STORMWATER

Asset Management Plan

August 2018r

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Executive Summary

Purpose of the Plan

Key reasons for writing this asset management plan are to:

- make a strong link between Council's strategic objectives and the Council's delivery of stormwater services
- identify the capital and operational expenditure required over the next 10 years, for inclusion in the Long Term Plan 2018–28
- provide information and accountability on how stormwater services are being delivered
- provide clear direction for staff on the improvement priorities over the next three years.

Asset Descriptions

The stormwater infrastructure is a reticulated network of pipes, channels, pump stations and associated apparatus required to drain rainwater from residential, commercial and industrial properties and surrounding land. The operating costs of the stormwater service account for around 2% of the Council's total operating expenditure.

The service is predominantly focused on the urban areas where the density of buildings and urban infrastructure disrupt both the natural flow paths and the soakage of surface water into the land. Blenheim has 125,199 metres and Picton has 28,547 metres of reticulation pipework.

The Blenheim system also has two pump stations at the termination of the stormwater reticulation that lift the water into the land drainage system, and Picton has one pump station. The pump stations are owned and operated by the Rivers and Land Drainage Department, but the operation of these stations is integral to the functioning of the upstream stormwater system.

There are also a number of short lengths of reticulation pipework in the smaller settlements around the Marlborough Sounds (Anakiwa, Okiwi Bay, Sounds) as a result of adopted reticulation from individual subdivisions.

Levels of Service

The levels of service and the subsequent performance measures are derived from these fundamental objectives of stormwater drainage:

- safeguard the community from urban flood hazards
- minimise damage to urban property from floodwater
- facilitate commercial and residential development
- protect the aquatic environment through the management of the quality of urban stormwater discharges
- provide the service at an efficient and equitable cost.

Some of the standards included in the stormwater levels of service are prescribed by legislation and have little room for negotiation; others recognise the limitations of delivering the desired goals within financial restraints.

The four levels of service outlined below guide Council's investments in stormwater services.

Level of Service 1 — Provide an overall level of service that meets or exceeds residents' expectations.

Performance Indicator: Residents' satisfaction survey.

Results:

The report based on the 2017 survey concluded: "*Urban storm water drainage* service satisfaction level has increased in 2017 up to 78.9% (65.5% in 2016). This service showed the second biggest improvement in satisfaction ratings in the past year."

Level of Service 2 — Minimise the environmental risks of stormwater discharges.

Performance Indicator:

Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of:
(a) abatement notices,
(b) infringement notices,
(c) enforcement orders, and
(d) convictions,
received by the territorial authority in relation to those resource consents.

Results:

A number of tactics can be deployed to protect the environment. 'Source control' of activities at the original site to prevent contaminants entering the system is generally the most cost-effective. Council also identifies high risk sites. These are typically industrial and commercial sites and are recognised either through the planning process or through the trade waste monitoring programme. Site owners are advised of the risks and their responsibilities. Engineering solutions are sought to mitigate the risks such as fitting canopies over high risk areas to avoid rainwater wash-off of contaminated material, fitting bunds around surface water sumps or fitting interceptors onto stormwater drains. Owners are encouraged to produce management plans to develop good practices and deal with accidental spillage.

Strategies are evolving to manage the more chronic and dispersed sources of contamination. Major new subdivisions are required to provide treatment swales using special plantings and substrate material which is designed to remove much of the road film from water before it enters the reticulation.

Level of Service 3 — Provide a reliable service.

Performance Indicator:

- 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.

Results:

This national performance measure was first introduced in 2015/16. In the first year there was one recorded flooding from a blocked drain. There was some evidence that private plumbing contributed to the flooding. A severe storm occurred in the northern part of the region on 15th November 2016, and there were six recorded events in which habitable floors were flooded.

Performance Indicator:

Number of residential properties (dwellings including outbuildings and garages) flooded as a result of a storm event with a two year, or less, average return interval (ARI).

Results:

Date	Storm ARI	Dwellings Flooded	Property Flooded	Total Calls
23/07/2009	<5	2	5	24
25/05/2010	3	2	6	28
2/06/2010	<5	0	1	12
7/06/2010	<5	2	8	37
21/12/2010	9	4	4	28
28/12/2010	20	6	10	10
18/01/2011	<1.3	0	0	na
3/03/2012	1.3	0	0	na
8/08/2012	<2.33	0	9	139
12/08/2012	<2.33	0	0	12
15/01/2013	<5	1	2	21
6/05/2013	9	0	10	48
17/04/2014	<1.5	1	4	60
15/11/16	5	6	9	79

Level of Service 4 — Provide a service that is timely and responsive to current needs.

Performance Indicator*:*

The median response time (in hours) to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

Results:

In 2015/16 and 2016/17 the median response time was 40 minutes and 47 minutes respectively. The target time of 1 hour was achieved.

Future Demand

Factors influencing future demand for stormwater services include:

- development of new urban areas and intensification of existing urban areas
- customer expectations of improved stormwater drainage
- legislative changes and higher environmental standards
- the need for resilience to extreme weather events and the more frequent occurrence of more intense storms as a result of climate change.

The impacts of changing demand on our stormwater assets

Urban Growth Strategy

The identification of eight urban growth pockets has allowed detailed and timely assessment of the stormwater requirements. The new urban zones to the north and west of the town are located upstream of existing urban infrastructure and generally have a high water table and a low gradient across the sites. However, early recognition of the development potential of this land has allowed an 'accepted development plan' to be established for some areas and upgrade work to Casey's Creek to be designed. During 2017 the preliminary design work and resource consents had been approved and a construction contract publicised for competitive tender.

Accepted development plans

Accepted Development Plans have been proposed and approved for major subdivisions at Boulevard Park on Taylor, Omaka Landings and Birchwood Avenue developments as well as the northwest urban development zones that drain to Murphy's Creek and Casey's Creek.

The Stormwater Action Group continues to investigate the Cameron's Creek, Yelverton Creek and Old Fairhall Creek subcatchments that provide drainage to the other urban development pockets**.**

Upgrade of the Redwood Street/Town Branch catchment

This catchment covers around 280 hectares of Blenheim, which is approximately 25% of the urban area. Consultants used hydraulic models to evaluate ten upgrade options, and the favoured option was recommended to Council in November 2015. The total cost of the solution was estimated at $20.6M with a further $2.5M for land purchase. It is likely to take 10 to 20 years to complete all aspects of the upgrade.

Murphy's Creek catchment

Residents along Murphy's Creek raised concerns about the effects of urban development in the north-west of Blenheim. A structured decision making process has helped to resolve the issues. The stakeholder group opted for a hybrid solution including on-site detention areas, a partial overflow into the headwaters of Murphy's Creek, new pipeline assets in Rose Street and Middle Renwick and an upgraded outfall pump station into Taylor River. The detention area and stormwater assets in the subdivision are costs to the developer. The new off-site infrastructure has been costed at $3.8M.

Grovetown

As a result of a number of subdivision applications at Grovetown, a comprehensive review of the township's stormwater infrastructure was carried out. Grovetown is a flat, low-lying, low density township in the lower Wairau Valley. An outline plan has been prepared to cope with future growth and will be implemented as further subdivision continues.

Demand Management

On-site soakage is the preferred option for stormwater disposal as it means there is no requirement for downstream infrastructure. However, a high groundwater table, unsuitable soils or steep gradients can restrict the areas in which this is a practical option.

Planning tools can also be used to manage run-off co-efficients from new zones and infill housing. The design of floor levels in relation to the surrounding land for new dwellings is a primary tool for managing future demand.

'Source Control' continues to be the most effective demand management technique to protect the stormwater system from contaminants and spillages. By managing industrial and commercial site activities that have potential to pollute the stormwater system, the need for elaborate engineering solutions such as oil interceptors and silt traps is reduced.

Lifecycle Management

Operational management

General maintenance and repairs of the stormwater infrastructure in Blenheim, Renwick, Havelock and Seddon are undertaken by the staff in the Works Operations section of the A&S Department. Works Operations repair and maintain the reticulation and provide a 24/7 call-out service. Routine maintenance schedules have been established to inspect, clean and maintain screens, gratings, channels, culverts and pump stations in the system.

Similar work in Picton is undertaken through a term contract.

SCADA telemetry is installed on three pump stations at Waitohi (Picton), Dry Hills and Hardings Road. A 24/7 standby roster is maintained to monitor the system and an automated tiered alerting system is employed to ensure system alarms are responded to in a timely way.

Renewal/Replacement

Renewal of stormwater assets is planned through the Stormwater Action Group in conjunction with the Operations & Maintenance Engineer and the Planning & Development Engineer. A schedule of potential renewal schemes is maintained and updated by the Operations & Maintenance Engineer. The renewal strategy is heavily influenced by the continued rapid growth in demand. Wherever possible renewals are coordinated with capacity upgrades and the costs shared between the two drivers.

Additional priority is awarded to projects where the existing asset is under-performing, causing a level of service issue.

Intervention points are established based on the criticality of the asset. Pipes and pumps that are critical to the drainage system are not allowed to fail. They are routinely monitored and maintained, and renewal is planned to avoid service failure.

Currently, non-critical assets are allowed to fail and are renewed when the cost of maintenance or service interruptions become untenable. This strategy ensures the useful life of the asset is maximised and delays the cost of renewal for as long as possible. This is considered a rational approach at this time.

The condition of the whole asset base has yet to be determined through comprehensive survey and assessment, and the sequence and detailed design of urban development is still to be established. A more detailed renewal programme will be developed once the pipe condition assessment and data analysis has been undertaken, and will be used to inform the Stormwater Management Area Plans.

Creation/Acquisition/Augmentation

Project	**Driver**	**Stage**	**Comments**
Redwood Street/Town Branch Drain	ILoS, Growth & Renewal	Alternatives and options	Detailed hydraulic modelling being undertaken to investigate options
Murphy's Creek	Growth	Alternatives and options	Investigation into water quality issues and stakeholder consultation on creek capacity
Casey's Creek	Growth	Alternatives and options	Investigation into channel upgrade and detention options prior to urban development
Taylor River Catchment Quality Monitoring	ILoS	Identification of need	Water quality monitoring to set benchmark levels and identify potential problems

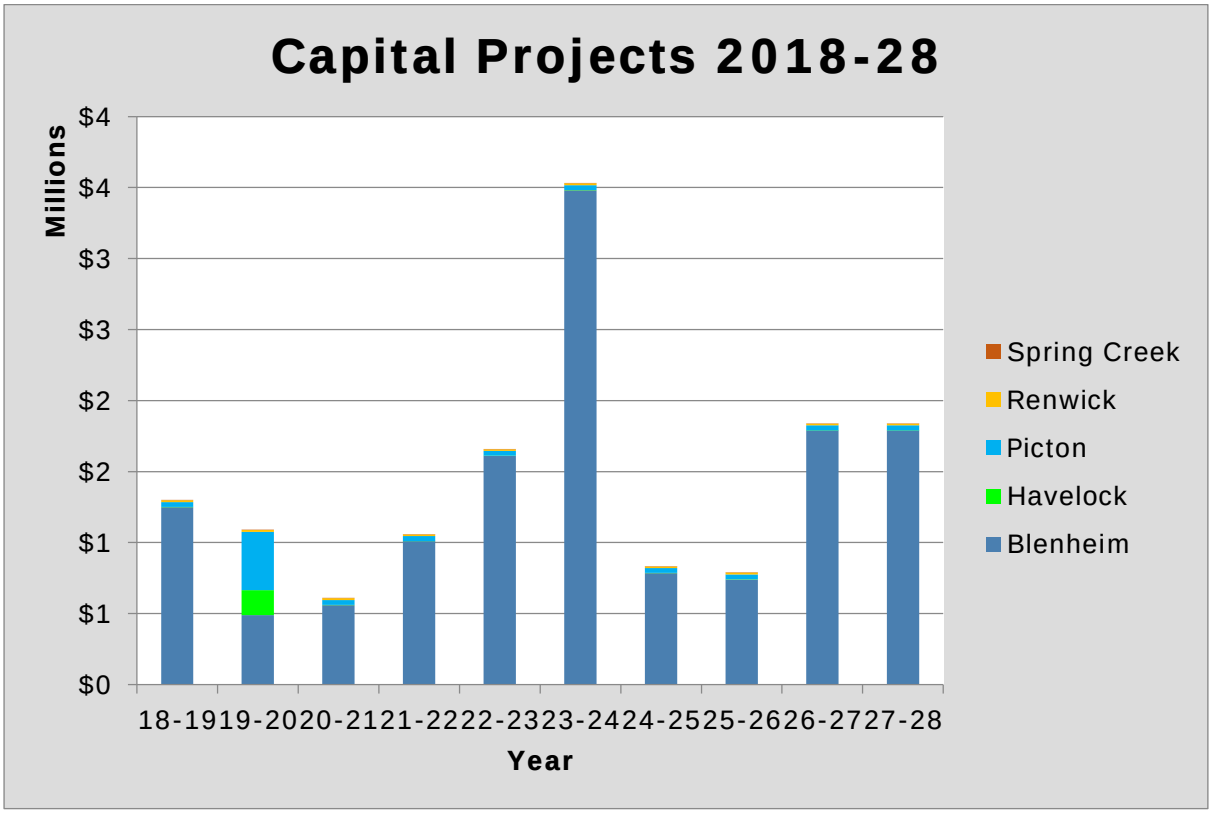
Capital projects which are currently under consideration are listed in the following table.

Disposal

Underground assets are normally decommissioned and left in the ground. They have a residual value as they can often be re-commissioned, or the pipelines can be used as conduits for other services. However they may also represent a continuing cost of ownership through the liability of collapse or ground subsidence, require continued maintenance, create unwanted flow paths for groundwater or present an obstacle to other services.

Financial Summary

The following charts show the major projects of the capital investment programme.



Asset Management Practices

Asset Management Information System

The register of assets and their attributes is stored in the Asset Management Information System (AMIS) along with the maintenance history, maintenance schedules and performance data. The system is linked to service requests, the Council's document management system and the financial expenditure database. The quality and completeness of this data is continually improving.

GIS

The AMIS has an automated interface with the GIS, through which all staff across the Council can view stormwater asset information.

Computer modelling

The Council has very high quality in-house network modelling capability which is augmented by specialist consultants. Models are used extensively to predict the behaviour of the reticulation network and as a planning tool for future designs.

Financial forecasting

Our capital expenditure forecasting is good/very good. Estimation of the timing of capital works is more challenging. Project budgets are normally scheduled on a best case scenario to ensure sufficient funds are available for projects to proceed on time.

Customer Service Data

A good mechanism is in place for registering customers' calls and recording response times. Service request data contributes to the performance monitoring of assets.

Asset Data Collection

Asset data is constantly being updated and checked. Assets & Services staff are converting our hard copy asset records to a digital format in the linked GIS and AMIS database.

Improvement Programme 2018–2021

Topic	Issue	Target date
Modelling	The benefit of the dynamic hydraulic model for the Redwood Street/Town Branch Drain has been recognised. Consider modelling other catchments in accordance with the Blenheim Stormwater Strategy.	Ongoing
Asset Management Information System (AMIS)	Develop reporting functionality and apply appropriate advanced AM reports.	2018 onwards
	Improve mobile field data collection systems.	2020
Asset Register	Use the sorting and auditing functions of the new AMIS to search and 'scrub' data for accuracy and inconsistencies.	2018 onwards
	Continue with asset transfer from hard-copy to electronic format using accepted quality protocols for Picton, Spring Creek and Grovetown.	2018–19
Urban Growth	Develop integrated agreed service plans for each growth pocket to ensure efficient coordinated infrastructure.	2018 onwards
	Ensure new subdivisions provide adequate stormwater treatment to meet resource consent conditions.	2018 onwards
Financial forecasts	Review and update unit rate cost curves.	Annually
	Revise the Development Contributions Policy in line with current growth predictions and infrastructure costs.	2018
Condition Monitoring	Develop a condition survey and monitoring strategy for stormwater reticulation assets.	2018
	Ensure CCTV survey data and condition assessments are stored and retrievable for future planning.	2018 onwards
	Improve condition grade recording and reporting systems within the asset management information system.	2018 onwards
	Continue to improve site feedback mechanisms from routine repair and maintenance activities.	2018 onwards

Topic	Issue	Target date
Performance Monitoring	Improved performance monitoring and reporting to be developed through the AMIS.	2019
	Ensure Taylor River monitoring data informs the repair/renewals programme.	2018
Proactive Maintenance Scheduling	Proactive maintenance schedule of asset groups.	2018 onwards

Monitoring and Review Procedures

The asset management plan is formally reviewed and updated every three years and informs the development of the Long Term Plan. The draft asset management plan is submitted to an external consultant for peer review.

The Council's asset management plans are made available to the auditors of the Office of the Auditor General (OAG) during the audit of the Long Term Plan and the intervening Annual Plans.

Asset valuation is undertaken annually. The valuations and all supporting calculations are submitted to an external valuer for independent verification. The valuation is scrutinised by Audit NZ to ensure asset management is adequately resourced in future plans and budgets.

Levels of service performance indicators are monitored at six monthly intervals and reported to the Council's Executive Management Team, and this information is made publicly available in the Annual Report.

Chapter 1: Introduction

Stormwater drainage services are provided to the urban areas of the Marlborough region through the Council's Assets & Services Department. The stormwater infrastructure is a reticulated network of pipes, channels, pump stations and associated apparatus required to drain rainwater from residential, commercial and industrial properties and surrounding land. The service is predominantly focused on the urban areas where the density of buildings and urban infrastructure disrupt both the natural flow paths and the soakage of surface water into the land.

This activity contributes to the community outcomes of:

- **Environment** — by providing urban drainage networks that effectively manage flood risk and the potential for surface contamination to enter aquatic environments
- **People** and **Economy** — by providing a safeguard against stormwater flooding of residential, commercial and industrial properties.

Stormwater drainage is integral to and reliant upon the flow and channel conditions of the receiving water courses. The Council's Rivers and Land Drainage Department manages the main rivers and creeks that receive the stormwater discharges. This department also maintains over 180 km of stopbanks on the main Wairau River that protect around 20,000 ha of fertile land, and manages a further 320 km of rivers and stream channels, along with floodway reserve land and erosion control works.

Closely coordinated management between the two departments is essential to achieve effective and efficient drainage of surface waters. The relationship between the departments has long been an informal arrangement. Recently there has been significant progress to formalise planning and operational management. The Blenheim Stormwater Strategy and the subsequent implementation arm — the Stormwater Action Group — are proving to be very effective mechanisms for coordinating the management of a complex relationship. The strategy is a detailed analysis of the stormwater issues for the town and a fundamental framework for infrastructure planning.

This stormwater asset management plan has been developed in close cooperation with staff from the Rivers and Land Drainage Department and their assistance is gratefully acknowledged.

Components of the Introduction:

1.1 Purpose — what the asset management plan seeks to achieve.

1.2 Strategic Goals — how stormwater asset management fits into the wider Council vision, goals and objectives.

1.3 Asset Management in Relation to the Planning Process — a summary of other planning processes within the Council.

1.4 Stormwater Assets Included in the Plan — a short summary of the stormwater assets managed by the Council.

1.5 AM Plan Stakeholders — the main stakeholders and interested parties in the stormwater activity.

1.6 Organisational Structure — how the stormwater function is managed within the Council structure.

1.7 Negative Effects — the consequences of not providing or not delivering a satisfactory stormwater service.

1.8 The Plan Framework — a short description of the main elements of the asset management plan.

1.9 Asset Management Planning Maturity — a discussion on the developmental status of stormwater asset management planning.

1.1 Purpose

The purpose of the asset management plan (AMP) is to document the assets and management processes undertaken by the Council regarding its stormwater infrastructure and services in order to:

- demonstrate to the stakeholders the sustainable operation and responsible management of stormwater infrastructure
- describe service delivery achievements against the defined community outcomes
- define the strategy for asset development and maintenance into the future
- outline the medium-term (10+ years) financial planning profile by reference to the life cycle of the stormwater assets
- describe the strategies employed to manage the risks associated with delivery of the service
- provide support for the Council's Long Term Plan and meet the requirements of the Local Government Act 2002.

An asset management plan describes the current standard of service, the future expectations of stakeholders and any assumptions about the changing environment in which the service operates. Subsequent asset expenditure decisions are explained within the context of the sustainable funding constraints of all Council activities.

The Council acknowledges asset management planning as a tool to deliver effective, efficient and sustained service to the community. The 2018 Stormwater Asset Management Plan updates the asset management plan of 2014 which was preceded by plans in 2008, 2005, 2003, 2000 and 1997.

The draft plan is submitted for peer review from an independent consultant. The comments received are reviewed for subsequent revisions before the final draft is presented to the Assets & Services Committee.

The management of stormwater assets is subject to continual improvement. Previous asset management plans are reviewed to ensure the improvement issues are addressed and emerging issues and options are incorporated into updates.

The asset management plan contains essential information to meet the requirements of Schedule 10 of the Local Government Act 2002. The asset management plans are coordinated with the Long Term Plan planning process, and the details of the stormwater activity within the plan are used to inform Council choices and decisions.

The draft plan is presented to the Assets & Services Committee for scrutiny and approval before it is presented to Council for ratification.

As a minimum the plan seeks to satisfy the requirements of a basic asset management plan as defined by the Auditor General.

1. Define the service level.
2. Define the timeframe (life cycle).
3. Describe the asset (physical, financial).
4. Include financial information (10 years +).

5. Recognise decline in service potential.

6. State assumptions and confidence levels.

7. Outline an improvement programme.

8. Be prepared by qualified persons.

9. Be a firm commitment of the governing body.

10. Be reviewed regularly.

The plan has also been developed in accordance with the guidelines published by the New Zealand National Asset Management Support Group (NAMS) and in collaboration with, and with contributions from, many departments throughout the Council.

Other legislation pertaining to the plan is summarised in chapter 2.

1.2 Strategic Goals

1.2.1 Council Vision and Mission

Marlborough District Council has an overarching vision and mission.

Our Vision

Marlborough is a globally-connected district of smart, progressive, high-value enterprises, known for our economic efficiency, quality lifestyle and wellbeing, caring community, desirable location and healthy natural environment.

Our Mission

We invest in Marlborough's future, our people, quality lifestyle and outstanding natural environment.

The Council's vision and mission are implemented through a number of community outcome statements which describe the sort of community Marlborough could become as a result of actions taken now and into the future.

The vision, mission and community outcomes are reviewed and updated from time to time to ensure they are clear and fit for purpose. Amendments are consulted on and published in the Long Term Plan, with the latest amendments made in 2018.

1.2.2 30 Year Infrastructure Strategy

A 2014 amendment to the Local Government Act requires local authorities to produce an infrastructure strategy to look at challenges over a 30 year planning horizon and to ensure the infrastructure strategy is aligned with the Council's financial strategy. This asset management plan complements and contributes to the Marlborough Infrastructure Strategy 2018.

The strategy looks at Council owned infrastructure related to water supply, wastewater, stormwater, roading and flood management. These activities are widely regarded as key services and critical to the functioning of the region. The strategy considers the major factors influencing the delivery of these service areas over the next 30 years. Community facilities have also been included in the strategy as they have an important role in the functioning of the community. As many of the infrastructural assets have a design life in excess of 80 years it is essential to plan for the medium to long term.

There are five main themes running through the infrastructure strategy.

Resilience — building and maintaining assets that are resistant to natural events such as earthquakes and storms and also adaptable to climate change, rising sea levels, changing patterns of use and future demand for the services.

Levels of Service — assets that can respond to changes in demand from customers in terms of the quality and quantity of the services provided and external influences on local government services such as changes in national and international policy and legislation.

Affordability — the costs of owning and operating the infrastructure assets need to be affordable in the future, bearing in mind changes in population demographics, economic prosperity and changing work patterns.

Renewals — within the 30 years of the strategy many of the built assets will have reached the end of their useful life. It is important to plan for their replacement to avoid a deterioration of services and to ensure works are undertaken in a timely and efficient manner.

Growth & Demographics — the 2013 census confirmed several emerging trends. There is a decline in natural population growth as the age profile throughout the country gets older. Future population growth will be reliant on inward migration, which in turn is heavily dependent on economic prosperity. There will be an increasingly elderly population which may make different demands on services and have a different ability to pay. The general trend to rural depopulation is likely to continue and be apparent in many small settlements and provincial towns.

These key themes provide a context to the asset management plan and are apparent throughout the plan.

1.2.3 Functional Environments

The Council operates in a number of distinct environments that shape the services it provides and the management of the assets required to deliver the services.

Legislative and Regulatory Environment — Stormwater services must be delivered in compliance with legislation for land drainage, flood control and environmental protection. The purpose is to provide safe and sanitary living conditions whilst protecting the natural environment from contaminated urban drainage. The main regulation of stormwater services is through the Building Act 2004, the Resource Management Act 1991 and the Local Government Act 2002. Health and safety and financial control legislation is also influential.

Commercial Environment — Local authorities' funding and spending mechanisms are important considerations for the delivery of community services. Councils have a moral responsibility to their ratepayers for financial prudence and are scrutinised and regulated by central government. A number of funding sources are available to Council including general rates, targeted rates, development levies, volumetric charges, loans, enterprise income, grants and charges. The allocation of costs must reflect due consideration of customer affordability and also be equitable and fairly distributed between business and domestic users.

Economic Environment — Council must consider its strategic approach to economic development — the amount and type of businesses to encourage to expand and/or move to the region along with the subsequent development of service industries and related commerce. Land must be identified and zoned for development accordingly. The prosperity of the area will contribute to population growth and urban development. The management of surface water drainage can be a significant cost or restraint to land availability. For this reason, the determination of development zones and the apportionment of costs is an important Council function.

Social Environment — Social responsibility requires fair and equitable business practices across the whole community; balancing the benefits and impacts of its service provision across socio-demographic groups. Stormwater services must be delivered fairly to urban communities of dwellings, businesses, utilities and community facilities.

Natural Environment — Environmental sustainability is becoming a pressing imperative. Councils are expected to set high standards of environmental stewardship. Policies and strategies must be adopted to protect the environment from the negative effects of urban drainage, and stormwater services need to comply with those standards.

Cultural Environment — Council has to pay due consideration to the cultural sensitivity and heritage of the community. People from European, Maori, Pacifica and other cultures can have significantly different relationships to the environment. Stormwater discharges to natural receiving waters must be considered from a cultural as well as an environmental perspective.

Within the context of these environments a number of Levels of Service have been established.

- Provide an overall level of service that meets or exceeds residents' expectations.
- Minimise the environmental risks of stormwater discharges.
- Provide a reliable stormwater service.
- Provide a service that is timely and responsive to customer needs.
- Provide a stormwater service that is sustainable.

The method of developing and establishing the Levels of Service is described in Chapter 2.

1.2.4 The Blenheim Stormwater Strategy

During the 1990s it became increasingly apparent there were key issues developing around the management of stormwater in Blenheim. A review of the history of stormwater management in Blenheim revealed a number of themes.

- There was a very close inter-dependency between stormwater infrastructure and the rivers and drainage channels that drain the Lower Wairau plain.
- The town had experienced considerable urban growth and more growth could be expected.
- There was a growing requirement to demonstrate responsible environmental stewardship.
- A legacy of existing discharge consents had evolved over time under a number of jurisdictions.
- There was a lack of consistency between the conditions of the consents.
- There was a need to clarify the level of service delivered now and in the future.

A scoping report was prepared in 2007 to outline how a coordinated stormwater strategy could be developed for Blenheim. The strategy identified several key drivers:

- complying with regulatory requirements
- achieving improved water quality
  protecting the receiving environment
- coping with increased stormwater run-off from urban development
- providing a strategic framework for all key stakeholders.

Following a series of development workshops a comprehensive strategy was developed and adopted by Council in May 2012. The strategy includes eight overarching goals.

Integrated Management

Goal 1 — To provide an integrated approach to the management of stormwater in Blenheim.

Goal 2 — To support the implementation of the strategy with a comprehensive monitoring and enforcement programme.

Asset Management and Flooding

Goal 3 — To ensure the stormwater network provides an appropriate response during flooding events so that people and property are protected to accepted standards.

Goal 4 — To provide guidance on effective and efficient management of MDC's stormwater assets.

Receiving Environment

Goal 5 — To maintain or enhance the environmental performance of the stormwater system and the quality of receiving environments.

Stakeholder Engagement & Education

Goal 6 — To engage with key stakeholders and educate the wider community on the importance of integrated stormwater management.

Planning and Regulation

Goal 7 — To ensure the planning and regulatory framework remains responsive to integrated stormwater management.

Goal 8 — To gain a comprehensive discharge consent for Blenheim's stormwater network for a 35 year term.

Whilst the strategy was developed specifically for Blenheim the process of its development and many of its outcomes will be readily transferable to the other reticulated settlements.

1.3 Asset Management in Relation to the Planning Process

The role of the stormwater asset management plan in Council planning is shown in Figure 1-1. The asset management plan provides a link between the strategic objectives of the Council, long term planning, and the day to day functioning of the operational activities.

Asset management is a continuous process because operational circumstances change minute by minute. Data is collected to inform short, medium and long term operational and maintenance decisions. The data is also analysed to identify where system improvements are required. The upgrade options are evaluated and presented to Council for consideration and approval. The asset management plan collates the available data and current decisions into a single document.

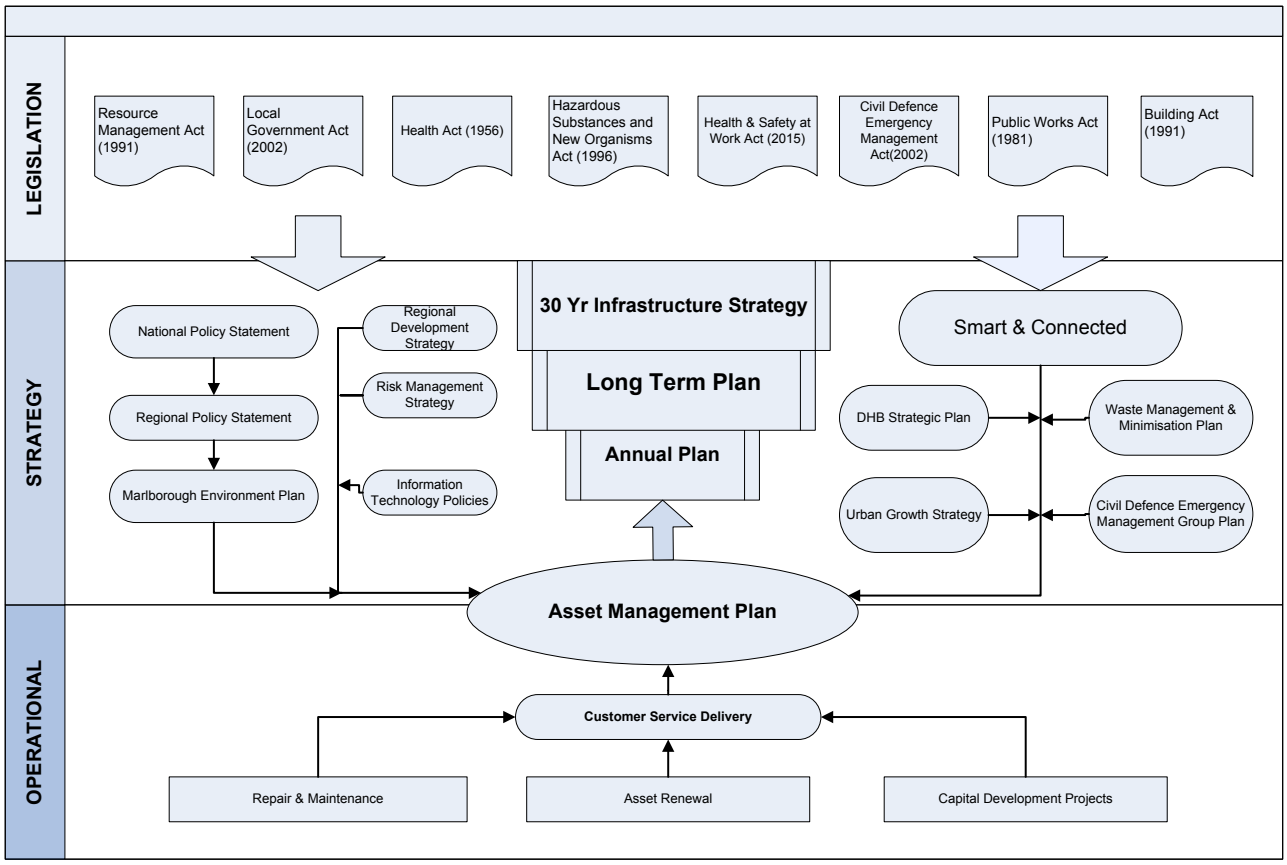


Figure 1-1 — The role of asset management plans in the planning process

The main planning cycle for local government in New Zealand revolves around the triennial Long Term Plan (LTP). It is therefore sensible to prepare the asset management plans in advance of the proposals put forward in the LTP. The issues raised and discussed in the asset management plans are presented to Council. Subject to approval, they are collated with the other Council activities and made available to the community along with the proposed funding strategy in the LTP. The asset management plans are therefore generally reviewed in the year immediately before the LTP is prepared. Adjustments can be made through the Annual Plan process but the more strategic management decision making is coordinated with the LTP.

1.3.1 Other Planning Documents

The 30 Year Infrastructure Strategy — This strategy is an important document for medium to long term planning and describes the future management of stormwater in relation to the other major council infrastructure.

The Long Term Plan — The Long Term Plan (LTP) is a requirement of the Local Government Act 2002. The LTP is the primary medium term planning document for local government and contains key information on the activities, assets, levels of service and financial details of all Council services. The plan covers a ten year period and is updated every three years. It contains detailed information for the first three years and outline information for a further seven years. Asset management plans provide additional detailed information on the main Council activities that feature in the LTP.

Annual Plan — Each year the LTP is reviewed and updated. Updates are publicly consulted on through the Annual Plan. Progress on infrastructure projects, performance against levels of service and financial matters are reported through the **Annual Report**.

Resource Management Plans — The proposed Marlborough Environment Plan includes the Council's environmental objectives, policies and rules, and these have a major influence on

stormwater management. The provisions relate to overarching issues such as land use, and discharges to freshwater and the marine environment.

Bylaws — Council has powers to develop local enforceable bylaws. The Council's Trade Waste Bylaw is predominantly concerned with the protection of the wastewater system but also provides the Council with some powers to protect the stormwater system.

Urban Growth Strategy — The Council has a well established urban growth strategy[1] which was developed from 2011–13 following thorough consultation and analysis of future growth patterns. The Assets & Services (A&S) Department was fully involved in the evolution of the strategy to ensure urban growth pockets could be adequately serviced.

The A&S Department works with developers from the outset to form an agreed service plan to ensure new infrastructure is designed and installed to meet the long term growth projections. Council coordinates the collection of development levies to ensure developers are reimbursed for installing additional capacity to meet future demand.

1.4 Stormwater Assets included in the Plan

The stormwater assets covered by this plan are the reticulation systems and three terminal pump stations shown in Table 1-1. and also shown in the maps – see Appendix 1 There are a number of short lengths of reticulation pipework in the smaller settlements around the Marlborough Sounds (Anakiwa, Okiwi Bay, Sounds) as a result of adopted reticulation from individual subdivisions.

