwater systems do not adversely affect or degrade the receiving environment.**	Council has resource consents in place for each of the 15 stormwater UDAs. Resource consents are held in Council's Confirm database.	**Actual** = 0 Resource consents will be obtained in conjunction with catchment management plans for each UDA.	1 of 15 Richmond	2/15 Motueka	4/15 Takaka & Mapua	15/15
2		Compliance with resource consents is achieved, as measured by the number of; • abatement notices • infringement notices • enforcement orders, or • convictions issued. (Mandatory measure 2)	**Actual = NA** (New measure, data will be recorded in NCS).	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
3	**We have adequate knowledge of our stormwater systems capacity and usage to facilitate improvement**	The number of Urban Drainage Areas that have Catchment Management Plans meets the target.	**Actual = 0** A draft plan exists for Richmond and this is be finalised to be the template for the other settlements. The AMP will record progress on completing plans.	1 of 15	2	4	All 15
4		The number of flooding events that occur (per year) is less is less than the target. As measured through complaints recorded in the Confirm database. (Mandatory measure 1)	**Actual = NA** (New measure, data will be recorded in Confirm)	<20	<20	<20	<20
5		Number of habitable floors affected in each flood event for each 1000 properties connected to the stormwater system is less than the target. As measured through complaints recorded in the Confirm database. (Mandatory measure 1)	Actual = NA (New measure, data will be recorded in Confirm)	<5	<5	<5	<5

ID	Levels of Service (we provide)	**Performance measure** (We will know we are meeting the level of service if…)	Current Performance	Future Performance Year 1 2015/16	Future Performance Year 2 2016/17	Future Performance Year 1 2015/16	Future Performance (targets) in Year 10 2024/25
Community Outcome: Our stormwater and essential services are sufficient, efficient and sustainably managed							
6	**Our stormwater activities are managed at a level which satisfies the community.**	% of customers satisfied with the stormwater service. As measured through the annual resident survey.	**Actual = 76%.** The annual residents' survey was undertaken in May/June 2014 and 76% of receivers of the service were found to be satisfied with the service they received. This is the second year below the 80% target value. 	80%	80%	80%	80%
7		Complaints per 1000 connections are less than the target - as recorded through Council's Confirm database (Mandatory measure 4)	**Actual = NA** (New measure, data will be recorded in Confirm)	<20	<20	<20	<20

APPENDIX S COUNCIL'S DATA MANAGEMENT, ASSET MANAGEMENT PROCESSES AND SYSTEMS

S1 Introduction

The Office of the Auditor General (OAG) has chosen to use the International Infrastructure Management Manual (IIMM) as the benchmark against which New Zealand councils measure their standards. The IIMM describes the Asset Management (AM) process as a step by step process applied to an activity or network level, to manage assets from planning to disposal or renewal. This process is shown in Figure S-1.

Each of these processes is summarised in this Appendix.

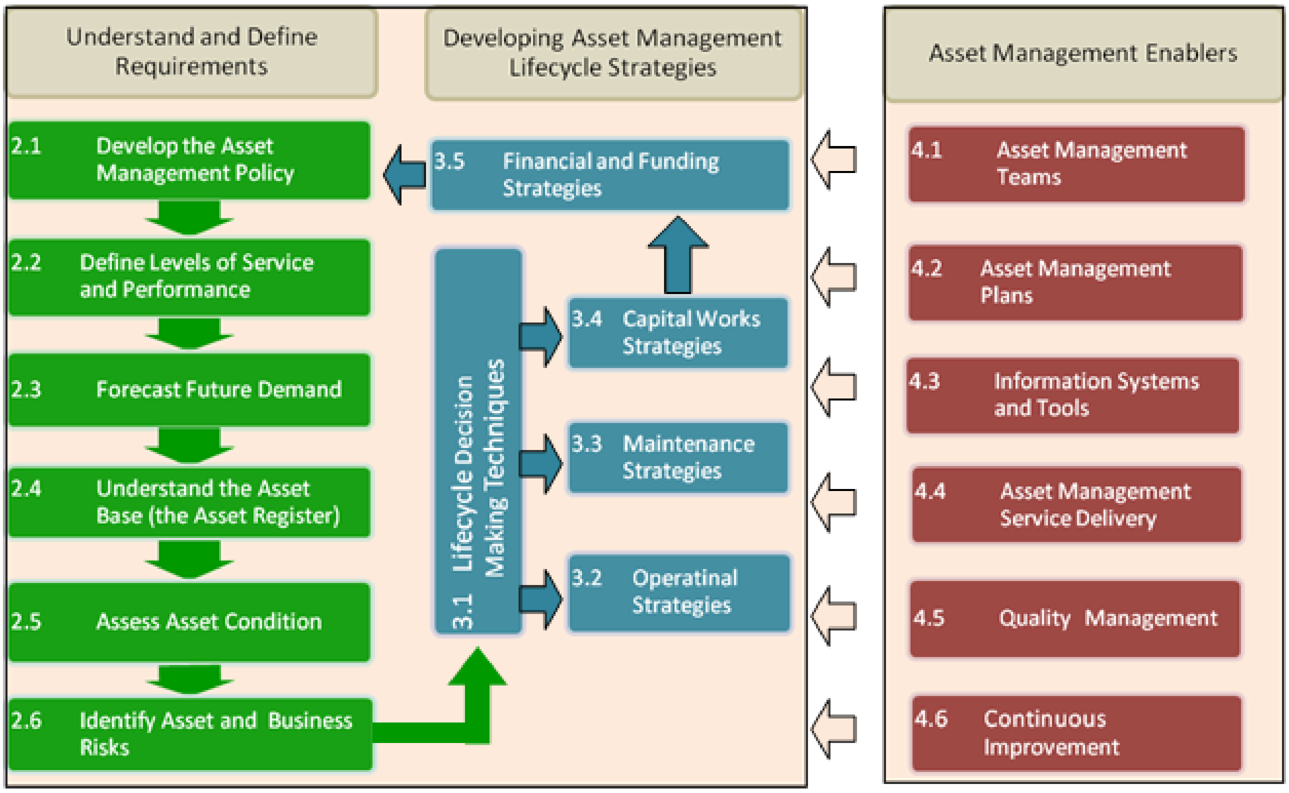


Figure S-1: The Asset Management Process (taken from IIMM 2011)

S2 Understand and Define Requirements

This phase determines what service levels are required and how future demand might change over time, as well as the current assets' capability to deliver on those requirements.

S2.1 Develop the Asset Management Policy

The Asset Management policy framework guides the organisation in terms of priorities and strategies, and sets out specific responsibilities, objectives, targets and plans. The Council has approached this by determining the desired and actual levels of asset management practice, and identifying the gaps between them for future improvement.

S2.1.1 Determine the Appropriate (Desired) Level of Asset Management Practice

The level of Asset Management expected can differ between activities. The IIMM defines the standards of the Activity Management Plans (AMPs) on a scale as follows:

- Minimum Starting point

- Core — Basic
- Intermediate (core plus) — Transition between Core and Advanced
- Advanced — Most thorough

In 2010, Waugh Infrastructure Management Ltd undertook a review these levels and advised on target levels. A range of parameters (including populations, issues affecting the district, costs and benefits to the community, legislative requirements, size, condition and complexity of assets, risk associated with failure, skills and resources available, and customer expectation) was assessed to determine the most suitable level of asset management.

The results showed that Tasman District Council should be managing its assets at the following levels:

- Transportation — Intermediate with demand management and resource availability drivers
- Stormwater, Water, Wastewater — Intermediate with demand and risk management drivers
- Solid Waste — Core with risk management drivers
- Rivers — Core
- Coastal Structures — Core (future reassessment may be required)

S2.1.2 Determine the Actual Level of Asset Management Practice and Identify Gaps

The Council underwent a process at the end of the 2009 AMP to undertake a high level review of the AMPs and associated activity management processes against good practice asset management as described in the IIMM and in accordance with the Office of Auditor General. During this process, the AMP and associated practices were scored to give a snapshot of the current status and then set targets as to where the Council wished to head. The 2009 AMP Improvement Plan was assessed in its effectiveness to close the gap between actual and target compliance levels and new items added to the Improvement Plan where gaps were identified.

The results of the review are detailed in a report (Performance Review of Stormwater Activity Management Processes, MWH New Zealand Ltd February 2010).

The two reviews described above were carried out independently of each other. However, the outputs from both were compared to ensure consistency of recommendations. Whilst both reviews focused on slightly different aspects of asset management practices, there was no conflict between the recommendations made.

This work is now somewhat dated as the AMPs have changed substantially since 2009. This area will be renewed following development of the LTP.

Table S-1 below shows analysis undertaken to link the two reviews to identify the compliance gaps and actions that should be undertaken to address them.

Table S-1: Analysis of Asset Management Reviews

	INTERMEDIATE	Compliance Status	Compliance Gaps to Address to Meet INTERMEDIATE
Description of Assets	Advanced	Substantially Compliant	**Action:** improve level of performance data in Confirm.
Levels of Service	Core	Higher level of compliance than suggested	There is substantial communication of LoS with the public.
Managing Growth	Advanced	Substantially Compliant	**Action:** Improve level of demand strategies for Wastewater and Stormwater.
Risk Management	Advanced	Substantially Compliant	**Action:** Improve integration with maintenance and replacement strategies.
Lifecycle Decision Making	Advanced (with the exception of predictive modelling)	Partially Compliant	**Action:** Improve evaluation tools.
Financial Forecasts	Advanced (with the exception of sensitivity testing of forecasts)	Compliant	No plans to undertake sensitivity testing of forecasts.
Planning Assumptions and Confidence Levels	Advanced	Substantially Compliant	**Action:** Improve confidence and accuracy of asset data and performance.
Outline Improvement Programmes	Advanced	Substantially Compliant	**Action:** Identify timeframes, priorities and resources for Improvement Plan actions.
Planning by Qualified Persons	Core	Compliant	Intending to achieve Advanced by undertaking Peer Review.
Commitment	Advanced	Substantially Compliant	**Action:** More emphasis and commitment needed to Improvement Plan.

S2.2 Define Levels of Service and Performance

The Level of Service and Performance Management frameworks will ensure that agreed stakeholder requirements are met. Levels of Service, Performance measures, and Relationship to Community Outcomes are detailed in Appendix R.

S2.3 Forecast Future Demand

Understanding how future demand for service will change enables the Council to plan ahead to meet that demand. Demand and future new capital requirements are dealt with in Appendix F.

S2.4 Understand the Asset Base (the Asset Register)

A robust asset register is a core requirement for asset management.

Data on the Council assets is collected via as-built plans (supplied through capital works and subdivision), maintenance contract work and field studies. Two enterprise asset systems are used to record core data:

- RAMM – Transportation excluding streetlights;

- Confirm – Stormwater, Water, Wastewater, Solid Waste, Rivers, Coastal Structures, Streetlights.

Most data sets are viewable on the corporate GIS browser, Explore Tasman. Reporting systems summarise data for management and performance reporting, and for providing links between AM systems and GIS / financial systems. Several other standalone applications exist for specific purposes.

The Asset Register and other Information Systems are described more comprehensively in section S4.3 Information Systems and Tools.

S2.5 Assess Asset Condition

The Council needs to understand the current condition of its assets. Monitoring programmes should be tailored to consider how critical the asset is, how quickly it is likely to deteriorate, and the cost of data collection.

Condition assessment is not performed on individual reticulation assets; reticulation systems as a whole are audited. The audits look at the conditions of the sites and items that need replacement or repair are identified. Our network is comparatively young so condition is not yet a big issue. Once critical assets are defined, these will be assessed for condition, especially those assets which are approaching the end of their theoretical useful life. We are also looking at ways to make better use of current information that is gathered but not stored in the asset register.

Where condition rating is done, a 1-5 scale is used, as per the NZQQA Infrastructure Asset Grading Guidelines, as shown in Table S-4.

Table S-4: Asset Condition Rating Table

Condition Grade and Meaning	General Meaning
1 **Very Good**	Life: 10+ years. Physical: Fit for purpose. Robust and modern design. Access: Easy; easy lift manhole lids, clear access roads. Security: Sound structure with modern locks. Exposure: Fully protected from elements or providing full protection.
2 **Good**	Life: Review in 5 – 10 years. Physical: Fit for purpose. Early signs of corrosion/wear. Robust, but not latest design. Access: Awkward; heavy/corroded lids, overgrown with vegetation. Security: Sound structure with locks. Exposure: Adequate protection from elements or providing adequate protection.
3 **Moderate**	Life: Review in 5 years. Physical: Potentially impaired by corrosion/wear, old design or poor implementation. Access: Difficult: requires special tools or more than one person. Secure: Locked but structure not secure, or secure structure with no locks. Exposure: Showing signs of wear that could lead to exposure.
4 **Poor**	Life: Almost at failure, needs immediate expert review. Physical: Heavy corrosion impairing use. Obvious signs of potential failure. Access: Restricted, potentially dangerous. Secure: Locks and/or structure easily breeched. Exposure: Exposure to elements evident e.g. leaks, over heating.
5 **Very Poor**	Life: 0 years – broken. Physical: Obvious impairments to use. Heavy wear/corrosion. Outdated/flawed design/build.

Condition Grade and Meaning	General Meaning	
	Access:	Severely limited or dangerous.
	Security:	No locks or easily breeched.
	Exposure:	Exposed to elements when not specifically designed to be.

S2.6 Identify Asset and Business Risks

A key process is assessing critical assets and risks. This feeds into all lifecycle decision making processes.

S2.6.1 Asset Risks - Critical Assets

All assets are now being graded for criticality as shown in Table S-3. This process is expected to be complete by early 2015.

Table S-3: Asset Criticality Rating Table

Condition Grade	Meaning	Significance for future maintenance
A	Critical	Advanced condition assessment and preventative maintenance
B	Normal	Standard condition assessment and maintenance
C	Non-critical	Reduced maintenance acceptable

Asset criticality is partially captured in Confirm; there is an ongoing project to complete this by early 2015.

Assets are created in Confirm with a default value of C. Asset type and site is then used as a first assessment of criticality. Further assessments are now being made using the criteria of position in the network and number of customers served, to get a final grading.

2.6.2 Business Risks

The Council has adopted an Integrated Risk Management framework to manage risks, both at corporate and activity level. This is detailed in Appendix Q, Significant Assumptions, Uncertainties and Risk Management.

S3 Developing Asset Management Lifecycle Strategies

S3.1 Lifecycle Decision Making Techniques

The lifecycle decision phase looks at how best to deliver on the requirements by applying various decision-making techniques, strategies and plans. These are discussed in separate appendices as listed below.

S3.2 Operational Strategies and Plans

Demand management strategies (reducing overall demand and / or reducing peak demands) are covered in Appendix N, Demand Management.

Emergency management processes are covered in Appendix Q, Significant Assumptions, Uncertainties and Risk Management.

S3.3 Maintenance Strategies and Plans

Optimised maintenance programmes are dealt with in Appendix E, Operations and Maintenance.

S3.4 Capital Works Strategies

Forecast growth and demand and new asset investment programming are detailed in Appendix F, Demand and Future New Capital Requirements.

Optimised renewal programmes and Asset investment programmes are covered in Appendix I, Capital Requirements for Future Renewals.

S3.5 Financial and Funding Strategies

A robust, long-term financial forecast is developed as the culmination of this phase, which identifies strategies to fund these programmes. This section covers how the resource demand of AM can be identified, disclosed and funded.

The following appendices hold this information:

Appendix D – Asset Valuations

Appendix G – Development Contributions / Financial Contributions

Appendix K – Public Debt and Annual Loan Servicing Costs

Appendix L – Summary of Future Overall Financial Requirements

Appendix M – Funding Policy, Fees and Charges

S4 Asset Management Enablers

Underpinning asset management decision-making at each stage are the following:

S4.1 Asset Management Teams

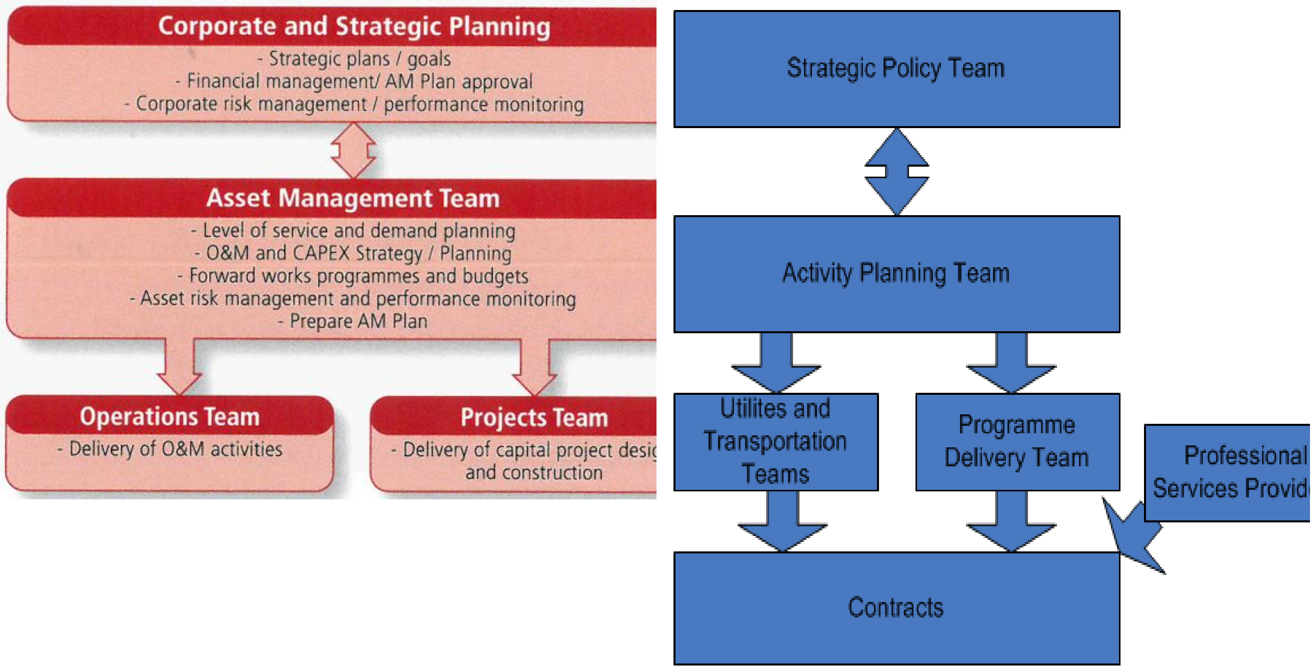
The Council has an organisational structure and capability that supports the AM planning process. Responsibility for asset planning across the lifecycle is delivered by teams within the Council as shown by Figure S-3 below.

Corporate and Strategic Planning is performed by the Strategic Policy team in the Community Services Department.

The Asset Management function is managed by Engineering's Activity Planning team. Operations are the responsibility of the Utilities and Transportation teams, while Projects and Contracts are managed by the Programme Delivery team.

Operations and maintenance and Contracts are externally tendered. Professional services are supplied by MWH New Zealand Ltd and other consultants. Details are discussed in Section 4.4.

Figure S-2: Asset Management Team Roles (taken from IIMM 2011) and Asset Management Teams at Tasman District Council.



S4.2 Asset Management Plans

Asset management plans need to be robust and set out clear future strategies and programmes. This document is a key part of the Asset Management process and will be updated on a regular basis in between AMP planning cycles.

S4.3 Information Systems and Tools

The Council has a variety of systems and tools that support effective operation and maintenance, record asset data, and enable that data to be analysed to support optimal asset programmes. These are detailed below. There is a continual push to incorporate all asset data into the core AM systems where possible; where not possible, attempts are made to integrate or link systems so that they can be easily accessed.

Figure S-2 shows how the various systems used in the Council inter-relate.

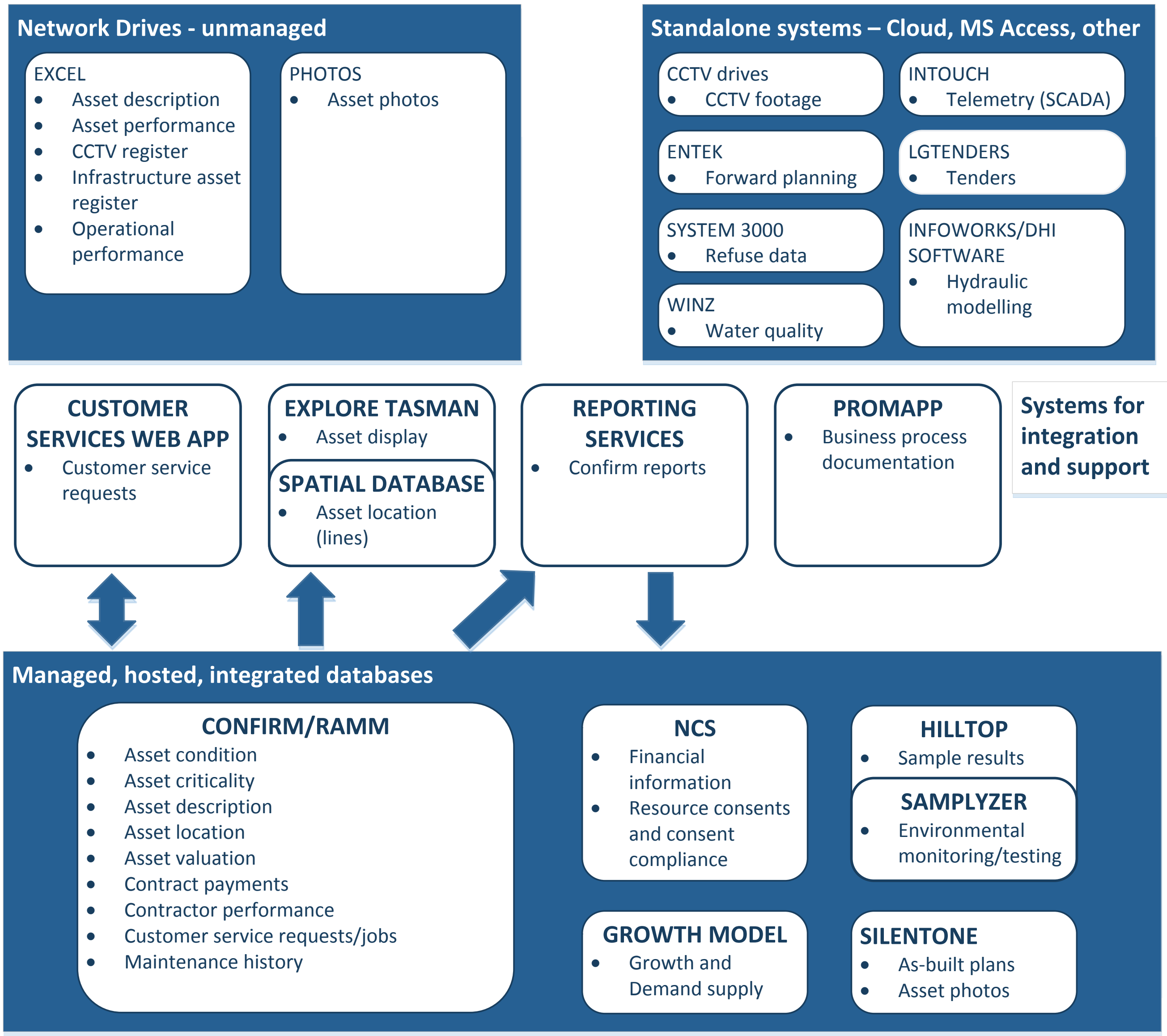


Figure S-2: Systems used for Asset Management at Tasman District Council

Table S-2 lists the various data types and systems they are held in, with a summary of how they are managed.

Table S-3 defines the Accuracy and Completeness grades applied to asset data in Table S-2

Table S-2: Data Types and Information Systems Used

Data type	Information system	Management strategy	Data accuracy	Data completeness
As-built plans	SilentOne	As-built plans are uploaded to SilentOne, allowing digital retrieval. Each plan is audited on receipt to ensure a consistent standard and quality.	2	2
Asset condition	Confirm	See discussion in section S2.5	N/A	N/A
Asset criticality	Confirm	See section S2.6.1 Asset Risks - Critical assets	4	3
Asset description	Confirm / spreadsheets	All assets are captured in Confirms Site and Asset modules, from as-built plans and maintenance notes. Hierarchy is defined by Site and three levels of Asset	2	2

Data type	Information system	Management strategy	Data accuracy	Data completeness
		ID (whole site, whole asset or asset). Assets are not broken down to component level except where required for valuation purposes. It is also possible to set up asset connectivity but this hasn't been prioritised for the future yet. Detail on some datasets held in spreadsheets relating to Utilities Maintenance Contract 688; work is in progress to transfer this detail to Confirm as resourcing allows.		
Asset location	Confirm (point data) / GIS (line data)	Coordinates for point data completely (NZTM) describe spatial location. Line data links to GIS layers that describe the shape.	2	2
Asset valuation	Confirm	Valuation of assets done based on data in Confirm and valuation figures stored in Confirm.	2	2
CCTV data	Hard drives / CCTV register / Confirm	CCTV footage on DVD is transferred to external hard drives and catalogued in a CCTV register spreadsheet and cross-referenced on Resource Consent in NCS if applicable. Data on condition and defects will be imported to Confirm and held against individual assets.	2	3
Contract payments	Confirm	All maintenance and capital works contract payments are done through Confirm. Data on expenditure is extracted and uploaded to NCS.	N/A	N/A
Contractor performance	Confirm	Time to complete jobs is measured against contract KPIs through Confirms Maintenance Management module.	N/A	N/A
Corporate GIS browser	Explore Tasman	Selected datasets are made available to all the Council staff through this internal GIS browser via individual layers and associated reports.	N/A	N/A
Customer service requests	Customer Services Application / Confirm	Customer calls relating to asset maintenance are captured in the custom-made Customer Services Application and passed to Confirms Enquiry module or as a RAMM Contractor Dispatch.	N/A	N/A
Environmental monitoring / testing	Hilltop / spreadsheet	Laboratory test results performed on monitoring and testing samples (from treatment plants and RRCs) are logged direct into Hilltop via an electronic upload from the laboratories. Due to historical difficulties in working with Hilltop data, it is duplicated in spreadsheets.	2	2
Financial information	NCS	The Council's corporate financial system is NCS, a specialist supplier of integrated financial, regulatory and administration systems for Local Government. Contract payment summaries are reported from Confirm and imported into NCS for	N/A	N/A

Data type	Information system	Management strategy	Data accuracy	Data completeness
		financial tracking of budgets.		
Infrastructure Asset Register	Spreadsheet	High level financial tracking spreadsheet for monitoring asset addition, disposals and depreciation. High level data is checked against detail data in the AM system and reconciled when a valuation is performed.	2	2
Forward planning	Entek TPM (Time and space Project Management)	Forward programmes for the Council's activities, and reseal / footpath renewal programmes, are uploaded to TPM in order to identify clashes and opportunities. The strength of this module relied on buy in from Utilities Companies and Local Contractors (neither of which occurred).	N/A	N/A
Growth and Demand Supply	Growth Model	A series of linked processes that underpin the Council's long term planning, by predicting expected development areas, revenues and costs, and estimating income for the long term.	2	2
Hydraulic modelling	Infoworks / DHI Software	Models have been developed for a number of schemes and catchments. Copies of the models are held on the Council's network drives.	2	4
Maintenance history	Confirm	Contractor work is issued via Confirms Maintenance Management module. History of maintenance is stored against individual assets. Prior to 2007 it was logged at a scheme level.	2	2
Photos	Network drives / SilentOne	Electronic photos of assets are mainly stored on the Council's network drives. Coastal Structures and Streetlight photos have been uploaded to SilentOne and linked to the assets displayed via Explore Tasman.	N/A	N/A
Processes and documentation	Promapp	Promapp is process management software that provides a central online repository where the Council's process diagrams and documentation is stored. It was implemented in 2014 and there is a phased uptake by business units.	2	5
Resource consents and consent compliance	NCS	Detail on Resource Consents and their compliance of conditions (eg, sample testing) are recorded in the NCS Resource Consents module.	2	2
Reports	Confirm Reports	Many SQL based reports from Confirm and a few from RAMM are delivered through Confirm Reports. Explore Tasman also links to this reported information to show asset information and links (to data in SilentOne and NCS)	N/A	N/A
Tenders	LGTenders	Almost all New Zealand councils use this system to advertise their tenders and to conduct the complete tendering process	N/A	N/A

Data type	Information system	Management strategy	Data accuracy	Data completeness
		electronically.		