In total the Blenheim system has 12 pump stations at the termination of the stormwater reticulation that lift the water into the land drainage system. 10 of the pump stations are owned and operated by the Rivers and Land Drainage Department. The operation of these stations is integral to the functioning of the upstream stormwater system. Close coordination between the two departments is critical to the effective operation of these systems and a good example of the inter-dependency of the two systems.

Table 1-1 — Stormwater assets

Area	Length (m)	Pump Stations	Replacement Value
ANAKIWA	849		$461,305
BLENHEIM	125,199	2	$82,240,306
GROVETOWN	293		$227,691
HAVELOCK	1,310		$864,954
OKIWI	822		$551,588
PICTON	28,547	1	$22,546,629
RENWICK	5,167		$3,881,613
RIVERLANDS	6,784		$4,977,851
SEDDON	257		$162,135
SOUNDS	332		$237,670
SPRING CREEK	3,385		$2,485,173
St. ANDREWS	323		$330,941
GRAND TOTAL	**173,268**	**3**	**$118,967,857**

The stormwater assets can have different functions depending on the geomorphology and rainfall regime in different areas. In some cases the assets are designed to detain the flow of

[1] Growing Marlborough – A Strategy For The Future (March 2013)

water, slow down the concentration and avoid accumulation of flood water downstream. In other areas it is important to facilitate the flow of stormwater to discharge it to the receiving channels as quickly as possible. These factors are discussed in “Procedures For Reviewing Blenheim Stormwater Capacity And Providing For New Areas (Draft)” (Williman, 2014).

The relationship between ground slope, rainfall and the capacity of the receiving channels has a consequence for the levels of service objectives. The secondary flow paths may be detaining the flow and creating areas of temporary flooding or facilitating rapid, high flows. Three slope categories were recognised for the Blenheim stormwater drainage catchment ranging from the foothills of the Wither Hills to the very flat lands on the valley bottom. The infrastructure has different purposes and functions in each of the areas. It is useful to communicate this to customers in order to manage expectations. A similar analysis of the steep catchments around Picton and Havelock will have a different outcome and the strategic management plan will be adapted accordingly.

1.5 AM Plan Stakeholders

This plan is a key reference document for managers and engineers within the Assets & Services Department and for operators of the system. It provides a systematic plan for the ongoing operation, maintenance and upgrading of the stormwater assets in order to meet the declared objectives of the community. It will also be a source of information for Council’s corporate planners, finance officers, building control and resource consent staff.

Marlborough is a unitary authority and, as such, is responsible for environmental monitoring and the management of natural water quality. Urban stormwater discharges can be a major contributor of contaminants to local waterways and are monitored by the Regulatory Department.

The District Health Board has an important role in monitoring and advising on public health issues such as bathing water quality and seafood gathering.

People responsible for civil defence and engineering lifeline utilities have a particular interest in the functioning of the stormwater system, and possible flooding issues when designing and locating infrastructure.

The performance of stormwater drainage may have a significant impact on local businesses. Flooding of business premises and roading may interrupt normal business, or obstruct staff and customers, with damaging financial consequences. Industrial and commercial businesses may also need to implement site controls to prevent spillages or other sources of pollution entering the stormwater system.

Other businesses are reliant on abstraction from surface water and are stakeholders in the quantity and quality of the water available.

Aquaculture is a huge contributor to the local economy. Generally the sites of aquacultural production are remote from urban areas, but stormwater contaminants may be enduring with unforeseen consequences for the wider environment. Non-commercial fishing and shellfish gathering also have a keen interest in the quality of local waterways.

The local iwi have deep cultural associations with the aquatic environment and have a close interest in stormwater discharges from urban areas.

Similarly there are many environmental groups with an interest in the quality of the receiving water including Forest & Bird, Guardians of the Sounds, the Grovetown Lagoons Restoration Project, as well as various sporting and recreational clubs, and individuals.

1.6 Organisational Structure

The Council’s Assets & Services Department is responsible for stormwater services. The capital programme is managed by the Planning and Development Engineer and the day-to-day running

of the system is managed by the Operations and Maintenance Engineer. The structure of the Department is shown in Figure 1-2. The Department has its own Finance and Information Manager to supervise the budget and liaise with the Corporate Finance Department.

Stormwater repairs and maintenance are undertaken by the Council's Works Operations team in all areas except Picton where the works are let on a term contract. By agreement, routine maintenance on the kerbside stormwater sumps is undertaken by Marlborough Roads.

The Rivers and Land Drainage team is also part of the Assets & Services Department which assists with coordination of these integrated functions.

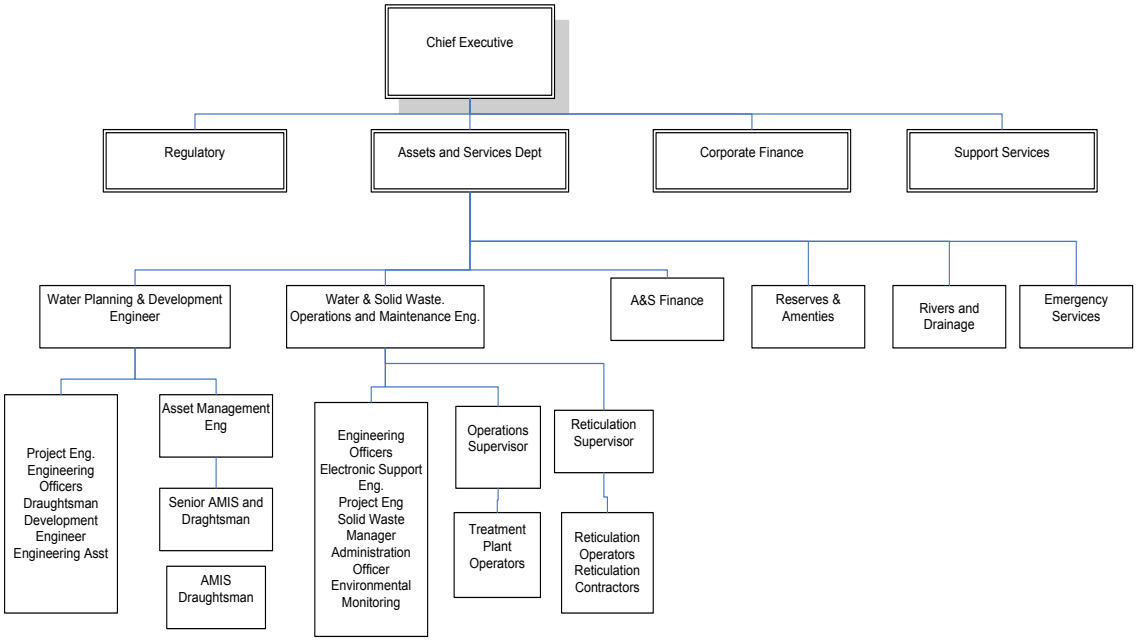


Figure 1-2 — Organisational structure of stormwater management at Marlborough District Council

1.7 Negative Effects

The stormwater network is designed to provide a safe and sanitary living environment for urban habitation. The consequences of not providing a satisfactory stormwater service could be severe and manifold.

Table 1-2 — Negative effects of stormwater services

Area of Impact	Negative Effects
The health of communities	Insanitary living conditions from flooded dwellings and property.
The safety of communities	Personal hazard from fast flowing or deep surface water. Restricted access to community facilities from flooded roads.
Minimising adverse environmental effects	Acute pollution events or long term degradation of natural receiving waters from urban run-off. Additional flows from urban drainage exacerbating downstream flow conditions.

Area of Impact	Negative Effects
Industrial and residential development	Damage to buildings, property, public infrastructure, vehicles etc from uncontrolled flood waters. Restricted building development opportunities due to inadequately drained land.
Commercial	Loss of productivity or sales as a result of flood water causing interruption to business activities.
Cultural sensitivity	Causing cultural offence from polluted stormwater discharges and environmental degradation.

1.8 The Plan Framework

The 2014 Stormwater Asset Management Plan has been rewritten and updated in accordance with the guidance of the NAMS International Infrastructure Management Manual 2011. The plan also incorporates the recommendations of the 2014 peer review by AECOM, the advice and guidance of SOLGM, advisory comments by Audit New Zealand and guidance issued by the Office of the Auditor General.

The structure of the document is outlined below.

Chapter 1 Introduction — Purpose, Strategic Goals, Asset Management in Relation to the Planning Process, Stormwater Assets included in the Plan, Stakeholders, Organisational Structure, Negative Effects, The Plan Framework and Asset Management Planning Maturity.

Chapter 2 Levels of Service — Strategic Overview, Community Outcomes, Who Are Our Customers, What Customers Want, What We Have To Do — Legal Obligations and Restraints, What We Currently Provide, What Our Customers Would Like — Future Challenges.

Chapter 3 Future Demand — Demand Drivers, Demand Forecasts, Demand Impacts on Assets, Demand Management Plan, Asset Plans to Meet Demand.

Chapter 4 Lifecycle Management Plan — Physical Parameters, Infrastructure Risk Management, Routine Operations and Maintenance Plan, Renewal/Replacement Plan, Creation/Acquisition/Augmentation Plan, Disposal Plan.

Chapter 5 Financial Summary — Financial Strategy and Projections, Funding Strategy, Valuation Forecasts, Key Assumptions.

Chapter 6 Plan Improvement and Monitoring — Status of Asset Management Practices, 2014 Improvement Programme Review, 2018–21 Improvement Programme, Monitoring and Review Procedures, Performance Measures.

Appendices.

1.9 Asset Management Planning Maturity

Generally the Assets & Services Department seeks to achieve a solid core standard of asset management. Intermediate and advanced asset management tools and techniques are deployed where they add demonstrable value to the decision making process. The maturity of asset management within Marlborough District Council is dependent upon a number factors — skills available; size, complexity and value of the infrastructure; criticality of the community facilities the infrastructure protects; experience and culture of staff; and risk management.

The Council recognises there is an element of diminishing returns between the effort required to collect and analyse data and the subsequent improvement in decision making. The stormwater

infrastructure networks are relatively small and comprehensible systems. They are managed by an experienced engineering management team and skilled operators. Advanced asset management techniques are employed only where it will add significant value to the current decision making process or significantly improve future forecasting.

Core asset management is being developed to provide intelligence to operational managers and to 'future-proof' the existing knowledge base. Advanced techniques such as mathematical modelling, option identification and selection, cost-benefit and total benefit analysis, risk management techniques and asset condition gradings are all regularly used within the current asset management implementation processes.

A team within the Assets & Services Department continues to collect data on asset condition, location and performance to support the asset managers. The quality of the data is systematically and continuously reviewed and improved.

As the treatment processes and the connectivity of the reticulation become more sophisticated, network modelling and other techniques provide insights into the complex behaviour and performance of the infrastructure. Dynamic mathematical models are being developed and deployed to model and predict future scenarios.

There is a current reliance on the knowledge and experience of a stable and highly skilled workforce. The depth and breadth of the skills base across the workforce mitigates many of the risks associated with reliance on individual staff members. However, high quality data and empirical analysis is required to optimise effective decisions and forward planning. There is an increasing demand for logical and robust processes to support and demonstrate effective management. Consequently there is growing emphasis on the collection of performance data and the condition of the asset base to achieve this objective.

The Council's approach to asset management will select and deploy advance techniques where they will assist in resolving conflicting demands whilst maximising the skills and practical experience of the workforce.

Chapter 2: Levels of Service

The purpose of the Levels of Service chapter is to describe the type and extent of stormwater services the Council provides, the context and manner in which they are delivered, the current achievements, and challenges in meeting future expectations.

Components of the Levels of Service Chapter

2.1 Strategic Overview — the context for the stormwater services.

2.2 Community Outcomes — the outcomes we are working towards for Marlborough.

2.3 Who Are Our Customers — a description of the stakeholders of stormwater services.

2.4 What Our Customers Want — the expectations of our customers and how they were discovered.

2.5 What Do We Have to Do — our statutory obligation to provide a stormwater service.

2.6 What We Currently Provide — the current levels of service and the performance indicators of our achievements.

2.7 What Our Customers Would Like — future challenges from changing expectation and growth.

2.1 Strategic Overview

The operating costs of the stormwater service account for around 2% of the Council's total activity expenditure. This proportion is predicted to remain relatively unchanged in the 2018–2021 planning period.

Stormwater drainage has an important role in the overall provision of Council services. In common with both Emergency Management and Rivers & Land Drainage Dept. the service is seldom tested but has a high impact on urban residents. Figure 1-1 in Chapter 1 shows the relationship between the stormwater asset management plan and the Council's strategic objectives.

The Council has adopted a regional 'Smart and Connected' strategy. The strategy was initiated for economic development of the region and has evolved across Council activities. The strategy emphasises an integrated approach that maximises the skills and resources of the region and how they interrelate with the national and international context.

The strategy's framework is closely aligned with the Council's six community outcomes — Governance, Environment, People, Economy, Living and Connectivity (referred to as 'Mobility' in the Smart and Connected Strategy).

Stormwater activities specifically contributes to the following values in the Smart and Connected framework shown overleaf:

- Environment — 'control over pollution levels, forms and effects', 'system protection and care', and 'sustainable resource management'
- Living — 'health' and 'individual safety'
- Economy — 'productivity'.

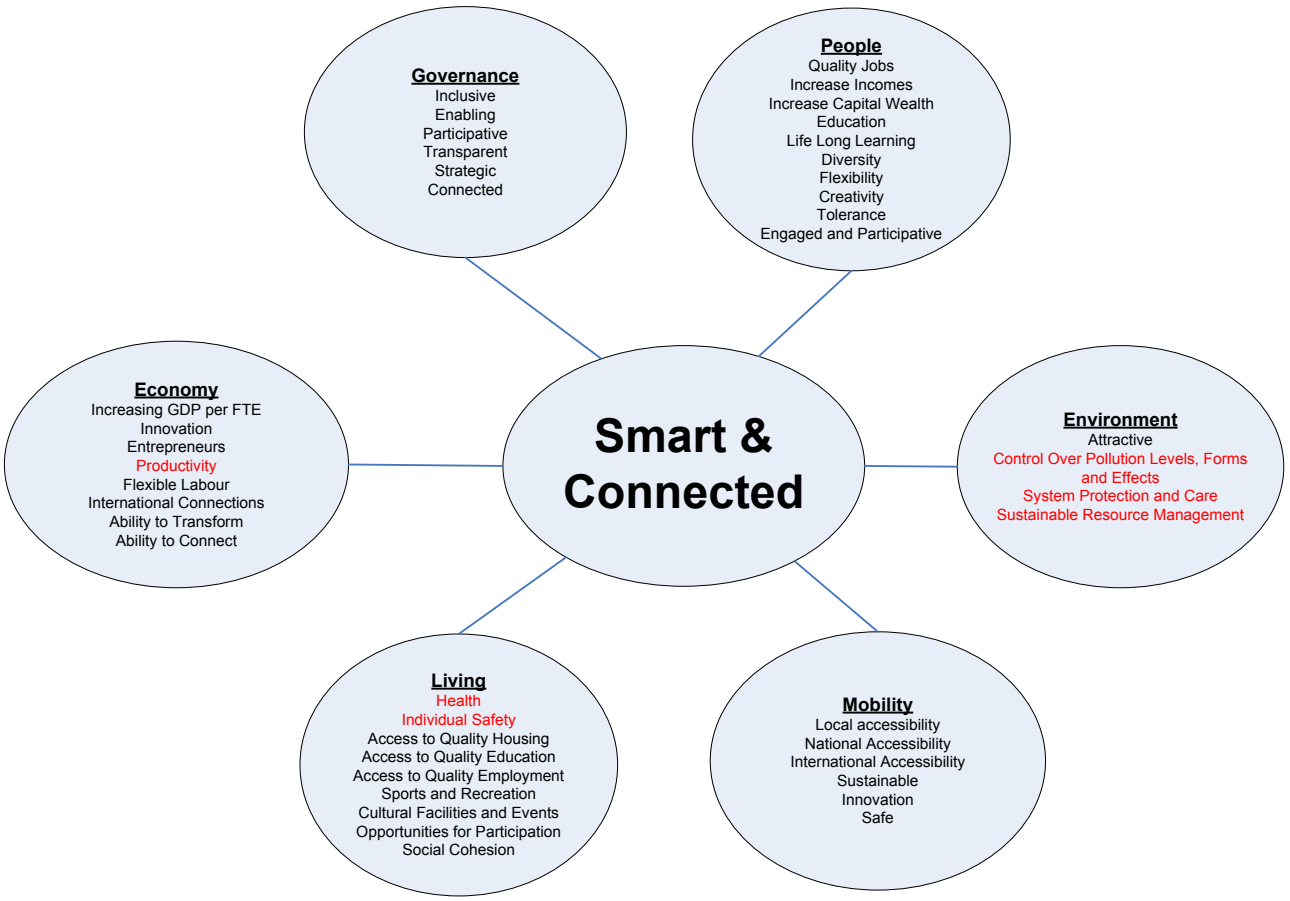


Figure 2-1 — The Smart and Connected Strategy framework

2.2 Community Outcomes

Community outcomes are a keystone to public service provision in New Zealand. The Long Term Plan (LTP) is the vehicle by which the relationship between community well-being, community outcomes and the services provided by the Council are communicated to the community. The LTP is updated every three years whilst Annual Plans and Annual Reports are published annually in the interim periods.

This activity contributes to the community outcomes of:

- **Environment** by providing urban drainage networks that effectively manage flood risk and the potential for surface contamination to enter aquatic environments
- **People** and **Economy** by providing a safeguard against stormwater flooding of residential, commercial and industrial property.

The community outcomes have been established through consultation with the community and their elected representatives. The Council conducts an annual customer satisfaction survey of 600 residents. Plans and strategies are published and the public are invited to submit their comments.

Special consultative committees and working groups are established to gain public opinion on specific projects. The structured decision making process with the Murphy's Creek Stakeholder Group was a very successful exercise in reaching a consensus solution with a variety of stakeholders.

The Council also draws intelligence from the experience and research of a number of national and local agencies such as the Nelson Marlborough District Health Board, Ministry for the Environment, Ministry of Social Development, Statistics New Zealand, the New Zealand Transport Agency, Marlborough Research Centre and many others.

Performance measures for Council activities are reported each year in the Annual Report. In 2014 national non-financial performance measures for water were introduced by the Secretary for Local Government. These have become the primary methods of monitoring and evaluating progress towards the community outcomes and comparing councils throughout New Zealand.

2.3 Who Are Our Customers

The expression 'customers' is a widely understood concept in the free enterprise economy. It has been less readily adopted to describe the relationship between ratepayers and the Council. This reluctance is partly due to the monopoly the Council has over many services, the charging mechanism through the general rates and the provision of regulatory functions that are beyond the normal concept of purchasing goods and services. The Council has a more complex role to play than a simple purveyor of services. It also has a statutory duty to provide certain services and a regulatory function to control the free market. This is particularly relevant for stormwater services and for this reason it is probably more accurate for this section to consider all of the stakeholders.

Commercial properties and domestic households connected to the stormwater reticulation may be regarded as more traditional 'customers'. All properties within urban zones can expect to benefit from the stormwater drainage system with the costs met from general rates. Developers of the urban zones are required to make provision for stormwater drainage within the subdivision and pay a stormwater Development Contribution towards the Council owned infrastructure.

Most central government legislation of drainage matters is devolved to local authorities to enforce. The legislative framework is outlined in Section 2.5.

Industries and businesses are heavily reliant on stormwater drainage to protect both their buildings and the productive areas surrounding them.

Many members of the public, iwi and environmental groups such as Forest & Bird, Guardians of the Sounds, Kaipupu Point Inland Island, and the Grovetown Lagoon Working Group, have a strong interest in the quality of waterways. Recreational users (swimming, angling, boating, shell-fishing, etc) also have an obvious interest in water quality.

Businesses within the commercial sector may represent a significant threat to stormwater quality. It is common for businesses to have a hardstanding area that drains to the stormwater system. The land can be used for processing, material storage, vehicle parking or loading. Accidental spillage, leakage or overflows of hazardous materials may flow across the impermeable surfaces into the stormwater system. It is part of the Council's duty to protect the receiving environment from potential pollutants being conveyed through its stormwater infrastructure. Council may need to regulate activities within businesses' properties in order to control sources of potential contaminants.

Iwi have a special cultural relationship with the environment which is an important element to consider in the abstraction and distribution of water, and construction of related infrastructure.

2.4 What Our Customers Want

The levels of service and the subsequent performance measures are derived from these fundamental objectives of stormwater drainage:

- safeguard the community from urban flood hazards
- minimise damage to urban property from floodwater
- facilitate commercial and residential development
- protect the aquatic environment through the management of the quality of urban stormwater discharges
- provide the service at an efficient and equitable cost.

In practice there is a tension between the provision of the first four objectives and the perceived value, and hence the willingness to pay for the service. Some of the standards included in the stormwater levels of service are prescribed by legislation and have little room for negotiation; others recognise the limitations of delivering the desired goals within financial restraints. The levels of service that are currently used have, therefore, been derived through consultation with the customer base to best reflect the realities of the situation.

The levels of service are included in the LTP which is reviewed at three yearly intervals, and the levels of service and related performance indicators are published in the Annual Reports. Major changes to the levels of service are normally dealt with through the LTP adoption process. However the Annual Plan process can be used for modifications in the interim periods. Submissions from the public either in support or challenging any proposed changes to levels of service are formally received and carefully considered by the Council.

The Council also collaborates with a number of national and international organisations to help to determine the appropriate levels of service and performance indicators. The National Asset Management Support Group (NAMS Ltd) publishes guidance and hosts training courses on good practice in the development of levels of service. Water New Zealand and the Institute of Public Works Engineering New Zealand (IPWEA) assist in the promotion of best practice through published guidance, research, working groups and discussion papers.

Each year an independent consultant is employed by the Council to undertake a customer satisfaction survey. The telephone poll of 600 residents is selected from a statistically representative sample of the population across the region. The survey asks respondents to score each of the Council's activities and the results are analysed and compared with responses from previous years. This provides a subjective assessment of Council performance relative to recent history. Verbatim comments are also recorded and these provide a good source of information on the appropriateness of the levels of service and individual concerns.

The outcome of the customer satisfaction survey can be heavily influenced by recent events. This is particularly apparent for the stormwater drainage service which deals with infrequent events that have a high impact. If there has not been a major storm opinions are likely to be neutral or high. However, if there has been a major storm the customer's direct experience or media coverage is likely to have a negative influence on the survey results. For instance, photographs of submerged roadways in the media are likely to suggest the system is not coping even though the roadway may have been designed as a secondary flow path for excess stormwater and is functioning as it should.

In August 2017 a Levels of Service Workshop was held to present councillors with information on the current levels of service, to discuss the options and seek their feedback. No major amendments were identified as a result of the workshop.

Marlborough District Council reviews its business processes from a 'systems' perspective. The foundation of the 'systems thinking' approach is to consider the performance of the business from the point of view of the customers. Once the customers' experiences are thoroughly understood the business 'systems' can be analysed to ensure they are aligned with delivering the best outcome. It has been frequently demonstrated that many business processes are adept at delivering internal objectives that are not necessarily aligned with providing the best outcome to the customer.

In December 2014 a new asset management information system was introduced. The project ensured that customer service requests were linked to work orders so that there was clear linkage between reported problems and remedial actions. The database is able to provide both asset performance and customer service data.

2.4.1 National Benchmarking

In 2013 Non-Financial Performance Measures were issued by the Secretary for Local Government in accordance with S.261B of the Local Government Act 2002. The rules came into force in 30 July 2014 and were incorporated into Council reporting in 2016.

Sub-part 3 of the rules prescribe eight performance measurements for stormwater drainage to be adopted by all local authorities in New Zealand. The measures have a similar intent to the previous performance indicators — measuring the number of properties flooded during storm events; the

quality of stormwater discharges, the response time to flooding events and the number of customer complaints. The new benchmark measures are included in Section 2.6.

2.4.2 The Murphy's Creek Case Study

The Council sought community involvement and acceptance throughout development of the Blenheim Stormwater Strategy and the early stages of its implementation. Public consultation and collaboration in decision making is an evolving process. Resolution of conflicting views on stormwater issues around Murphy's Creek has been an exemplary exercise in this evolving process.

Murphy's Creek is a spring fed creek that drains through a northern suburb of Blenheim and into the Taylor River just north of the town centre. The creek also receives drainage from the adjacent land through private drains and Council's stormwater pipes. The surface water flows have increased over the years as a result of housing infill and a decrease in permeable surfaces for rainwater soakage. Flow characteristics in the creek are also influenced by weed growth in the watercourse.

Commercial development and rezoning of land in the headwaters of the catchment was the catalyst for a collaborative decision making process relating to Murphy's Creek. A resource consent application was approved to permit the stormwater from a large retail park to be discharged into upper Murphy's Creek. The pipe was installed in 2012 with additional capacity to allow for future urban development on the north-west periphery. The potential consequences of the additional flow from a large commercial site provoked considerable concern amongst the downstream residents.

Murphy's Creek has high amenity value to local residents and particularly property owners adjacent to the watercourse. The spring fed creek is generally considered to be high quality water and is valued for its aesthetic and ecological value. Whilst this would appear to be self-evident there has been little supportive long term scientific data regarding the chemical and biological quality of the stream.

The Murphy's Creek stakeholders were well organised in their opposition to the upstream developments. Their concerns centred around an increased risk of flooding due to the additional flows and the potential damage to water quality and the ecosystem from the stormwater collected from a commercial/urban area.

Council has responded by helping to facilitate an investigation into the stakeholders' concerns. An independent facilitator was appointed to conduct a structured decision making process into the issues and options. Five stakeholder workshops were organised.

Detailed hydraulic modelling of the relationship between the flows in the creek and Taylor River have been undertaken. Flood levels along the course of the creek have been projected from the mathematical models for a range of different storm scenarios. A permanent water quality monitoring station has been established on the creek. The data has been supplemented by routine manual sampling. An analysis of 'first flush' rainwater run-off has also been undertaken to check the effects of surface water draining to the creek after a prolonged dry spell. The data is being made available to an independent consultant to analyse and report to the stakeholder group.

Ten alternative solutions to the stakeholders' concerns emerged from the workshops. Each option was evaluated by the stakeholder group on set criteria — stream bed, aesthetic value, water quality, bank stability, ecosystem health, mauri, economic impact, cost and recreation. At the end of the fifth workshop one solution predominated (Option G) with a reasonable consensus agreement between the stakeholders.

Councillors attended many of the workshops and a proposal was prepared for the Assets & Services Committee to consider.

It is likely this approach will be a model community consultative process for other Stormwater Management Areas in the Blenheim strategy, and subsequent strategies.

2.5 What We Have To Do — Legal Obligations and Restraints

National Policy Statement for Freshwater Management 2014 — National policy statements are issued by central government to provide direction to local government about how they carry out their responsibilities under the Resource Management Act when it comes to matters of national significance.

Local Government Act 2002 S.10 — *T*he *purpose of local government is*

a) to enable democratic local decision-making and action by, and on behalf of, communities; and

b) to meet the current and future needs of the 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' in the legislation is defined as efficient, effective and appropriate for present and anticipated future circumstances.

Note: The 2018 Local Government (Four Wellbeings) Amendment Bill proposes to amend section 10 of the Act by replacing section 10(1)(b) with: "(b) to promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future."

Section 11A states local authorities are required to provide 'core services'. Network services are listed as a core service.

Section 125 requires the local authority to undertake an assessment of the water and sanitary services within their area.

Section 126 states the purpose of an assessment is to assess the "adequacy of water and other sanitary services available to communities…" in terms of the quality of the service currently available; the potential health risks from the absence or deficiency of the service; the current and estimated future demand; and the potential consequences of discharges of sewage and stormwater.

The Building Act 2004 requires new houses and habitable buildings to be designed with a floor level above the 50 year Average Return Interval (ARI) event. It also requires that a 10 year ARI storm event shall not cause nuisance to other properties. This applies only to the building of new houses, but there is an implicit indication that these are appropriate standards for older properties too.

Resource Management Act 1991 — The purpose of this Act is to promote the sustainable management of natural and physical resources. Section 15(a) states no person is allowed to discharge water or contaminants into water unless it is expressly allowed to do so. This is the major piece of legislation that controls the quality and quantity of stormwater discharged into local waterways.

The Health and Safety at Work Act 2015 provides the legislation for the occupational health and safety of staff employed in stormwater management.

Section 60 of the Civil Defence Emergency Management Act 2002 requires lifeline utilities to prepare to function to the greatest possible capability during an emergency. The design and operation of the stormwater system is encompassed within the requirements of the Act.

2.6 What We Currently Provide

Currently the Council has four levels of services pertaining to stormwater drainage. Achievement against these standards is judged through eight 'performance indicators' which are reported in the LTP/Annual Report. The levels of service and reported performance are outlined here.

Level of Service 1 — Provide an overall level of service that meets or exceeds residents' expectations.

Performance Indicator — Residents' satisfaction survey.

The residents' satisfaction survey is conducted each year. A telephone poll of approximately 600 residents is undertaken around June/July. Participants are asked to rate the Council's performance in providing the service. The measure is subjective and can be heavily affected by recent storm activity or publicity on a particular topic. However as a general indicator of public opinion it is an important reference. The survey scores achieved between 2008 and 2017 are shown in Figure 2-3.

The telephone survey was introduced to the customer in the following way — "The Council provides a stormwater drainage system to manage storm water runoff in urban catchments, predominantly in Blenheim and Picton, and smaller networks in Renwick, Havelock, Spring Creek, Riverlands and Cloudy Bay Business Park". Residents were then asked: "on a scale of 1 to 9 where 1 = not at all well, 5 = neutral and 9 = extremely well, how well do you think the Council performs in providing this service?" The responses are illustrated in Figure 2-2.

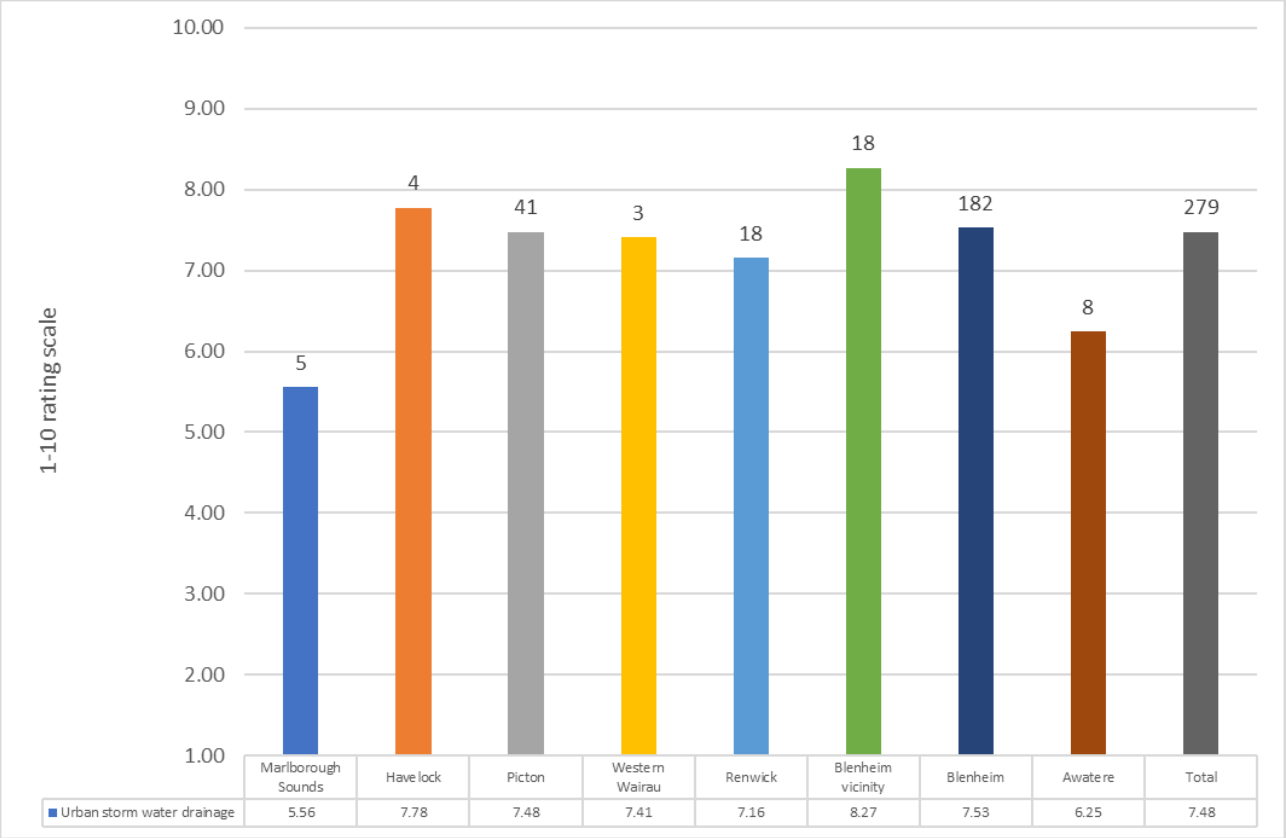


Figure 2-2 — Customer satisfaction survey results 2017

Careful interpretation of the survey result is required to attain an accurate understanding of the service performance. For example there is very little stormwater infrastructure in the Marlborough Sounds area so it is difficult to know on what experience the five participants of the survey from the Sounds based their judgment. Significant flood damage was inflicted on many roads in the Sounds as a result of the storms in November 2016. Road drainage in the Sounds is not stormwater infrastructure. However, with caution the data can continue to give useful feedback on the service.

The report based on the 2017 survey concluded: "*Urban storm water drainage* service satisfaction level has increased in 2017 up to 78.9% (65.5% in 2016). This service showed the second biggest improvement in satisfaction ratings in the past year. Across areas there were differences, however, these variations could correspond with small sample size in some areas and availability of the service provision. There were significantly less negative comments (*Flooding still occurring*), and more residents answered *No problems.*"

Some of the noted improvement may have been due to the relatively low incidence of flood events in the previous year.