Table S-3: Asset Data Accuracy and Completeness Grades

Grade	Description	% Accuracy
1	Accurate	100
2	Minor inaccuracies	± 5
3	50% estimated	± 20
4	Significant data estimated	± 30
5	All data estimated	± 40

Grade	Description	% Completeness
1	Complete	100
2	Minor gaps	90 – 99
3	Major gaps	60 – 90
4	Significant gaps	20 – 60
5	Limited data available	0 – 20

S4.4 Asset Management Service Delivery

The Council has opted to tender Capital Works and Operations and Maintenance externally to obtain more cost-effective service delivery.

The Council has adopted effective procurement strategies, such that AM activities are being delivered in the most cost-effective way (value for money rather than lowest cost).

S4.4.1 Procurement Strategy

Tasman District Council has a formal Procurement Strategy for its Engineering Services. This strategy has been prepared to meet New Zealand Transport Agency's (NZTA) requirements for expenditure from the National Land Transport Fund, and it describes the procurement environment that exists within the Tasman District. It has been developed following a three-year review of the Strategy and approved in November 2013. It principally focuses on Engineering Services activities but is framed in the NZTA procurement plan format, which is consistent with whole of government procurement initiatives.

The Council's objectives are to:

- implement policies and financial management strategies that advance the Tasman District;
- ensure sustainable management of natural and physical resources, and security of environmental standards;
- sustainably manage infrastructure assets relating to Tasman District;
- enhance community development and the social, natural, cultural and recreational assets relating to Tasman District;
- promote sustainable economic development in the Tasman District.

The Council has recently implemented a procurement and tender award governance gateway process. This is shown in Figure S-3 below.

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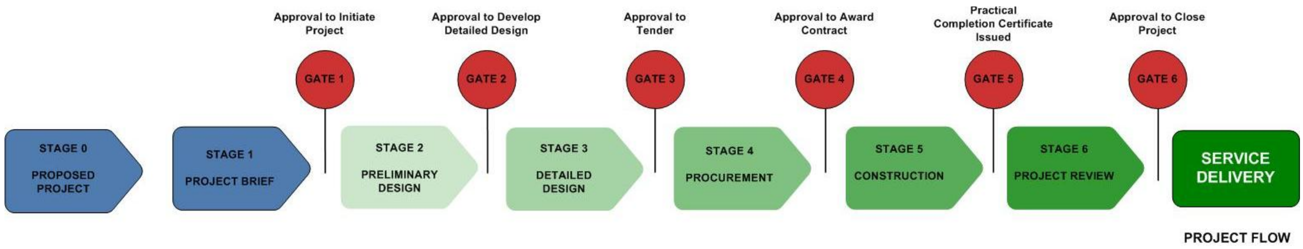


Figure S-3: Gateway process used by Programme Delivery

At the Approval to Tender gate (Gate 3), the Tender Evaluation Team:

1. Carefully reviews the specifications, drawings, detailed design
2. Reviews estimate against allocated budget and checks availability of funds
3. Assesses/ reviews project-specific risks and critical success factors
4. Selects the evaluation method (supplier panel or direct to market; Price/Quality, Lowest Price Conforming, Weighted Attributes, Target Price, Brooks Law, etc) – check best suited to project's scope and risk levels
5. Checks peer review of design
6. Checks status of required consents and land issues
7. Reviews Price/ Non-Price weightings, risk review and quality premium they are prepared to pay
8. Reviews attributes (including pass/ fail and/ or weightings) and targeted questions in RFT to check for relevance to project-specific success factors and differentiators
9. Reviews the response period (relative to RFT requirements) to ensure there is sufficient time for quality responses.

At the Approval to Award gate (Gate 4), the Programme Delivery Manager:

1. Reviews the tender process to check relevance/ effectiveness.
2. Reviews the recommendation.
3. Checks if Tender Panel approval is required.
4. Awards the Contract.

S4.4.2 Professional services Contract

The Engineering Services Department has a need to access a broad range of professional service capabilities to undertake investigation, design and procurement management in support of its significant transport, utilities, coastal management, flood protection and solid waste capital works programme. There is also a need to access specialist skills for design, planning and policy to support the in-house management of the Council's networks, operations and maintenance.

To achieve this the Council went to the open market in late 2013 for a primary professional services provider as a single preferred consultant to undertake a minimum of 60% in value of the Council's infrastructure professional services programmes. The contract was awarded to MWH New Zealand Ltd following a six month tender selection process and commenced on 1 July 2014 with an initial three year term and two three-year extensions to be awarded at the Council's sole discretion.

S4.5 Quality Management

Table S-4 outlines quality management approaches that support the Council's asset management processes and systems.

Process documentation	This is being phased in across the Council with the implementation of Promapp. Over time business units are capturing organisational knowledge in an area accessible to all staff, to ensure business continuity and consistency. Detailed documentation, forms and templates can be linked to each activity in a process. Processes are shown in flowchart or swim lane format, and can be shared with external parties.
Quality Management systems	Tasman District Council does not have a formal Quality Management system across the Council; quality is ensured by audits and checks that are managed in individual teams. Quality checks are done at many stages throughout the Asset Management process.
Planning	The planning process is formalised across the Council, with internal reviews and the Council approval stages. Following completion of the AMPs, a peer review is done. From that a comprehensive Improvement Plan is drawn up. Actions are discussed at regular meetings and progress noted. These will be incorporated into the following round of AMPs.
Programme Delivery	This follows strictly a gateway system with inbuilt checks and balances at every stage. Projects can't proceed until all criteria of a certain stage have been completely met and formally signed off.
Subdivision works	Subdivision sites are audited for accuracy of data against the plans submitted. CCTV is performed on all subdivision Stormwater and Wastewater assets at completion of works and again before the assets are vested in the Council, so that defects can be repaired.
Asset creation	As-built plans are reviewed on receipt for completeness and adherence to the Engineering Standards and Policies. If anomalies are discovered during data entry, these are investigated and corrected. As-built information and accompanying documentation is required to accompany maintenance contract claims.
Asset data integrity	Monthly reports are run to ensure data accuracy and completeness. Stormwater, Water, Wastewater, Coastal Structures, Solid Waste and Streetlight assets are shown on the corporate GIS browser, Explore Tasman, and viewers are encouraged to report anomalies to the Activity Planning Data Management team.
Asset performance	Audits of reticulation flows are done regularly to ensure that system performance is optimal.
Operations	Audits of a percentage of contract maintenance works are done every month to ensure that performance standards are maintained. Failure to comply with standards is linked to financial penalties for the contractor.
Levels of Service	Key performance indicators are reported regularly in Engineering Services Committee meetings and then again annually and audited by the OAG.
Customer Service Requests (CSRs)	Asset based CSRs (in Confirm and RAMM) are checked monthly for outstanding items via a customised report that is e-mailed to action officers. Non-asset based CSRs (in NCS) are checked for compliance weekly at Senior Management Teams, via a dashboard reporting system.
Reports to Council	All reports that are presented to the Council are reviewed and edited by the Executive Assistant prior to approval by the Engineering Manager and the Senior Management Team.

Table S-4: Quality Management Approach

S4.6 Continuous Improvement

Processes are in place to monitor the adequacy, suitability and effectiveness of all asset management planning activities to drive a continuous cycle of review, corrective action and improvement. These are covered by Appendix V, Improvement Programme.

APPENDIX T BYLAWS

The following bylaws have been adopted by the Council:

- Consolidated Bylaws 2013 - Introduction
- Control of Liquor in Public Places 2012
- Dog Control Bylaw 2014
- Freedom Camping Bylaw 2011
- Freedom Camping (Motueka Beach Reserve) Bylaw 2013
- Navigation Safety Bylaw 2014
- Speed Limits Bylaw 2013
- Stock Control and Droving Bylaw 2005
- Wastewater Bylaw 2015
- Trading in Public Places Bylaw 2010
- Traffic Control Bylaw 2013
- Water Supply Bylaw 2009

In accordance with the Local Government Act 2002, these bylaws will be reviewed no later than 10 years after they were last reviewed.

There are no bylaws of direct relevance to this activity.

Provision has been made in the Operations budget to develop a Stormwater Bylaw in conjunction with next bylaw review in year 2, refer to Appendix E for further information. The purpose of this bylaw will be to give the Council power to meet anticipated resource consent conditions relating to discharge quality and potentially to increase control over privately maintained stormwater assets.

APPENDIX U STAKEHOLDERS AND CONSULTATION

U.1 Stakeholders

There are many individuals and organisations that have an interest in the management and / or operation of the Council's assets. The Council has a Community and Engagement Policy which is designed to guide the expectations with the relationship between the Council and the Tasman community. The Council has made a promise to seek out opportunities to ensure the communities and people it represents and provides services to have the opportunity to:

- be fully informed;
- provide reasonable time for those participating to come to a view;
- listen to what they have to say with an open mind;
- acknowledge what we have been told; and
- inform contributors how their input influenced the decision the Council made or is contemplating.

Engagement or consultation:

- is about providing more than information or meeting a legal requirement;
- aids decision making;
- is about reaching a common understanding of issues;
- is about the quality of contact not the amount; and
- is an opportunity for a fully informed community to contribute to decision-making.

The key stakeholders the Council consults with about the wastewater activity are:

- elected members (Councillors and Community Board members);
- iwi/Maori (including Tiakina te Taiao and Manawhenua ki Mohua, iwi monitors);
- regulatory (consent compliance, Public Health);
- fisheries organisations;
- Public Health Service (Nelson-Marlborough District Health Board);
- Heritage New Zealand;
- Civil Contractors New Zealand (Nelson - Marlborough);
- service providers / suppliers (Network Tasman, power companies);
- affected or interested parties (when applying for resource consents);
- neighbours

U.2 Consultation

U.2.1. Purpose of Consultation and Types of Consultation

The Council consults with the public to gain an understanding of customer expectations and preferences. This enables the Council to provide a level of service that better meets the community's needs.

The Council's knowledge of customer expectations and preferences is based on:

- feedback from surveys;
- public meetings;
- feedback from elected members, advisory groups and working parties;
- analysis of customer service requests and complaints; and
- consultation via the Annual Plan and Long Term Plan (LTP) process.

The Council commission's resident surveys on a regular basis, every year since 2008, from the National Research Bureau Ltd[1]. These Communitrak™ surveys assess the levels of satisfaction with key services including stormwater services, and the willingness across the community to pay to improve services.

From time to time the Council undertakes focused surveys to get information on specific subjects or projects.

U.2.2. Consultation Outcomes

The most recent NRB Communitrak™ survey was undertaken in May 2014. This asked whether residents were satisfied with the stormwater system and included residents that had a Council service and some that were not on a Council service. The results from this survey are summarised in Figure U-1.

Overall Satisfaction with Council Stormwater Systems **Satisfaction Where Service Provided**

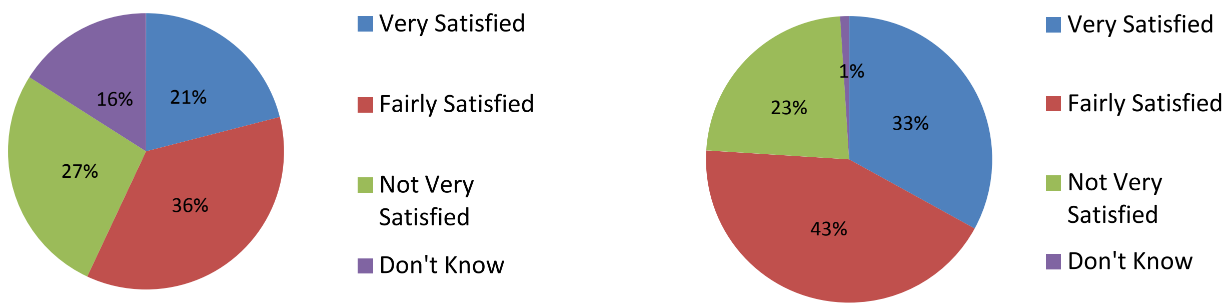


Figure U-1: Customer Satisfaction with Council Stormwater

These figures show a relatively high level of dissatisfaction. This is above the peer group and national averages. There is also a very low level of "don't know" responses where the service is provided. This indicates a heightened community awareness of stormwater which is consistent with the significant storm events which have impacted the area over the last few years.

Figure U-2 shows that customer satisfaction levels with the stormwater service have been on a variable but declining trend since 2009.

[1] Communitrak™: Public Perceptions and Interpretations of Council Services / Facilities and Representation, NRB Ltd May 2014.

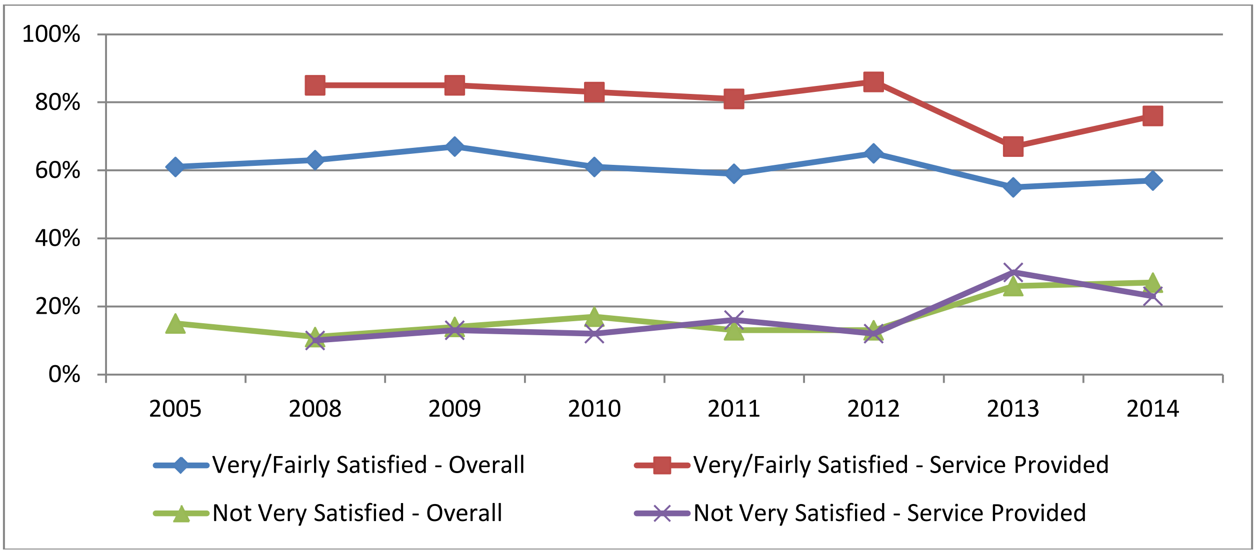


Figure U-2: Satisfaction with Stormwater

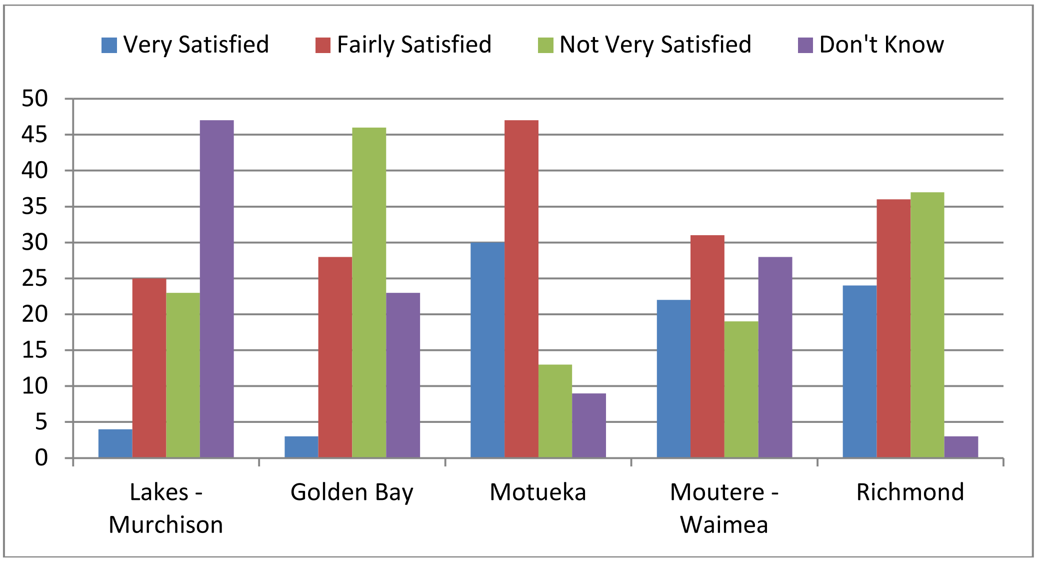


Figure U-3: Overall Satisfaction by Ward

The main reasons residents are not very satisfied with stormwater services are:

- flooding / surface flooding;
- poor drainage / inadequate system / needs upgrading / improving;
- run-off/flooding on property;
- no stormwater service;
- drains / culverts blocked / need cleaning

When asked whether they would like more to be spent, less, or about the same for stormwater service provision, 88% said they would like to see the same or more (given that the Council cannot spend more without increasing rates or user charges). This is shown in Figure U-4 and compared to previous results.

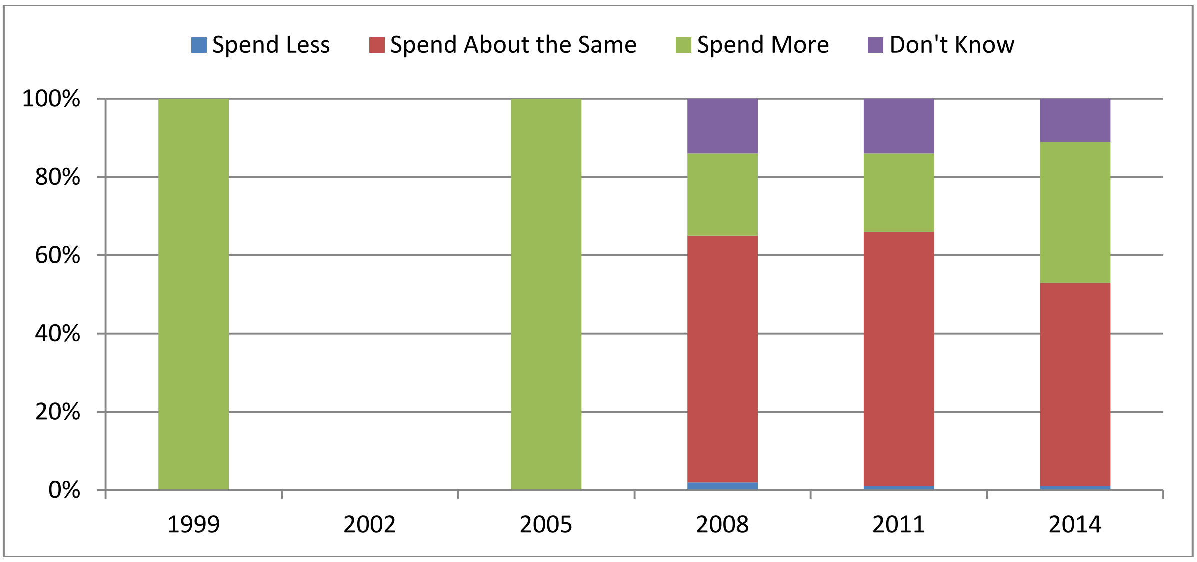


Figure U-4: More or Less Spending on Stormwater

This shows that few people want to spend less and most want to spend the same or more. This is a significant indication by the community which the Council has recognised in the level of funding provided to stormwater in the 2015-2025 period.

Overall, the survey shows that:

- residents are not really satisfied with the service received whether they are connected or not and this is directly attributable to a series of large storm events which have highlighted the deficiencies in the system;
- a small number of people want to spend less on stormwater services;
- the percent not very satisfied (23%) is above the peer group average and the national average;
- thirty-six percent want more spent on stormwater knowing that this will mean higher charges.

APPENDIX V IMPROVEMENT PLAN

To be provided in final document.

APPENDIX W ASSET DISPOSALS

W.1 Asset Disposal Strategy

The Council does not have a formal strategy on asset disposals and as such it will treat each asset individually on a case-by-case basis when it reaches a state that disposal needs to be considered.

Asset disposal is generally a by-product of renewal or upgrade decisions that involve the replacement of assets.

Assets may also become redundant for any of the followings reasons:

- under utilisation;
- obsolescence;
- provision of the asset exceeds the required level of service;
- uneconomic to upgrade or operate;
- policy change;
- the service is provided by other means (eg, private sector involvement); and
- potential risk of ownership (financial, environmental, legal, social, vandalism).

Depending on the nature, location, condition and value of an asset it is either:

- made safe and left in place;
- removed and disposed of;
- removed and sold; and
- ownership transferred to other stakeholders by agreement.

In most situation assets are replaced at the end of their useful lives and are generally in poor physical condition. Consequently, the asset with be disposed of to waste upon its removal. In some situations an asset may require removal or replacement prior to the end of its useful life. In this circumstance the Council may hold the asset in stock for reuse elsewhere on the network. Otherwise, if this is not appropriate it could be sold off, transferred or disposed of.

When assets sales take place the Council aims to obtain the best available return from the sale and any net income will be credited to that activity. The Council follows practices that comply with the relevant legislative requirements for local government when selling off assets.

W.2 Disposal Standards

The Council follows a practice of obtaining best available return from the disposal or sale of assets within an infrastructural activity and any net income is credited to that activity.

W.3 Forecast Asset Disposals

There are currently no significant stormwater assets programmed for disposal.

APPENDIX X GLOSSARY OF ASSET MANAGEMENT TERMS

Acronyms and Abbreviations

AMP	Activity Management Plan
LGA	Local Government Act
LTP	Long Term Plan
TRMP	Tasman Regional Management Plan

Term	Description
Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Activity Management Plan (AMP)	Activity Management Plans are key strategic documents that describe all aspects of the management of assets and services for an activity. The documents feed information directly in the Council's LTP, and place an emphasis on long term financial planning, community consultation, and a clear definition of service levels and performance standards.
Advanced Asset Management	Asset management that employs predictive modelling, risk management and optimised renewal decision-making techniques to establish asset lifecycle treatment options and related long term cash flow predictions. (See Basic Asset Management).
Annual Plan	The Annual Plan provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility that has value enables services to be provided and has an economic life of greater than 12 months.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long-term cash flow projection for the activities.
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.

Term	Description
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Basic Asset Management	Asset management which relies primarily on the use of an asset register, maintenance management systems, job/resource management, inventory control, condition assessment and defined levels of service, in order to establish alternative treatment options and long term cashflow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than risk analysis and optimised renewal decision making).
Benefit Cost Ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs.
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Plan into detailed work plans for a particular, or range of, business activities. Activities may include marketing, development, operations, management, personnel, technology and financial planning.
Capital Expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.

Term	Description
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (eg. swimming pool complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised 'ordinary' assets as components.
I.M.S.	Infrastructure Management System - computer database
Level of Service (LoS)	The defined service quality for a particular activity (ie. water) or service area (ie. Water quality) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	Life cycle has two meanings. • The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset ie. from planning and design to decommissioning or disposal. • The period of time between a selected date and the last year over which the criteria (eg. costs) relating to a decision or alternative under study will be assessed.
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Life Cycle Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Long Term Plan (LTP)	The Long Term Plan is the primary strategic document through which Council communicates its intentions over the next 10 years for meeting community service expectations and how it intends to fund this work. The LTP is a key output required of Local Authorities under the Local Government Act 2002. The LTP replaces the Long Term Council Community Plan (LTCCP).
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.

Term	Description
Objective	An objective is a general statement of intention relating to a specific output or activity. They are generally longer-term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the life cycle costs of an asset.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance Indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned Maintenance	Planned maintenance activities fall into three categories. • Periodic – necessary to ensure the reliability or sustain the design life of an asset. • Predictive – condition monitoring activities used to predict failure. • Preventive – maintenance that can be initiated without routine or continuous checking (eg. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Recreation	Means voluntary non-work activities for the attainment of personal and social benefits, including restoration (recreation) and social cohesion.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Renewal Accounting	A method of infrastructure asset accounting which recognises that infrastructure assets are maintained at an agreed service level through regular planned maintenance, rehabilitation and renewal programmes contained in an asset management plan. The system as a whole is maintained in perpetuity and therefore does not need to be depreciated. The relevant rehabilitation and renewal costs are treated as operational rather than capital expenditure and any loss in service potential is recognised as deferred maintenance.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.

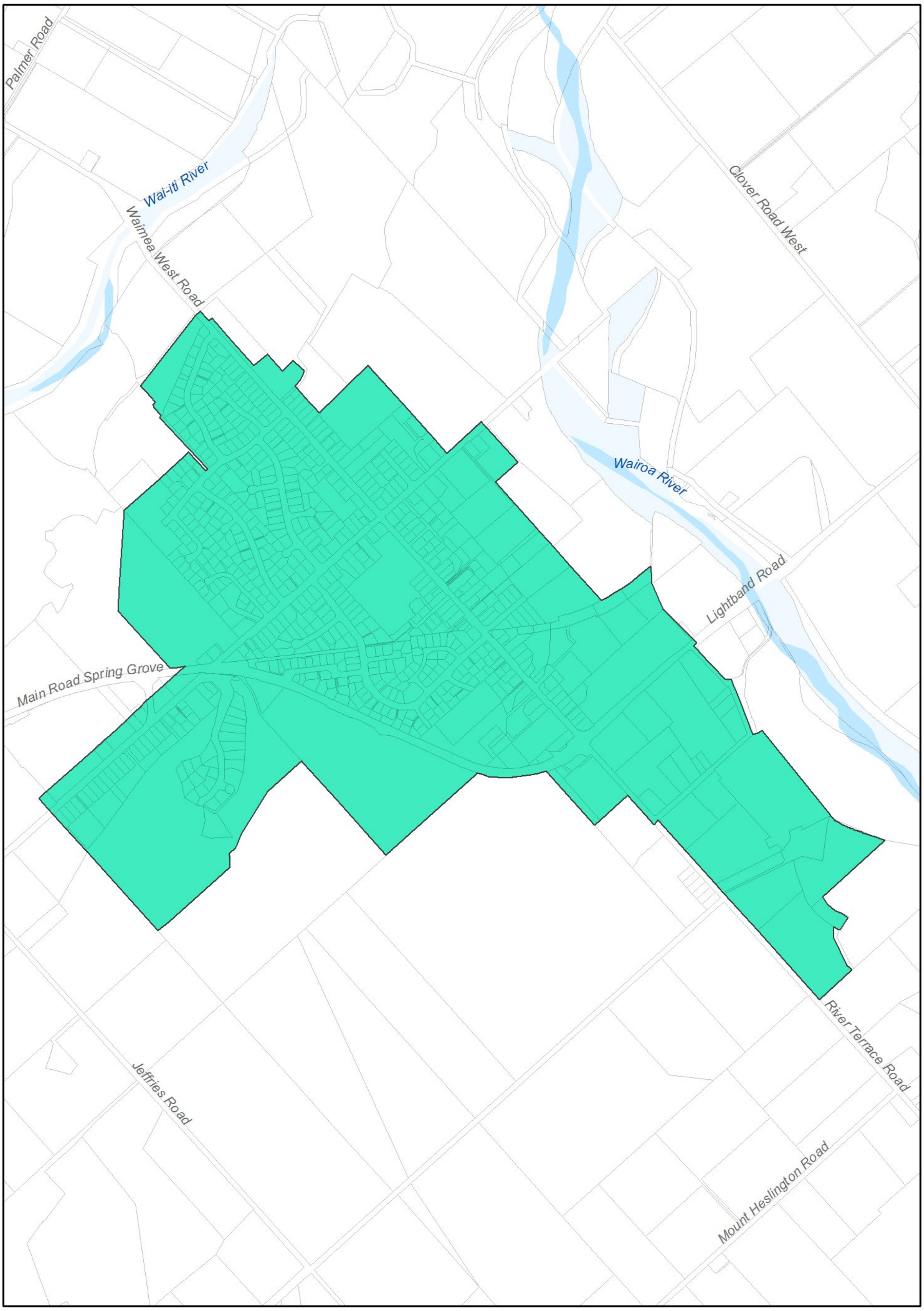
Term	Description
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine Maintenance	Day to day operational activities to keep the asset operating (eg. replacement of light bulbs, cleaning of drains, repairing leaks) and which form part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic Plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value that may depend on the purpose for which the valuation is required, ie. replacement value for determining maintenance levels or market value for life cycle costing.