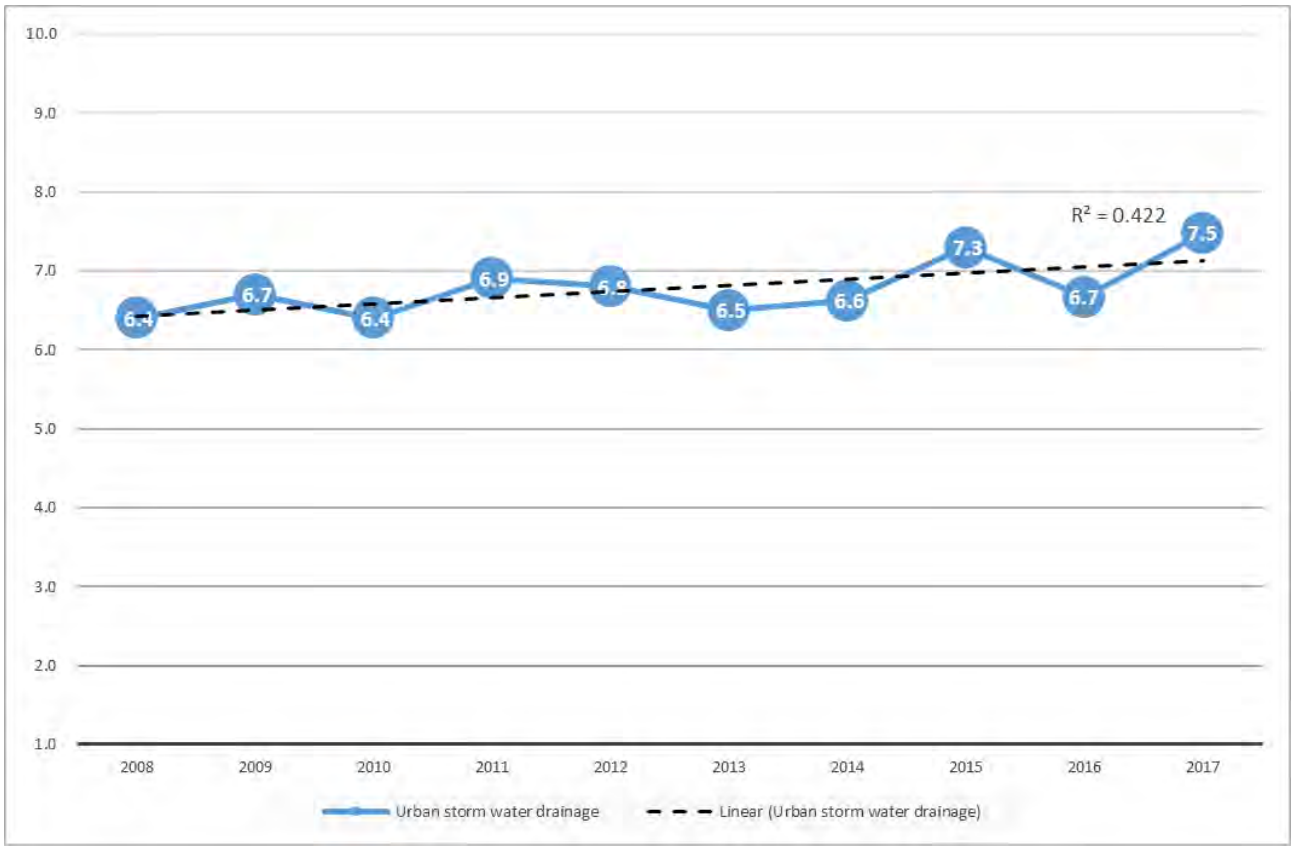


Figure 2-3 — Survey scores achieved between 2008 and 2017

The impromptu comments are an interesting insight into customer perception. Although subjective they can provide a valuable source of information. For this reason they are carefully scrutinised and considered in future planning.

Table 2-1 — Summary of impromptu comments from customer satisfaction survey 2017

		Count
Positive	No problems	72
	Not much flooding	32
	Very well controlled	21
	Other	7
Negative	Council doesn't follow up	4
	Drains blocked/ need clearing	15
	Flooding still occurring	19
	Irregular mulch/ mowing of banks	2
	Poor maintenance	8
	Rubbish in rivers	4
	Other	10

Table 2-1 shows a summary of the impromptu comments from the 2017 survey. The comments regarding "Irregular mulch/mowing of banks" and "Rubbish in rivers" may demonstrate some confusion between the urban stormwater system, which has very little open channel infrastructure, and the rivers and land drainage assets.

Level of Service 2 — Minimise the environmental risks of stormwater discharges.

Performance Indicator — Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of:
(a) abatement notices,
(b) infringement notices,
(c) enforcement orders, and
(d) convictions,
received by the territorial authority in relation to those resource consents.

The types of discharge that can cause deterioration to the aquatic environment can range from serious chemical or oil spillages to soil sediment from de-watering excavation works and other point-source pollution events. There are also more chronic effects such as metals (zinc, iron and lead) dissolving into rainwater from metal roofs, and accumulated road grime such as oils, greases, rubber, copper (from brake pads) and bitumen.

Drainage from the roads and many private properties are directly connected to the stormwater reticulation. It can be very difficult to control contamination from these sources. Road inlets have grating and sumps to trap the gross materials washed from the road surface.

Council is providing the method of conveyance to discharge into the environment and therefore has a responsibility for the quality of the discharge. Marlborough Roads is generally responsible for the maintenance of the road sumps, ensuring debris is removed from the gratings and sumps are sucked out at routine intervals.

This indicator was adopted by Council the with the national performance indicators in 2015. Table 2-2 shows the achievement to date for this indicator. The future target proposed in the LTP will remain as nil.

Table 2-2 — Achievement against the environmental risk performance indicator 2015-17

Key Performance Indicators	LTP Baseline	2011-12 Actual	2012-13 Actual	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Target	2016-17 Actual
Discharge compliance: Minimise the environmental risks of stormwater discharge.								
Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions, received by the territorial authority in relation those resource consents.	Nil				New measure	Nil	Nil	0

A number of tactics can be deployed to protect the environment. 'Source control' of activities at the originating site to prevent contaminants entering the system is generally the most cost-effective. Council also identifies high risk sites. These are typically industrial and commercial sites and are recognised either through the planning process or through the trade waste monitoring programme. Site owners are advised of the risks and their responsibilities. Engineering solutions are sought to mitigate the risks such as fitting canopies over high risk areas to avoid rainwater wash-off of contaminated material, fitting bunds around surface water sumps or fitting interceptors onto

stormwater drains. Owners are encouraged to produce management plans to develop good practices and deal with accidental spillage.

Strategies are evolving to manage the more chronic and dispersed sources of contamination. Major new subdivisions are required to provide treatment swales using special plantings and substrate material which is designed to remove much of the road film from water before it enters the reticulation.

Assets & Services Department staff are notified of customer complaints and are able to respond immediately on a 24/7 basis. Pollution clear-up kits are readily available to the response crew. Temporary bunds can be deployed to contain surface contaminants and absorbent pads are used to soak up spillages. There is close cooperation between Assets & Services staff and the Environmental Protection Officers to respond to pollution incidents and to search for the source of the pollution.

Level of Service 3 — Provide a reliable service.

Performance Indicator

- 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.

This national performance measure was first introduced in 2015/16. In the first year there was one recorded flooding from a blocked drain. There was some evidence that private drainage contributed to the flooding. A severe storm occurred in the northern part of the region on 15th November 2016. This was one day after the Kaikoura earthquake and staff were stretched by the need to respond to, and repair damaged infrastructure. There were six recorded events in which habitable floors were flooded.

Table 2-3 — Achievement against the system adequacy performance indicator 2015-17

Key Performance Indicators	LTP Baseline	2011-12 Actual	2012-13 Actual	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Target	2016-17 Actual
The number of flooding events that occur in a territorial authority district.	Actual number to be reported				New measure	Nil		1
For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to the territorial authority's stormwater system.	3				New measure	0.08	3	0.4

Accurate recording during an emergency event can be difficult. There is a high volume of activity, urgent works are being undertaken to mitigate damage, and personnel are extremely busy working in arduous circumstances. It is not always obvious if rising flood waters entered 'habitable floors' or if there was a lesser outcome. For reporting purposes the worst is assumed unless there is evidence to the contrary.

Table 2-4— Recent storm events and their consequences

Date	Storm ARI	Dwellings Flooded	Property Flooded	Total Calls
23/07/2009	<5	2	5	24
25/05/2010	3	2	6	28
2/06/2010	<5	0	1	12
7/06/2010	<5	2	8	37

Date	Storm ARI	Dwellings Flooded	Property Flooded	Total Calls
21/12/2010	9	4	4	28
28/12/2010	20	6	10	10
18/01/2011	<1.3	0	0	na
3/03/2012	1.3	0	0	na
8/08/2012	<2.33	0	9	139
12/08/2012	<2.33	0	0	12
15/01/2013	<5	1	2	21
6/05/2013	9	0	10	48
17/04/2014	<1.5	1	4	60
15/11/16	5	6	9	79

Table 2-4 shows the history of recent storm events the number of customer service request received by the Council and the number of properties flooded. The table distinguishes the flooding of a dwelling and the flooding of gardens, driveways or out-buildings.

Level of Service 4 — Provide a service that is timely and responsive to current needs..

Performance Indicator — The median response time (in hours) to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

Table 2-5 — Achievement against the reliable service performance indicator 2015-17

This specific performance measure was adopted in 2016 as the national measure, but it was preceded by the Council's similar measure of response times. **Key Performance Indicators**	**LTP Baseline**	**2011-12 Actual**	**2012-13 Actual**	**2013-14 Actual**	**2014-15 Actual**	**2015-16 Actual**	**2016-17 Target**	**2016-17 Actual**
The median response time (in hours) to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.	1 hour	N/A	N/A	N/A	New measure	0.7	1	0.8

Infrastructure cannot be economically installed to cope with all possible rainfall events. The system is designed to meet a criteria that is acceptable to customers in terms of frequency and consequences. The most uncommon, intense storm events that cause very high flows of stormwater will cause some localised flooding. A combination of planning legislation, building regulations and stormwater management is designed to minimise the impact on habitable property. However once a flooding event occurs it is important that the Council responds to requests for assistance in a timely fashion.

A weather forecast of a severe storm will initiate the establishment of an Incident Management team within the Council's Assets & Services Department. The team receives all customer service requests. Calls are triaged. The severity of the problem and the likelihood and speed of deterioration is estimated. Responsibility is determined between roading, rivers, stormwater or private drainage issues. The work is prioritised and work orders are assigned to appropriate teams.

Customers have a range of expectations and tolerances, and determining priority can be problematic. Receiving good, clear feedback from the field during an emergency event can also be difficult as resources are inevitably stretched, with people working in difficult circumstances.

In many storm events the Council receives calls regarding customers' problems with the sewerage system. Toilets and domestic plumbing are slow to drain and can backup, sometimes alarmingly. This is due to stormwater ingress into the sewer pipes causing them to surcharge and preventing them from taking any further foul wastewater. This is a problem with the sewer reticulation and must be considered separately from the performance of the stormwater system.

In 2015/16 and 2016/17 the median response time was 40 minutes and 47 minutes respectively. The target time of 1 hour was achieved.

A debriefing is held after each major event to identify any structural changes required to improve asset performance or operational matters to ensure the response times to customer requests are minimised.

2.7 What Our Customers Would Like — Future Challenges

The target performance indicators for 2018-21 are shown in Appendix 2.

The Blenheim Stormwater Strategy provides an excellent framework for analysing needs and for planning and implementing future improvements. This has also been supported by insights from the Murphy's Creek structured decision making process.

The strategy identifies 85 possible actions which are derived from the strategic goals. The Blenheim area has been divided into Stormwater Management Area Plans (SMAPs) based on eight natural drainage basins within the Blenheim area. The SMAPs will assist management by focusing and prioritising potential actions into a practical implementation plan. The Council will progressively develop the plans in order to implement the strategy. It is likely that the same methodology will be adopted for the other urban areas.

The Blenheim Stormwater Strategy Action Plan is attached as Appendix 3 as it demonstrates the thorough content and detail of the Strategy.

The importance of community involvement in urban stormwater management decision making was highlighted in the Murphy's Creek case study. It included complex issues and potentially conflicting views from the various stakeholders. The process of gaining public approval can be time consuming but ultimately can be cost-effective as delays and challenges in the planning process add significant delays and costs to projects.

The programme of capital investment to meet the levels of service targets is shown in FinancialChapter 5: Table 5-2.

The levels of service are likely to remain relatively unchanged in future.

2.7.1 Levels of Service — Water Quality

The National Policy Statement for Freshwater Management 2014 (NPSFM) was amended in 2017. It provides direction on how local authorities should carry out their responsibilities under the Resource Management Act 1991. In 2014 the framework for national objectives was established. As a minimum, two national objectives for compulsory values were set — ecosystem health and human health for recreation. In 2017 the further amendments included the target for 90% of rivers and lakes to be swimmable by 2040.

There is a legacy of many different historical resource consents covering the discharges of stormwater throughout the region. The Blenheim Stormwater Strategy proposes a comprehensive review and renewal of the urban stormwater resource consents. The objective is to consolidate consents based on stormwater catchment areas. The conditions imposed by future consents can be anticipated. A succession of amendments to the NPSFM are setting more stringent targets for rivers and receiving waters. The Stormwater Action Group maintain close liaison with both the

Council's Environmental Monitoring and Regulatory departments to inform future infrastructure plans.

It's possible that future consent applications will have consent conditions regarding the physical, chemical and biological quality of stormwater discharges to the receiving water. Alternatively target values may be set for the water quality of receiving streams as they pass through the urban environment.

Recent large subdivisions on the periphery of Blenheim have been required to fit stormwater treatment devices. A combination of stormwater detention, roadside swales with plantings and substrate designed to remove suspended particulate matter have been installed. Infiltration swales have been incorporated into the design of The Omaka Landings and Westwood Residential sub-divisions. The majority of stormwater from the Taylor Pass subdivision discharges into a wetland treatment pond.

There are a number of proprietary treatment filters which are being evaluated by staff. To date these have not been installed but are likely to be retrofitted to existing outfalls where the space available for natural filter designs is insufficient.

Resource consents for recent subdivisions increasingly require ongoing monitoring of stormwater, particularly the 'first-flush' of stormwater from the onset of rainfall. Contaminants are likely to accumulate on road surfaces and drainage infrastructure during prolonged dry weather. The first rainfall event may mobilise the particles and cause a sudden 'shock 'of contamination into the watercourses. The monitoring requirements will provide a base of information for future decision making.

There is evidence of a deterioration of water quality in the Taylor River as it passes through Blenheim. CCTV surveys of the sewer and stormwater network following the 2016 earthquakes has shown considerable pipe damage. Monitoring of the river and stormwater quality may show a causative effect and help to direct the future rehabilitation programme. CTTV survey evidence is being presented to the Department of the Prime Minister and Cabinet (DPMC) and Council's commercial insurers for funding assistance (as outlined in Chapter 5) to help meet the costs of repair and rehabilitation of the earthquake damaged reticulation..

In 2017 the Council's Environmental Science and Monitoring Department was successful in a bid for a grant from the Ministry for the Environment's Freshwater Improvement Fund (FIF.) The project is centred on the Taylor River, which is recognised for its cultural and amenity value, but also for its vulnerability to land use changes and contamination from leaking sewer and stormwater infrastructure through Blenheim.

In the spring of 2017 the Assets & Services Department initiated a weekly stormwater monitoring programme to sample eight stormwater outfalls along the Taylor River as it passes through Blenheim. The monitoring was coordinated with a wider survey undertaken by the Environmental Science and Monitoring Department for the FIF project. Additional samples are routinely taken from the stormwater network upstream of the outfall to check for bacterial contamination. There is some anecdotal evidence that ex-filtration from the sewer network, possibly as a result of earthquake damage, may be infiltrating the stormwater reticulation and discharging to the river. The monitoring programme will provide evidence and help to identify the possible sources of cross-contamination. This information will help the Assets & Services Department to target CCTV surveys of both sewer and stormwater networks. The Taylor River Freshwater Improvement Project has been funded for two years. It has wider environmental objectives but will provide base data for future rehabilitation and renewals planning.

Gap Analysis – continue to monitor water quality of stormwater outlets and receiving waters. Analyse route cause and identify remedial works.

Continue to monitor research and best practice of stormwater treatment and incorporate methods into new designs and consider retrofit treatment where required.

2.7.2 Levels of Service – Flooding

The Building Act 2004's standard for avoiding flooding of buildings is a well-recognised standard and is likely to remain for new housing and to be a goal for existing property. The Act requires new

houses and habitable buildings to be designed with a floor level that will not be flooded by a storm event with a 50 year Average Return Interval (ARI). It also requires that in a 10 year ARI event that nuisance to other properties is avoided. This applies only to the building of new houses, but there is an implicit indication that they are appropriate standards for older properties too.

The safe floor level requirement in a 50 year ARI event can be achieved by several methods:

- setting of minimum floor levels, and/or
- a pipe network to take some/all stormwater, and/or
- surface storage/ponding, and/or
- providing a secondary overflow path.

Often a pipe network is constructed to deal with a 5 year ARI storm event (Q_5), but can be less or sometimes more. Surface methods of secondary overflow or acceptable ponding storage are then required to cope with storm run-off in excess of a 5 year ARI event and up to a 50 year ARI event to ensure house floor levels are not flooded. To prevent nuisance to other properties in a 10 year ARI event requires such ponding storage to be limited to the road.

The challenge will be to ensure that surface drainage around houses built prior to 2004 can achieve a similar performance and that the standard can be maintained in the face of further urban growth and climate change.

A detailed mathematical model of the Redwood Street catchment in Blenheim has identified a number of upgrades to the stormwater pipe network and receiving drains that would improve the drainage capacity of the area and resolve long-standing issues in the South of the town. The stormwater work will be integrated with the Rivers and Land Drainage Department which is overseeing a series of improvements to the Town Branch Drain. An outline budget of $10 million has been approved for the project. The first phase has been to upgrade the Town Branch drain channel immediately east of Redwood Street. This was completed in the autumn of 2017 by the Rivers Department for around $750,000.

There is a trend towards increasing customer expectations and lower tolerance levels. Significant work has been undertaken both locally and nationally to understand the components of stormwater management through soakage, detention and conveyance and to maximise the effectiveness of each. Once a drainage area is thoroughly understood, the infrastructure is installed and the customers' expectations managed. To this end an important report[2] has been drafted based on the Blenheim system. The report examines the attributes of a stormwater system, the factors affecting surface water drainage, previous and current design criteria and includes a review of best practice from around the country. The report provides an excellent platform for future stormwater design.

Gap Analysis – Ensure new structures are designed with minimum floor levels and impacts on stormwater flows. Continue to implement the stormwater strategy.

Ensure designs accommodate climate change forecasts

2.7.3 Levels of Service — Service Response Times

Customers will continue to require a speedy response to service requests. Evidence from the customers service request data base and from the customer satisfaction survey suggests the current performance achievement is adequate. The existing business model using directly employed service operatives can be supplemented at short notice by local contractors who are available to respond to emergency needs. This approach is working satisfactorily. The system is tested under duress during storm events.

The introduction of the 'Floodwatch' programme to the MDC website has been very popular. The site provides access to live information on the quantity of rainfall recorded at the network of MDC weather stations and the levels of the major rivers in the district. The information is of primary benefit to the rural population but is also widely accessed by urban dwellers during storms. The site is readily available through the Council's 'Smart Maps' application on the website.

[2] Procedures for Reviewing Blenheim Stormwater Capacity and Providing New Areas, MDC (August 2014).

Gap analysis – no significant changes to this level of service however seek to improve site feed-back particularly during severe storms

2.7.4 Levels of Service — Affordability

Affordability is perhaps the most important challenge to be faced in the achievement of the levels of service. As noted in Section 2.4 there is often a conflict between the desired, or imposed, levels of service and the ability of the community to pay for them.

The Council's Revenue and Financing Policy is reviewed every three years and the updated version is included in the Long Term Plan. The policy seeks to establish a fair and equitable distribution of costs between the individuals that pay and the beneficiaries of the Council's services.

Gap Analysis – ensure whole life costs including maintenance and depreciation costs of increasing infrastructure are included in initial design assessment and strategic overview.

Chapter 3: Future Demand

Components of the Future Demand Section

3.1 Demand drivers — factors influencing the demand for stormwater services.

3.2 Demand Forecasts — how future demand has been evaluated.

3.3 Demand Impact on Assets — asset additions, augmentation and utilisation to meet demand.

3.4 Demand Management Plan — non-asset solutions to meet demand estimates.

3.5 Asset Programmes to Meet Demand — major demand driven programmes and costs.

3.1 Demand Drivers

Future demand for stormwater services is influenced by a number of factors that work together in combination.

Population Growth and New Zoned Areas — The Marlborough Urban Growth Strategy 2013 identified eight greenfield sites on the peripheries of the current urban areas that are suitable for future development. These have been zoned Urban Residential. A further area to the south has been identified for employment land.

Population Growth and Infill Housing — The urban growth strategy recognises housing density will intensify within the existing urban areas as this land is further subdivided. The loss of permeable ground will have consequences for stormwater run-off.

Improved Levels of Service — There is an increasing trend for customers to demand increasingly higher standards of stormwater drainage and to be less tolerant of surface flooding.

Improved Environmental Standards —There is increasing concern over the impact of human activities on the quality of waterways and the coastal environment. Central government provides direction through National Policy Statements that are regularly updated. Tighter regulation and more rigorous enforcement of existing controls can be expected in future.

Climate Change — There has been a significant increase in extreme weather events and researchers predict this trend will continue. As severe storms become more frequent there will be pressure to upgrade infrastructure to mitigate the impact on the urban environment.

Legislation — The main legislative powers influencing stormwater services are outlined in Chapter 2. Further changes to the National Policy Statement for Freshwater Management, as well as further work on climate change adaptation, has recently been signalled by the Government, and may require additional drainage capacity and environmental protection upgrades.

Resilience —The stormwater system provides a level of protection to the urban community from uncommon extreme events. Having a robust and durable system in place is important. Meeting the demand for additional security against natural hazards would require further upgrades or extensions of the existing system.

3.2 Demand Forecast

3.2.1 Population Growth Trends

Previous analysis of the four Census counts from 1991–2006 coincided with a period of rapid economic growth in the Marlborough region. Overall population growth in the region was around 1.5% per annum although there were some significant local variations. For example, the Waikawa area experienced a population increase of 237% whilst the usual resident population of Seddon decreased by 8%.

In 2014 a reassessment of population projections was undertaken and presented to the Council's Assets & Services Committee. The report recognised several trends in global population demographics that are contrary to historical growth patterns. These trends are likely to have significant implications for national and regional planning assumptions.

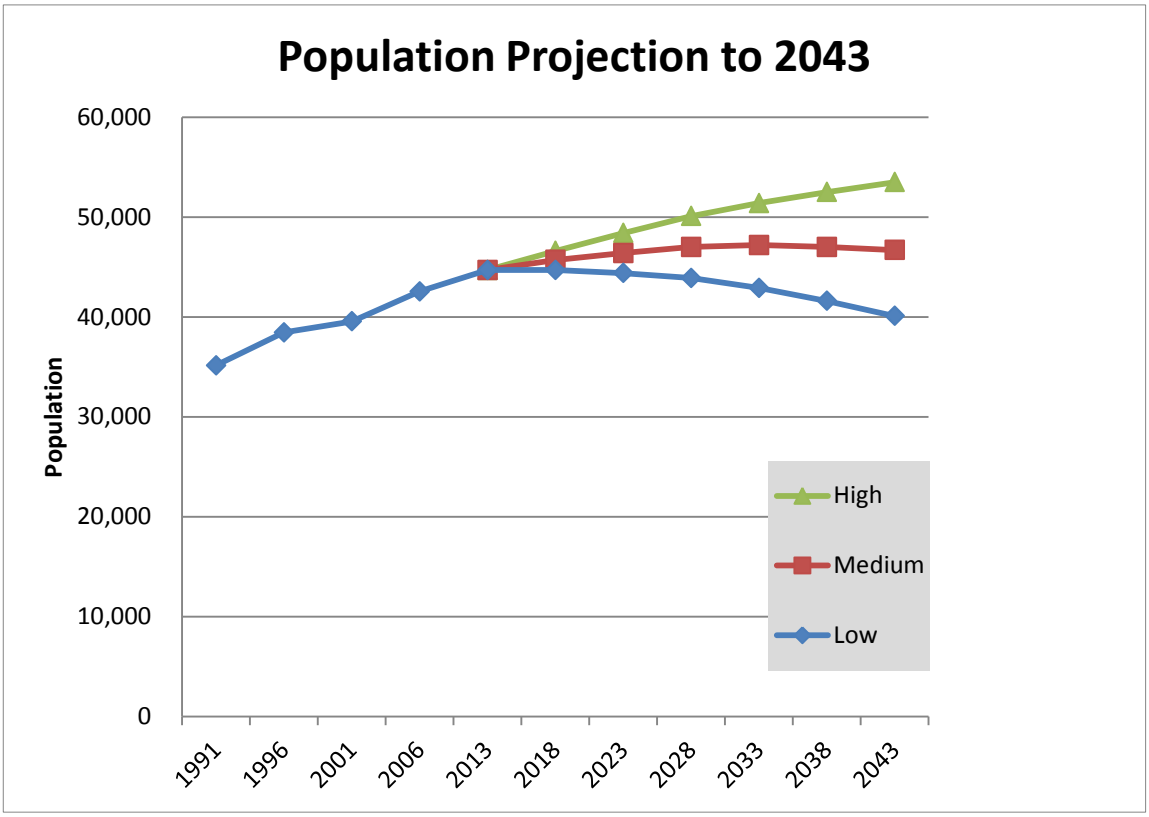


Figure 3-1 — Population projections to 2043

3.2.2 Marlborough Population Growth

There are two major trends in the demographics of developed countries that are unprecedented — a slow down in population growth and an increase in the age of the population.

Within a generation most developed countries (including New Zealand) as well as many developing countries will be experiencing negative population growth. Figure 3-1 shows the population projection for Marlborough based on the data collected in the 2013 Census by Statistics NZ. In addition the Council commissioned two reports from the National Institute of Demographic and Economic Analysis (University of Waikato). The Institute's report provided further detailed analysis and population projections for the region. The conclusions in this 2012 report are informed by local economic data supplied by Infometrics.

Both Statistics NZ and the Institute of Demographic and Economic Analysis report provided projections on high, medium and low growth scenarios. The trends are broadly similar. The Institute generally projected lower growth over a narrower time period than the Statistics NZ projections but this is within the overall range of the Census projections. The Institute's report looked at the whole of Marlborough rather than the individual settlements, and projected further into the future. The conclusion for all three projection scenarios (low, medium and high) was that the population will continue to grow for some time, then slow down and then decline. The timing of the population peak varied from as early as 2017 for the low projection to as late as 2061 for the high projection.

The release of the 2013 usual resident population statistics show the actual population for Blenheim to be very similar to the medium projection previously published by Statistics NZ. The Census showed some of the smaller settlements to have grown at a slower rate than was previously projected. These statistics fit with the national pattern of slowing growth in rural areas and more people moving to the urban areas. However, local economic opportunities can strongly influence regions or individual townships, bucking the national trends.

Over the next 35 years there will be a slowing down of population growth, followed by a period of no growth and eventual negative growth.

The changes in population are not occurring uniformly through the region or uniformly across all settlements. Generally the smaller rural settlements are experiencing a more rapid slow-down in growth than the urban populations. However, there is also a shift in the "centre of gravity" of the Blenheim–Renwick and Picton–Waikawa urban areas. Renwick and Waikawa have experienced considerable increases in population whilst central Blenheim and Picton have seen less growth or a decline in population.

The main urban growth areas are the greenfield sites on the periphery of the existing urban areas. Urban growth pockets have been identified to the north and west of Blenheim's town centre and these areas have been zoned for urban residential development.

The number of inhabitants per dwelling is also falling. This means the demand for housing will decline at a slower rate than the fall in population. With Marlborough's age distribution this could indicate there will be fewer wage earners per household, which has consequences for the future affordability of stormwater services.

Planning for Growth

The methodology for infrastructure planning most commonly adopted by the Assets & Services engineers is to use the medium growth scenario for population projections. The Census data is analysed at mesh-block level and population estimates are assigned to the stormwater management catchments. Adjustments can be made depending on the growth characteristics of individual mesh-blocks and local knowledge.

When planning services with a long lead time, the anticipated increase in demand needs to factor in a margin of error. A 'just in time' approach is prudent both from the point of view of capital expenditure and the uncertainty of projections and assumptions. In contrast, from a financial planning perspective, it is prudent to anticipate a slower growth in the rateable property base and income from development contributions, with a subsequent delay in cash flow returning to the Council.

A further consideration is that many infrastructure assets have a planned life in excess of 80 years. As a large proportion of the total asset cost occurs in the initial construction phase, it would be expensive to underestimate the long term demand and be forced to upsize assets in future. Thus the tactic employed is to err on the high side for long life components, use the medium scenario for the design of shorter life components, and for all other assets to build 'just in time' to meet demand.

3.2.3 Ageing Population

The proportion of the total population over 65 years old will increase significantly. The baby boom that followed the conclusion of World War Two continued into the 1960s. However subsequent generations had unprecedented access to effective birth control and a different attitude to family size. Other social factors such as opportunities for women in the workplace and greater financial security in old age have also been influential. As a result the average size of families has been dropping steadily.

Improving life expectancy for the baby boomers, and continued trends of smaller family sizes by the following generations, means the proportion of older people in the population will increase significantly over the next 30 years. Currently the proportion of the Marlborough population over 65 is around 23%, which is marginally above the national average. By 2043 this is projected to increase to 34%. The proportion of the population of working age will decrease from 64% to 50%. Taking into account a considerable number of people of working age may not be working, significantly less than half of the total population will be wage earners.

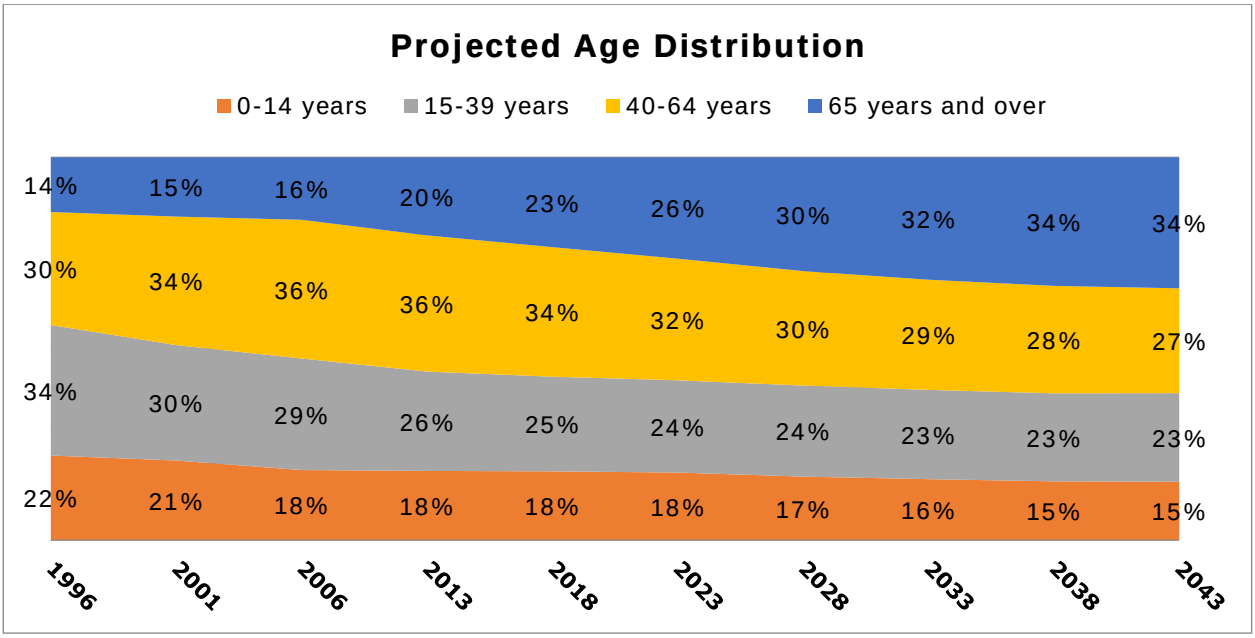


Figure 3-2 — Marlborough population projected age distribution

At a high level there are two consequences for Council infrastructure that need to be highlighted.

1. Councils can no longer simply design infrastructure for significant growth secure in the knowledge that at some time in future the capacity will be required.
2. A greater portion of the population will be on fixed incomes so people will have a limited capacity to pay for increased costs.

Population growth is probably the most obvious and ubiquitous influencing factor for the projection of the future demand for services. However population growth alone is a poor indicator of demand for infrastructure services. Other underlying factors such as climate change, environmental standards, national legislation, major hazard resilience, levels of service and other social aspects often have a far greater impact either alone or in combination. There is less empirical data to support assumptions relating to these factors. However it is important these are also placed on a common footing and a consistent approach underlies medium term strategy development.

3.2.4 Marlborough Urban Growth Strategy

In 2009 the Council embarked on a major project to develop a comprehensive urban growth strategy for the Marlborough region. Population projections were based on the previous Census which estimated growth over the next 25 years of approximately 9,300 additional residents across the region. The opportunity for infill housing and urban densification within the existing settlements was taken into consideration. Household and section sizes were also analysed and trends were projected into the future.

The data was used to inform a major consultative process with the public, expert stakeholders and Council staff. The quantity of land required was estimated and areas with potential to be developed into urban growth pockets identified. Wholly new settlement hubs were considered unlikely and future growth was assumed to occur on the periphery of existing settlement nodes. All areas of the region were considered for their growth potential and capacity to provide for future growth.

The final strategy was accepted by Council and published in March 2013[3]. The Canterbury earthquakes occurred during the development of the strategy and early drafts had to be revised after land around Blenheim, particularly to the east, was assessed as susceptible to liquefaction and lateral spread. The strategy forms a valuable platform for planning future capacity upgrades of all services.

[3] Growing Marlborough — A Strategy for the Future. District-wide Overview and Decision Summary (March 2013)

In Blenheim, seven land parcels to the west and north of the town were identified as suitable for zoning for urban-residential development and these are outlined in red in the following aerial photo (Figure 3-3). A total area of around 240 hectares of urban-residential and a further 53 hectares of employment land is earmarked for development. In addition, a private development north of the Omaka Airfield and south of New Renwick Road was approved by the Environment Court following an appeal. The area known as Omaka Landings has provided a further 21 hectares of land for development.

The provision of utility services was considered from the outset of the project. The Wairau River drains from west to east. The new developments to the west of the town will naturally drain towards the town which will have an impact on the drainage of the existing settlement.