APPENDIX Y STORMWATER UDA BOUNDARIES

The area boundaries are correct as at July 2015. The boundaries are revised periodically.

The current version is located in the Long Term Plan.

- Brightwater
- Collingwood
- Kaiteriteri
- Ligar Bay / Tata Beach
- Mapua / Ruby Bay
- Motueka
- Murchison
- Patons Rock
- Pohara
- Richmond
- St Arnaud
- Takaka
- Tapawera
- Tasman
- Wakefield



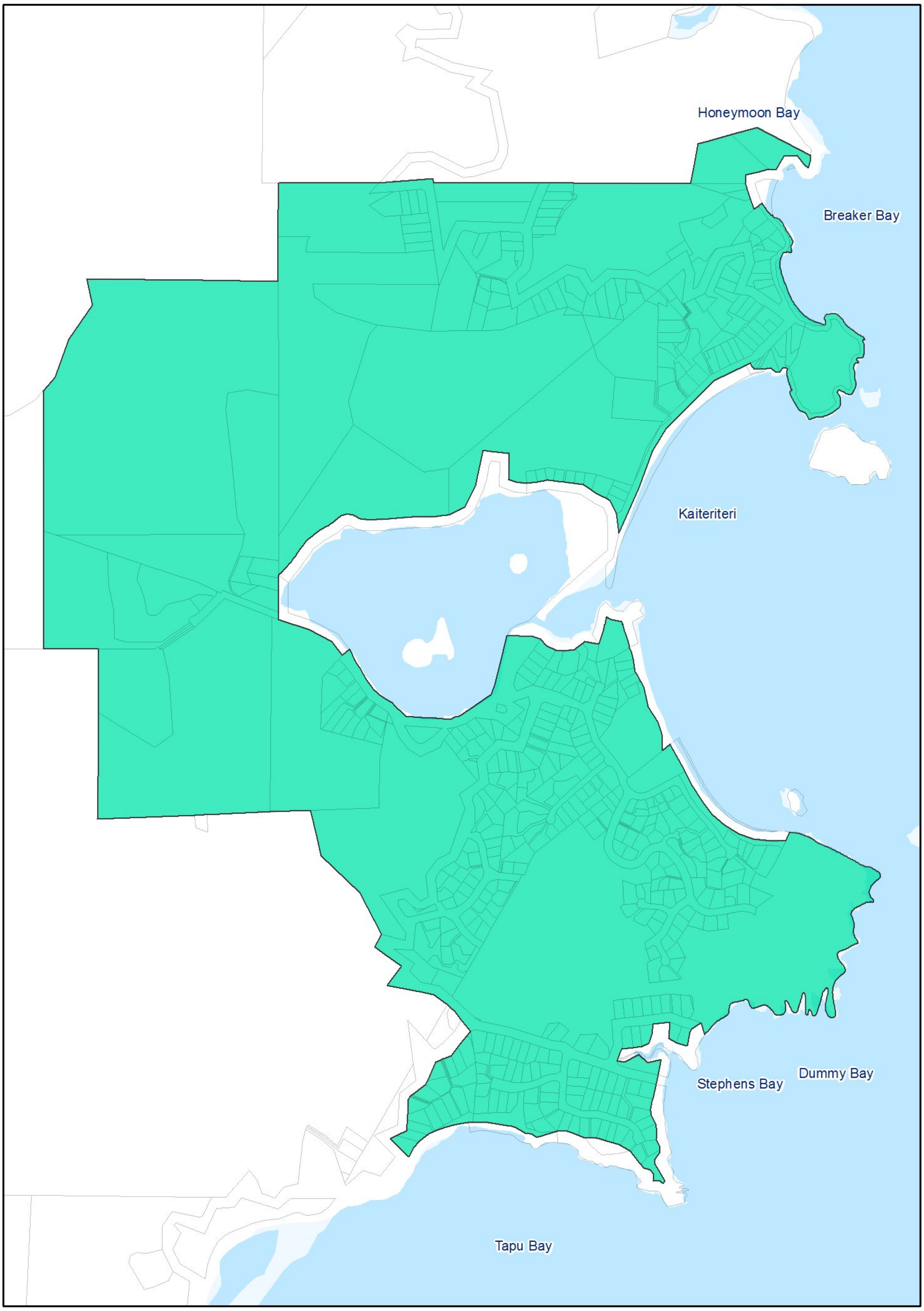
Brightwater
Stormwater Urban Drainage Rating Area