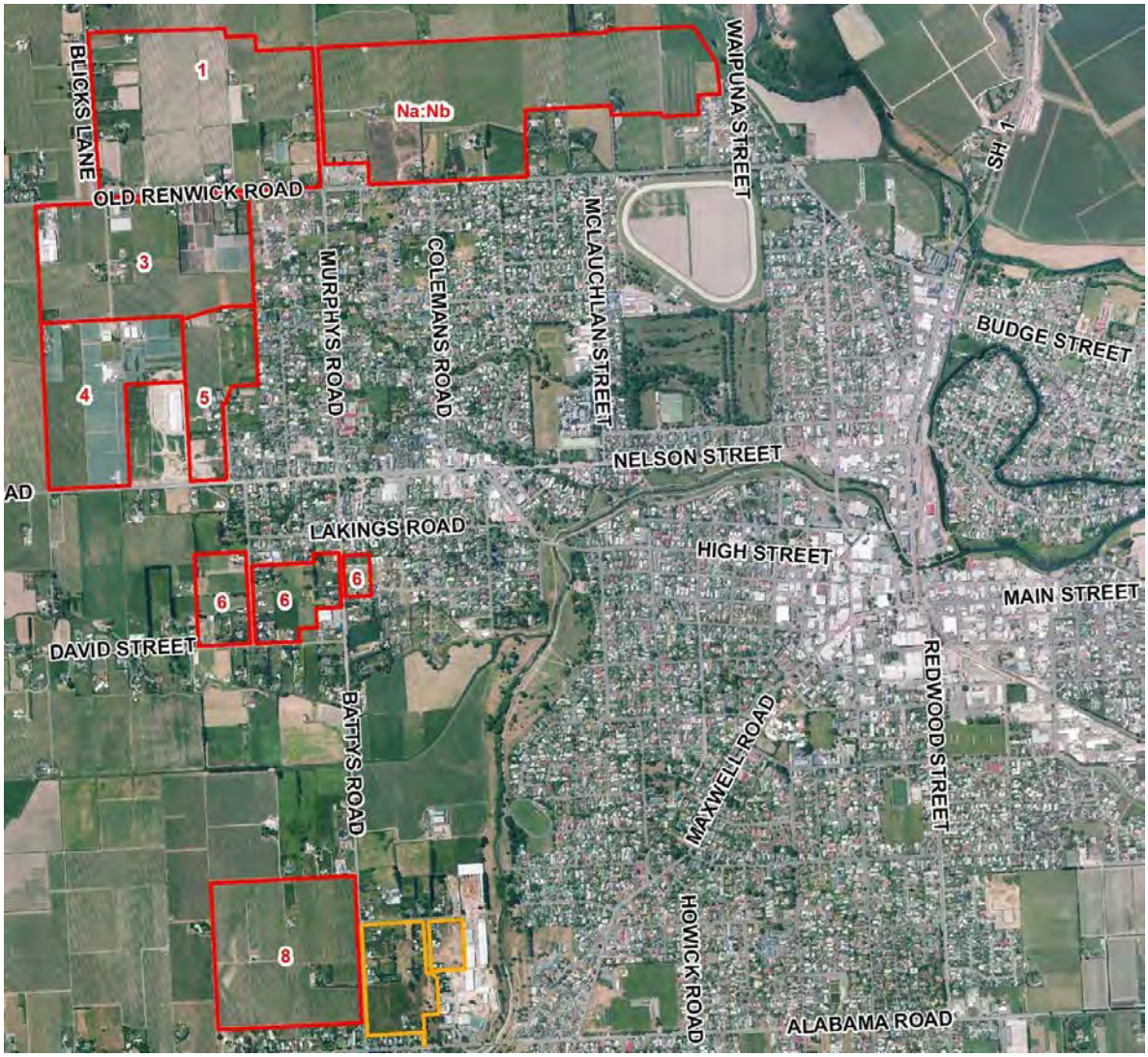


Figure 3-3 — Growth pockets identified and zoned for residential development

Site investigations have been undertaken to determine groundwater levels and the soakage capacity of the soils. This information has been used to prepare an outline plan for the early development zones at Na-Nb, Zone 1 and the Omaka Landings subdivision. The final plan is a balance between on-site soakage, the capacity of downstream drainage channels and infrastructure and the provision of stormwater detention to smooth the peak flows of run-off.

Research work has been undertaken by the Rivers and Land Drainage Department to prepare good design data and gain a solid understanding of the factors which influence stormwater and river flows. Blenheim has been categorised into 27 catchments and 224 sub-catchments. Rainfall patterns are analysed to establish the relationship between rainfall intensity, duration and location and the earlier weather and river flows. Flow monitoring is undertaken at critical locations in the

drainage network. Actual flows are compared with the predictions from hydraulic models and the models refined to improve future projections.

The Urban Growth Strategy recognised the potential for infill housing within the existing urban zones. The specific sections were not detailed but a major exercise was undertaken to systematically assess the soakage capacity and run-off coefficient of the sub-catchments throughout Blenheim. The data has been used in the development of hydraulic models and can be adjusted as further infill progresses.

3.2.5 Improved Levels of Service

The implications of meeting the current levels of service are discussed in section 2.7.2.

3.2.6 Improved Environmental Standards

The implications of meeting environmental standards are discussed in section 2.7.1.

3.2.7 Climate Change

The advice on the Ministry for the Environment's website (updated December 2017) on the likely impacts of climate change in Marlborough is shown in Appendix 4.

There is still academic and political debate over man-made climate change and climatic variation. However it is reasonably certain that weather patterns are going through a period of change and the impact of the changes on stormwater flows will be very significant. Engineering design and evaluation methods have included a factor for climate change for many years. Hydraulic models can be programmed for different weather events and frequency of occurrence. A major hydraulic model exercise of the Redwood Street catchment in Blenheim has identified a number of upgrades that have been incorporated into the capital programme.

Sea level rise will also change the flow characteristics of the receiving waters. As the sea level rises there will be more resistance to rivers and drains discharging into tidal zones. The Rivers and Land Drainage Department is already considering the need for pump stations to be fitted to the outfall of some major drains to assist with discharge flows. A major review of climate change and levels of service is planned by the Rivers and Land Drainage Department around 2020.

Climate change is only one of the variables to take into account. However, it is critically important, and is being incorporated into the planning and design of infrastructure.

3.2.8 Resilience

Improving the resilience of the stormwater infrastructure is also included in future demand planning.

The Council has embarked on a thorough investigation of the sewer and stormwater reticulation networks following the November 2016 Kaikoura Earthquakes. A CCTV survey programme has been initiated and the older, brittle materials such as earthenware, vitreous clay, asbestos cement and un-reinforced concrete pipes have been prioritised for inspection. The programme has initially focused on the sewer network as the consequences of failure on public health are more severe. However, it is evident that the damage is similar on both networks.

Ground displacement and ground shaking has caused significant damage to linear assets including pipelines and the stopbanks managed by the Rivers and Land Drainage Department. The earthenware and vitreous clay pipelines in Blenheim have been particularly affected. There is significant evidence of longitudinal and circumferential cracking, joint displacement and holing. Complete collapse is more uncommon but the structural integrity of the pipes has been compromised and failure is likely. The assets' life expectancy was adjusted for the 2017 revaluation and the earthenware asset value has been impaired.

There is 7,700 metres of earthenware stormwater mains and services in Blenheim and 600m of pipe in Picton that is being investigated.

The Council is in discussions with the Department of the Prime Minister and Cabinet (DPMC) on government funding support for earthquake damage. A consultant has been employed to evaluate the damage surveys and advise the DPMC.

Following the Christchurch Earthquake sequence there has been substantial research and information on the resilience of utility infrastructure. The Wairau Plains has many common geographical features with the Canterbury Basin and comparisons can be usefully made.

Lateral spread adjacent to watercourses was particularly damaging to stopbanks, utilities and other structures. New standards are being incorporated into planning and engineering designs. Setback standards define how close buildings can be located to incised watercourses.

Manholes and wet-wells had a tendency to 'float' in liquefied ground conditions. New design standards have been developed to mitigate this effect.

The Stronger Christchurch Infrastructure Rebuild Team (SCIRT) has been generous in publishing its findings and solutions, providing a repository of technical advice and engineering standards which will assist local authorities to design and build more resilient infrastructure in future.

As improvements are incorporated into the design and management of the stormwater service the risk management plan is reviewed and updated as new priorities identified – see Section 4.2.

3.3 Demand Impact on Assets

The identification of eight urban growth pockets has allowed detailed and timely assessment of the stormwater requirements. The new urban zones to the north and west of the town are located upstream of existing urban infrastructure and generally have a high water table and a low gradient across the sites. However early recognition of the development potential of this land has allowed an 'accepted development plan' to be established for the Na-Nb area and upgrade work to Casey's Creek to be designed. During 2017 the preliminary design work and resource consents had been approved and a construction contract publicised for competitive tender.

The storm in May 2013 revealed a number of flooding incidents in the Muller Road/ Howick Road area of Blenheim. The post-event analysis led to further investigation using a detailed CCTV survey. The 600 mm steel stormwater main in Muller was found to be badly corroded and partially collapsed. Subsequently 348 metres of the pipe in Muller Road was renewed with a new 675 mm concrete main.

The report of the design investigation into the Redwood Street/Town Branch Drain (TBD) catchment was received in August 2015. The catchment covers around 280 hectares of Blenheim which is approximately 25% of the urban area. Consultants had used hydraulic models to evaluate ten upgrade options. The options were assessed, costed and ranked using Multi Criteria Analysis. The favoured option (Option 9) was recommended to Council in November 2015. The total cost of the solution was estimated at $20.6M with a further $2.5M for land purchase. It is estimated it will take 10 to 20 years to complete all aspects of the upgrade but the project can be readily broken down into phases with progressive benefits. Much of the capital investment will be to the Rivers and Land Drainage assets. In 2018 work commenced on the upper channel of the TBD. Later in 2018 a new 1250mm x 1000mm box culvert will be installed to connect the existing 1500mm stormwater main in Muller Road into the head of the TBD. This connection will provide an emergency overflow for the Redwood Street 750mm main. In the event of an emergency a valve can be opened to allow surcharges from Redwood Street into the TBD. Once the upgrades of the TBD have progressed to provide additional capacity the valve can be removed and the flows from Muller Road can be permanently diverted to the TBD. Capacity pressure on the Redwood Street main will be relieved and upstream drainage improved.

The urban development in the north-west of Blenheim contributed to the concerns of residents along Murphy's Creek (see Chapter 2). The structured decision making process has helped to resolve the issues. The stakeholder group opted for Option G which is a hybrid solution including on-site detention areas, a partial overflow into the headwaters of Murphy's Creek, new pipeline assets in Rose Street and Middle Renwick and an upgraded outfall pump station into Taylor River. The detention area and stormwater assets in the subdivision are costs to the developer. The new off-site infrastructure has been costed at $3.8M.

As a result of a number of subdivision applications at Grovetown, a comprehensive review of the township's stormwater infrastructure was carried out. Grovetown is a flat, low-lying, low density township in the lower Wairau Valley. The stormwater system evolved from the original agricultural drainage network. The installation of a reticulated sewerage system in 2011 has helped to facilitate further growth in the township. An outline plan has been prepared to cope with future growth and will be implemented as further subdivision continues.

The capital expenditure budget programme to meet future demand is shown in Table 5-2.

3.4 Demand Management Plan

More than 72% of the Council's stormwater assets are in Blenheim. The town has benefited from the Blenheim Stormwater Strategy and the identification of future growth pockets through the Growing Marlborough Urban Growth Strategy. The implementation of the stormwater strategy has been overseen by the cross-departmental Stormwater Action Group. The Group has provided sustained and coordinated progress towards the strategic objectives. Research has been undertaken to improve understanding of groundwater soakage capacity, run-off coefficients, design criteria and standards, and complex hydraulic modelling.

Coordinating design between urban stormwater flows and river flood management through the Stormwater Action Group has allowed for an efficient balance between upstream flow attenuation and downstream infrastructure capacity.

On-site soakage is the preferred option for stormwater disposal as it means there is no requirement for downstream infrastructure. However, a high groundwater table, unsuitable soils or steep gradients can restrict the areas in which this is a practical option.

Planning tools are used to predict run-off co-efficients from new zones and infill housing. The design of floor levels for new dwellings in relation to the surrounding land and stormwater flows is a primary tool for managing future growth.

The diversion of roof water into storage vessels has been considered but is unlikely to provide adequate flow reductions during the more severe storm events when flows become problematic. Detention vessels have been required as a condition of the resource consent for specific sub-divisions where peak flows cannot be accepted into the system

'Source Control' continues to be the most effective demand management technique to protect the stormwater system from contaminants and spillages. By managing industrial and commercial site activities that have potential to pollute the stormwater system, the need for elaborate engineering solutions such as oil interceptors and silt traps is reduced.

The introduction of the 'Flood Watch' interactive maps onto the Council's website has provided benefit to the public by publishing 'live' data from the rainfall and river monitoring stations around the region. Whilst the stations are on the main rivers and the service mainly benefits the rural community, it is also a useful source of information for urban dwellers and helps to distribute contemporary information about storm events.

3.5 Asset Plans to Meet Demand

Accepted Service Plans have been proposed and approved for major subdivisions at Boulevard Park on Taylor, Omaka Landings and Birchwood Avenue developments as well as the northwest urban development zones that drain to Murphy's Creek and Casey's Creek.

The Stormwater Action Group continues to investigate the Cameron's, Yelverton, Fulton and Old Fairhall Creek sub-catchments that provide drainage to the other urban development pockets. Once the drainage characteristics are understood it will be possible to discuss the layout of new developments and agree an Accepted Service Plan for the growth pocket and design the downstream upgrades required to meet demand.

Chapter 4: Life Cycle Management Plan

The life cycle management plan is a coherent plan to deliver the best value for money for the assets' owners whilst providing satisfactory service to the customers. The plan seeks to anticipate future requirements, manage risks and optimise decision making throughout the assets' lives.

Components of the Life Cycle Management Plan

4.1 Physical Parameters — asset capacity/performance, asset condition, asset valuation and historical data.

4.2 Infrastructure Risk Management

4.3 Routine Operations & Maintenance Plan

4.4 Renewal/Replacement Plan

4.5 Creation/Acquisition/Augmentation Plan

4.6 Disposal Plan

The lifecycle of an asset follows the progression shown below.

Planning	The process of preparing for a new asset, or non-asset solution, to a service delivery issue. Service delivery issues may derive from growth, a current or anticipated failure to meet levels of service or to replace a failing or obsolete asset. The planning process involves engineering expertise, legal compliance and community engagement to size, locate, programme and operate with consideration to design options, whole life costs, risks and non-asset alternatives.
Creation	The purchase, construction or vesting of an asset to the Council. The management of the design and construction to ensure the required quality is delivered on time and at the agreed cost.
Operation & Maintenance	The day to day running of the infrastructure to ensure a continual, effective and efficient service to the customer. Maintenance is the proactive and reactive repair and servicing of assets. It is undertaken with respect to the 'criticality' of the assets and the overall quality of the service delivered.
Rehabilitation	Proactive restoration of assets to extend the serviceability and ultimate life expectancy in a cost-effective manner.
Renewal	The controlled replacement of assets that have reached the end of their useful lives.
Disposal	The removal of redundant assets by decommissioning, physical removal, sale or reutilisation for an entirely different purpose (eg using decommissioned sewer pipes as cable ducts).

4.1 Physical Parameters

Table 4-1— Mains Pipe material

Row Labels	BLENHEIM	PICTON	RENWICK	RIVERLDS	SPRINGCK	HAVELOCK	OKIWI	SEDDON	SOUNDS	ST. ANDR	ANAKIWA	GROVETN	Grand Total
Concrete	71,448	17,968	3,584	4,615	2,947	768	303	102		313	680	271	102,999
PVC/PE	30,761	7,938	1,262	1,672	216	319	214	67				21	42,470
Asbestos Cement	14,321	590	19	23	45								14,997
Earthenware/ Clay	3,809	569		4									4,381
NOF	1,366	510		471	178	130					168		2,823
Steel	2,067	252	7			31				10			2,367
Other	1,807	872	295			62	306	88	332			2	3,764
Grand Total	**125,578**	**28,698**	**5,167**	**6,784**	**3,385**	**1,310**	**822**	**258**	**332**	**323**	**849**	**294**	**173,801**

Settlements establish in areas that take advantage of natural drainage channels for removal of stormwater. As the urban area develops and the buildings interrupt the natural drainage patterns it becomes necessary to install a more elaborate piped infrastructure and engineered channels to remove the surface water. The piped stormwater network is considerably shorter and younger than both the water and sewer networks.

Table 4-1 shows the composition of the stormwater reticulation network. Around 90% of the entire network is constructed of three materials — concrete, PVC and asbestos cement. Generally concrete is the preferred material for larger diameter pipes (225 mm and greater), and PVC is commonly used for pipes up to 300mm diameter (it has replaced asbestos cement as the modern equivalent).

Concrete is the oldest pipe material recorded in the current stormwater network. It has been used for at least 75 years in Marlborough. Over the years the method of manufacture has developed considerably. The early pipes were unreinforced and were cast in vertical moulds. Modern concrete pipes are now supplied as steel reinforced, centrifugally spun pipes, manufactured in accordance with NZS 3107. A variety of jointing methods, joint materials and linings have also been incorporated over the years.

Asbestos cement was a popular material in the 1940s. Records show it was still being used into the 1980s. Modern plastics and particularly PVC were being introduced into the market in the latter part of the 20th century. Their acceptance was accelerated as the health risks associated with handling asbestos cement became more apparent.

A CCTV survey revealed a concrete arch structure from the roundabout at the High Street/Redwood Street intersection running north under Park Terrace. This was previously unknown. The arch was probably cast in place and is one of the oldest structures of the Blenheim stormwater system.

The pipe material NOF is a corrugated polyethylene drainage pipe recorded under the brand name Novaflo. It is used extensively in agricultural and rural drainage, and it has a number of advantages as it is lightweight and easy to handle and install. It has reasonable strength and durability but is best suited to non-trafficked areas such as the road berm and private land.

Table 4-2 — Stormwater pipe age and material

	Post 2000	1990 - 99	1980 - 89	1970 - 79	1960 - 69	1940 - 59	Pre 1940	Grand Total
Concrete	23,683	9,522	6,479	42,059	19,616	1,320	309	102,989
PVC/Pe	25,230	12,381	2,482	2,281	16	27	53	42,470
Asbestos Cement	75	159	3,316	10,238	1,173	36		14,997
Earthenway/Clay	57	40	762	2,167	1,256	100		4,381
NOF	627	1,300	216	634			46	2,823
Steel	85	17	116	1,015	980	128	27	2,367
Other	1,114	367	406	1,223	394	200	60	3,764
Grand Total	**50,870**	**23,786**	**13,778**	**59,616**	**23,436**	**1,811**	**495**	**173,791**

Pipe materials and standards of manufacture have evolved over the years. Modern materials are generally easier to handle, more robust and are constructed to a more consistent standard. However, when a new material is introduced there is often a fall in the overall life expectancy of the pipeline as the construction industry acquires the necessary skills and experience in using it.

A variety of pipe materials in the network have been grouped together as 'Other'. This is partly due to the different authorities that have administered stormwater across the region over the years. At various times the responsibility for stormwater infrastructure has been in the hands of drainage boards, town, county or borough councils, and in some cases privately installed schemes which have been adopted by the Council.

4.1.1 Asset Capacity/Performance

The overarching objective that has guided stormwater design was first defined nationally in the Building Act 1991 (superseded by the Building Act 2004). It states that:

- surface water from a storm with a 2% probability of occurring annually will not enter a building
- surface water collected or concentrated by a building or site shall not cause nuisance from an event that has a 10% probability of occurring annually.

These clauses set the standard for the building structure, floor levels and areas immediately surrounding the buildings. They are often referred to as the 50 year ARI (Average Return Interval) and the 10 year ARI, respectively. They guide planning approval through the resource consent process and have clear implications for the stormwater infrastructure serving the building sites.

The quantitative management of stormwater has two major components — conveyance and attenuation (through detention or soakage). A recent study of the stormwater system in Blenheim recognised the town could be roughly separated into two objectives based on the underlying topography of the town.

On the sloping terrain to the south of the town centre, rainwater flows off the impermeable surfaces. It accumulates and concentrates as it flows downhill. In intense storms this may become a threat to the properties downstream. In these circumstances the stormwater system needs to be designed to protect the lower lying property from the run-off from the hillside. The objective is to either retard the flow in order to limit the accumulation, or intercept the flow and direct it to a suitable watercourse away from low lying houses.

On the flat valley floor the absence of any appreciable gradient in this landscape means that rainfall can be slow to drain away. A high groundwater table is often associated with this type of land which restricts the soil's capacity to absorb rainwater. The resultant ponding becomes a threat to property owners and road users. The primary objective of the stormwater system on the valley floor is to convey the surface water away as rapidly as possible. The system is required to collect the surface water and channel it away from properties to water courses or land drains. Pumps are often necessary to accelerate the natural flow and lift water over the stopbanks.

The stormwater management goals in the two areas are quite different. The main objective on the flat alluvial plain is to speedily reduce and remove the ponded water. In hilly areas the downhill flows need to be attenuated. A degree of ponding is beneficial to avoid further flooding downstream. It is therefore important to consider the stormwater catchment as a whole and to recognise the primary purpose of the drainage infrastructure in the overall design.

About 60% of Blenheim's urban stormwater catchment is on the flat alluvial plain. Approximately 9% of the catchment is in the foothills of the Wither Hills. The remainder of the land has a shallow slope, typically with a gradient around 1:100, formed as an alluvial fan by the emergence of the Taylor River into the Wairau Valley[4].

4.1.2 Stormwater Conveyance

Rain water that cannot penetrate the soil runs across the surface of the land and collects into a variety of channels. In urban areas the accumulated stormwater is conveyed through pipes, kerb channels on roadways, and through modified and naturally occurring water courses. The weather patterns in New Zealand are such that it is uneconomical to build specific infrastructure to accommodate flows from large, infrequent storms. The roadways therefore become useful alternative conveyance pathways. Many roads are specifically designed as secondary flow paths for stormwater. On the flat plains the roads serve as temporary detention ponds as there is often little gradient to permit a flow at the peak.

Historically there has been little consistency regarding the size of storm that should be accommodated by the primary stormwater infrastructure and that which spills over into the secondary flow path. Recommendations for the design of the piped water system have varied between the 2 and 10 year Annual Return Interval (ARI). The final design is likely to depend on a number of contributory factors — the permeability of the catchment area, the topography, and the vulnerability/sensitivity of the surrounding properties. Industrial areas tend to have less permeable surfaces than residential suburbs. Business may be severely interrupted by surface water flooding. In these instances the piped system may be designed for a greater capacity and be able to cope with more frequent storm events.

4.1.3 Performance

For the above reasons, measurement of the performance of stormwater systems can be difficult. The baseline set by the Building Act has become an accepted standard although in strict terms it only refers to buildings constructed after 1991. The interpretation of 'nuisance' is reliant on case law. During storm events the Assets & Services Department establishes an Incident Management Centre to deal with flooding incidents and analysis of customer complaints, and issues received at the Centre give an indication of system performance.

Table 4-3 is a statistical summary of the customer issues received during storm events since 2009. The data has been screened to remove rural issues outside of the stormwater system. Issues primarily relating to road access and traffic management have also been removed.

Table 4-3 — Customer service requests during storm events 2009–17

Date	Storm ARI	Dwellings Flooded	Property Flooded	Total Calls
23/07/2009	<5	2	5	24
25/05/2010	3	2	6	28
2/06/2010	<5		1	12
7/06/2010	<5	2	8	37
21/12/2010	9	4	4	28
28/12/2010	20	6	10	10

[4] The technical detail of this topic is explored in greater depth in "Procedures for Reviewing the Blenheim Stormwater Capacity and Providing for New Areas (Draft)" (Williman).

Date	Storm ARI	Dwellings Flooded	Property Flooded	Total Calls
18/01/2011	<1.3	0	0	na
3/03/2012	1.3	0	0	na
8/08/2012	<2.33	0	9	139
12/08/2012	<2.33	0	0	12
15/01/2013	<5	1	2	21
6/05/2013	9	0	10	48
17/04/2014	<1.5	1	4	60
15/11/2016	Various	6	30	60

'Dwelling flooding' is interpreted as habitable floors of buildings, regardless of whether they are domestic, commercial or industrial buildings. 'Property flooding' refers to stormwater entering garages, outbuildings etc to an extent that is beyond the scope of expected ponding on private sections.

The absolute numbers are relatively low but can disguise some significant events to small local communities affected by local storms. For example the storm on 15 November 2016 was much more intense in the northern part of Marlborough. The impact on Havelock, Rai Valley and the small communities of the Marlborough Sounds was very considerable. The storm was less significant in Picton and had negligible impact on Blenheim and the southern part of the region. There was significant flooding and damage to roading and private property in north Marlborough. There is very little Council owned stormwater infrastructure in the area.

Rainfall intensity, duration and the preceding weather conditions have considerable influence on the volume of stormwater and the subsequent performance of the infrastructure and customers' experiences of a storm event.

4.1.4 Asset Condition

The condition of the stormwater reticulation is generally based on the age of the pipes. In general buried pipelines have a design life of 80–100 years. The actual life of buried assets is subject to many factors — pipe material, depth of pipe, groundwater level, workmanship during installation, interference from other utilities, surface traffic, ground movement, jointing materials, bedding and surround, etc. These factors may act singly or combine their effects. It is therefore very difficult to anticipate the condition of any particular asset or to predict trends in life expectancy.

The internal condition of pipes can be inspected with the use of a closed-circuit television camera (CCTV). A pipe's structural and service condition can be assessed through a nationally recognised pipeline evaluation technique. CTTV has been deployed to investigate suspect pipes and to assess the condition of pipes that may require upsizing.

Since the November 2016 earthquake sequence a CCTV monitoring programme has been undertaken on sewer and stormwater pipes. Early assessment showed the earthenware and vitreous clay pipes in Blenheim had been particularly damaged by the earthquake. Significant cracking and tomos were apparent in the pipe walls. Collapse is less common but can be expected to increase as the structural integrity of the pipes has been compromised. The survey work continues but is concentrating on the wastewater reticulation in the first instance due to the potential public health implications of sewage ex-filtration.

Due to the additional workload the Council has commissioned a consultant to review the CCTV survey and the returned condition grading. The information is being prepared and presented to the Department of the Prime Minister and Cabinet and to the Council's insurers, the Local Authority Protection Programme, to secure funding for rehabilitation.

In early 2018 the CCTV surveys continued to focus on the sewers. Individual stormwater pipelines were investigated if a problem was suspected. The stormwater reticulation will be systematically surveyed when resources become available. The programme will be informed by the outcome of the survey investigation but is likely to initially concentrate on the brittle material pipes —

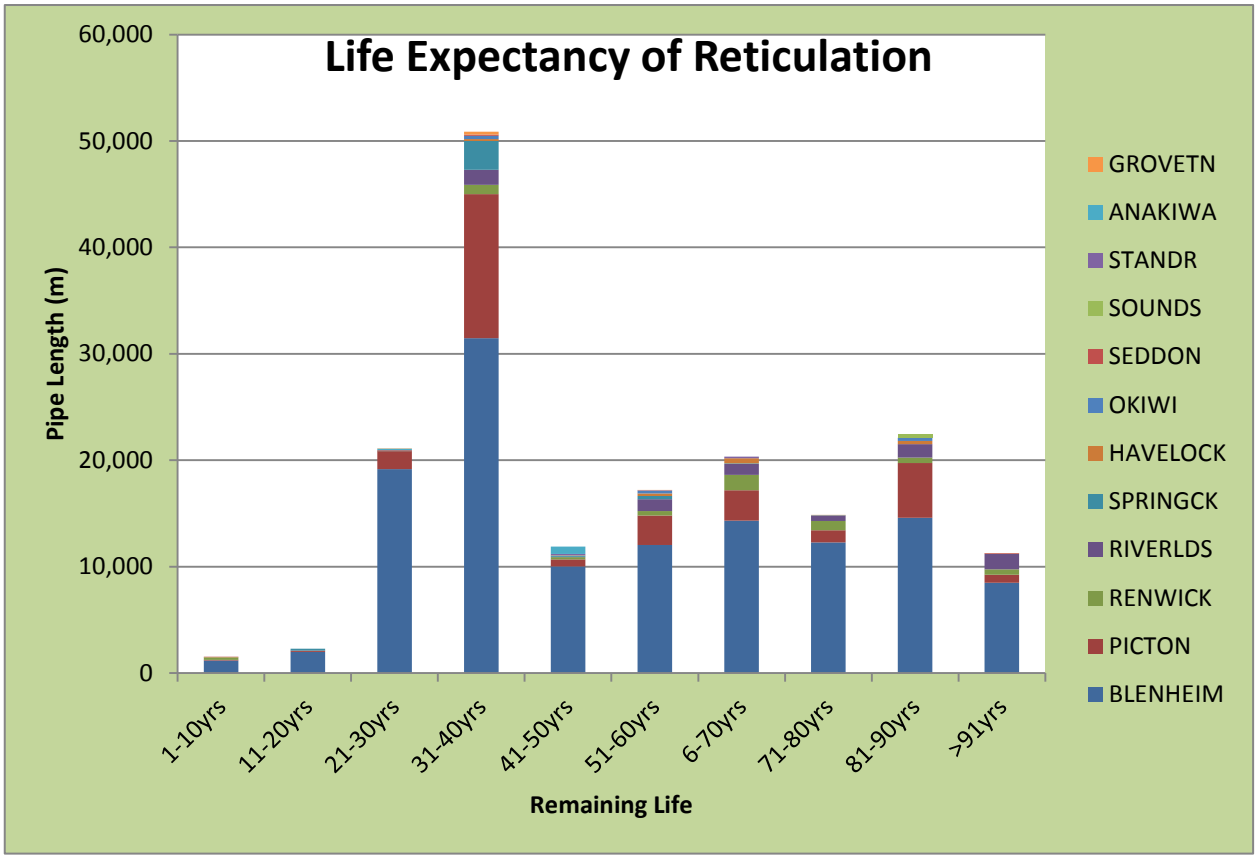
earthenware, vitreous clay and asbestos followed by the older concrete mains, more recent concrete and finally PVC and polyethelene.

The life expectancy of asbestos cement pipes has been derived from the tables published in the New Zealand Asbestos Cement Watermain Manual (2001). The manual uses data from practical experience gathered throughout New Zealand. The study was confined to water mains and the correlation to stormwater and sewer mains has not been tested. However for medium and large sized pipes the life expectancy is within the 72 year to 100 year range.

Table 4-4 shows the remaining life of stormwater reticulation in the serviced areas. Using the assumptions above it can be seen that less than 2% of the network will reach the end of its useful life in the next 20 years. However the projection would suggest that in the period from 2035 to 2065 almost half of the entire network will require replacing. There is a need to verify the assumptions in the projection.

It is desirable to smooth the renewals programme to make the workload manageable and to avoid too much disruption to the system. Equally, it is important to maximise the useful life of the underground assets but also to avoid failure to critical services and consequential flood damage. A timely programme of condition assessment through systematic CCTV survey will provide greater confidence in the condition grading and assist with the planning of future renewals programmes.

Table 4-4 — Life expectancy of stormwater reticulation



4.1.5 Stormwater Strategy

The Blenheim Stormwater Strategy provides detailed analysis and prioritisation of each of the Stormwater Management Areas.

A brief summary of the main issues is shown in Table 4-5. The Blenheim Stormwater Strategy Action Plan, which is included in the appendices, includes further details of the strategy proposals.

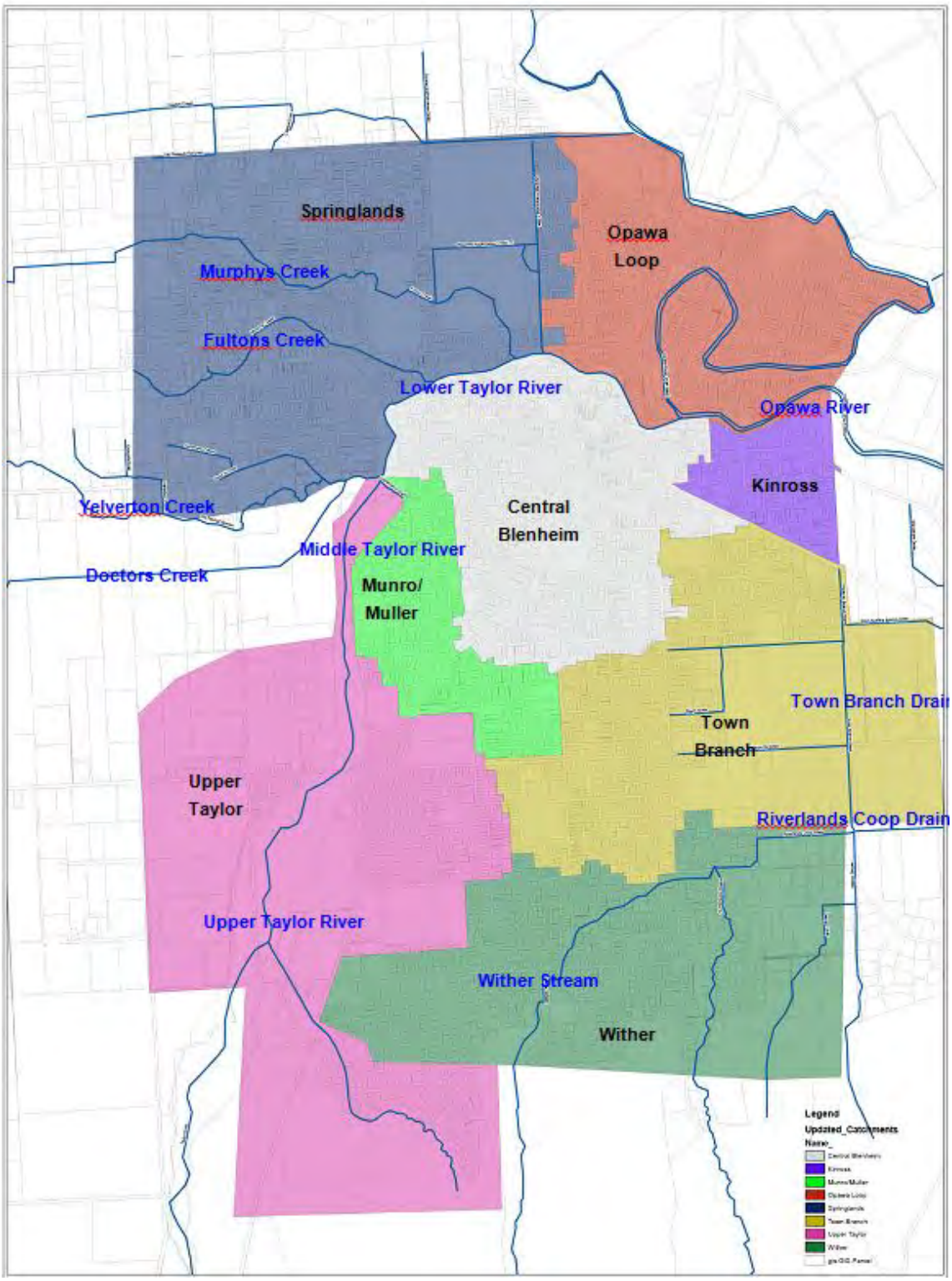


Figure 4-1 — Blenheim stormwater catchments

Table 4-5 — Summary of key issues for Blenheim Stormwater Management Areas

Stormwater Management Area	Management Area	Description Key Issues
Springlands	This area discharges into Fulton's Creek, Murphy's Creek and Racecourse Creek and then into the Lower Taylor River. This SMA is primarily zoned residential; however, there is rural catchment upstream to the west of the residential area.	Pipe and drain capacity limited Urban growth/infill Lack of soakage High natural spring-fed water clarity Sedimentation from dewatering of construction sites
Ōpaoa Loop	This area discharges into the Ōpaoa River at a number of locations upstream of the Taylor River confluence. This area is made up of residential and some industrial areas.	Industrial and transport corridors Inadequate pipe capacity
Central Blenheim	The Central Blenheim SMA discharges via a small number of discharge points into the Lower Taylor River. This area is made up of a mixture of residential, high density residential, commercial and some industrial zonings.	Lack of pipe and pump capacity Risk of flooding (especially Redwood Street) Infill development Commercial and transport corridors High value receiving environment
Kinross	The Kinross SMA discharges via one main discharge point to the lower Ōpaoa River downstream of the Taylor River confluence.	Lack of pipe and pump capacity Industrial and transport corridors Soakage not available
Monro/Muller	This SMA discharges partly into the Taylor River system upstream of the Doctors Creek confluence and partly into the Central Blenheim area to the Lower Taylor River.	Lack of soakage Lack of pipe capacity Flood prone Urban growth/infill
Upper Taylor	This SMA discharges into the Upper Taylor River at a number of locations including Rifle Range Creek. Part of this area discharges directly to ground soakage.	Approach for accommodating future growth on southern zoned land Good ground soakage

Stormwater Management Area	Management Area	Description Key Issues
Town Branch	This area is collected in a series of drains that flow in an easterly direction. A pump station located on the edge of town pumps this stormwater to the Lower Ōpaoa River, and another pumps to the Riverlands Co-op Drain. Therefore, this drainage system has no influence on water quality issues within the town itself except in high flows when the system capacity is exceeded and overland flow occurs.	Lack of soakage Insufficient pipe capacity Flood prone Urban growth — development pressure Outlet capacity constrained
Wither	This SMA is firstly collected in natural watercourses in the lower parts of the Wither Hills. These natural water courses then flow into a series of drains which enter the Riverlands Co-op Drain System. Some of this area discharges directly to ground soakage.	Stream erosion Not suitable for soakage Flooding risk in some areas downstream Urban growth Industrial discharges downstream Some limited capacity

4.1.6 Asset Valuation

The stormwater drainage assets are valued annually. Details of the valuation, process and methodology are included in the Asset Valuation report and a summary of the main asset values in 2017 is included in Table 4-6 and Table 4-7.

Table 4-6 — Stormwater plant valuation 2017

Area	Site	ORC	ODRC	DISP
BLENHEIM	Pump Station	$ 206,325	$ 109,589	$ 3,563
BLENHEIM Total		**$ 206,325**	**$ 109,589**	**$ 3,563**
PICTON	Pump Station	$ 702,014	$ 284,596	$ 11,512
PICTON Total		**$ 702,014**	**$ 284,596**	**$ 11,512**
Grand Total		**$ 908,339**	**$ 394,185**	**$ 15,075**

Table 4-7— Stormwater reticulation valuation 2017

Area	ORC	ODRC	DISP	Pipe Length 2017
ANAKIWA	$ 461,305	$ 226,321	$ 6,029	849
BLENHEIM	$ 82,033,981	$ 50,832,955	$ 980,071	125,578
GROVETN	$ 227,691	$ 104,089	$ 2,898	294
HAVELOCK	$ 864,954	$ 657,700	$ 10,716	1,310
OKIWI	$ 551,588	$ 326,840	$ 6,064	822
PICTON	$ 21,844,615	$ 12,371,290	$ 261,980	28,698
RENWICK	$ 3,881,613	$ 2,795,711	$ 46,406	5,167
RIVERLDS	$ 4,977,851	$ 3,828,168	$ 57,519	6,784

Area	ORC	ODRC	DISP	Pipe Length 2017
SEDDON	$ 162,135	$ 87,384	$ 2,908	258
SOUNDS	$ 237,670	$ 199,643	$ 2,377	332
SPRINGCK	$ 2,485,173	$ 1,070,146	$ 31,041	3,385
STANDR	$ 330,941	$ 228,624	$ 4,120	323
Grand Total	**$118,059,518**	**$ 72,728,871**	**$ 1,412,128**	**173,801**

ORC = Optimised Replacement Cost
ODRC = Optimised Depreciated Replacement Cost
DISP = Annual Decline in Service Potential

4.2 Infrastructure Risk Management

Risk management of the stormwater function has been prepared in accordance with the MDC Risk Management Strategy and Tools[5]. The strategy was initially developed by the Risk Management Steering Committee in 2001 in accordance with AS/NZS 4360 Risk Management and later updated to ISO 3100(2009).

The aim of the strategy is stated as:

> *To identify, assess, and manage risks in a consistent and demonstrable way.*
>
> *Our strategy is to:*
>
> *Introduce tools and internal assistance that enables sections to complete a risk analysis relevant to their operation.*
>
> *Ensure our decision making is consistent and demonstrable.*
>
> *Develop a 'risk aware' culture that encourages everyone to identify risks and associated opportunities.*
>
> *Promote and foster communication and risk monitoring throughout the organisation.*
>
> *This framework will be managed by the Risk Manager and supported by the executive management team.*

A joint assessment of the hazards associated with both the stormwater and wastewater operation is undertaken on an annual basis under the guidance of the Council's Risk Manager and the O&M Engineer. The hazards are risk assessed on the standard Likelihood/Consequence matrix to establish a risk profile. The controls for each risk are considered and an action plan is prepared to either augment the controls or manage the residual risk. The risk profile is reviewed and updated every year.

The risks are also separated on a network basis. For example the risks on the steep valleys of the Picton system have different characteristics to the urban Blenheim system.

The risk management process is included in the Standard Operating Procedures and Emergency Management Plans. They have been developed from two perspectives — all hazards that may affect individual sites such as a chemical spillage at a site, and specific events that may affect multiple sites such as a storm event.

During 2010 the stormwater risk assessment was reviewed and rationalised to ensure there was a rational and consistent approach to each reticulated area and the asset group. The risk assessment was reorganised to follow a flow path from 'source to sea.' The risks associated with

[5] Risk Management Strategy and Tools. V3.2 (Dec 2011) MDC

stormwater drainage are considered in order; starting from the stormwater inlet, pipes, channels, pumps and outlets. Also included are managerial risks such as reputation, financial and legislative risks. At each annual review the flow path is followed and risks are reviewed. New hazards are added and redundant ones are removed. All risks are evaluated against any changes to ensure a comprehensive assessment.

Emergency Response Planning — The risk assessment and mitigation process of existing hazards; the consideration and implementation of future controls, and the management of the residual risks provides a structured framework for emergency response planning. For example power failure is a significant risk to the operation of stormwater pumps. Examples of risk treatments are alternative backup connections to the power network, installation of permanent emergency generators, deployment of mobile generators and provision of additional storage. The preferred solution is selected and implemented, and the outcome reviewed.

Critical Assets — The criticality of particular components of the stormwater infrastructure is recognised in the risk assessment process. Generally, critical assets are those for which failure would cause widespread loss of service, serious public health risk or serious environmental damage. In each of the stormwater systems the critical assets are:

- the major trunk mains
- terminal pump stations.

Individual pipes or assets may be added to the list as the Stormwater Action Areas are developed further. The criticality rating will be recoded in AMIS for future reference.

The Assets & Services Department is an active participant in the Marlborough Engineering Lifelines Group and regularly contributes to coordination meetings and civil defence exercises to prepare and test for major events. Engineering Lifelines facilitate the exchange of information and planning between the utilities such as Marlborough Lines, Marlborough Roads, telecommunications companies, major transport hubs and other stakeholders.

4.3 Routine Operations and Maintenance Plan

The operation and maintenance plan of the stormwater system sets out the procedures and tasks necessary to deliver the agreed level of service to the stakeholders, whilst ensuring the asset continues to meet its minimum life expectancy. A formal plan has not been documented but in practice includes the strategic drivers to provide for public safety, health and well-being.

Operational Works — Routine operational works will be undertaken by suitably trained and supervised staff or contractors at sufficient intervals to ensure the efficient functioning of the system.

Repairs — Reactive repairs will be assessed and undertaken in a timely fashion to minimise disruption to the service, meet the customer service expectations, minimise collateral damage or danger, and avoid unnecessary nuisance.

Preventative Maintenance — Planned maintenance schedules are implemented to minimise risk and costs of premature failure, promote the effective and efficient functioning of assets, and optimise the whole life service potential of the infrastructure.

Operational management — Operational activities are undertaken by Assets & Services engineering officers and technicians under the direction of the O&M Engineer to ensure the outcomes and service standards are achieved in the most efficient and cost-effective manner.

System Control and Monitoring — The stormwater assets are monitored and data is communicated to automatic or manual control mechanisms. Systems are controlled to operate within predefined ranges, and procedures are implemented to respond to detected abnormalities according to need.

Incident management — Assets & Services Department staff prepare and plan for managing emergency incidents to mitigate the effects of major storm events or system failures, and to return to business as usual as soon as possible.

4.3.1 Operational Management

General maintenance and repairs of the stormwater infrastructure in Blenheim, Renwick, Havelock and Seddon are undertaken by the staff in the Works Operations section of the A & S Department. Works Operations repair and maintain the reticulation and provide a 24/7 call-out service. Routine maintenance schedules have been established to inspect, clean and maintain screens, gratings, channels, culverts and pump stations in the system.

A full-time technician is employed to oversee the maintenance of electrical and telemetry components within the system. More specialist work is contracted out to specialist electrical, mechanical, telemetry or civil engineers.

Similar work in Picton is undertaken through a term contract. The term contract was retendered in 2014 and awarded to the incumbent contractor for a further three years, with two options to renew for two years each. The contract is managed by a dedicated MDC engineering officer. The conditions of the contract specify the operational procedures, skills of the operatives and the quality of materials and fittings to be used. Renewal of the contract is reliant upon meeting minimum key performance indicators.

SCADA telemetry is installed on three pump stations at Waitohi (Picton), Dry Hills and Hardings Road. The telemetry data is returned to the engineering officers who have direct access to monitor real time data and trending of the parameters. A 24/7 standby roster is maintained to monitor the system and an automated tiered alerting system is employed to ensure system alarms are responded to in a timely way.

A new asset management information system was introduced in December 2014 to replace the existing Hansen asset information management system. Work orders created in the system software record all scheduled and reactive maintenance as well as the attributes of the assets worked upon.

Maintenance schedules are programmed to automatically generate work orders for routine servicing. The maintenance history from the existing Hansen AMIS has been migrated. Collating this data and developing reports allows asset performance to be analysed.

The recent history of stormwater operational costs are shown (Overleaf Figure 4-2). There was a significant increase in depreciation costs in 2008/09 when pipe laying costs were reviewed. Depreciation continues to contribute a very significant proportion of the overall operational costs. This reflects the relative simplicity of a largely gravitational reticulation. Reticulation maintenance costs have increased over the period but remain as a relatively small proportion of the total. Future expenditure is shown in Chapter 5

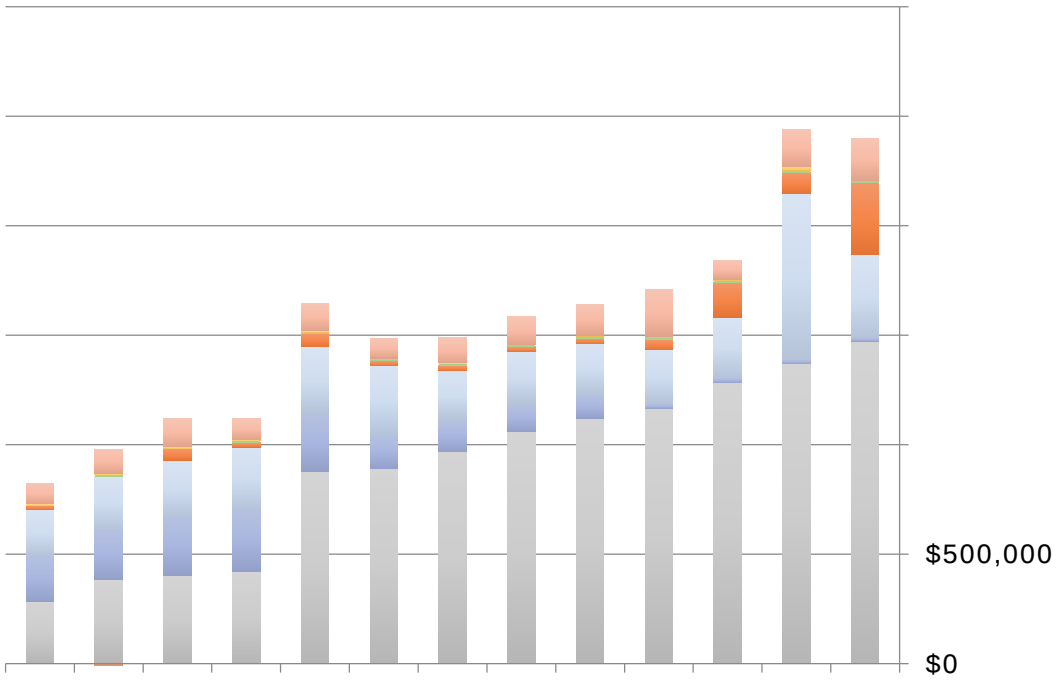


Figure 4-2 — Operating expenditure by significant type

4.4 Renewal/Replacement Plan

The renewal strategy is designed to maintain the overall condition and performance of the asset infrastructure through a continuous, progressive cycle of replacement.

The renewal programme is based on the following factors.

Age — The age of each asset is recorded in the asset management information system. A nominal useful life for each asset is allocated based on industry standards, experience or factual assessment.

Condition — The condition of assets will be assessed through systematic survey and asset condition grading and also through casual observation during reactive or routine maintenance.

Performance — Information is gathered on the performance of assets through post-storm analysis of surcharging and surface flooding. Consent compliance issues are recorded and contaminant ingress or inflow incidents are investigated and traced to the source.

Maintenance Costs — Routine and reactive maintenance is recorded against individual assets. Both the quantum of maintenance and the costs are used to assess the full life cost of asset ownership.

Customer Service Delivery — Requests for service and customer complaints are analysed.

Economic Obsolescence — the availability of spares, skills, techniques or restricted access through resurfacing etc may affect the physical useful life of an asset.

Renewal of stormwater assets is planned through the Stormwater Action Group in conjunction with the Operations & Maintenance Engineer and the Planning & Development Engineer. A schedule of potential renewal schemes is maintained and updated by the Operations & Maintenance Engineer. The renewal strategy is heavily influenced by the continued rapid growth in demand. Wherever possible renewals are coordinated with capacity upgrades and the costs shared between the two drivers.

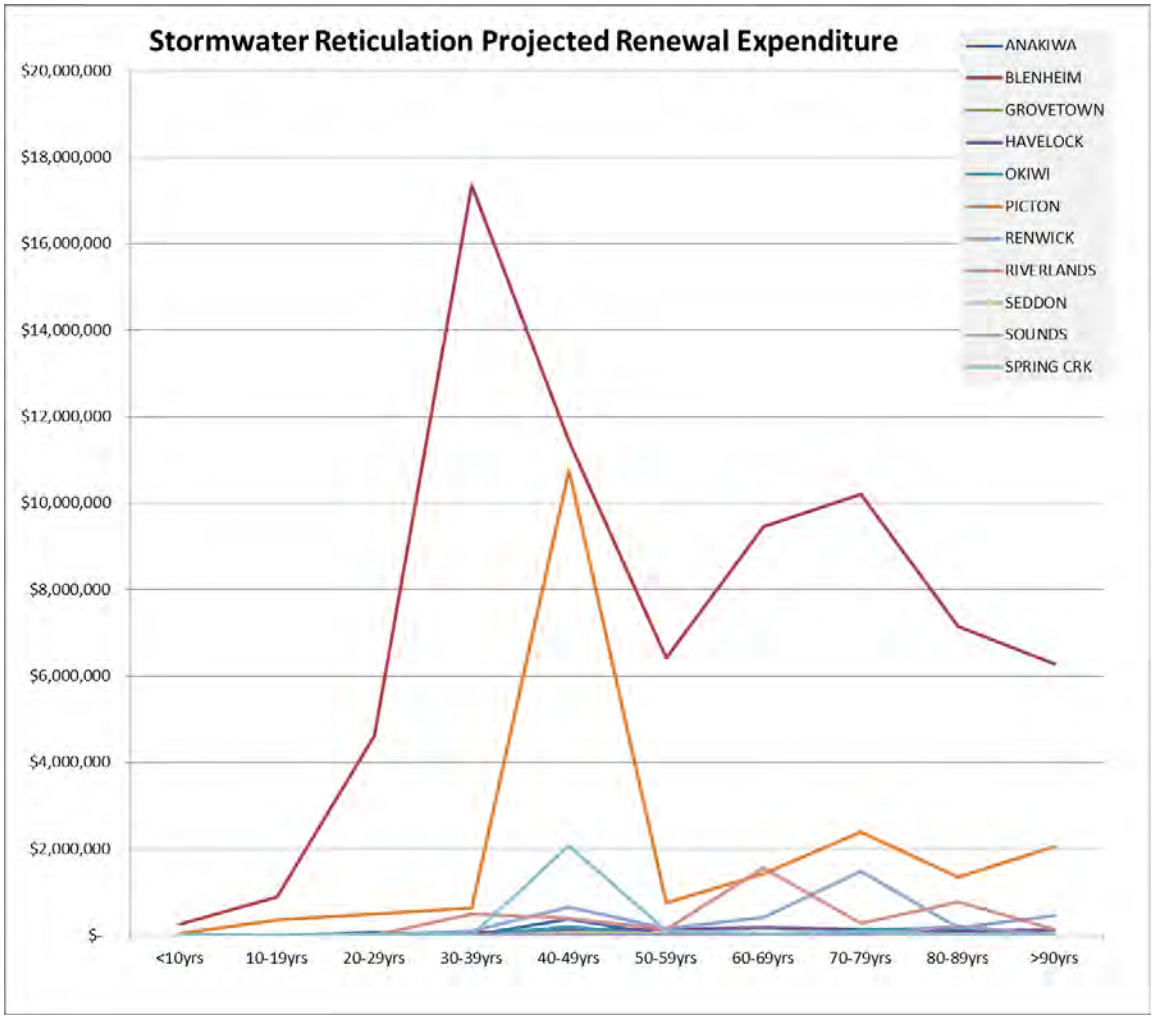


Figure 4-3 — Projected stormwater renewal expenditure

Similarly, additional priority will be awarded to projects where the existing asset is under-performing, causing a level of service issue. The costs of all capital projects are distributed between the main drivers — renewals, improvement to levels of service, and growth.

Intervention points are established based on the criticality of the asset. Pipes and pumps that are critical to the drainage system are not allowed to fail. They are routinely monitored and maintained, and renewal is planned to avoid service failure.

Currently, non-critical assets are allowed to fail and are renewed when the cost of maintenance or service interruptions become untenable. This strategy ensures the useful life of the asset is maximised and delays the cost of renewal for as long as possible. This is considered a rational approach at this time. The condition of the whole asset base has yet to be determined through comprehensive survey and assessment. The sequence and detailed design of urban development is still to be established. There is, therefore, a motivation for delaying renewals whilst the overall strategies for the Stormwater Management Areas are further developed.

Figure 4-3 is informed by the revaluation data. There is a significant peak in pipeline replacement activity forecast in 20 to 40 years time. From a practical project management point of view and for financing purposes it is desirable to ‘smooth’ the peaks. A more detailed renewal programme will

be developed once the pipe condition assessment and data analysis has been undertaken, and will be included in on-going updates of the Stormwater Management Area Plans.

Asset upgrades are included in the capital programme and the costs apportioned between growth, renewal and improved level of service (see Table 4.9.) The capital investment programme to meet growth is shown in Chapter 5: Table 5-2.

4.5 Creation/Acquisition/Augmentation Plan

All capital upgrade projects for the stormwater infrastructure follow a process from inception though to construction and commissioning, as outlined below.

Identification of need — New infrastructure may be required to meet forecasts of growth in demand, and issues with level of service will be identified through performance monitoring and customer feedback.

Project prioritisation — Projects are prioritised through a risk management process of likelihood/consequence but prioritisation will also be influenced by the overall objectives of the relevant Stormwater Area Management Plan once this is completed, as well as by cost and timescale, and the structural integrity of the drainage areas.

Alternatives and options — Alternative solutions including non-infrastructure solutions are considered before examining different design options.

Once an outline design solution has been agreed, detailed design can proceed. Further options or unforeseen problems may be encountered at this stage and the decision making process may need to be reviewed. Additional specialist consultancy and peer review continues through the process.

Project approval — Realistic design options are evaluated by the engineering hierarchy and presented to the Council's Assets & Services Committee for approval. The outline budget costs and the sources of funding are also considered at this time and aligned with the objectives of the Long Term Plan. The decision of the A & S Committee is tabled at the full Council meeting for ratification.

Detailed design — An approved project will progress to detailed design. Specialist engineering consultants are often employed as they have greater experience in the design of major works. Draft designs are submitted to the engineer and may be passed on for peer review. Generally, all engineering works are designed to national or international specifications and standards. The standards may be amended to local conditions. The design criteria set out in the draft document 'Procedures for Reviewing Blenheim Stormwater Capacity and Providing for New Areas' is likely to provide the basis for future infrastructure projects.

Tender — Once a final design has been proposed and agreed with Council engineers, most construction projects are publicised for competitive tender. The Council has a rigorous procurement policy which was recently subject to scrutiny from an independent lawyer following unsupported allegations of corruption. His findings were that Council's procurement systems were very robust and no corruption was found. Returned tenders are evaluated on the basis of a series of pre-determined weighted attributes. The weighted attribute methodology is designed to provide the best possible overall outcome and may consider matters such as health and safety, value for money, productivity, certainty of outcome, previous experience, innovation and risk.

It is usual for specific contracts to be prepared for every tender. Each one is updated to include the latest standards, materials and techniques. A specialist contract lawyer is employed to check and review contracts prior to tendering.

Construction — The construction phase is normally managed by Council's project engineers, supported by specialist consultant project managers and supervisors. A risk register is compiled at the beginning of each project and is monitored throughout the construction to help ensure smooth progression and successful outcomes.

Significant variations in the final design may have to be returned to the Assets & Services Committee for verification and approval. Papers are regularly submitted to the Committee to advise the governance body of progress on the major projects.

Capital projects which are currently under consideration are listed in Table 4-8.

Table 4-8 — Capital projects under consideration (ILoS = increased level of service)

Project	Driver	Stage	Comments
Redwood Street/Town Branch Drain	ILoS, Growth & Renewal	Detailed option paper presented to Council.	Option 9 recommended. An initial budget of $10M (of a total estimate of $20.4M) approved and allocated. To be manged between stormwater and Rivers
Murphy's Creek	Growth	Alternatives and options	Investigation into water quality issues and stakeholder consultation on creek capacity
Casey's Creek	Growth	Alternatives and options	Investigation into channel upgrade and detention options prior to urban development
Taylor River Catchment Quality Monitoring	ILoS	Identification of need	Water quality monitoring to set benchmark levels and identify potential problems

Vested assets — The Council will accept ownership of assets constructed by private developers. These are normally pipes and pump stations created as part of a land development subdivision. The assets will be accepted only if they are designed and constructed to the rigorous standards prescribed in the Code of Practice for Subdivision (NZS4404: 2004) and amended by MDC. The process is supervised by the Infrastructure Project Engineer and is subject to his final approval related to the quality of the assets.

Purchased assets — Specific assets may be purchased directly by Council staff. Generally there are sufficient in-house engineering skills to select the suppliers and evaluate the purchase options. External assistance from consultants may be sought when selecting suppliers of specialist plant and equipment.

4.6 Disposal Plan

There is a need to plan for the disposal of assets that are no longer operational. The plan recognises the costs and benefits of redundant assets.

Underground assets are normally decommissioned and left in the ground. They have a residual value as they can often be re-commissioned, or the pipelines can be used as conduits for other services. However they may also represent a continuing cost of ownership through the liability of collapse or ground subsidence, require continued maintenance, create unwanted flow paths for groundwater or present an obstacle to other services.

Chapter 5: Financial

The stormwater supply activity accounts for around 2.1% of Council expenditure. The stormwater activity is significantly smaller than water supply and wastewater but implementation of this asset management plan will have important consequences for the overall budget, and for ratepayers and other sources of funding which support this activity.

Pressures to improve the quality and quantity of stormwater have been discussed in chapters 2 and 3 of this plan. Affordability has been highlighted as a key challenge in the Infrastructure Strategy, which is exacerbated by the anticipated change in demographics in the region over the 30 year span of the strategy. The Council has developed financial plans and strategies to meet the financial demands of the future. A summary of the direction signalled in these financial plans and strategies is outlined in section 5.1 below.

Components of the Financial Section

- Financial Strategy and Projections — including operational and capital expenditure.
- Funding Strategy — matters to consider, funding sources, and the Development Contributions Policy.
- Valuation Forecasts — asset valuation, depreciation methodology and forecasts.
- Key Assumptions — implications for stormwater assets and data confidence.

5.1 Financial Strategy and Projections

The Council has developed a number of key strategies and plans that meet statutory requirements and explain how the financial demands of the future will be met. Documents such as the Financial Strategy, the Revenue and Financing Policy, the Treasury Policy and the Development Contributions Policy form the basis for Council's financial planning.

The policies and plans are regularly reviewed and updated. The cycle usually corresponds with the three-year update of the Long Term Plan.

The Council's financial statements are published in detail in the Long Term Plan and the Annual Reports. They are prepared in accordance with the Local Government Act 2002 and comply with Generally Accepted Accounting Practices in New Zealand. They comply with New Zealand's International Financial Reporting Standards (NZIFRS) and other applicable financial reporting standards as appropriate to public benefit entities. All documents are scrutinised and approved by Audit New Zealand.

The Financial Strategy was updated and published for public consultation in April 2018. The strategy seeks to demonstrate how Council will:

- ensure that the levels of rates and borrowing are financially sustainable and kept within pre-set limits
- maintain levels of service
- maintain the assets it owns on behalf of the community
- provide for growth and changing demand patterns within the District
- fund improvements to infrastructural and other community facilities
- manage Council's investments and liabilities.

Council's responsibility for financial prudence is defined by statutory obligation and is recognised in the Financial Strategy:

"Under section 101 of the Local Government Act 2002, Council considered its financial management responsibilities where it must manage revenues, expenses, assets, liabilities, investments and general financial dealings prudently and in a manner that promotes the current and future interests of the community. The Council also considered whether it was sustainable to undertake the level of capital expenditure proposed in the Long Term Plan together with increased operating costs associated with the higher debt level. If the Council has too much debt then future ratepayers will subsidise current ratepayers. If population growth, which is expected to fund the growth portion of assets incorporated into the capital expenditure programme, does not occur or occurs at a slower rate this may either increase rates or slow the delivery of capital projects.

"The policy of fully funding depreciation except for Community Assets has been continued in the Long Term Plan 2018–28 and is considered an appropriate measure to ensure the concept of intergenerational equity is maintained. That is, current ratepayers will pay for its use and a share of its replacement cost in relation to the assets provided."

The strategy continues with regard to maintaining the assets in the following way:

"The policy of fully funding depreciation except for Community Assets has been continued in the Long Term Plan and is considered an appropriate measure to ensure the concept of intergenerational equity is maintained. That is, current ratepayers will pay for its use and a share of its replacement cost in relation to the assets provided."

Regarding growth, the strategy states:

"Council believes that, as development increases the consumption of its current infrastructure capacity and accelerates the requirement for new infrastructure, developers should bear the cost of this increased demand.

"Through the application of its Development Contributions Policies to fund the cost of this additional infrastructure, Council is seeking to achieve an appropriate balance between encouraging growth and reducing the potential for additional burden on the ratepayer.

"Undertaking development in a planned, co-ordinated manner can reduce costs as infrastructure development is not responding to "adhoc requests" for isolated, scattered, piecemeal development. Responding to adhoc development can mean that parts of the infrastructure networks are replaced earlier in their life than optimum while allowing other parts of the network to remain comparatively underutilised."

Regarding levels of service the strategy states:

"During the development of the 2018–28 Long Term Plan, the Council considered how to maintain its current levels of service, operating expenditure and capital expenditure needed to replace existing assets and provide new infrastructure and facilities to meet the levels of growth that are forecast within the 10 years of the Long Term Plan. The Long Term Plan as presented should, for the majority of activities, enable Council to maintain current levels of service."

Stormwater infrastructure will develop over the course of the plan in response to urban growth, improvement to the level of service and providing additional resilience to climate change impacts.

The Financial Strategy makes it clear that to achieve the required financial prudence there were four main factors to consider:

- *The estimated expenses of achieving and maintaining the predicted levels of service provision set out in the Long Term Plan, including the estimated expenses associated with maintaining the service capacity and integrity of the assets throughout their useful life;*
- *The projected revenue available to fund the estimated expenses associated with maintaining the service capacity and integrity of assets throughout their useful life;*
- *The equitable allocation of responsibility for funding the provision and maintenance of assets and facilities throughout their useful life;*
- *The funding and financial policies.*

Council's Financial Strategy sets out the strategic financial direction; the external and internal factors expected to have a significant impact (in particular over the next ten years); and the approaches used to fund this scenario in a prudent manner.

The strategy identifies that in general:

- growth driven capital expenditure is funded by development contributions
- capital expenditure to increase levels of service, e.g. improve quality of stormwater discharges, is funded by borrowing
- renewals capital expenditure is funded from revenue — rates and charges — set to recover depreciation expenses, and accumulated until spent. This funding source emphasises the importance to Council of continually fully funding depreciation on infrastructural assets.

In practice any funds available are used before new loans are drawn down, to avoid paying interest unnecessarily; excepting development contributions which are only ever used to fund growth projects.

The major stormwater projects are primarily to:

- provide stormwater facilities for new subdivisions whilst protecting downstream areas
- improve the quality of stormwater discharges to the environment
- upgrade existing infrastructure to meet the levels of service and cope with urban infill and climate change.

The renewals expenditure based on expected useful life has been budgeted to "fill the gaps" between the major projects.

Beyond the planning horizon of the asset management plan and into the later 15 years of the Infrastructure Strategy the focus of capital expenditure is forecast to move to renewals. The capital investment outline over 30 years is shown in the Infrastructure Strategy 2018-48.

5.1.1 Operational Maintenance Expenditure

There are increasing pressures on the operational expenditure from a number of causes:

- improved levels of service may require additional cleaning and routine maintenance to ensure reliable drainage
- growing infrastructure will require additional maintenance and depreciation costs
- maintenance of ageing infrastructure will require additional maintenance
- an increased asset condition assessment programme will be necessary to assist with renewals planning
- mitigation of risks through insurances will fluctuate as national and international insurance markets respond to demand and claims.

The financial impact of these decisions have been estimated and included in budget projections into the future (see Table 5-1.)

Historical operational expenditure is discussed in Chapter 4 (Lifecycle Management).

Table 5-1 — Projected operational expenditure 2018-28

Stormwater Drainage 2018-28 (un-inflated)	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Reticulation - mains maintenance	103,000	103,000	103,000	103,000	103,000	103,000	103,000	103,000	103,000	103,000
Reticulation - open drains maintenance	38,000	38,000	38,000	38,000	38,000	38,000	38,000	38,000	38,000	38,000
Reticulation - connection maintenance	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500
Reticulation - berm sump maintenance	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Pump stations - other	10,000	22,000	2,000	2,000	12,000	7,000	22,000	2,000	2,000	2,000
Reticulation - manholes maintenance	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Pump Stations - power	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Pump stations - mechanical	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Total Infrastructure costs	**208,000**	**220,000**	**200,000**	**200,000**	**210,000**	**205,000**	**220,000**	**200,000**	**200,000**	**200,000**
Personnel	29,486	38,861	38,861	38,861	38,861	38,861	38,861	38,861	38,861	38,861
Operating Costs	79,276	79,276	79,276	49,276	49,276	49,276	49,276	49,276	49,276	49,276
Depreciation	1,473,090	1,516,639	1,570,040	1,616,899	1,638,062	1,696,365	1,754,879	1,802,047	1,856,551	1,917,413
Interest Expense	13,873	12,321	10,682	8,951	7,124	5,195	3,158	1,116	153	-
Overheads Allocated	429,058	438,614	449,698	459,021	467,973	478,468	487,896	497,683	507,317	520,419
Total Operating Costs	**2,232,784**	**2,305,711**	**2,348,557**	**2,373,008**	**2,411,297**	**2,473,166**	**2,554,070**	**2,588,984**	**2,652,158**	**2,725,970**

Table 5-2 — Projected Capital Expenditure

Stormwater Drainage 2018-28 (un-inflated)	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Blenheim										
Renewal	489,725	-	-	-	-	-	-	-	50,000	50,000
Other capex	760,000	490,000	560,000	1,010,000	1,610,000	3,481,327	785,000	740,000	1,740,000	1,740,000
Havelock										
Renewal	-	-	-	-	-	-	-	-	-	-
Other capex	1,000	176,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Picton										
Renewal	9,000	384,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Other capex	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Renwick										
Renewal	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Other capex	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Spring Creek										
Renewal	-	-	-	-	-	-	-	-	-	-
Other capex	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total capex	**1,299,724**	**1,090,000**	**610,000**	**1,060,000**	**1,660,000**	**3,531,327**	**835,000**	**790,000**	**1,840,000**	**1,840,000**
Level of Service	280,000	270,000	340,000	335,000	195,000	1,126,214	165,000	520,000	520,000	20,000
Growth	251,000	251,000	251,000	706,000	446,000	2,036,113	251,000	251,000	251,000	251,000
Renewal	768,725	569,000	19,000	19,000	1,019,000	369,000	419,000	19,000	1,069,000	1,569,000
Total capex	**1,299,724**	**1,090,000**	**610,000**	**1,060,000**	**1,660,000**	**3,531,327**	**835,000**	**790,000**	**1,840,000**	**1,840,000**

Table 5-2 shows the projected stormwater capital expenditure and the distribution of costs between the funding sources for growth, levels of service and renewal. The majority of expenditure is focused on Blenheim to realise the objectives of the Blenheim Stormwater Strategy and the upgrades necessary for the new urban growth pockets.

Table 5-3 — Projected capital expenditure 2018-48

Stormwater Drainage 2018-48 (un-inflated)	18-23	23-28	28-33	33-38	38-43	43-48
Blenheim						
Renewal	489,725	100,000	886,782	831,465	5,047,884	11,529,497
Other capex	4,430,000	8,486,327	-	-	-	-
Havelock						
Renewal	-	-	-	-	-	-
Other capex	180,000	5,000	-	-	-	-
Picton						
Renewal	420,000	45,000	-	-	-	-
Other capex	125,000	125,000	-	-	-	-
Renwick						
Renewal	50,000	50,000	-	-	-	-
Other capex	15,000	15,000	-	-	-	-
Spring Creek						
Renewal	-	-	-	-	-	-
Other capex	10,000	10,000	-	-	-	-
Total capex	**5,719,724**	**8,836,327**	**886,782**	**831,465**	**5,047,884**	**11,529,497**
Level of Service	1,420,000	2,351,214	-	-	-	-
Growth	1,905,000	3,040,113	-	-	-	-
Renewal	2,394,725	3,445,000	886,782	831,465	5,047,884	11,529,497
Total capex	**5,719,724**	**8,836,327**	**886,782**	**831,465**	**5,047,884**	**11,529,497**

5.1.2 Capital Expenditure

The major focus for capital expenditure over the first years of the plan will be the upgrades to the Blenheim Stormwater Management Areas of Redwoodtown/Town Branch, Murphy's Creek, Casey's Creek and Fulton's Creek

The following charts show the major projects of the capital investment programme.