0 320 640 960 1,280 m

N

1:13,500

Collingwood
Stormwater Urban Drainage Rating Area

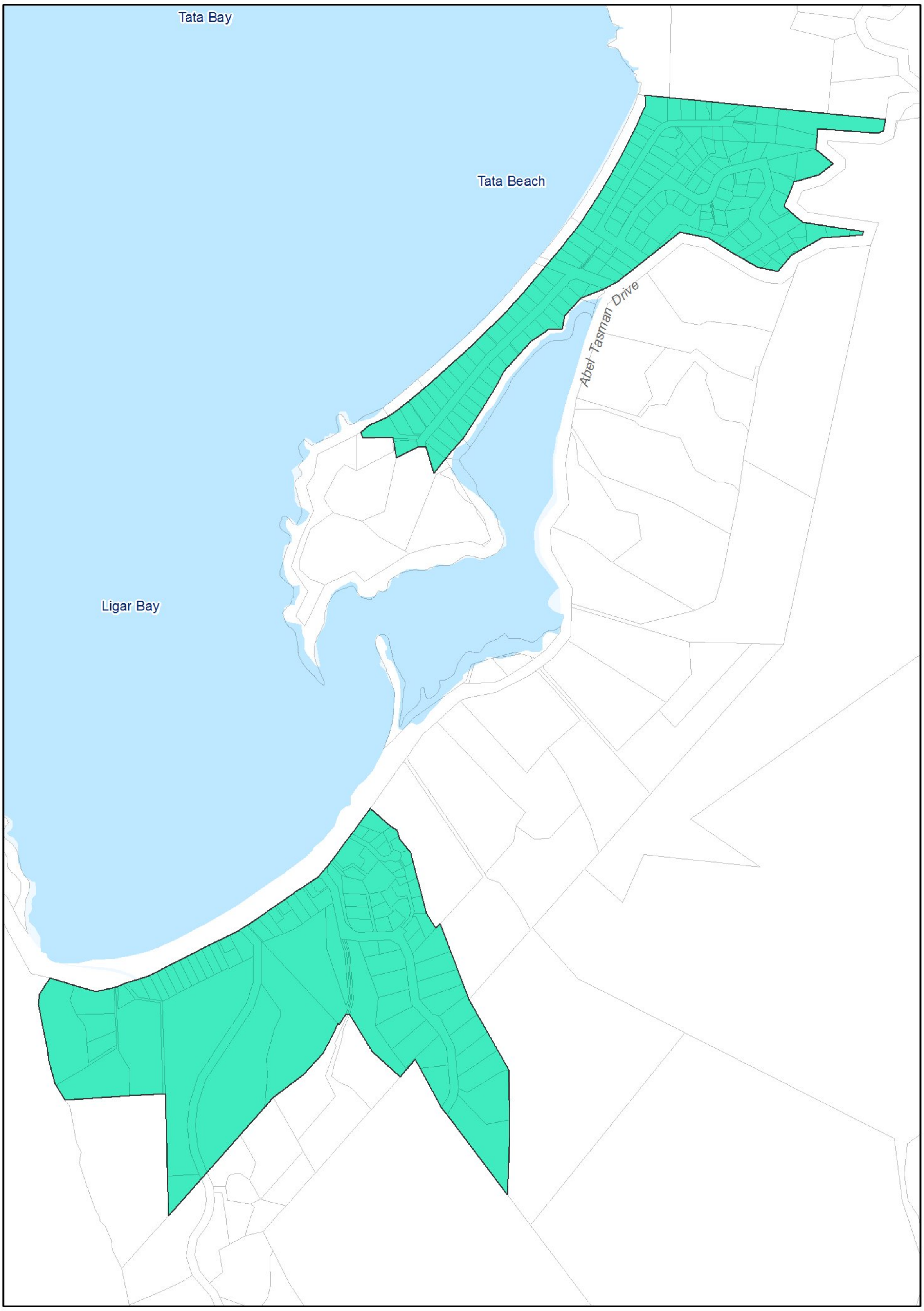


Kaiteriteri
Stormwater Urban Drainage Rating Area

0 250 500 750 1,000 m

N
1:10,500

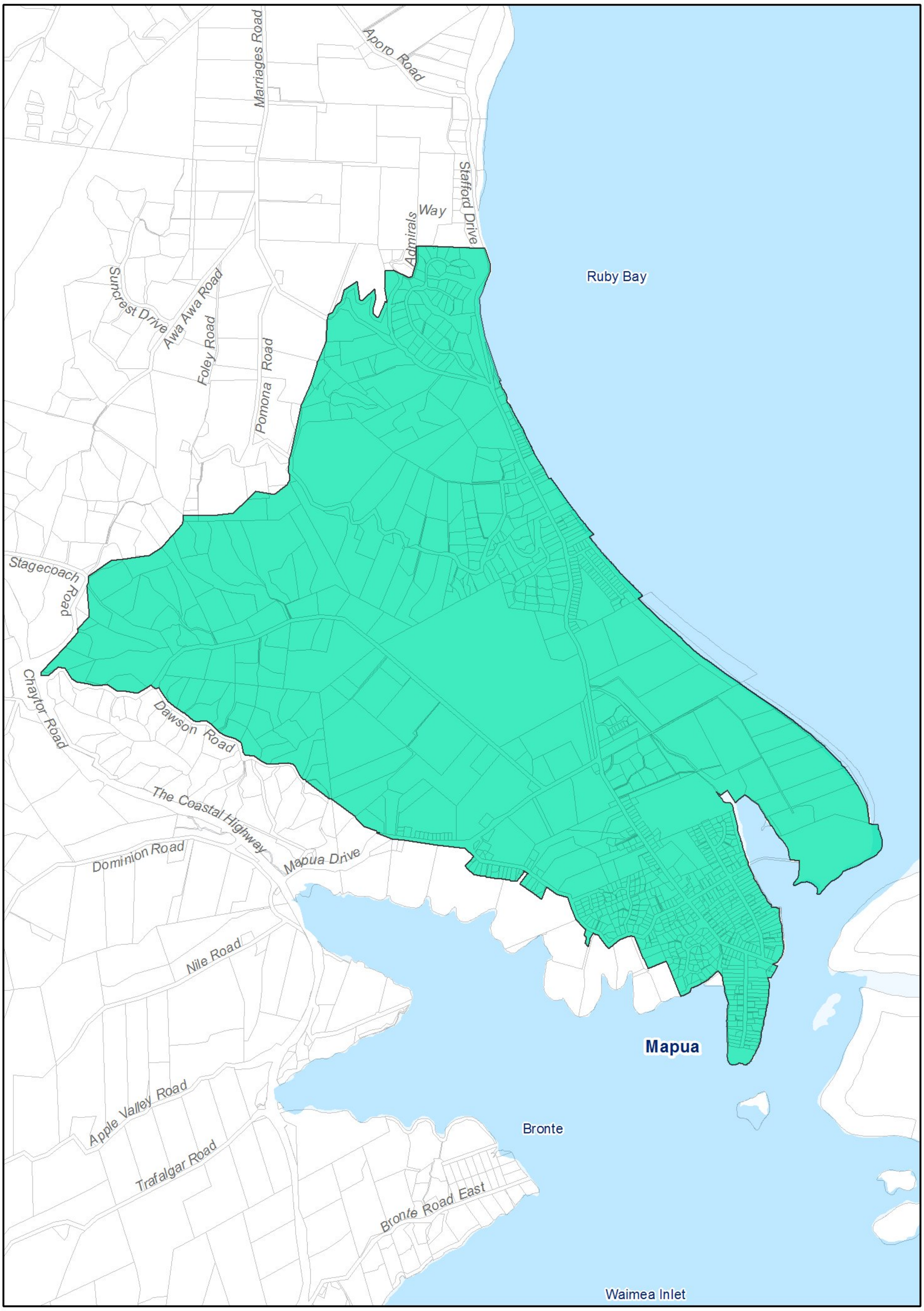
tasman district council



Ligar Bay - Tata Beach
Stormwater Urban Drainage Rating Area

0 210 420 630 840 m

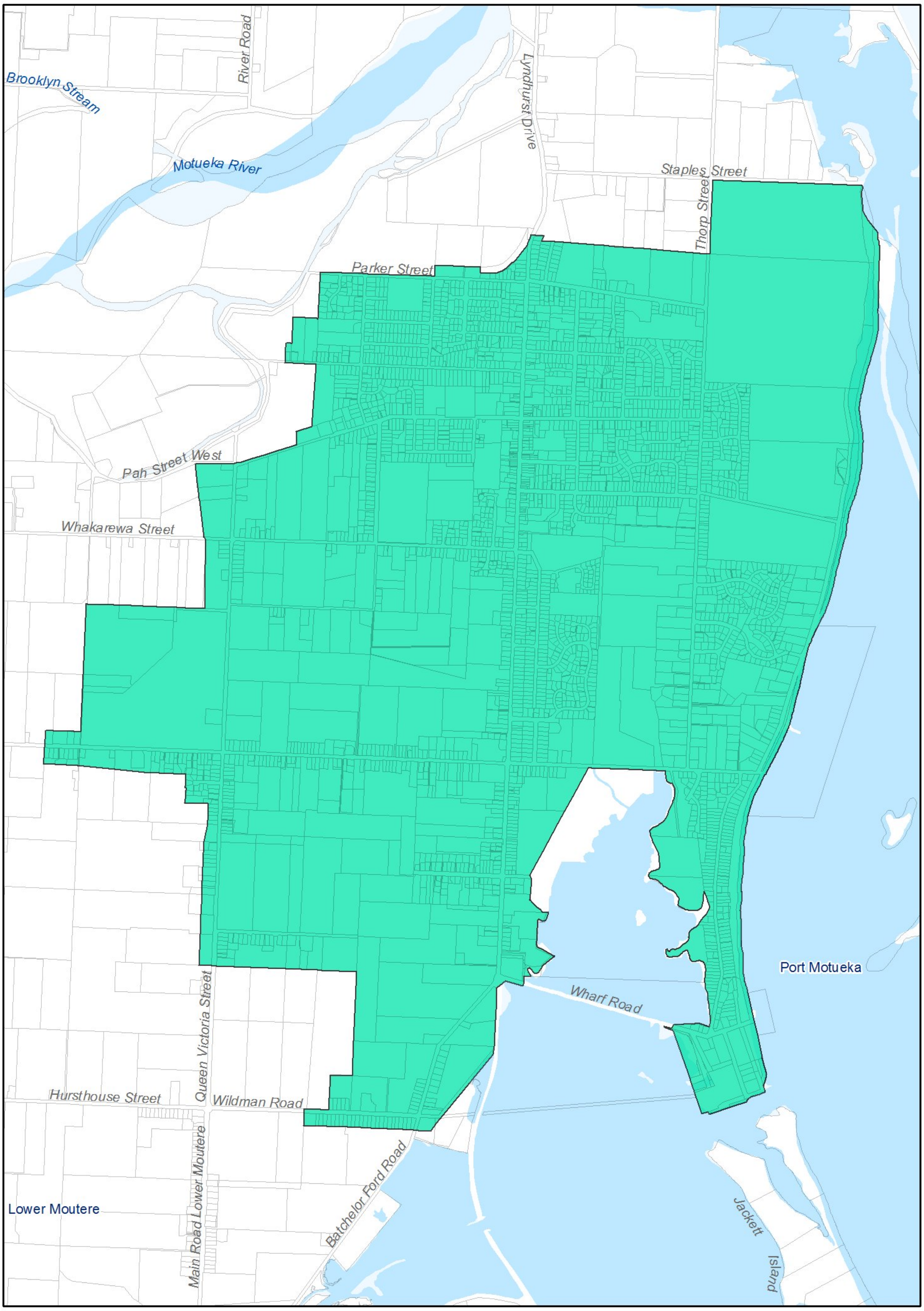
N
1:9,000



Mapua - Ruby Bay
Stormwater Urban Drainage Rating Area

0 610 1,220 1,830 2,440 m

N
1:25,500

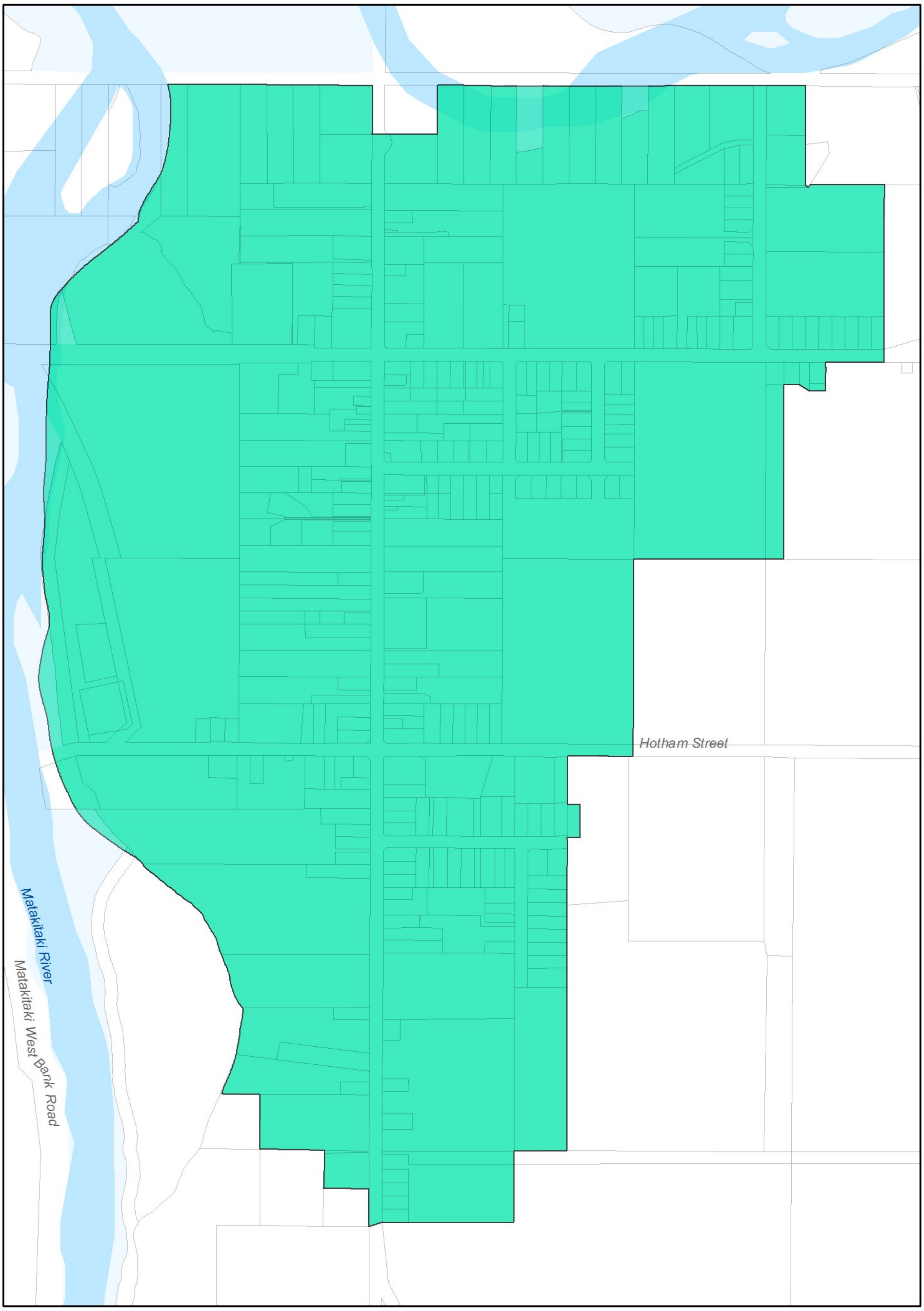


Motueka
Stormwater Urban Drainage Rating Area

0 540 1,080 1,620 2,160 m

N

1:22,500

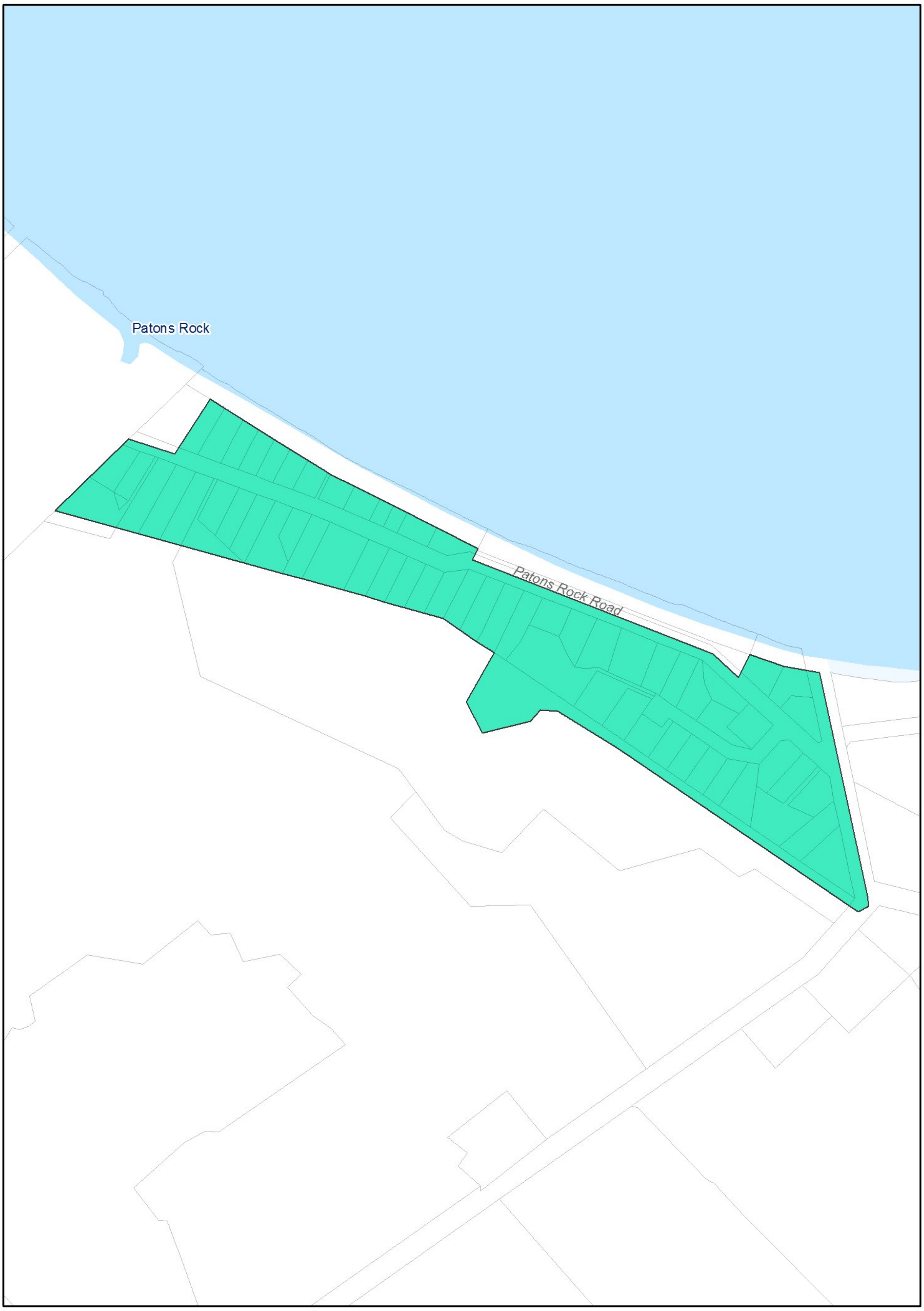


Murchison
Stormwater Urban Drainage Rating Area

0 180 360 540 720 m

N

1:7,500

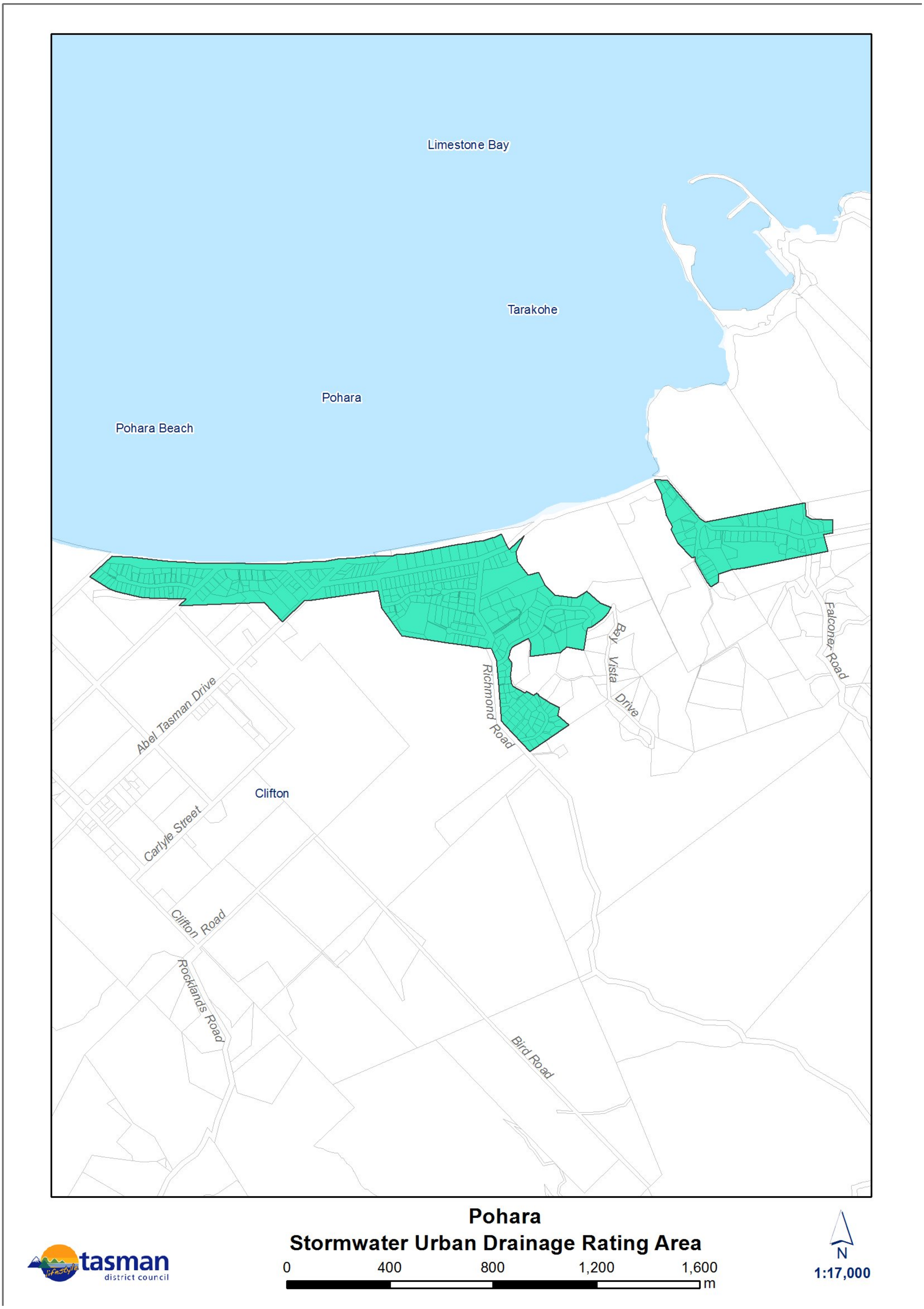