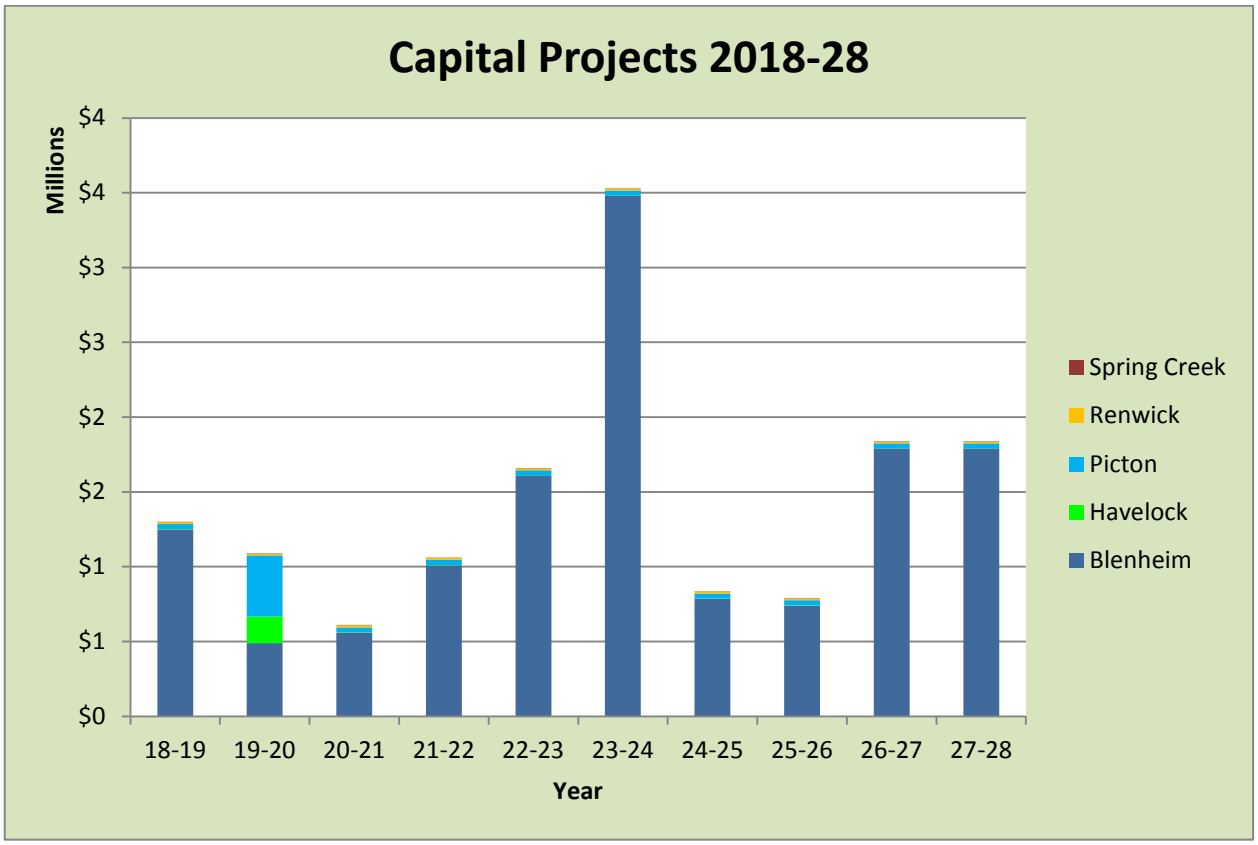


Figure 5-1 — Major capital projects 2018–28

The proposed timing of the capital expenditure is shown in Figure 5-1. However, the actual timing of the delivery of the capital programme is highly dependent on preliminary investigation and preparation — resource consent approval, land purchase, public consultation, etc. Thorough investigation is time consuming but valuable to ensure smooth progress of works and certainty of contract cost and delivery. It is common to under-estimate the time required for project preparation to ensure Council approval and funding are sourced in good time. However, unnecessary finance servicing costs can be incurred if funds are secured too early and not spent.

In the past five years the Council's overall actual Capital Expenditure has ranged from $28.3M in 2013 to $42.7M in 2017 with an average of $34.1M. The projection for 2017/18 is over $50M. In all of these years the actual spending was below budget, often significantly. Capital project timing has been delayed due to:

- finalising community consultation
- obtaining land access
- obtaining resource consents
- accessing available external professional expertise
- receiving acceptable contract prices and contractor availability.

It is unlikely that projects will rapidly overcome the obstacles described and accelerate much beyond an annual expenditure of $60M. The Council has therefore decided to limit its overall capital financing to $60M per annum for the first three years of the LTP.

Growth/Levels of Service/Renewals

In accordance with Schedule 10(3) of the Local Government (Financial Reporting) Regulations 2011, capital expenditure budgets are apportioned between three elements — renewal, improvement in levels of service and growth. Correctly apportioning the costs is important to ensure funding is retrieved from the appropriate sources. It is normally obvious at the outset of a capital project as to the main 'driver' — growth, level of service or renewal. The council's strategy to apportioning costs is to assess the expired/remaining life of an asset and to attribute the depreciated value of the life-to-date to 'renewal'. This value is obtained from the annual asset revaluation. The remaining costs are apportioned between growth and level of service according to the additional capacity or improvement experienced by the customers.

In instances where new assets are built or modern, serviceable assets are replaced it is possible to assign costs to growth and/or levels of service only.

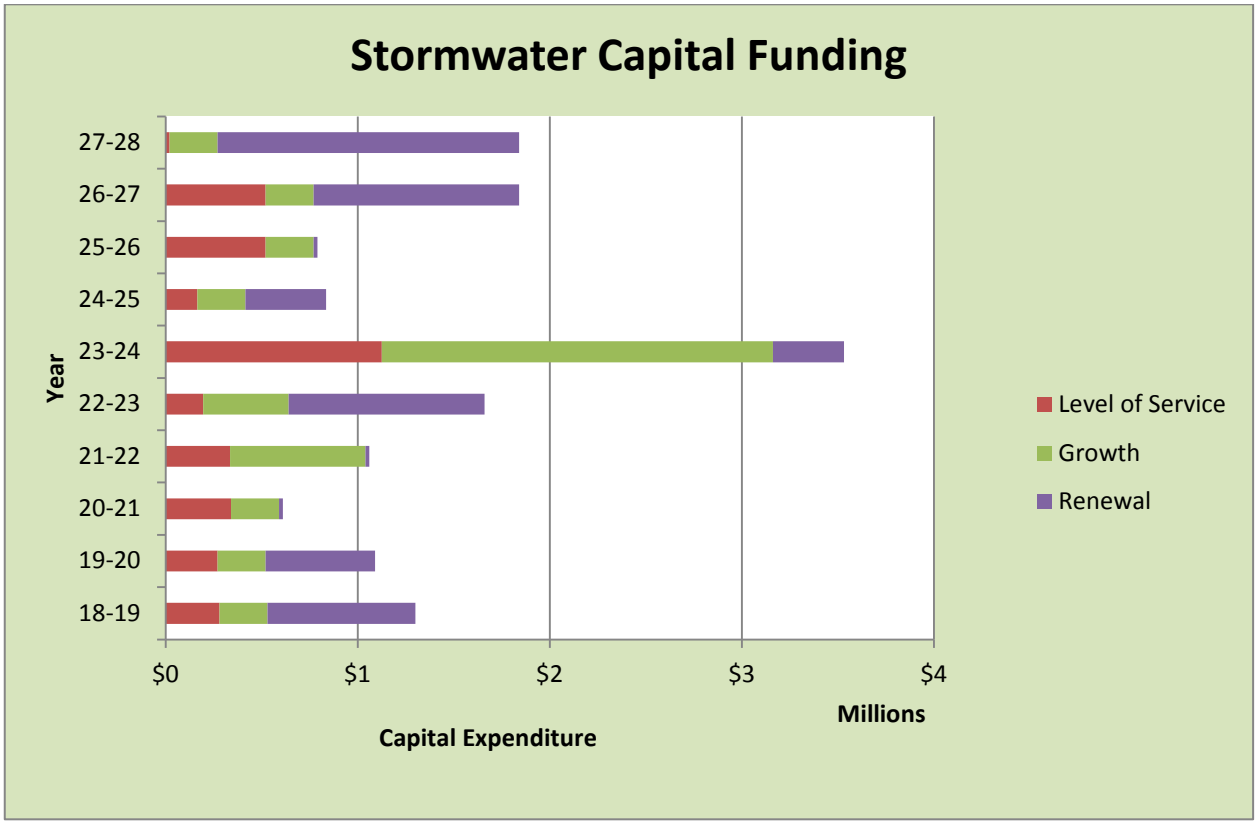


Figure 5-2 — Stormwater capital investment by main drivers

Figure 5-2 shows how the costs of the major capital projects have been attributed to the major drivers — growth, level of service and renewals. The information is used within the financial models to ensure funding is collected from the appropriate source.

5.2 Funding Strategy

The Revenue and Financial Policy sets out the sources of funding available to Council and how the funding source is allocated between different activities and the drivers for expenditure (growth, level of service and renewal).

There are several sources of funding for the stormwater activity — general rates, targeted rates, lump sum contributions, fees and charges, interest and dividends from investments, borrowing, proceeds from asset sales, development contributions, grants and subsidies and other sources as permitted by statute.

In determining which funding sources were appropriate, Council gave consideration to the following matters in relation to each activity to be funded:

- the community outcomes to which the activity primarily contributes
- the distribution of benefits between the community as a whole, any identifiable part of the community, and individuals
- the period in or over which those benefits are expected to occur
- the extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity
- the costs and benefits, including consequences, for transparency and accountability, of funding the activity distinctly from other activities
- the overall impact of any allocation of liability for revenue needs on the current and future social, economic, environmental, and cultural well-being of the community.

The sources of funding and the approach taken by Council are listed in the Revenue and Financing Policy, which highlights the funding sources for every Council activity and any sub-activity which may exist. The policy shows the rating tools which Council has determined to be fair and equitable for each activity.

As noted previously, the stormwater activity contributes to the Community Outcomes of:

- **Environment** by providing urban drainage networks that effectively manage flood risk and control potential surface contamination from entering aquatic environments
- **People** and **Economy** by providing a safeguard against stormwater flooding of residential and commercial property.

The beneficiaries of the stormwater systems are identified in the Revenue and Financing Policy in the following way

"Owners of developed properties require that there are systems for the collection and disposal of stormwater. Developers who are adding to the demands placed on schemes which require the Council to undertake new capital works related to growth will also contribute to these costs."

Separate Targeted Rates and Charges

"*The benefit of funding drainage distinctly is that only those within urban drainage areas will contribute to their funding and rural drainage systems will be funded by rural areas*."

The Council considers separate targeted rates are the most equitable funding mechanism for stormwater services based of the benefits assessed for the targeted area.

Operational Expense Funding

Prior to determining the "residual amount to be funded by general-type rates", Council identifies all other funding sources appropriate to the type of cost incurred for the stormwater service after the exclusion of fees, charges, subsidies, grants and general revenue.

Fees and Charges — These have been set at a level to recover private benefits where it is practical and economic to do so, unless there have been determinations arising from previous funding reviews to fund all or part of such benefits from rates.

Grants and Subsidies — These are sought and applied for whenever they are available.

General Revenues — These are allocated to geographic rating areas in proportion to the gross general-type rates and charges.

The Council has determined the fair and equitable charge for the operational costs of the stormwater service to be funded through a combination of general rates, uniform annual charges and metered charges. The allocation of charges is dependent on geographical location and the details are included in the Long Term Plan.

Funding of Capital Investment

The sources of funds for capital expenditure are as follows:

- development and financial contributions.

- capital grants and subsidies (where available).
- user charges.
- general revenue sources.
- Council financial reserves, including Depreciation Reserves.
- loans
- targeted rates (directly charged).

5.2.1 Development Contributions Policy

The Development Contributions Policy was reviewed and updated based on the latest forecasts and included in the Long Term Plan 2018–28.

Marlborough District has experienced significant growth over the last decade. Although this is often hailed as positive for the community, growth also presents a number of challenges. Not least is Council's task of expanding infrastructure networks to support the increased use of essential services.

The cost of expanding these networks is often high, and the issue of funding inevitably arises. Funding the expansion of these core networks entirely from general rates (or other indirect means) is inequitable, because existing ratepayers may neither cause these works to occur, nor materially benefit from them. As a result, alternative means for funding these capital works must be considered. Development contributions is one such source.

Council adopted a Development Contributions Policy effective from 1 July 2009. The Development Contributions Policy replaced the Financial Contributions Policy with the exception of the North West zone, parking contributions and where the new Policy is silent on issues in the Resource Management Plans.

Council considers the use of the development contributions mechanism under the Local Government Act 2002 provides a fair and robust means of recovering the cost of growth as compared to charging ratepayers.

The purpose of the development contributions is to recover an appropriate proportion of the costs of growth-related capital expenditure from participants in the property development process, rather than from general rates or any other indirect funding source. The full policy is included in the LTP.

Charges are calculated for each catchment and each activity on the basis of:

- the expected scale and timing of capital works required to service growth
- the expected rate and timing of developments for which the works are required.

The growth projections used to determine income from development contributions in the modelling are based on long run straight line averages using the Department of Statistics population projections. For infrastructure outside of Blenheim forecast Household Equivalents (HEUs) used in the modelling are higher than the Department of Statistics' population projections. This favours developers as it has the effect of reducing the modelled development contributions results. This approach recognises the slower development rates in these areas and the lack of economies of scale. The drivers for capital works projects are categorised into growth, improvement/maintenance of the level of service and renewal of existing capability. The costs and source of funding the work is proportioned accordingly.

The capital expenditure used for modelling what the appropriate charges include:

- expenditure previously incurred to create spare capacity to enable future development to occur
- expenditure beyond the 10 year programme which is required to cater for the cumulative effects of growth
- an assessment of expenditure which relates to future growth beyond the life of the LTP.

5.3 Valuation Forecasts

5.3.1 Asset Valuation

The asset valuation has been undertaken annually since 2008. The asset register of stormwater reticulation consists of nearly 4,000 pipes with individual age, length, diameter and life expectancy characteristics. A data set has been collected of the out-turn costs of stormwater and wastewater pipeline renewal contracts. From this data set a cost curve has been established and unit rates for pipe-laying estimated. The rates are reviewed and updated each year and used in the re-valuation. A summary of recent valuations is shown in Table 5-4.

New assets are added to the register as they are bought, built or vested to the Council. There has been a steady increase in assets in recent years as new subdivisions have been developed, including new stormwater treatment structures.

5.3.2 Depreciation Methodology

The Gross Replacement Cost is the sum of the replacement costs of each of the components if it is replicated with *modern equivalent asset* and recognises the use of modern materials, standards and installation techniques to replicate the existing system.

The Depreciated Replacement Cost distributes the value of the asset across its useful life.

“The way in which depreciation is allocated over the life of the asset must reflect the pattern in which the assets’ future economic benefits are expected to be consumed by the entity.” (NZ International Accounting Standard 16).

In recognition of the above straight line depreciation is considered appropriate for the assets included in this valuation. The Depreciated Replacement Cost has therefore been calculated by:

- Depreciated Replacement Cost = Replacement Cost x (Remaining Life/Life Expectancy).
- The Annual Depreciation (Decline in Service Potential) spreads the current value of the asset across the remaining life of the asset. (Depreciated Replacement Cost /Remaining Life.)

Depreciation is fully funded. The Annual Decline in Service Potential is used for determination of Council’s general and targeted rates for the funding of future infrastructure renewal.

The valuation provides fundamental information for the Long Term Plan as required by Schedule 10 of the Local Government Act 2002. It has been prepared in accordance with the New Zealand Accounting Standards Board Public Benefit International Public Sector Accounting Standard 17 – Property, Plant & Equipment (PBE IPSAS 17) and follows the guidance provided by the National Asset Management Steering Group (NAMS) in the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines, Version 2 (2006).

An annual report is compiled by the asset management engineer in collaboration with the engineering managers. It is peer reviewed by an independent external valuer and scrutinised by auditors from Audit NZ.

Table 5-4 — Summary of stormwater revaluations 2001–17

Valuation	Replacement Cost	Optimised Depreciated Replacement Cost	Annual Decline in Service Potential
2001	$ 25,876,448	$ 19,623,418	$ 267,708
2005	$ 31,411,844	$ 22,372,989	$ 383,787
2008	$ 79,300,805	$ 59,659,898	$ 879,616
2009	$ 79,300,805	$ 59,659,898	$ 879,616

Valuation	Replacement Cost	Optimised Depreciated Replacement Cost	Annual Decline in Service Potential
2010	$ 83,802,882	$ 55,767,953	$ 970,015
2011	$ 90,340,962	$ 60,134,069	$ 1,060,855
2012	$ 95,292,666	$ 63,017,286	$ 1,119,349
2013	$ 101,236,592	$ 65,929,486	$ 1,201,717
2014	$ 107,029,325	$ 69,132,353	$ 1,275,912
2015	$ 111,802,589	$ 69,218,705	$ 1,372,005
2016	$ 115,614,223	$ 72,029,771	$ 1,461,769
2017	$ 118,967,857	$ 73,123,056	$ 1,427,204

A sharp increase in the valuation occurred in 2008 when the unit rates were reassessed. Prices had increased as a result of high global demand and an economic boom in many international markets. Since then prices have stabilised substantially although there is evidence that the current rates are again under pressure. The rates have not been increased in response to the latest data as it is not clear if the prices are a transient spike or a long term trend.

5.3.3 Revaluation Rates

In recent years the revaluation rates have been increased by the application of an index derived from the Capital Goods Price Index as published by Statistics New Zealand.

A cost curve has been established by graphing the out-turn costs of pipe renewals contracts undertaken within the region. The data is updated with all new contract costs. Between 2013 and 2015 an additional 8% was factored into the rates for pipe-laying and 12% for plant and equipment. The increase to contract rates covers design, supervision and other overheads.

Recent tender prices have shown a sharp increase in pipe-laying costs particularly at larger diameters. Whilst these have been added to the data, the cost curve has not been realigned as there is some doubt as to whether this a permanent increase in prices or a transient peak. The rates will continued to be reviewed and adjusted as necessary.

In 2017 revaluation rates were exchanged with five other local authorities and information from a survey by Hayes Consulting. No immediate adjustments were required as a result of the comparison.

In the foreseeable future depreciation will continue to be calculated on a straight-line basis.

There are significant and unpredictable risks to the valuation process — prices of raw materials, local plant and labour costs, fluctuations in international exchange rates, etc. Perhaps the major risk to future valuations is a significant shift in life expectancy of a large group of assets either due to a material type deteriorating faster than expected, or an external influence causing accelerated deterioration of an assets group.

The earthquake in November 2016 caused some damage to the reticulation. Subsequent CCTV surveys has shown significant damage to the stormwater and wastewater earthenware pipes particularly in Blenheim and Picton. The surveys are continuing to evaluate the extent of the damage.

Optimisation

The Marlborough stormwater systems are relatively young and continuing to expand as the population continues to grow. None of the systems are over-designed or have significant redundant capacity. There are no opportunities for optimisation identified at this time.

5.4 Key Assumptions

The key assumptions including the level of uncertainty, risk and financial impact for all Council activities are described in the Long Term Plan – see Appendix 5. Topics include: legislation, inflation, interest rate on Council borrowing, population growth, economic life, subsidy rates, natural disasters, taxation framework, asset ownership and valuation, sources of funding for capital projects, climate change, the emissions trading scheme and resource consents.

Issues specific to stormwater assets are described below or in greater detail elsewhere in this asset management plan.

Pipe life expectancy is based on the NAMS Guidelines with the exception of asbestos cement which is based on the tables in the New Zealand Asbestos Cement Watermain Manual 2001. The life expectancy varies with the diameter of the pipe and the subsequent wall thickness. Life expectancy of the diameters has been capped at 100 years.

Replacement of reticulation pipework will be with modern materials — PVC, polyethylene, ductile iron, steel or concrete. All plant and equipment will be replaced with modern equivalents.

Pipe-laying rates are inclusive of manholes, valves, hydrants, air valves, fittings apparatus and branch connections. The rates are an average across all ground conditions and depths and include trench support and de-watering.

Reticulation pipework below a nominal diameter of 75 mm is assumed to be predominantly installed in non-carriageway locations and with a proportion of low-dig installation techniques. Assumptions on pipe life expectancy have been described above.

Service lines are valued separately at connection fee rate. An adjustment is made if meters are included in the rate and the meters valued separately.

The adopted life expectancies suggest there is a significant amount of pipe-work that is beyond its theoretical life. A programme of targeted pipe surveys is to be undertaken in the future to determine condition trends and amend life expectancy if necessary.

The life expectancy of plant and equipment assumes the continuation of the good standard of planned pre-emptive maintenance currently undertaken. The NAMS guidance on life expectancy has generally been followed unless there is clear local evidence to the contrary.

Table 5-5 — Asset.life expectancies used in revaluation

Material Type	Pipe Diameter	Useful Life		Material Type	Pipe Diameter	Useful Life
AC	25	38		EW		77
AC	32	38		FT		100
AC	40	38		HEL		100
AC	50	38		MPVC		100
AC	75	43		NOF		60
AC	100	53		NOVA		100
AC	125	63		PE 100		100
AC	150	72		PE 80		100
AC	200	90		PVC		100
AC	250	98		RC		100
AC	300	100		SP		100
AC	375	100		ST		100
AC	225	100		ST-CC		100
ALUFLO		100		ST-D		100
B-ARCH		80		ST-GL		60

Material Type	Pipe Diameter	Useful Life		Material Type	Pipe Diameter	Useful Life
C-ARCH		80		ST-SW		100
CC		80		UNKNOWN		100
CI		100		UPVC		100
CU		40		VC		80
DI	0	100				
DRUM		50				

Plant	Useful Life
Mechanical Plant	40
Electrical Plant	25
Civil Structures	100

5.4.1 Data Confidence

The data quality is regarded as good. Of the pipes recorded in the asset management database one or more of the attributes (age, diameter or material type) was missing for around 1% of records. Estimates were made for the missing data based on adjacent pipes or the known history of land drainage in the area.

The following table provides an indication of the quality of data held regarding the stormwater reticulation in each of the service areas.

1 = Excellent, 2 = Good, 3 = Average, 4 = Poor, 5 = Unknown

Table 5-6 — Estimated asset data quality

Area	Length	Diameter	Material	Age	Condition
Blenheim	1	2	2	2	3
Picton	3	3	3	3	4
Havelock	1	2	2	2	3
Renwick	1	2	2	2	3
Riverlands	1	2	2	2	3
Awatere	2	3	4	3	3
Spring Ck /Grovetown	3	3	4	4	4
Other	3	3	3	3	3

The risks and assumptions considered in this plan are shown in Table 5-7— Risks and assumptions. The wider assumptions for Council activity are described in the Long Term Plan and are included in Appendix 5.

Table 5-7— Risks and assumptions

Risks & Assumptions	Discussion	Responses	Confidence in Assumption	Risk
Financial assumptions All expenditure has been stated at 2017 values and inflated through the Local Government Price Index (LGPI).	The LGCI is typically 1 or 2 percentage points above CPI. The LGCI includes a bundle of prices representative of all council costs that may not represent the cost increases in water materials and contract rates.	Many costs are subject to fluctuations in international markets which are outside of the Council's control. The A&S Department uses the best information practically available and seeks Council approval with updated estimates as the projects progress.	Medium	Low
Accuracy of capital project cost estimates That the capital project cost estimates are sufficiently accurate to determine the required funding level.	Under-estimation of project out-turn costs will cause a problem in delivery of projects within the agreed budget. Delays or refinancing may result. Over-estimation of the capital projects may incur additional financing costs.	Outline costs are prepared during feasibility. Detailed construction costs are peer-reviewed prior to contract tender and returned tenders are compared with the engineers' estimates. Project constructions are closely supervised to avoid delays or additional costs.	Low	Low
Emergency funding The level of funding available to the Council will be adequate to cover asset rehabilitation following an emergency event.	Funding requirements and sources are regularly reviewed and updated. The Council has employed consultants to undertake a Maximum Probable Loss assessment and provide advice on risk management strategies.	Funding sources include use of reserves, central government relief, commercial and co-operative insurance (LAPP). Once other sources of funding have been exhausted capital projects will be deferred and money reassigned.	Low	High

Risks & Assumptions	Discussion	Responses	Confidence in Assumption	Risk
Impacts of climate change There remains some uncertainty about the extent and timing of climate change impacts in the region.	The Council follows the recommendations of the Ministry for the Environment and research and advice from international organisations.	Infrastructure is designed for the worst case projections but only constructed 'as and when' necessary in order to maintain the maximum flexibility and defer investment.	Medium	Medium
Changes in legislation and national policy.	The risk of major change is high due to the changing nature of the Government and political focus.	The Council takes all opportunities to engage with central government and local government representation — LGNZ, SOLGM, NZWWA, etc to help anticipate future policy development.	Medium	Medium
Growth forecasts That the district will grow as forecast in line with current projections.	The capital expenditure programme is based on the medium to high growth forecast. Migration is likely to have a greater influence on growth as birth rates decline. Migration will respond more rapidly to changes in the economic prosperity of the region than natural growth.	Continue to monitor population statistics and influencing factors. Ensure the design of long life assets can accommodate the higher growth projection and assets with a shorter life can be readily upgraded as necessary.	Medium	Low
Demographic Projections The age profile of the population will increase significantly.	An older population will see an increase in the proportion of ratepayers on a fixed income and a decreasing ability to respond to cost increases. An older population will have a different lifestyle and changing demand for services.	Ensure infrastructure is flexible and appropriately sized. Manage operational and capital costs and seek cost efficiencies.	Low	Low

Risks & Assumptions	Discussion	Responses	Confidence in Assumption	Risk
Timing of capital projects. That capital projects will be undertaken when planned.	The risk to the programme timing of capital projects is high due to factors such as — delays to the approval of resource consents, public consultation and land purchase.	The Council tries to mitigate these issues by undertaking the consultation, investigation and design phases sufficiently in advance of the construction phase. Budgets are prepared for the best case scenario but delays can result in additional costs from under-utilised funding.	Medium	Low
Resource consents That the approval of resource consent applications and the associated consent conditions have been reasonably anticipated.	There is a high risk that a resource consent application will have restrictive conditions that will delay or incur costs to construction or operation of new infrastructure.	Thorough public consultation and early engagement with the regulatory authorities and an Environmental Assessment help to manage the risks.	High	High
Asset data knowledge The Council has adequate knowledge of the assets and their condition so that the asset management plan will allow the Council to meet the proposed levels of service.	Increased frequency of asset failure will affect the capacity to meet levels of service without increased maintenance costs or an accelerated renewal programme.	Above ground assets are generally well monitored. There is additional effort to conduct a CCTV survey of underground assets and improve data collection on their condition. The hydraulic modelling of all areas has advanced to a good standard. Maintain flexibility within renewal programmes and funding models to absorb fluctuations in timing and investment.	Low	Medium

Risks & Assumptions	Discussion	Responses	Confidence in Assumption	Risk
Network capacity That Council's knowledge of network capacity is sufficient enough to accurately programme capital works.	The Council holds good records on the existing networks which assists in the development of hydraulic models	Detailed hydraulic models have been developed and verified for most networks. The models can be used to assess changing demand patterns as the result of climate change, population growth, changing lifestyles, etc	Low	Low
Demand patterns Both total demand and the daily/seasonal pattern have been accurately assessed.	The factors contributing to changes in demand such as population, lifestyle, climate and economic development have been included in future projections.	Other influences such as new on-site stormwater treatment technology is likely to have a beneficial influence on the quantity and quality of stormwater discharges.	Low	Low

Chapter 6: Plan Improvement and Monitoring

Council asset management practices and processes are continually evolving to help improve decision making related to the operation and investment in high value infrastructure. New data collection practices are being deployed. Advances in electronic data management and performance monitoring technology is providing improved information to support key decisions.

Previous asset management plans and subsequent decisions are reviewed and the plan is adjusted to meet the changing demands of customers and stakeholders and to match the financial realities of the future.

Components of the Improvement and Monitoring section

- The Status of Asset Management Practices — current and desired state of AM processes, data and systems.
- 2014 Improvement Programme Review — review of progress on the 20015/25 improvement programme.
- 2018–21 Improvement Programme — issues identified and to be progressed.
- Monitoring and Review Procedures — includes three yearly AMP reviews, annual asset revaluations, and six monthly monitoring of levels of service.
- Performance Measures — including the national non-financial performance measures.

6.1 Status of Asset Management Practices

6.1.1 Asset Management Information System

The Assets & Services Department has used proprietary databases for the collection of asset data for over 20 years. A project was commenced in 2011 to upgrade the asset management information system. The project was led by the Information Systems Department and a small team of subject experts. External consultants were employed to examine the asset management information needs throughout the Council including Reserves, River Control, Regulatory, Fleet, Libraries, Property, the Harbour Master and others.

In February 2013 the Works and Assets module of the TechnologyOne software was purchased. Extensive effort was required to build and configure the software to meet the needs of water, wastewater and stormwater asset management. The project evolved to include the revision and integration of the financial accounting system. In December 2014 all data from the previous (Hansen) database was migrated and the new system went live.

The register of assets and their attributes is stored in the Asset Management Information System (AMIS) along with the maintenance history, maintenance schedules and performance data. The system is linked to service requests, the Council's document management system and the financial expenditure database.

The AMIS has universal access across the Council. Editing rights are controlled but ownership of the data is devolved as close to the source of the data as possible.

The quality and completeness of the stored data is continually improving. Data is extracted from a variety of historical and contemporary records — service record plans, property files, new connection records, as-built records (internal and contractor) and maintenance works orders. The quality of historical data can be variable and considerable effort is deployed to check the accuracy of the data sources.

Ensuring there is consistency and accuracy in contemporary data collection is also a challenge. Discussions with staff throughout the A&S Department has resulted in the development of a

protocol that defines a common understanding of the accuracy of asset data and the confidence in the source data. In conjunction with this work there has been an ongoing effort to ensure contract specifications and in-house record checks are consistent with the required information.

6.1.2 Geographical Information System

The ESRI ARCMap GIS system has become a cornerstone for information management within the Council. The AMIS has an automated interface with the GIS. The GIS has many tools and features that can be leveraged by the AMIS and a well developed integration was a prime criterion in the selection of the AMIS upgrade.

Water asset information can be viewed by all staff across the Council through the GIS viewer, Dekho. Brief details of the asset are available on an inquiry window within Dekho including the asset reference number for additional information

6.1.3 Computer Modelling

The Council has very high quality in-house network modelling capability which is augmented by specialist consultants. Models are used extensively to predict the behaviour of the reticulation network and as a planning tool for future designs.

Models are verified by on-site observations and measurement and have a high level of reliability. They are extensively used to predict flows and pressure in the water supply system, and to model the effects of infrastructure upgrades and operational configuration.

6.1.4 Financial Forecasting

An extract/transform/load programme has been developed to undertake the annual revaluation of assets from the asset register. Unit rates and prices are updated from contemporary contract prices and where possible are verified with rates from other councils. Where insufficient direct information is available, historical construction/purchase costs are inflated through nationally published construction cost indices.

Current financial forecasts are considered to be moderate to good. Asset condition grading and subsequent determination of life expectancy is being improved. Further refinement of asset components and unit rates estimation may be expected in future.

The quantum of capital expenditure forecasting is good/very good. Project costs are regularly reviewed as they progress or particular cost pressures become apparent. Estimation of the timing of capital works is more challenging. Public consultation, land purchase and resource consent applications can be very time consuming and the outcomes are difficult to predict. Project budgets are normally scheduled on a best case scenario to ensure sufficient funds are available for projects to proceed on time.

6.1.5 Customer Service Data

The introduction of the Water Services Database in 2010 and the accurate logging of customer service requests have added great value to asset management. The database was superseded in December 2014 following the introduction of the TechnologyOne AMIS and the use of the Customer Request Management module.There is now a good mechanism for registering customers' calls and recording response times. There is a facility to sort and filter service requests in order to monitor the performance of assets.

6.1.6 Asset Data Collection

Asset data is constantly being updated and checked. Assets & Services staff are converting the hard copy asset records to a digital format in the linked Geographical Information System (GIS) and the AMIS database. The spatial information on the location of assets, zones and catchment areas is kept in the GIS whilst the individual asset attributes are stored in the AMIS. A small team of staff systematically 'sweep' through a networked area, trawling through the data sources to extract accurate attribute details in order to test the systems are operating correctly.

Table 6-1— Data capture completion

% Complete	Blenheim	Picton	Havelock	Renwick	Riverlands	Awatere	Wairau Valley	Grove'n/ Spring Ck
Water	100	50	100	100	85	75	80	na
Waste-water	100	50	100	100	70	60	na	90
Storm-water	100	50	100	90	70	50	na	40

Information sources include as-built drawings supplied when the asset was constructed. These are produced when the asset is built and can therefore be quite old. Quality can be variable and many drawings are in imperial measurements. Recent as-built drawings can be either hard copy or electronic CAD drawings. These are carefully scrutinised by the Asset Development Officer and the asset will not be accepted for adoption by the Council until the drawings meet the specified standard.

From time to time specific surveys are undertaken. Often plans and long-section drawings are produced and data such as depth and invert levels of underground pipes recorded. Closed circuit TV (CCTV) surveys of sewer and stormwater pipelines are generally undertaken to investigate specific problems or confirm particular requirements. The surveys are reviewed by engineering staff and pipe condition grades are assessed and recorded. The location of laterals can also be ascertained and recorded.

Applications for connections from the mains to new properties or subdivisions are kept as separate records. The Council's property files often record the location, size and material of underground services within the property boundary.

The repairs and maintenance operatives return records of the assets they have worked on. In the past the quality of the records has been variable, with little consistency in how they are provided. Recently efforts have been made to improve the quality of this source of information. Field staff have been trained and mentored in the data requirements. Ongoind training is provided to ensue standards are maintained. The current status of data quality is shown in Table 6-2.

Table 6-2 — Assessment of data quality

	Manholes	Pipes	Connections	Pumps	Pump Stations
Age	A	B	B	A	A
Material	A	C	C	A	N/A
Diameter	B	B	B	A	N/A
Location	A	B/C	B/C	A	A
Criticality	A	A	A	A	A
Performance	B	C	B	B	A
Condition	C	C	C	A	A

Data quality is rated from A to E as outlined below.

A = Highly reliable — Data is based on sound records, procedures, investigations, and analysis, documented properly and recognised as the best method of assessment. Data set is complete and estimated accuracy is +/–2%.

B = Reliable — Data is based on sound records, procedures, investigations, and analysis is documented properly but has minor shortcomings, for example some data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or extrapolation. Data set is complete and estimated to be accurate to +/–10%.

C = Uncertain — Data is based on sound records, procedures, investigations, and analysis which is incomplete or unsupported or extrapolated from a limited sample for which grade A or B data are available. Data set is substantially complete but 50% is extrapolated data and accuracy is estimated +/–25%.