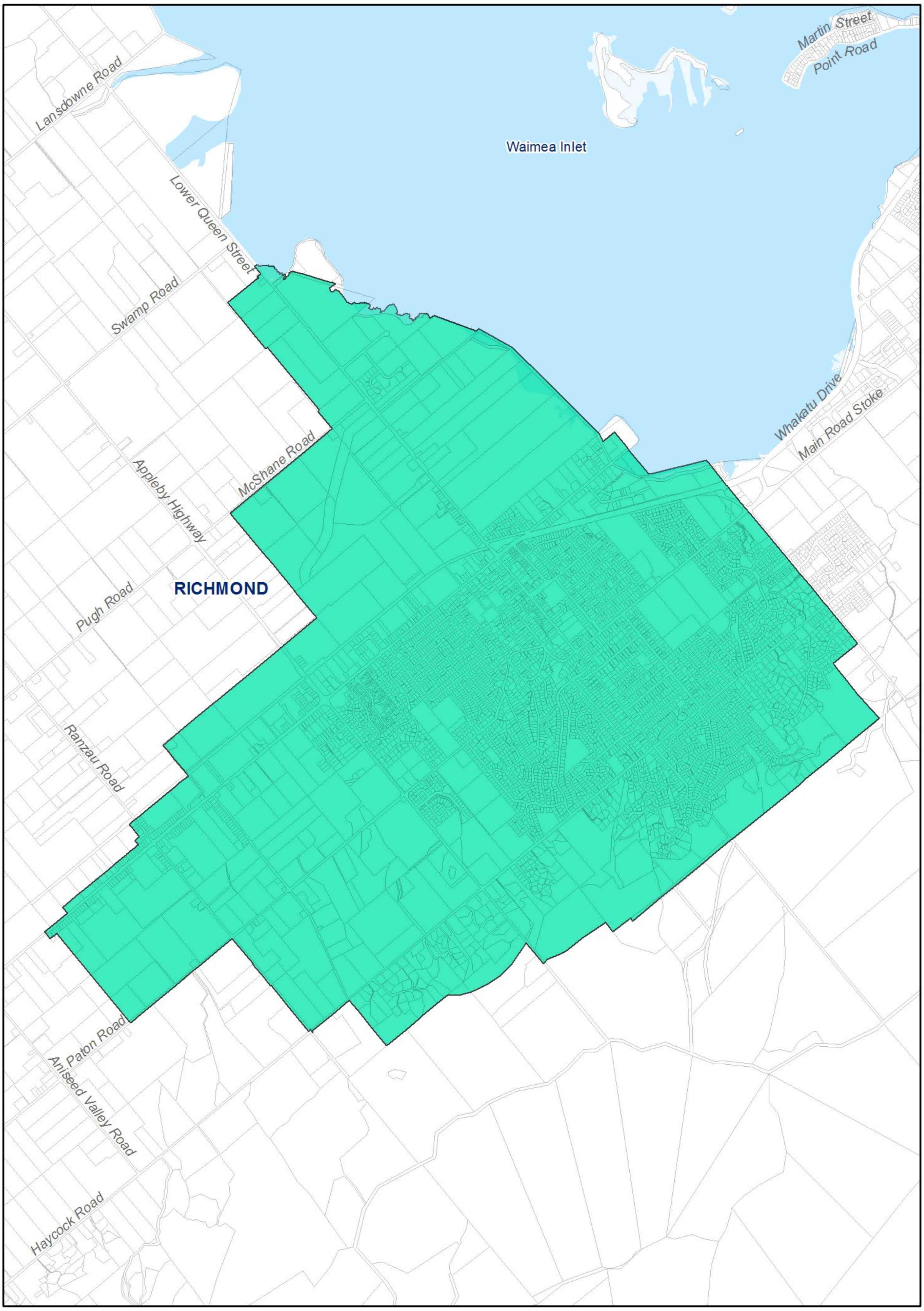
Patons Rock
Stormwater Urban Drainage Rating Area

tasman district council

0 100 200 300 400 m

N
1:4,500


Limestone Bay
Tarakohe
Pohara
Pohara Beach
Abel Tasman Drive
Richmond Road
Bay Vista Drive
Falconer Road
Clifton
Carlyle Street
Clifton Road
Rocklands Road
Bird Road
Pohara
Stormwater Urban Drainage Rating Area
0
400
800
1,200
1,600
m
N
1:17,000



Richmond

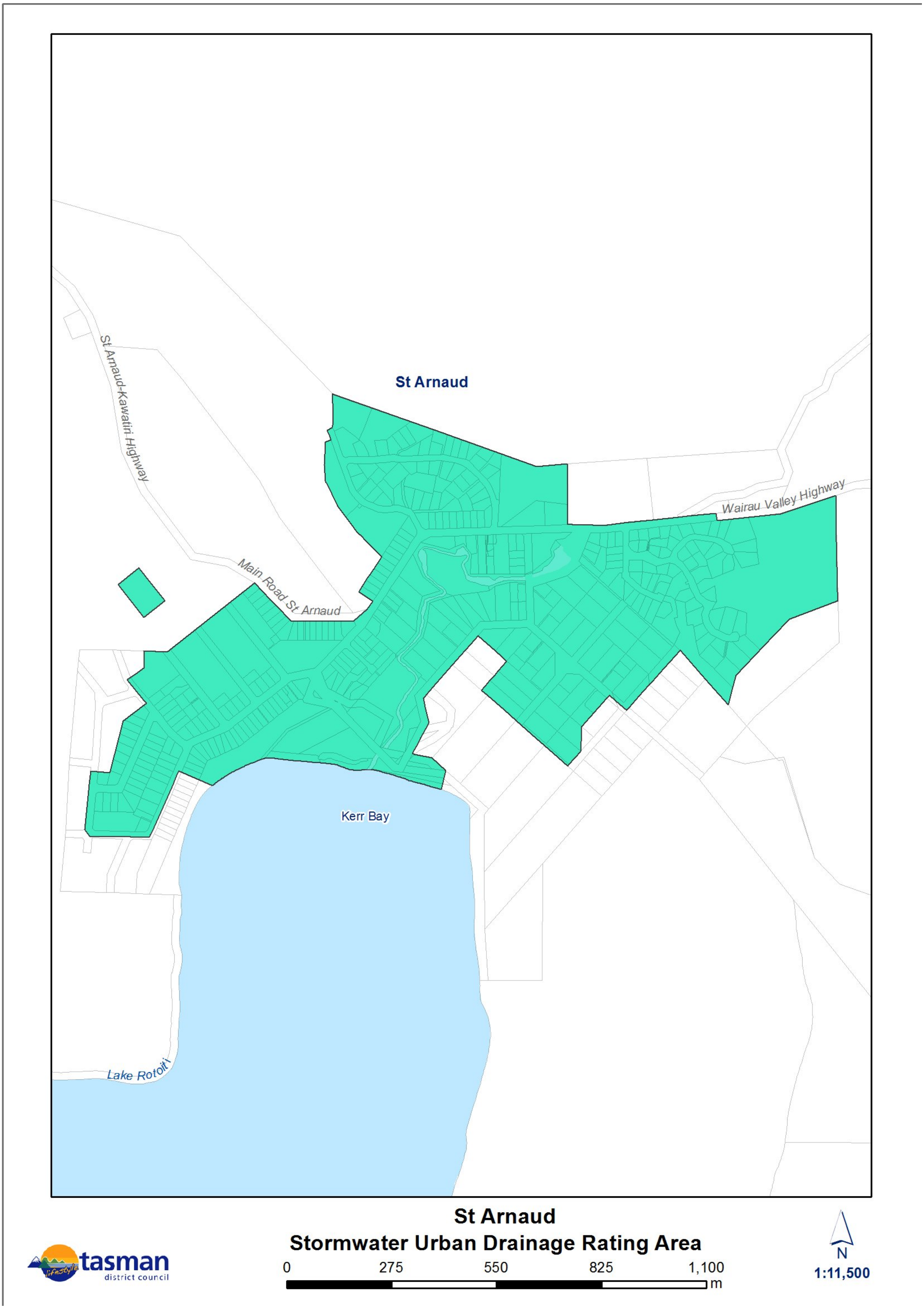
Stormwater Urban Drainage Rating Area

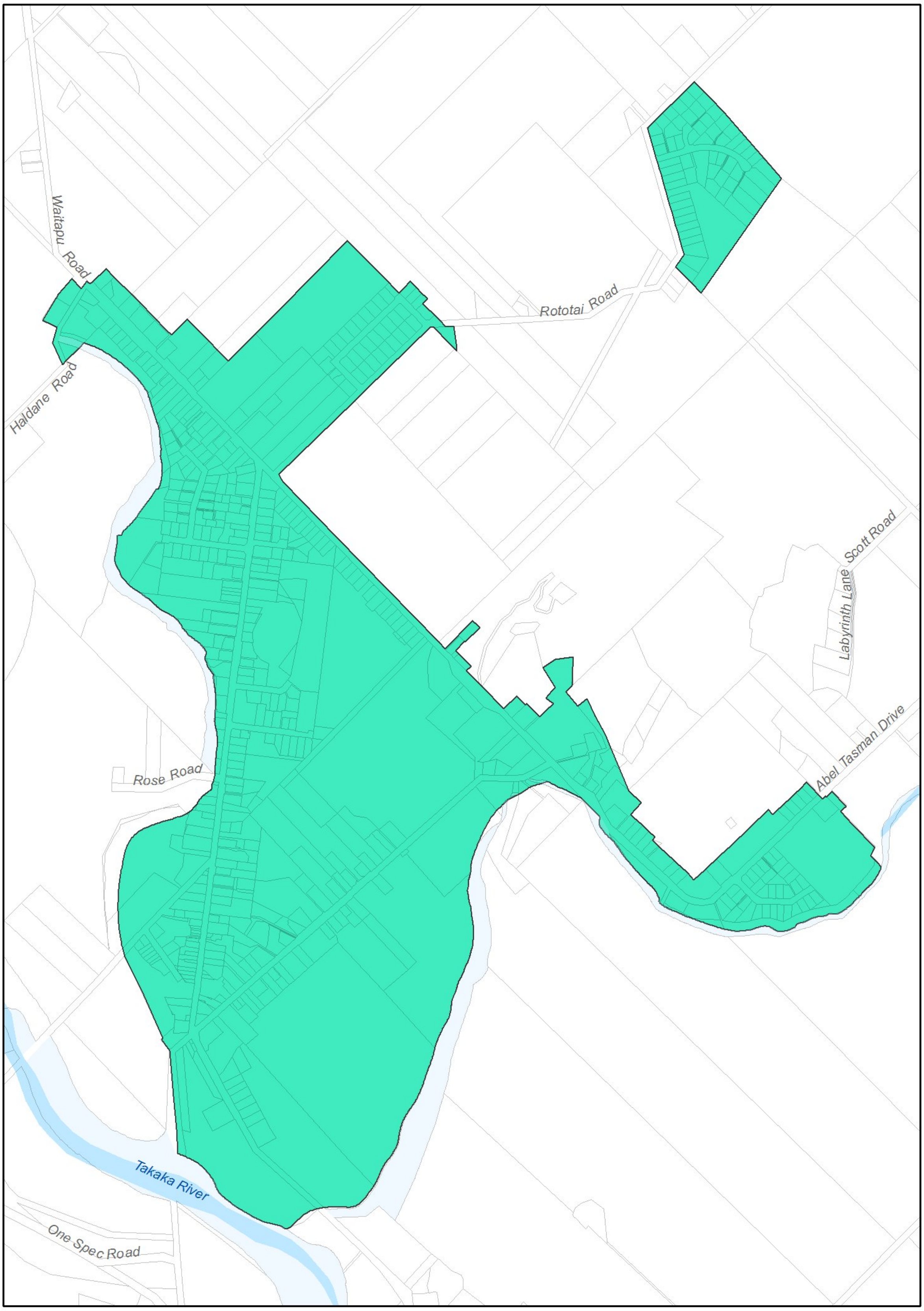
0 800 1,600 2,400 3,200 m

N

1:33,500

tasman district council


St Arnaud
St Arnaud-Kawatiri Highway
Main Road St Arnaud
Wairau Valley Highway
Kerr Bay
Lake Rotoiti
St Arnaud
Stormwater Urban Drainage Rating Area
0
275
550
825
1,100
m
N
1:11,500
tasman district council



Takaka

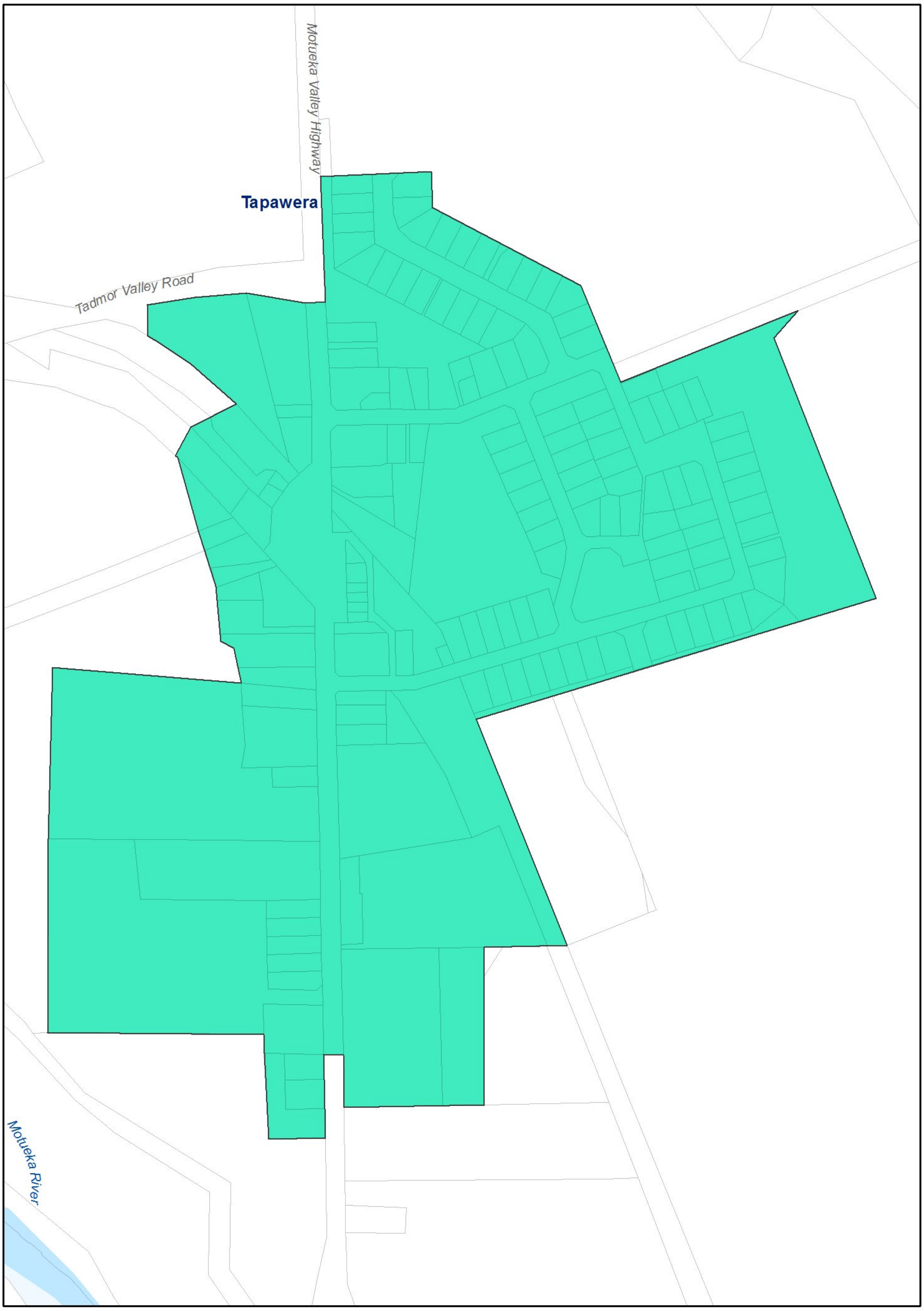
Stormwater Urban Drainage Rating Area

tasman district council

0 280 560 840 1,120 m

N

1:12,000



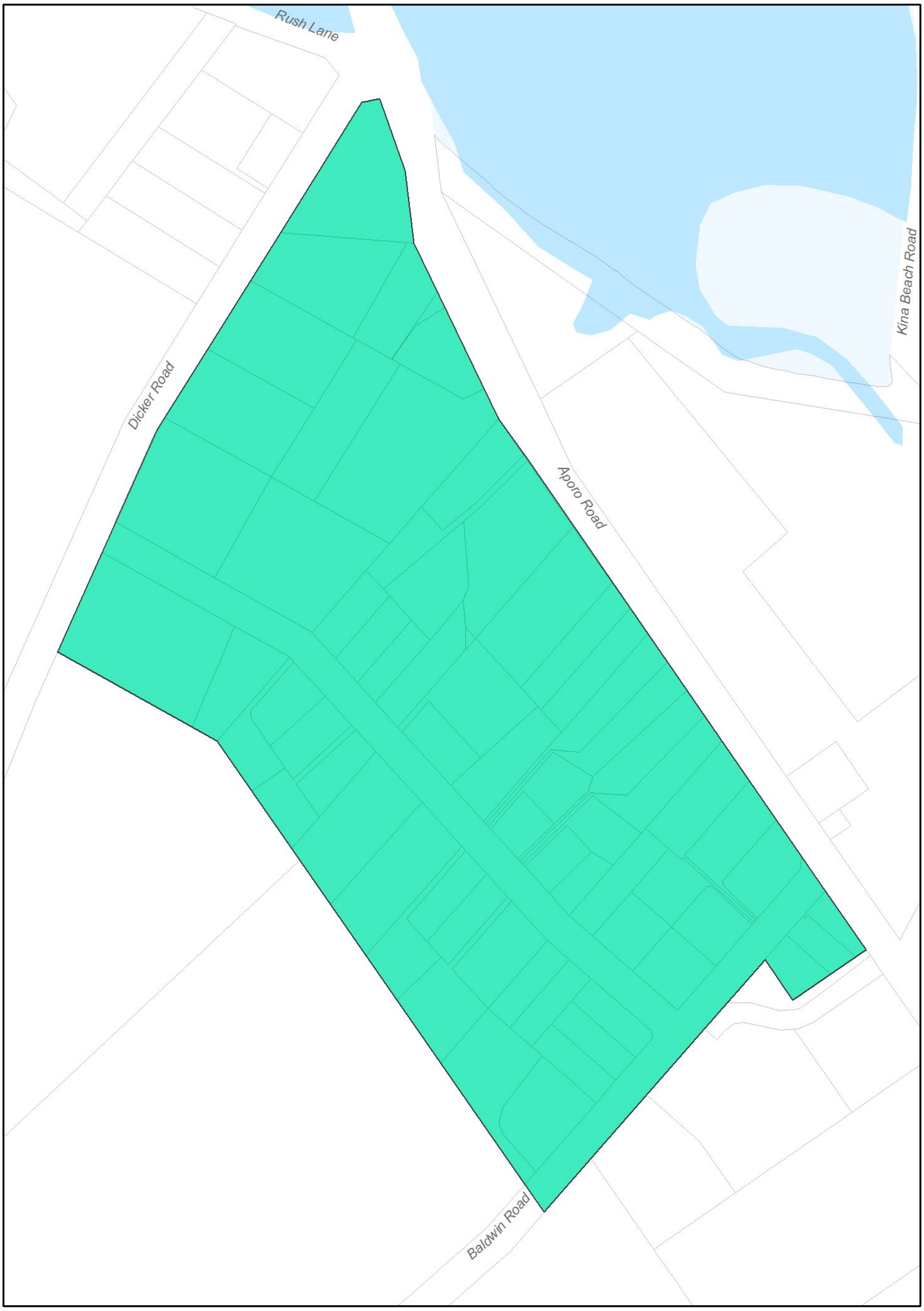
Tapawera

Stormwater Urban Drainage Rating Area

0 120 240 360 480 m

N

1:5,000



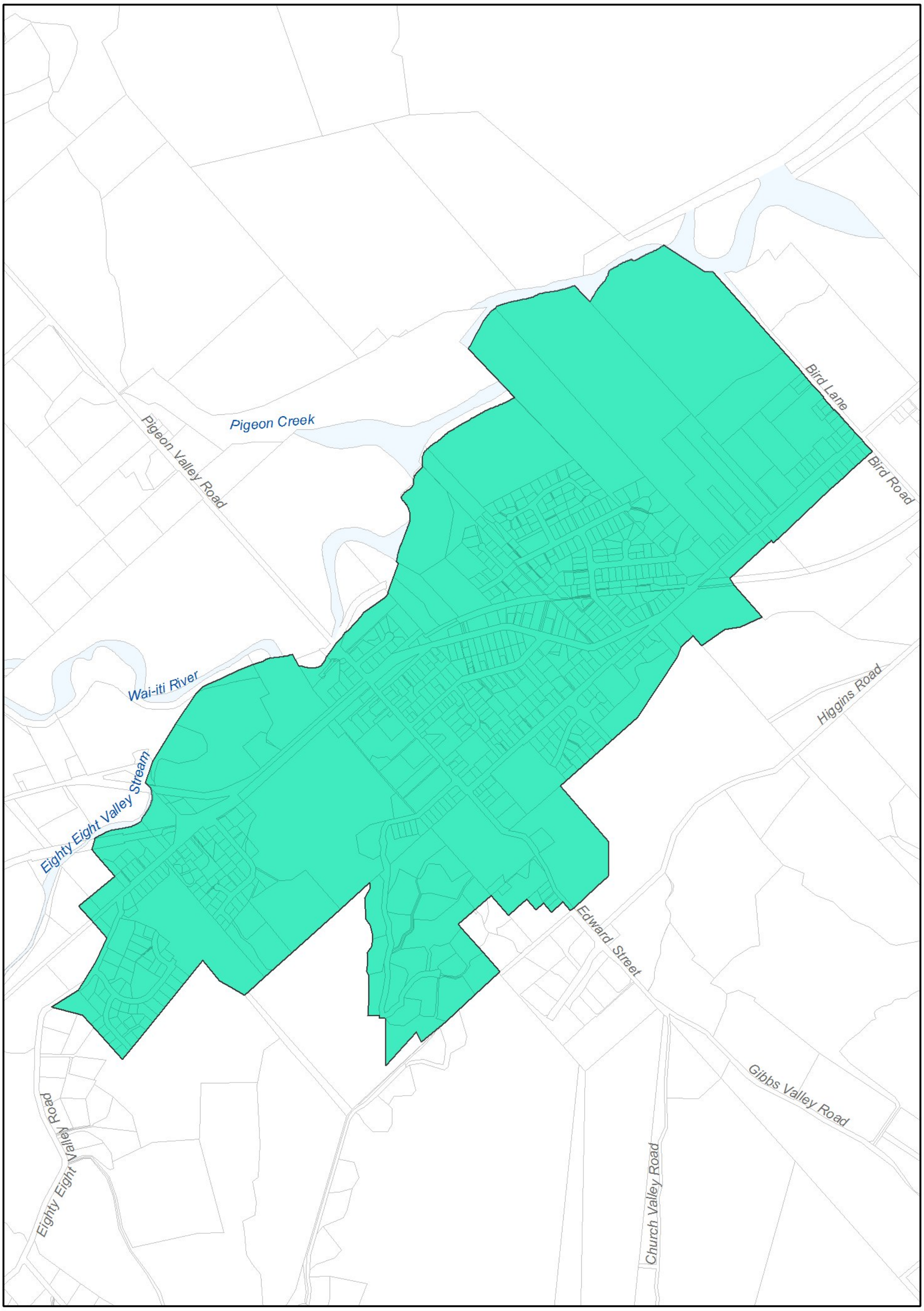
Tasman

Stormwater Urban Drainage Rating Area

0 70 140 210 280 m

N

1:3,000



Wakefield

Stormwater Urban Drainage Rating Area

0 340 680 1,020 1,360 m

N

1:14,500

APPENDIX Z AMP STATUS AND DEVELOPMENT PROCESS – STORMWATER

Z.1 Quality Assurance

Quality Assurance Statement		
Tasman District Council 189 Queen Street Private Bag 4 Richmond 7050 Telephone: (03) 543 8400 Fax: (03) 543 9524	**Version:**	Draft – January 2015
	Status:	Draft
	Project Manager:	Dwayne Fletcher
	Prepared by: **AMP Author**	Ian McComb
	Approved for issue by: **Engineering Manager**	Peter Thomson

Z.2 Quality Requirements and Issues

	Issues and Requirements	Description
1	Fitness for Purpose	The AMP has to be "fit for purpose". It has to comply with Audit NZ expectations of what an AMP should be to provide them the confidence that the Council is adequately managing the Council activities.
2	AMP Document Consistency	Council want a high level of consistency between AMPs so that a reader can comfortably switch between plans.
3	AMP Document Format	The documents need to be prepared to a consistent and robust format so that the electronic documents are not corrupted (as happens to large documents that have been put together with a lot of cutting and pasting) and can be made available digitally over the internet.
4	AMP Text Accuracy and Currency	The AMPs are large and include a lot of detail. Errors or outdated statements reduce confidence in the document. The AMPs need to be updated to current information and statistics.
5	AMP Readability	The AMPs in their current form have duplication – where text is repeated in the "front" section and the Appendices. This needs to be rationalised so that the front section is slim and readable and the Appendix contains the detail without unnecessary duplication.
6	Completeness of Required Upgrades/Expenditure Elements	The capital expenditure forecasts and the operations and maintenance forecasts need to be complete. All projects and cost elements need to be included.
7	Accuracy of Cost Estimates	Cost estimates need to be as accurate as the data and present knowledge allows, consistently prepared and decisions made about timing of implementation, drivers for the project and level of accuracy the estimate is prepared to.

	Issues and Requirements	Description
8	Correctness of Spreadsheet Templates	The templates prepared for use need to be correct and fit for purpose.
9	Assumptions and Uncertainties	Assumptions and uncertainties need to be explicitly stated on the estimates.
10	Changes Made After Submission to Financial Model	If Council makes decisions on expenditure after they have been submitted into the financial model, the implications of the decisions must be reflected in the financial information and other relevant places in the AMP – eg. Levels of service and performance measures, improvement plans etc.
11	Improvement Plan Adequate	Improvements identified, costed, planned and financially provided for in financial forecasts.