D = Very Uncertain — Data is based on unconfirmed verbal reports and or cursory inspection and analysis. Dataset is substantially complete and most data is estimated or extrapolated. Accuracy +/–40%.

E = Unknown — No, or very little data, is available.

6.2 2014 Improvement Programme Review

During the preparation of this asset management plan, improvements have been identified that will assist in the management of assets and delivery of services in the future. Improvement is required as technology progresses, the operating environment changes and the aspirations of stakeholders evolve. The provision of stormwater services is also subject to changes in the legal framework and the political climate. Business processes need to continuously adapt to meet new demands.

Progress on the 2015-25 improvement plan is detailed in the table below.

Table 6-3 — Progress on the 2015–2025 improvement plan

2014 Improvement Plan With Update		2018 Update
Customer Service	**2014**	**Update**
Improved data capture: • revised data capture form • training • inputting	The Water Services Database was introduced in February 2010 and extended to wastewater and stormwater in March 2011. Customer Services staff have been given comprehensive training including site visits to gain a better appreciation of customer requirements and to accurately record service requests.	Standard of data returned from WorksOps has improved.
Customer Contact Recording		Protocols agreed and delivered to Customer Service staff. All customer calls are now recorded in AMIS and linked to word orders.
Written complaint response recording	Written complaints are infrequent and responses are now recorded in the TRIM electronic document management system. Recording and retrieval are improved.	Written responses recorded in HPE Content Manager electronic document management and reported as national performance measure.
Integrated IT	See details about the Asset Management Information System in section 6.1.1 of this plan.	TechOne AMIS is integrated with TechOne Financials.
Business process review	Extensive business process review workshops were undertaken whilst specifying and designing the replacement AMIS.	Business processes were thoroughly reviewed during AMIS implementation.

2014 Improvement Plan With Update		2018 Update
Review all LoS for Community Outcome Review	A Councillor workshop was held in September 2014 to review the current levels of service and performance indicators.	LoS have been aligned with national performance measures. The Councillor workshop was repeated August 2017
Asset Register		
Updating Asset Register	Two full time data entry staff have been given permanent contracts. Asset data is being systematically updated to agreed accuracy protocols. An outline programme has been adopted.	Areas are being systematically 'swept' and AMIS data and GIS updated to a high standard.
Asset Condition & Performance		
Field data capture process	Engineering officers undertake field condition assessments of pipes and underground assets. Pipe samples are returned to the depot for assessment where possible. Further work is required to standardise the process and ensure consistent data is stored in the AMIS.	Field crews return condition grading of all pipes exposed during maintenance. Extensive CCTV survey programme initiated following the 2016 earthquake.
Asset condition assessment training	Further work is required to determine the accuracy and consistency of on-site assessment of pipes and underground assets by field operatives and provide training where necessary.	A 1-5 scale of condition grading has been adopted and staff trained.
AMIS Facilitation	The replacement AMIS has been specifically configured to ensure condition grading can be adequately recorded.	Done.
Asset Management Information System		
Review of existing Hansen V7 to V8 upgrade with integration to other data systems	A Council wide review of AMIS requirements was undertaken in 2010/11. A thorough procurement process was undertaken. The Technology One AMIS module was selected with integration functionality to the GIS, customer request management and the financial system. The system went 'live' in December 2014.	Migration to TechOne AMIS completed in December 2014. The GIS integration tool requires constant maintenance and a more stable solution is being sought.
Planned Maintenance		
Assess pump station preventative maintenance trial	The trial was satisfactory and will be incorporated into the new AMIS.	Maintenance schedules have been implemented for routine maintenance of stormwater plant.
Maintenance scheduling	The replacement AMIS has improved maintenance scheduling functionality. Current paper based schedules are being loaded and programmed through the AMIS.	

2014 Improvement Plan With Update		2018 Update
Asset Management Plan		
Revise to include peer review recommendations	Consider and include recommendations of AECOM peer review in future drafts.	2018 AM Plan updated with peer review recommendations included.
Develop an asset management policy for the A&S Department	Following recommendations of Audit NZ, an asset management policy is to be developed for future guidance.	MDC Executive Management Team provide guidance on AM policy.
Risk Management		
Undertake a Risk Management Profile and Action Plan	Risk management process overhauled to follow 'source to sea' flow. Annual update undertaken by Operations Engineer and staff, overseen by the Corporate Risk Manager.	Update of the risk plan is undertaken annually, led by MDC Risk Manager and O&M Engineer.

6.3 2018-21 Improvement Programme

Issues identified and to be progressed in the future are outlined below.

6.3.1 Modelling

A detailed hydraulic model of the Redwood Street/Town Branch Drain system has been developed. The model uses the latest data on run-off co-efficients, detention, open channel and piped flows, receiving water conditions and rainfall patterns. The sophisticated model uses the latest predictive techniques available and provides greater confidence in solutions for current and future issues. As a result, specialist consultants were able to propose nine separate options to improve stormwater drainage for southern Blenheim. A preferred option was submitted to Council and an initial $10M budget approved. A ten year implementation programme has commenced in conjunction with the Rivers & Land Drainage Department.

Issue	Responsibility	Target Date
Monitor the improvements to the Redwood Street/Town Branch Drain predicted by the dynamic hydraulic model as construction progresses.	Stormwater Action Group (SAG)	Ongoing
Commission modelling for other catchments in accordance with the Blenheim Stormwater Strategy.	Stormwater Action Group (SAG)	Ongoing

6.3.2 Asset Management Information System (AMIS)

A new asset management information system was purchased in February 2013. Extensive efforts have been made to understand the existing business processes and design and configure the system to meet the needs. The new system was installed in December 2014.

The initial implementation of the Technology One AMIS has been completed. During the migration business processes were analysed and mapped. Training and familiarisation was provided to asset management staff and operatives.

The new system allows universal access throughout the Council. The asset database and maintenance scheduling and works is available to operatives and asset managers. The system readily facilitates proactive maintenance scheduling.

Mobile field data has been introduced but further work is required to improve the user interface and assist consistent field data collection.

Asset attributes and works orders are stored in different tables within the system. Business intelligence reporting needs to be developed to integrate the content of two data sets to provide a basis for improved decision making.

Issue	Responsibility	Target Date
Develop reporting functionality and apply appropriate advanced AM reports.	Asset Management Engineer	2018 onwards
Improve mobile field data collection systems.	Asset Management Engineer	2020
Continue work to seek stabilisation of the GIS integration tool	Asset Management Engineer	2019

6.3.3 Asset Register

Significant advances have been made in the transfer of hard copy records into the GIS and AMIS. Existing records include original public works utility plans, multiple and overlapping as-built plans of new subdivision and mains extensions, field books, new connections records, maintenance records, property files and PIMs/LIMs. These sources of information are rarely consistent and considerable effort is required to determine the accuracy and reliability of the data.

A protocol was established to record the degree of accuracy; the source of information is transcribed into the AMIS/GIS system and a data confidence grade is given to it. Underground services that can be recorded to within 300 mm, with a high degree of certainty are given a confidence grade of 1. Confidence grade 2 is within one metre accuracy and confidence grade 3 is less certain. Similar grades are given to the material type and installation date of assets.

A permanent data team of three have been systematically transferring data from the various hard copy sources to the electronic information systems. The systematic ‘sweeping’ of areas has been mapped to record and communicate progress to other staff. Blenheim, Renwick, Havelock and Riverlands have been ‘swept’ to a consistent and high standard. PIcton and the smaller networks at Spring Creek and Grovetown remain to be completed.

There are instances within the asset register of data that has been estimated or taken from less accurate sources. For example the installation date of some pipes in Picton was recorded as the date the record drawing was created and not the actual installation date. Some errors and estimates have been tolerated as adequate in the circumstances but need to be corrected through further research.

Issue	Responsibility	Target Date
Use the sorting and auditing functions of the new AMIS to search and 'scrub' data for accuracy and inconsistencies.	Asset Management Engineer	2018 onwards
Continue with asset transfer from hard-copy to electronic format using accepted quality protocols for Picton, Spring Creek and Grovetown.	Asset Management Engineer	2019- 20

6.3.4 Urban Growth

The commitment to developing urban growth strategies for North and South Marlborough has been a valuable contribution to the Council planning functions. Growth pockets have been identified and zoned for urban residential development to the north and west of Blenheim.

Site investigations are being undertaken to assist with the detailed design of stormwater services to the zoned areas around Blenheim.

Agreed service plans will be developed and used to ensure coordinated design of complete development zones, particularly those in multiple ownership.

Issue	Responsibility	Target Date
Develop integrated agreed service plans for each growth pocket to ensure efficient coordinated infrastructure.	Infrastructure Projects Engineer/SAG	2018 onwards
Ensure new subdivisions provide adequate stormwater treatment to meet resource consent conditions.	Infrastructure Projects Engineer/SAG	2018 onwards

6.3.5 Financial Forecasts

Continue to monitor contract prices for pipeline and plant installations. The spike in contract prices recently received needs to be closely monitored and intelligence gathered from other councils or consultants to determine whether the price increases are likely to endure.

Issue	Responsibility	Target Date
Review and update unit rate cost curves.	Asset Management Engineer	Annually
Revise the Development Contributions Policy in line with current growth predictions and infrastructure costs.	Chief Financial Officer	2018

6.3.6 Condition Monitoring

There is good knowledge of the performance of pipes by a long-established and experienced work force. Some visual condition assessment and photographic recording is undertaken on major repairs. A limited amount of pipe sample analysis has been undertaken on cast iron and asbestos cement pipes in the last 15 years. The condition of the reticulation is generally estimated based on staff experience and the age and material of the pipes.

The current life expectancy of pipes is based on a theoretical maximum of 80–100 years or guidance from the AC Pipe Manual. Using this methodology, a significant proportion of the network is predicted to reach the end of its useful life in 30 to 40 years' time. There is a need, therefore, for a more systematic condition analysis of the reticulation network.

Following the November 2016 earthquake a CCTV survey programme was implemented. The programme targeted the pipes that represented the greatest risk, critical assets and those considered most vulnerable. Significant progress has been made on the survey of wastewater mains in Picton and Blenheim made of earthenware and older concrete. The programme will continue with stormwater mains and prioritised to the critical reticlation.

The asset management information system must be developed to accept, report and display the condition grades to support decision making.

Progress is being made with the on-site reporting of asset condition during routine maintenance. Electronic data capture through handheld devices has been introduced but requires improvement. Continued training and mentoring is required to ensure accuracy and consistency of data capture.

Issue	Responsibility	Target Date
Develop a condition survey and monitoring strategy for stormwater reticulation assets with the focus on critical reticulation.	O & M Engineer/ Asset Management Engineer	2018
Ensure CCTV survey data and condition assessments are stored and retrievable for future planning.	Asset Management Engineer	2018 onwards
Improve condition grade recording and reporting systems within the asset management information system.	Asset Management Engineer	2018 onwards
Continue to improve site feedback mechanisms from routine repair and maintenance activities.	O & M Engineer/Asset Management Engineer	2018 onwards

6.3.7 Performance Monitoring

A key output of the asset management information system upgrade was to introduce of a suite of performance reports to be readily available to engineering staff and management. This objective is yet to be realised and further work is required. Improved reports on service request response times, types of failures, performance of materials and fittings, operational costs, reactive/routine maintenance, etc will be beneficial.

There is evidence of wastewater entering the stormwater system and contaminating the receiving waters. A sampling programme was initiated in the spring of 2016 to monitor the water quality of the Taylor River and the stormwater outfalls throughout Blenheim. The data will help to target investigations through pipe surveys and development of a repair or renewal programme.

Issue	Responsibility	Target Date
Improved performance monitoring and reporting to be developed through the AMIS.	Asset Management Engineer/SAG	2019
Ensure Taylor River monitoring data informs the repair/renewals programme.	O&M Engineer/SAG	2018

6.3.8 Proactive Maintenance Scheduling

The new AMIS has helped to facilitate improved planned maintenance scheduling by operators. Development of schedules and data collection also assists with effective asset management.

Issue	Responsibility	Target Date
Proactive maintenance schedule of asset groups.	Asset Management Engineer/O & M Engineer	2018 onwards

6.3.9 Cost Effectiveness

Under Section 17A of the Local Government Act the Council is required to review the cost effectiveness of its governance, funding and delivery of good quality local infrastructure.

A paper, prepared by the chief financial officer, was presented to the Planning, Finance and Community committee of Council in June 2017. All Council Services were reviewed. It was decided that the three waters activities will be exempt from further review under Section 17A until the outcome of the Havelock North Inquiry is known.

6.4 Monitoring and Review Procedures

The asset management plan is a compilation of day to day planning and management by the engineering managers and other senior Assets & Services staff. Subsequently the asset management plan is 'live' and under constant review.

The asset management plan is formally reviewed and updated every three years. The update is drafted to coincide with the development of the Long Term Plan. It includes a detailed summary of the information used and decisions made during the planning process. The draft asset management plan is submitted to an external consultant for peer review.

The Council's asset management plans are made available to the auditors of the Office of the Auditor General (OAG) during the audit of the Long Term Plan and the intervening Annual Plans.

The introduction of increased business intelligence reporting from the asset management information system will help to ensure the currency and accuracy of asset data collection.

Asset valuation is undertaken annually. The valuations and all supporting calculations are submitted to an external valuer for independent verification. The valuation is scrutinised by Audit NZ to ensure asset management is adequately resourced in future plans and budgets.

Levels of service performance indicators are monitored at six monthly intervals and reported to the Council's Executive Management Team. Council results in relation to the performance indicators are published in the Annual Report, which is made publicly available. The Council intends to elevate the status of performance measures and supplement them with other internal benchmark measures in future. These will be under constant review and published on the internal intranet. Progress has already been made towards this goal.

6.5 Performance Measures

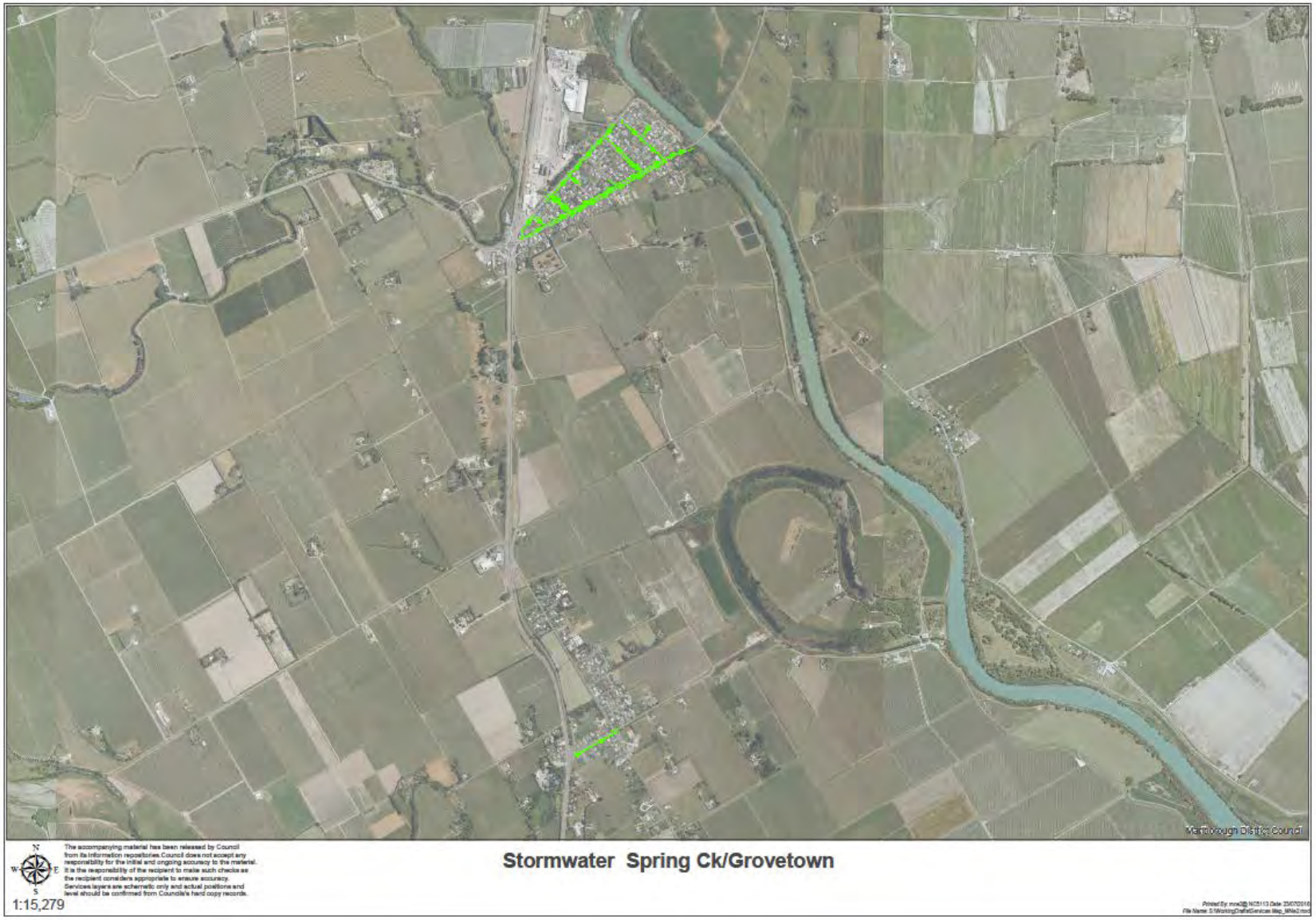
The Local Government Act 2002 Amendment Act 2014 enabled the introduction of national non-financial performance measures for water, wastewater, stormwater, roading and flood protection.

Some performance measures adopted by the Council have been difficult to measure, and there was no defined interpretation of the method of measurement. Detailed methodologies have subsequently been documented for each measure to ensure repeatable consistency and accuracy. Recommendations by the OAG to improve the control environment, including the data collection and storage mechanisms, have been actioned.

The AMIS is partially integrated with the customer request management system. There is a capability to trace service requests to subsequent work orders. The system allows response time monitoring, symptom and fault analysis, interruption and restoration monitoring, and cost recording.

The Council also participates in the annual National Performance Review undertaken by Water NZ. Forty-four councils submitted data for the 2016/17 review covering 90% of the population of New Zealand. The data is categorised into large, medium and small local authority participants. The report covers the three water services and provides an opportunity for councils to compare their performance on a large number of financial and non-financial performance indicators. Inevitably there is some difficulty in 'normalising' data across numerous agencies but the report still provides a valuable comparative guide on the performance of the Council's stormwater activity within a national context.

Appendix 1: Stormwater Asset Maps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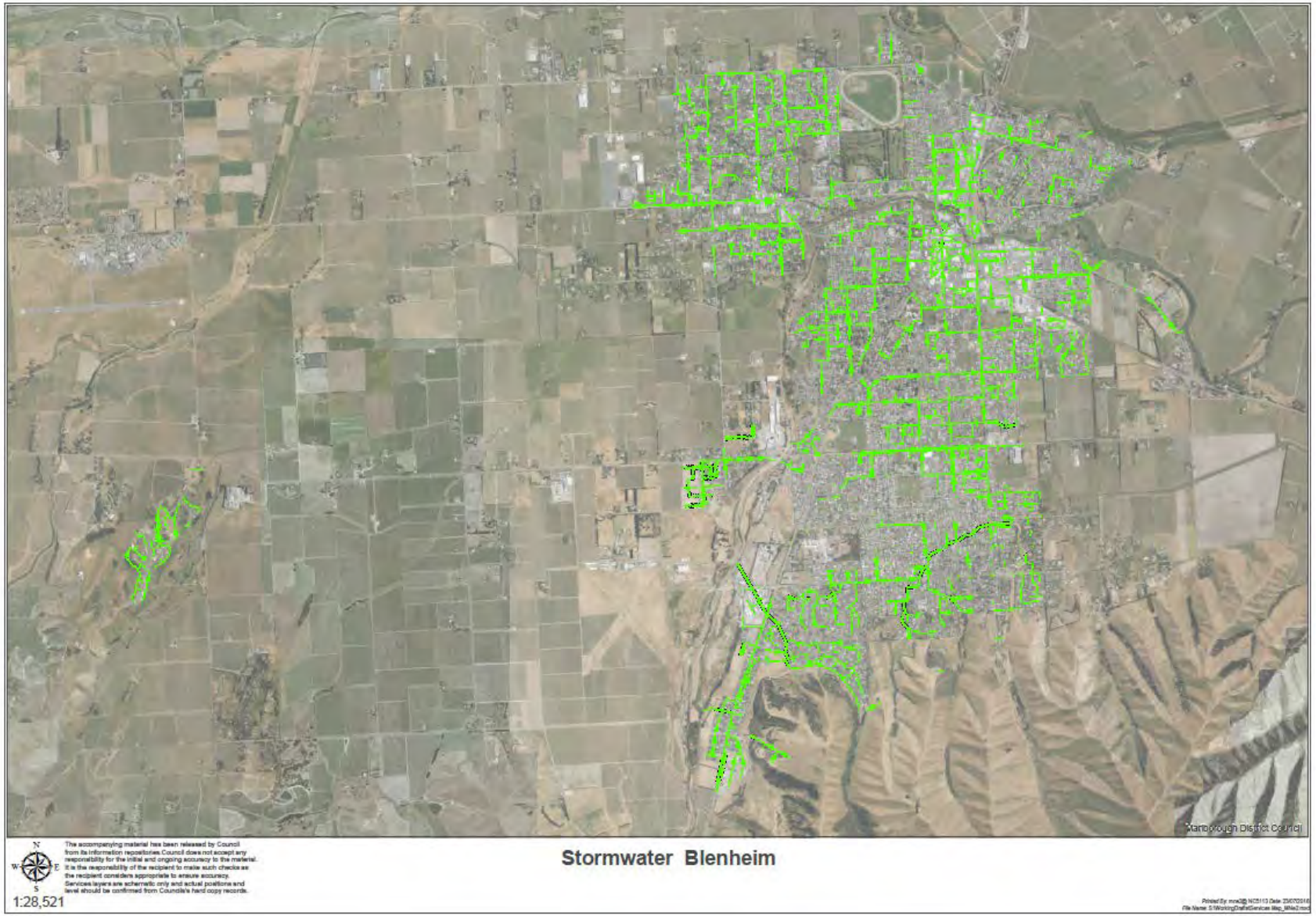
The accompanying material has been released by Council from its information repositories.Council does not accept any responsibility for the initial and ongoing accuracy to this material. It is the responsibility of the recipient to make such checks as the recipient considers appropriate to ensure accuracy. Services layers are schematic only and actual positions and level should be confirmed from Councils's hard copy records.
1:15,279
Stormwater Spring Ck/Grovetown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The accompanying material has been released by Council from its information repositories.Council does not accept any responsibility for the initial and ongoing accuracy to the material. It is the responsibility of the recipient to make such checks as the recipient considers appropriate to ensure accuracy. Services layers are schematic only and actual positions and level should be confirmed from Councils's hard copy records.
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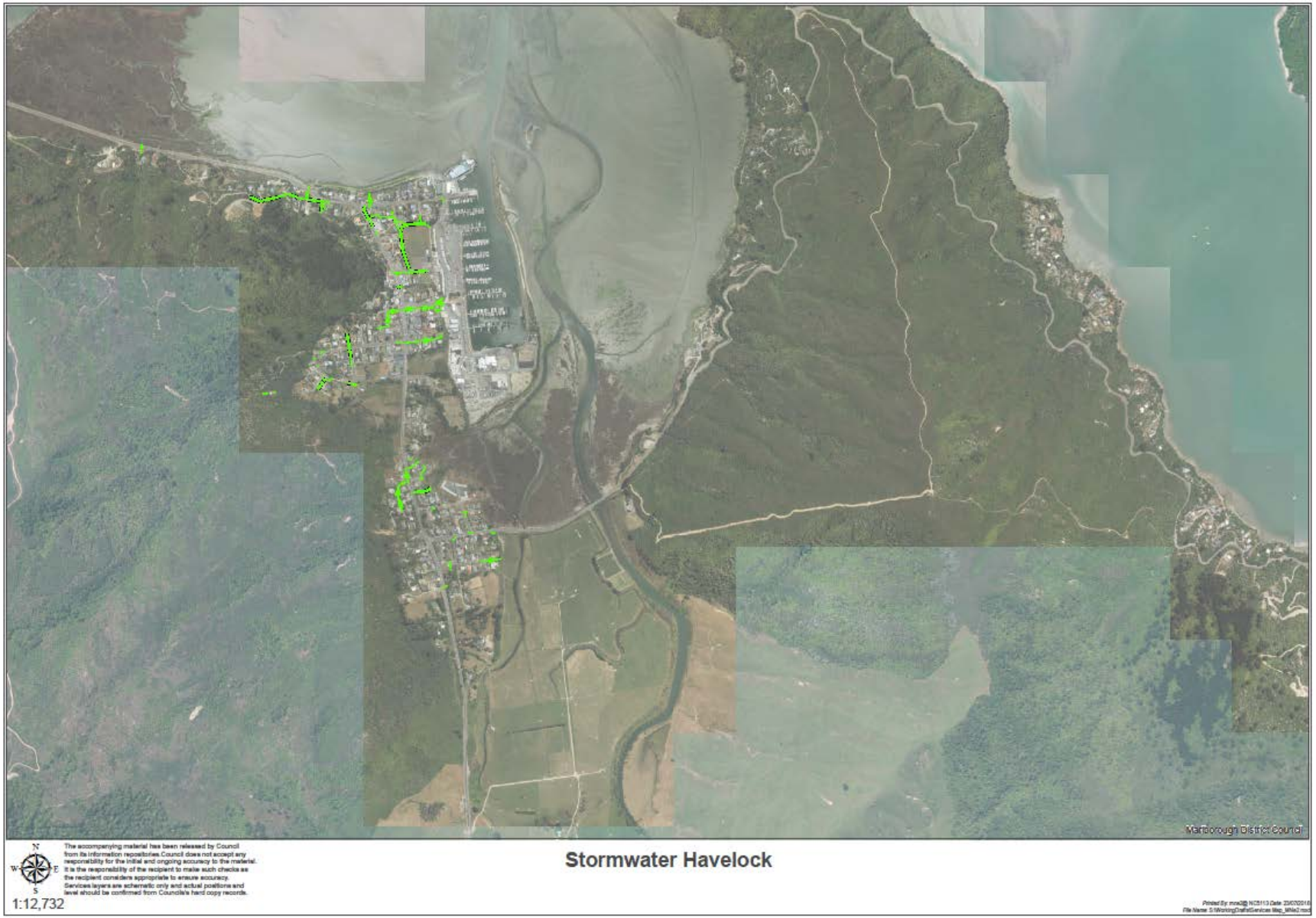
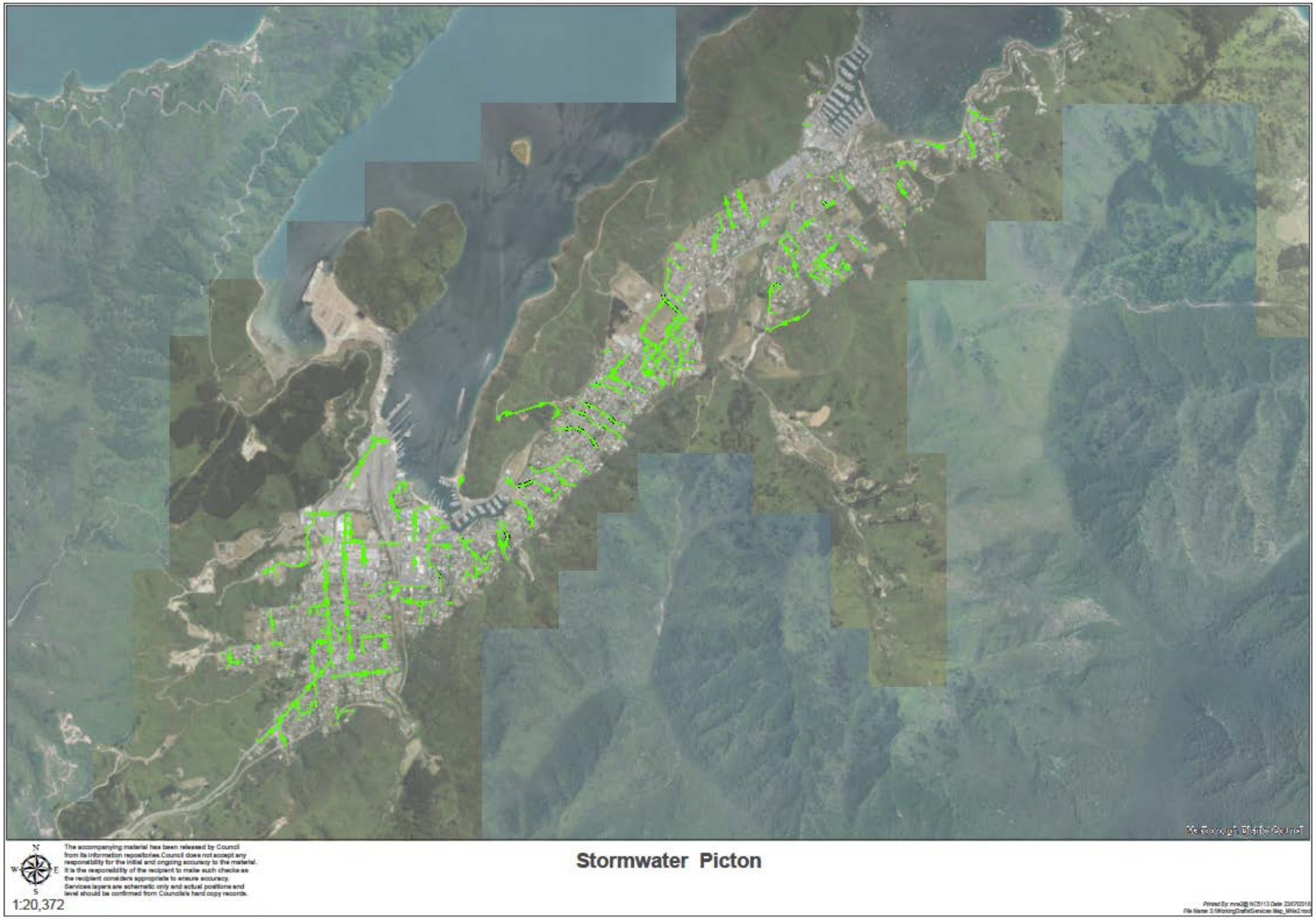
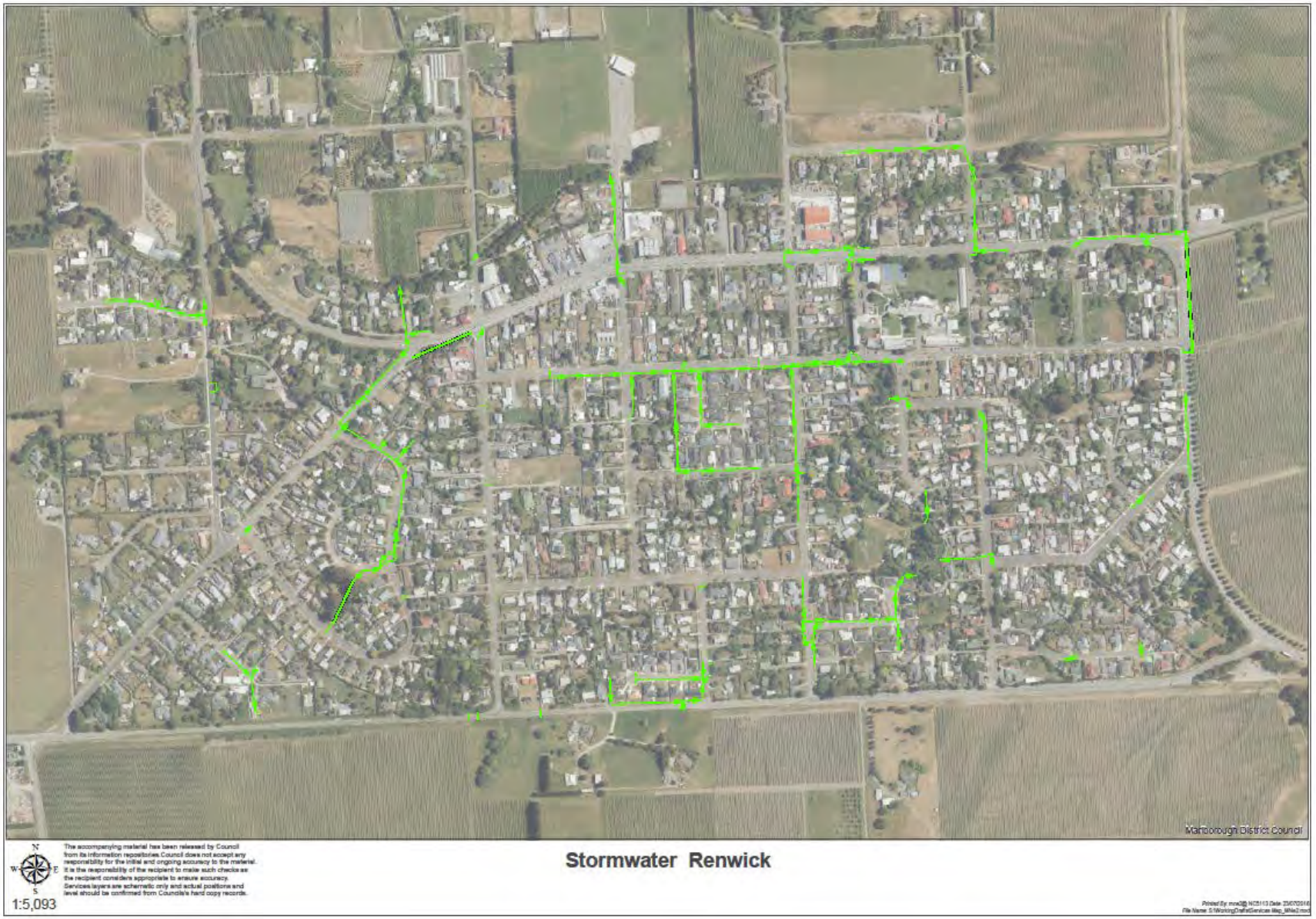
Stormwater Blenheim


Marlborough District Council
The accompanying material has been released by Council from its information repositories.Council does not accept any responsibility for the initial and ongoing accuracy to the material. It is the responsibility of the recipient to make such checks as the recipient considers appropriate to ensure accuracy. Services layers are schematic only and actual positions and level should be confirmed from Councils's hard copy records.
1:12,732
Stormwater Havelock


The accompanying material has been released by Council from its information repositories.Council does not accept any responsibility for the initial and ongoing accuracy to the material. It is the responsibility of the recipient to make such checks as the recipient considers appropriate to ensure accuracy. Services layers are schematic only and actual positions and level should be confirmed from Councils's hard copy records.
1:20,372
Stormwater Picton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1:5,093
The accompanying material has been released by Council from its information repositories. Council does not accept any responsibility for the initial and ongoing accuracy to the material. It is the responsibility of the recipient to make such checks as the recipient considers appropriate to ensure accuracy. Services layers are schematic only and actual positions and level should be confirmed from Councils's hard copy records.
Stormwater Renwick

Appendix 2: Levels of Service 2018-28

Levels of Service: Stormwater Drainage

Performance Targets (for the financial year)

Level of Service	Indicator	Baseline	2018-19	2019-20	2020-21	2021-28
Customer satisfaction Provide an overall level of service that meets or exceeds residents' expectations.	Resident satisfaction with this service as measured by survey, where 10 = "service delivered extremely well".	6.6	6.7	6.6	6.6	6.5
	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.	2	2	2	2	1.8
System adequacy Provide a reliable stormwater service	The number of flooding events that occur in a territorial authority district.	Actual number to be reported	Actual number to be reported	Actual number to be reported	Actual number to be reported	Actual number to be reported
	For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to the territorial authority's stormwater system.	3	2.8	2.8	2.6	2.6
Discharge compliance Minimise the environmental risks of stormwater discharge	Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of:	Nil	Nil	Nil	Nil	Nil
	(a) abatement notices					
	(b) infringement notices					
	(c) enforcement orders, and					
	(d) convictions,					
	Received by the territorial authority in relation those resource consents.					
Response times Provide a service that is timely and responsive to customers' needs.	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. (in hours)	1 hour	1 hour	1 hour	1 hour	1 hour

Appendix 3: Blenheim Stormwater Strategy Action Plan

Report

Blenheim Stormwater Strategy - Action Plan

Prepared for Marlborough District Council (Client)

By Beca Carter Hollings & Ferner Ltd (Beca)

28 May 2009

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Revision History

Revision N°	Prepared By	Description	Date
A	Greg Lee	Draft	21 May 2009

Document Acceptance

Action	Name	Signed	Date
Prepared by	Greg Lee		
Reviewed by	Graham Levy		
Approved by	Greg Pollock		
on behalf of	Beca Carter Hollings & Ferner Ltd		

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8 Schedule 6 – Planning and Regulation Actions 17

Glossary

AEP	Annual Exceedance Probability. A statistical term defining the probability of an event of a given size being equalled or exceeded in any year, expressed as a percentage. For example, a 5% AEP event has a 5% chance of being equalled or exceeded in any one year.
BMP	Best Management Practice. Methods (programmes, systems or structures) used to control or prevent contamination of receiving environments.
CMA	Coastal Marine Area
CSC	Comprehensive Stormwater Consent. The purpose of a CSC is to consent multiple activities associated with stormwater management and discharge within urban catchments[1].
Contaminants	Includes any substance or heat that when discharged into water or onto land, changes or is likely to change the physical, chemical or biological condition of that land or water onto or into which it is discharged.
MDC	Marlborough District Council
Modified Watercourse	A watercourse or river that has always existed in some form in the general area. However, the watercourse has been modified by engineering works to alter is original form or alignment such as, for example concrete or gabion lining, or channel straightening works.
River	Is a continually or intermittently flowing body of freshwater and includes a stream and modified watercourse, but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation and farm drainage canal)
RMA	Resource Management Act 1991
Sediment	Eroded material that can include adsorbed contaminants.
SMAP	Stormwater Management Area Plan
Stormwater	Water that falls to the ground, runs off the surface into streams lakes, marine areas or underground aquifers and includes the contaminants washed off surfaces by water.

[1] In the context of these guidelines, an 'urban catchment' is considered to be a defined urban area for which a CSC is sought. The defined urban catchment may be the entire urban area from which rainfall is collected and consist of many hydrological sub-catchments. It is likely to have multiple stormwater discharge points to receiving water that are located both within and beyond it's boundaries.

Stormwater Management Area Plan	A unit which represents the areas catchment (area within which runoff is carried under gravity drainage system to a common outlet) plus, selected adjacent areas where the aspiration is for those areas to be managed by the same network or process
Stormwater Network	A system of pipes and ancillary works to collect and convey stormwater to the place of discharge.
Suspended Solids	Sediment or other solids either suspended or floating in runoff.
WARMP	Wairau Awatere Resource Management Plan
Watercourse	See River

1 Introduction

Stormwater management in Blenheim is a critical challenge for the town, both currently and when future potential growth is concerned. Many challenges are created by the flat topography and unique and sensitive receiving environments.

The Blenheim Stormwater Strategy has been developed in order to provide a clear, long term direction for stormwater management in Blenheim. It provides a a guide to making decisions on the future management of the stormwater system and in this context provides a number of goals and policies. This Strategy also provides a basis for applying for a comprehensive discharge consent of stormwater in Blenheim.

This document provides a suite of actions which deliver improvements wanted by the strategy. This Action Plan, therefore, needs to be read in conjunction with the Stormwater Strategy.

1.1 Responsive Process

This document is a living document. The priority of and specifics of actions will be modified following analysis of monitoring information and in response to any issues identified. Modification is anticipated to be needed following the first year of operation which will in particualr entail examination of the priority of actions listed in schedule 1.

It is proposed that Council should establish a working group, with a small focussed team to guide the development of the strategy and ensure that it is integrated with the action plan. This working group should:

- Work to a program;
- Seek to gain the appropriate budgets; and,
- Review the outcomes of the process over the agreed duration of the project.

1.2 Stormwater Strategy

This Strategy has a number of goals, policies and actions. The Strategy firstly identifies a range of issues, both at a generic and a catchment level. A total of eight stormwater management areas are identified to assist in managing stormwater and developing priorities. A number of receiving environments are also affected by the Strategy. These are shown in the Figure 1.

The strategy is aimed primarily at Council to assist the assets and operations team in managing stormwater. There are a number of other stakeholders too, including other parts of MDC (acting as regulators, for example), the development community, and Blenheim residents and ratepayers.

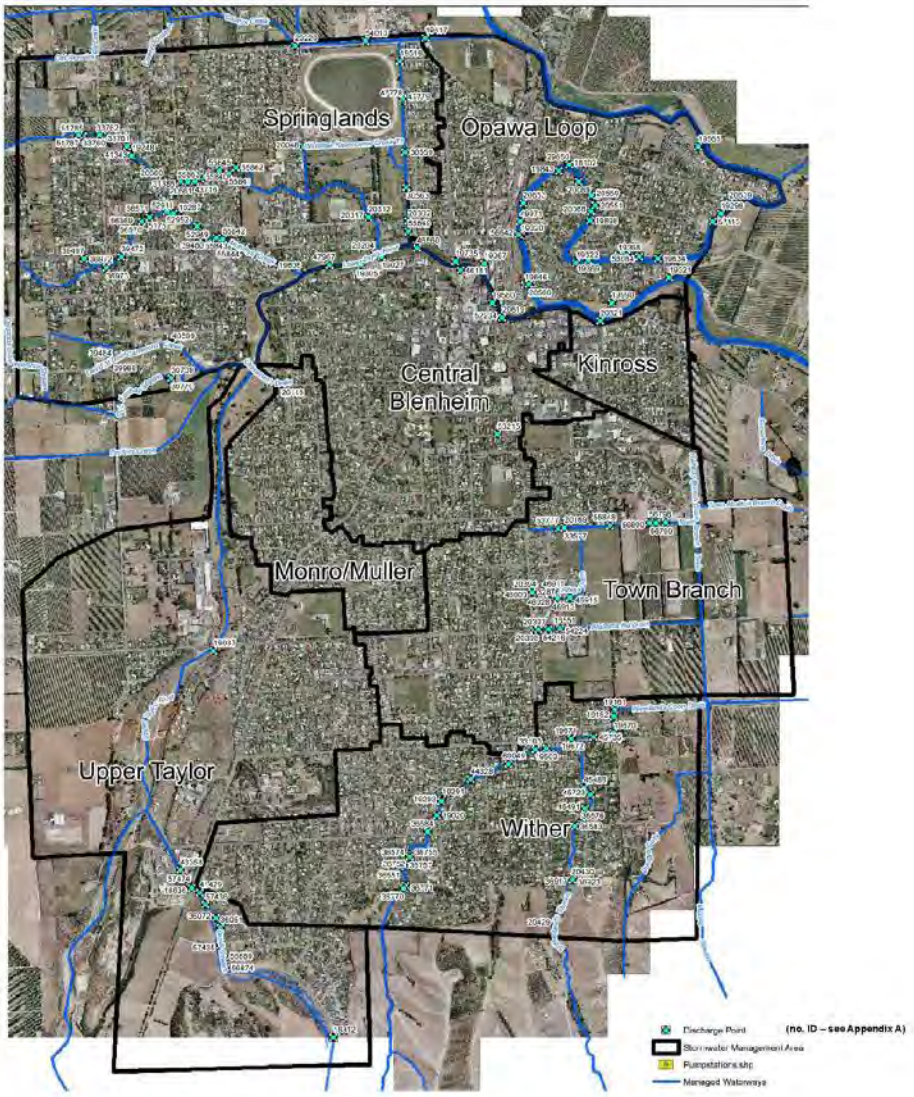
The goals and policies of the Strategy have been developed to provide an integrated approach and to guide the management of stormwater for Blenheim. The Strategy has the following, over-arching goals:

Integrated Management	
Goal 1	**To provide an integrated approach to the management of stormwater in Blenheim.**
Goal 2	**To support the implementation of the strategy with a comprehensive monitoring and enforcement program.**

Asset Management and Flooding	
Goal 3	To ensure the stormwater network provides an appropriate response during flooding events so that people and property are protected to accepted standards.
Goal 4	To provide guidance on effective and efficient management of MDCs stormwater assets.
Receiving Environment	
Goal 5	To maintain or enhance the environmental performance of the stormwater system, and quality of receiving environments.
Stakeholder engagement and education	
Goal 6	To engage with key stakeholders, and educate wider community on the importance of integrated stormwater management.
Planning and Regulation	
Goal 7	To ensure the planning and regulatory framework remains responsive to integrated stormwater management.
Goal 8	To gain a comprehensive discharge consent for Blenheim's stormwater network for a 35 year term.

Figure 1: Stormwater Management Areas and Receiving Environments

Blenheim Stormwater Strategy - Action Plan



2 Actions

The actions are arranged in schedules which correspond with the 6 management approaches listed in the Strategy document and are provided as schedules 2 to 7 of this report. Schedule 1 of this report provides a selection of actions from schedules 2 to 7 which are proposed to be brought forward first.

A full list of actions (by identifier number only) cross referenced to the schedules 1 - 7 of the Action Plan is provided overleaf (table 2-1). The colour indicates priority and also those projects which are 'ongoing' are identified. Once these are implemented and if needed (subject to annual review) they can continue to be delivered for a number of years.

Timeframes

The implementation of this stormwater strategy relies on three key timeframe periods, as follows:

- **Short Term** – this is the 0-5 year period, which specifically is the initial period to be governed by the comprehensive discharge consent, and allows a range of further investigations, monitoring and other activity.
- **Medium term** – this is the 5-10 year period; during which is it anticipated most of the catchment management plans will be prepared and finalised.
- **Ongoing** and/or long term – these may be tasks that occur in the short or medium term, or may be long term tasks that take 35 years (or the life of the stormwater strategy combined with the comprehensive discharge consent).

Priorities

Each action is assigned a priority, as follows:

- **High** – must be undertaken either to address a known or imminent issue which is or will shortly cause significant adverse effects, or which is to be required as part of the comprehensive discharge consent.
- **Medium** - must be undertaken either to address a known or imminent issue which is causing adverse effects or which may be causing effects but which are of lower risk, or which is to be required as part of the comprehensive discharge consent.
- **Low** - to be undertaken as part of the wider implementation program, but not critical to addressing immediate effects or issues, but part of the strategic direction of the strategy.

In order to identify important tasks more readily, the following 'traffic light' rating system is used to identify those projects which need to be initiated as soon as practicable ('red light') versus those that are medium term ('orange light') or long term/ ongoing but of lower priority ('green light').

Table 2-2: Prioritisation of Actions

	High	Med	Low
Short Term	🔴	🟡	🟢
Medium Term	🔴	🟡	🟢
Ongoing - Long Term	🟡	🟢	🟢

Table 2-1: Overview of Actions by Schedule (colour coding indicates priority)

All Actions	Ongoing?	Actions to be implemented first	Integrated Management	Asset management and flooding	Receiving Environment	Stakeholder and Education	Planning and Regulation
1a	✓						
1b							
1c							
1d						1d	
1e			1e				
1f							
2a	✓		2a				
2b							
2c							
2d			2d				
2e							
2f							
2f							
2g							
3a							
3b							
3c			3c				
3d	✓		3d				
3e							3e
3f							
3g							
4a							
4b							
4c	✓						
4d				4d			
4e							
4f				4f			
4g							
4h	✓			4h			
4i				4i			
5a				5a			
5b							
5c							
5d							5d
5e							5e
5f							
5g				5g			
5h				5h			
5i							5i
5j							
6a					6a		
6b	✓				6b		
6c	✓						
6d	✓				6d		
6e	✓		6e				
6f	✓				6f		
7a							
7b	✓				7b		
7c	✓				7c		
7d					7d		
7e	✓						
7f							
7g							
7h							
7i	✓		7i				
8a							
8b							
8c							
8d			8d				
9a	✓						
9b	✓						
9c	✓						
9d	✓						
9e							
9f	✓						
9g							
10a							
10b	✓		10b				
10c							
10d							
10e				10e			
10f				10f			
10g				10g			
10h				10h			
11a	✓						11a
11b	✓						11b
11c	✓				11c		
11d	✓						11d
12a							
12b							
12c						12c	
12d						12d	
13a						13a	
13b							
13c							

3 Schedule 1: Implementation – Stage 1

This Schedule provides a summary of the key activities to be undertaken in the first stage of implementation. This is considered to be the first five years, or should the comprehensive discharge consent identify an alternative timeframe, the point at which the first key monitoring report is completed, and the strategy reviewed.

This schedule should be reviewed and updated annually, and aligned with budgets and inputs to the annual plan process.

Prior to any of the actions below being carried out, an assessment of costs and benefits of carrying out each of the actions, should be done. Costing should also include the costs involved in installing any stormwater treatment devices.

Specific actions also identify timeframes and priorities for implementation. These are explained below.

Resource Consent Application

The first task once this Strategy is adopted is to lodge a resource consent for the comprehensive discharge consent (or CSC). This will involve the preparation of an Assessment of Environmental Effects in accordance with the Fourth Schedule of the RMA, and associated documentation.

Priority Implementation Measures

The following table identifies those priority implementation measures which are considered critical to the first implementation period, and which are likely to be required by any consent conditions for the comprehensive discharge consent.

Indicative budgets are provided where possible, for the purpose of external costs

#	Action	Priority	Timeframe	Indicator
1a	Review specific stormwater management information including flooding and stormwater contaminant levels on an annual basis.	High	Short	
1c	Develop and implement a specific environmental monitoring program aimed at identifying the relative contributions and issues associated with urban versus rural water quality.	High	Short	
1f	Establish clear overall accountability for stormwater management across both network and urban streams/waterways for quantity and quality.	High	Short	

#	Action	Priority	Timeframe	Indicator
2f	Prepare comprehensive stormwater catchment management plans for all catchments within the Blenheim area, priority based on risk. A risk based programme priority is provided in table below	High	Medium	
3a	Develop a comprehensive monitoring programme to support the resource consents and enable a staged and prioritised approach to addressing stormwater management issues across the City.	High	Short	
3b	Undertake monitoring to allow refinements in the application of the strategy principles and action plan requirements, within the boundary of any subsequent resource consent granted for stormwater discharge.	High	Short	
3g	Review Implementation Programme annually (need some questions answered, including who does the review, should initially be driven by assets, submitted to regulatory to satisfy consent conditions occurs annually and must be tangible.	High	Short	
8a	Review results of water quality monitoring and distinguish rural and urban contaminants and effects for receiving environments upstream of urban Blenheim to determine level of change occurring as a result of non-point source rural discharges.	High	Short	
9e	Provide for integration between Stormwater Strategy and Urban Growth Strategy in LTCCP to ensure funding for future services is earmarked ahead of time (and give priority to identified catchments/works).	High	Short	
4a	Determine the level in the roading hierarchy where it is acceptable to have flooding by secondary flows	High	Short	
4b	Develop specific outcomes sought in relation to each type of land use, in particular set standards for the level of protection that should be offered to open space, commercial, industrial and residential development.	High	Short	
5c	Identify and map areas where discharge to ground or ground soakage is possible and appropriate, and ensure this is linked into the WARMP and building consent processes.	High	Short	

#	Action	Priority	Timeframe	Indicator
5j	In assessing discharge applications any additional discharge shall not compromise the performance of the downstream drainage system. This shall take into account potential discharge from other zoned but undeveloped land draining to the drainage system.	High	Short	
10d	Identify where stormwater systems and treatment devices are not performing.	High	Short	
2b	Develop a risk-based framework to managing land use and stormwater contaminants.	High	Short	
7a	Develop specific guidelines on dewatering techniques for construction projects.	High	Short	
12a	Improve the understanding of the effects of stormwater derived sediments and contaminants on the ecological and amenity values of the receiving environments.	High	Short	
1b	Review the stormwater strategy within five years to determine the appropriateness of this Stormwater Strategy and associated stormwater discharge consents.	High	Short	
7f	Develop a bylaw on tradewaste connections which provides Council sufficient powers to remedy/prosecute any non-compliance with the standards and rules.	High	Short	
7g	Review WARMP rules to ensure they provide sufficient ability to regulate land use, including specifically industrial and commercial landowners.	High	Short	
9g	Review approach to collecting development contributions to ensure it remains responsive (preference to move to LGA rather than RMA).	High	Short	
10c	Develop bylaws for new connections of industrial and commercial premises to the Council stormwater network, including for treatment of stormwater quality.	High	Short	
13c	Apply for comprehensive discharge consent.	High	Short	

Program of Stormwater Management Area Plans

Based on the above priorities (and as described in section 6 of the Stormwater Strategy Technical Report), the programme for preparation of SMAPs could be, as follows (note that the following prioritisation does not allow for emerging potential future development locations):

Stormwater Management Area	Year 1	Year 2	Year 3	Year 4	Year 5	Years 5-10
Monitoring data						
SMAP Guidelines prepared.						
Blenheim Central						
Opawa Loop						
Springlands						
Kinross						
Monro/Muller						
Upper Taylors						
Town Branch						
Wither						

The prioritisation shown above is provisional and the first year of implementation involves the collection of further monitoring data. Once this data has been collected and analysed, and taking into consideration parallel work streams of the Council (e.g. on urban growth) the prioritisation of preparation of Stormwater Management Plans may be modified. It is thus understood for example that Town Branch and Springlands may be brought forward earlier (in the first tranche of work) in response to emerging future development locations and pressures.

4 Schedule 2 – Integrated Management Actions

#	Action	Priority	Timeframe	Indicator
1a	Review specific stormwater management information including flooding and stormwater contaminant levels on an annual basis.	High	Ongoing	
1c	Develop and implement a specific environmental monitoring program aimed at identifying the relative contributions and issues associated with urban versus rural water quality.	High	Short	
1e	Identify and utilise appropriate databases including GIS to integrate rivers and stormwater network; to ensure validity of information and update as necessary. Allow access to database to facilitate good data availability.	Medium	Short	
1f	Establish clear overall accountability for stormwater management across both network and urban streams/waterways for quantity and quality.	High	Short	
2a	Maintain a total environmental perspective in managing the stormwater network and receiving environment.	High	Ongoing	
2d	Prepare or revise design codes and guidelines to support the use of appropriate stormwater management practices.	Medium	Medium	
2f	Prepare comprehensive stormwater catchment management plans for all catchments within the Blenheim area priority based on risk.	High	Medium	
2g	Develop a comprehensive network plan for Blenheim which identifies at a city-wide level the basic model for moving stormwater from land to receiving environment, including any significant needs to re-divert catchments to alternative receiving environments.	High	Medium	
3a	Develop a comprehensive monitoring programme to support the resource consents and enable a staged and prioritised approach to addressing stormwater management issues across the City.	High	Short	
3b	Undertake monitoring to allow refinements in the application of the strategy principles and action plan requirements, within the boundary of any subsequent resource consent granted for stormwater discharge.	High	Short	
3c	Undertake monitoring to demonstrate the result of investment in stormwater management infrastructure and management techniques.	Medium	Short	

#	Action	Priority	Timeframe	Indicator
3d	Continue research to better understand the monitoring of the environment.	High	Ongoing	
3f	Undertake monitoring to assess the effectiveness of management methods.	High	Medium	
3g	Review Implementation Programme annually (need some questions answered, including who does the review, should initially be driven by assets, submitted to regulatory to satisfy consent conditions occurs annually and must be tangible.	High	Short	
4g	Integrate capacity upgrades with urban growth strategy for Blenheim.	High	Medium	
6e	Any development relating to existing and future waterways (including channels/drains) shall incorporate as appropriate multiple functions (recreation, access for maintenance, habitat, visual amenity, connectivity).	High	Ongoing	
7i	Wherever a stormwater quantity storage device is being constructed, consider opportunities to achieve quality improvement (and any other objectives).	High	Ongoing	
8a	Review results of water quality monitoring and distinguish rural and urban contaminants and effects for receiving environments upstream of urban Blenheim to determine level of change occurring as a result of non-point source rural discharges.	High	Short	
8b	If rural contributions to water quality are considered significant, develop a specific action plan for addressing these water quality challenges, including (a) Create and protecting riparian buffers between stormwater sources and watercourses; (b) Re-evaluate whether stormwater treatment options being pursued in urban Blenheim are not providing best value for money; (c) Retrofit stormwater treatment devices in existing drainage systems should problems be identified. This should include options for employing the use of wetlands (including constructed wetlands) and other retention systems along stormwater drains.	High	Medium	

#	Action	Priority	Timeframe	Indicator
8c	If urban contributions to water quality are considered significant, develop a specific action plan for addressing these water quality challenges, including (a) Create and protecting riparian buffers between stormwater sources and watercourses. (b) Re-evaluating whether stormwater treatment options being pursued in urban Blenheim are not providing best value for money (c) Retrofit stormwater treatment devices in existing drainage systems should problems be identified. This should include options for employing the use of wetlands (including constructed wetlands) and other retention systems along stormwater drains.	High	Medium	
8d	Map stream classifications.	Medium	Short	
9c	Where significant pressure for brownfield development occurs in any one SMA, review priorities for preparing SMAP.	Medium	Ongoing	
9e	Provide for integration between Stormwater Strategy and Urban Growth Strategy in LTCCP to ensure funding for future services is earmarked ahead of time (and give priority to identified catchments/works).	High	Short	
10b	Monitor the effectiveness of existing stormwater treatment practices, particularly those provided for industrial and commercial sites.	High	Ongoing	

5 Schedule 3 – Asset Management and Flooding Actions

#	Action	Priority	Timeframe	Indicator
4a	Determine the level in the roading hierarchy where it is acceptable to have flooding by secondary flows	High	Short	
4b	Develop specific outcomes sought in relation to each type of land use, in particular set standards for the level of protection that should be offered to open space, commercial, industrial and residential development.	High	Short	
4c	Prepare comprehensive flood maps for each SMA to identify areas where insufficient capacity in network exists. This should occur as part of the SMAP for each specific catchment.	Medium	Ongoing	
4d	Develop a transparent framework for making decisions in relation to how network flow problems will be solved in each catchment.	Medium	Medium	
4f	Undertake further evaluation of Flow levels to assist in providing clear guidance for asset managers and future developments.	Medium	Medium	
4h	Infill subdivision development will not be approved until the network can accept flow without compromising standards.	High	Ongoing	
4i	Existing serviced development can only occur where capacity exists: define acceptable standards and future growth areas.	Medium	Medium	
5a	Reduce hydrological effects of development on more frequent storm peaks to manage potential effects on stream morphology and erosion.	Medium	Medium	
5b	Minimise the impact of new greenfields development on existing, runoff patterns, including requiring new development to limit peak runoff rates to existing levels and minimise runoff volumes.	High	Medium	
5c	Identify and map areas where discharge to ground or ground soakage is possible and appropriate, and ensure this is linked into the WARMP and building consent processes.	High	Short	
5f	Develop agreed maximum limits of site impervious coverage that are appropriate for each catchment, and ensure rules and/or education measures are in place to minimise the amount of impervious cover of keep it within the acceptable limits.	High	Medium	
5g	Identify options for reducing existing impervious cover, in particular through best practice on Council owned or developed property.	Medium	Medium	

#	Action	Priority	Timeframe	Indicator
5h	Explore whether the reuse of stormwater is a viable option in parts of Blenheim, including the use of rainwater storage tanks on private properties.	Medium	Medium	
5j	In assessing discharge applications any additional discharge shall not compromise the performance of the downstream drainage system. This shall take into account potential discharge from other zoned but undeveloped land draining to the drainage system.	High	Short	
10a	Develop and implement stormwater management action plans for each catchment, based on priorities identified in this strategy.	High	Medium	
10d	Identify where stormwater systems and treatment devices are not performing.	High	Short	
10e	Identify and map infrastructure in poor condition in each catchment – make sure this information is available and is utilised when making capacity upgrade decisions.	Medium	Short	
10f	Identify retrofit opportunities to upgrade existing stormwater systems that have been identified as discharging to priority catchments. This should occur in conjunction with land intensification decisions to identify areas where infill is most appropriate.	Medium	Medium	
10g	Undertake mapping and auditing of soakpits, including development of a database of information.	Medium	Short	
10h	Develop improved understanding of current runoff characteristics including informal storage and runoff coefficients. Incorporate results into design techniques and guidelines.	Medium	Short	

6 Schedule 4 – Receiving Environment Actions

#	Action	Priority	Timeframe	Indicator
2b	Develop a risk-based framework to managing land use and stormwater contaminants.	High	Short	
2c	Identify high risk sites based on criteria developed in 2B and develop an auditing and action program for high risk land users to improve quality of discharges from these sites.	High	Medium	
6a	Map riparian margins along existing streams, and identify areas where future riparian margins should be protected or enhanced, including for flood storage, ecological, access and water quality objectives.	Medium	Medium	
6b	Avoid piping or channelling stream channels, including first order streams.	High	Ongoing	
6c	Maintain sufficient water flows in streams to support aquatic life, with a particular emphasis on maintaining baseflows.	Medium	Ongoing	
6d	Avoid constructing stormwater quality improvement devices 'on line' within perennial watercourses, and where there is on-line flood attenuation, ensure fish passage is provided.	High	Ongoing	
6f	Any instream works/structures to provide for fish passage.	High	Ongoing	
7a	Develop specific guidelines on dewatering techniques for construction projects.	High	Short	
7b	Maximise the use of appropriate stormwater quality control measures at source for new industrial and commercial development.	High	Ongoing	
7c	Encourage/require good housekeeping systems on existing commercial and industrial sites.	High	Ongoing	
7d	Apply industry specific Codes of Practice, which include environmental management procedures and for major transport corridors.	Medium	Medium	
7h	Until such time as monitoring shows otherwise, Council will not require point source/stormwater treatment from existing residential.	Low	Short	
11c	Promote the use of stormwater methods that minimise, retain and treat direct stormwater runoff.	High	Ongoing	

7 Schedule 5 – Stakeholder Engagement and Education Actions

#	Action	Priority	Timeframe	Indicator
1d	Develop a broader MDC wide awareness campaign on environmental issues, including stormwater. This should include targeted education packages, including for homeowners to ensure they understand what can and cannot be discharged into Council's stormwater system.	Medium	Short	
2e	Identify examples of best practice that Council will accept.	Low	Short	
12a	Improve the understanding of the general public of the effects of stormwater derived sediments and contaminants on the ecological and amenity values of the receiving environments.	High	Short	
12b	Carry out industry specific education programmes, outlining the impact of the specific contaminants on the environment.	High	Medium	
12c	Improve the understanding of costs associated with managing flooding and contamination issues.	Medium	Medium	
12d	Develop partnerships with local schools specifically on stormwater management and stream protection. provide resource materials.	Medium	Medium	
13a	Develop guidelines/training – regular and ongoing programme for regulatory staff processing/compliance consents (SW, subdivision, building).	Medium	Short	

8 Schedule 6 – Planning and Regulation Actions

#	Action	Priority	Timeframe	Indicator
1b	Review the stormwater strategy within five years to determine the appropriateness of this Stormwater Strategy and associated stormwater discharge consents.	High	Short	
3e	Set standards and/or guidelines where practicable to enable useful and comparative environmental assessments to be undertaken.	Medium	Medium	
4e	Review WARMP to review activity status for infill development and recommend changes. The review should also determine the most appropriate status for greenfield and brownfield residential development, including reviewing densities and activity status (so that consents can be declined if there is inappropriate provision for stormwater disposal).	High	Medium	
5d	In development areas, retain good surface infiltration characteristics wherever practicable.	Medium	Medium	
5e	Identify groundwater recharge areas and minimise the effects of development on water quality in these areas, in particular in the Springlands catchments.	Medium	Medium	
5i	Review building consent processes for alignment with stormwater strategy.	Medium	Medium	
7e	Have a progressive enforcement programme to discourage potential polluters, specifically for industrial and commercial sites.	Medium	Ongoing	
7f	Develop a bylaw on tradewaste connections which provides Council sufficient powers to remedy/prosecute any non-compliance with the standards and rules.	High	Short	
7g	Review WARMP rules to ensure they provide sufficient ability to regulate land use, including specifically industrial and commercial landowners.	High	Short	
9a	Subdivision and development of greenfield sites should be designed and managed so as to emphasise the protection and enhancement of streams, lakes, watercourses, wetlands and the coast and the enhancement or restoration of riparian vegetation.	Medium	Ongoing	
9b	Structure planning processes should be undertaken and include full consideration of matters relating to stormwater issues.	Medium	Ongoing	
9d	Develop designs and stormwater management techniques (e.g. LID) that minimise the need for stormwater infrastructure, especially reticulated systems with direct discharges to streams.	Medium	Ongoing	

#	Action	Priority	Timeframe	Indicator
9f	Any significant new development at residential density on parent lots >10ha or rezoning shall be subject to structure planning to identify key infrastructure connections to Councils existing networks (amongst other things).	Medium	Ongoing	
9g	Review approach to collecting development contributions to ensure it remains responsive (preference to move to LGA rather than RMA).	High	Short	
10c	Develop bylaws for new connections of industrial and commercial premises to the Council stormwater network, including for treatment of stormwater quality.	High	Short	
11a	Ensure stormwater strategy is a key driver in developing future land use and growth options for Blenheim, particularly in those catchments or parts of the network where there are already significant capacity constraints.	High	Ongoing	
11b	Encourage development styles and stormwater management methods that mimic natural runoff patterns.	High	Ongoing	
11d	Ensure that appropriate techniques are supported by design codes to provide for best practice application – revise codes if necessary.	High	Ongoing	
13b	RPS or WARMP Review – any review of RMA policy/regulation should incorporate the provisions in, and preferably give-effect to the Stormwater strategy (via comprehensive review or variation).	High	Medium	
13c	Apply for comprehensive discharge consent.	High	Short	

Appendix 4: Ministry for the Environment advice on Climate Change. Dec 2017

"Projections of climate change depend on future greenhouse gas emissions, which are uncertain. There are four main global emissions scenarios ranging from low to high greenhouse gas concentrations. This page presents regional projections as a range of values from a low emissions to a high emissions future.

The projected changes are calculated for 2031–2050 (referred to as 2040) and 2081–2100 (2090) compared to the climate of 1986–2005 (1995).

Temperature — Compared to 1995, temperatures are likely to be 0.7˚C to 1.0˚C warmer by 2040 and 0.7˚C to 3.0˚C warmer by 2090.

By the end of the century, Marlborough is projected to have from 6 to 38 extra days per year where maximum temperatures exceed 25˚C. The number of frosts could decrease by around 7 to 19 per year.

Rainfall —Rainfall will vary locally within the region. The largest changes will be for particular seasons rather than annually.

Summer rainfall in Blenheim is projected to increase by up to 9 per cent by 2090.

According to the most recent projections, extreme rainy days are likely to become more frequent in Marlborough by 2090 under the highest emissions scenario.

Snowfall — The Marlborough region is likely to experience significant decreases in seasonal snow. By the end of the century, the number of snow days experienced annually could decrease by as much as 30 to 40 days in some parts of the region. The duration of snow cover is also likely to decrease, particularly at lower elevations.

Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the region. Places that currently receive snow are likely to experience increasing rainfall as snowlines rise to higher elevations due to rising temperatures. So for rivers where the winter precipitation currently falls mainly as snow and is stored until the snowmelt season, there is the possibility for larger winter floods.

Wind — The frequency of extremely windy days in Marlborough by 2090 is likely to increase by between 2 and 10 per cent. There may be an increase in westerly wind flow during winter, and north-easterly wind flow during summer.

Storms — Future changes in the frequency of storms are likely to be small compared to natural inter-annual variability. Some increase in storm intensity, local wind extremes and thunderstorms is likely to occur.

Sea-level rise — New Zealand tide records show an average rise in relative mean sea level of 1.7 mm per year over the 20th century. Globally, the rate of rise has increased, and further rise is expected in the future."

Appendix 5: Assumptions, Disclosure and Compliance

Assumptions

With any financial forecasting, a number of assumptions must be made. The following assumptions have been made in the preparation of this document. Also presented for each assumption is the "Level of uncertainty", "Risk" and "Financial Impact" for each.

Legislative

Assumption

Local Government may be significantly affected by changes in legislation as a result of a new Government being elected in late 2017. However, until the Coalition settles in fully there is no certainty as to its policy direction and specifics to achieve its desired outcomes. As a result of the uncertainty, it is assumed that legislative and Government policy changes will not significantly impact upon Council's current responsibilities and activities.

Level of Uncertainty

Medium.

Risk

It is highly likely that the new Government will want to advance its own agenda. As a result of local government having a very broad range of activities it is also very probable the cumulative effect on Council will be significant.

Financial Impact

To date Government's reforms have not reduced legislative obligations, costs or the impact on the ratepayer. It is too early to assess the financial impact of the Government's signalled policy announcements. However, it is expected that there will be specific requirements resulting from legislative change, the Havelock North Water Quality Inquiry and a continued issuance of National Policy Statements. However, Council is moving to address the likely outcomes of the Havelock North Inquiry in its infrastructure planning.

Inflation

Assumption

The costs, revenues and asset values reflected in this plan reflect the following "Forecasts of Price Level Change Adjustors to 2028" produced by Business Economic Research Limited (BERL) in September 2017 for the Society of Local Government Managers.

Label Year Ending	Planning and Regulation	Roading	Transport	Community Activities	Water and Environmental
	% change on year earlier				
June 2017	1.4	1.6	1.6	1.8	1.2
June 2018	1.8	1.9	1.9	1.7	1.8
June 2019	2.0	2.0	2.0	1.7	2.3
June 2020	2.1	2.2	2.0	2.0	2.5
June 2021	2.1	2.2	2.1	2.1	2.3
June 2022	2.1	2.3	2.2	2.1	2.4
June 2023	2.2	2.4	2.2	2.2	2.4
June 2024	2.3	2.4	2.3	2.3	2.5
June 2025	2.3	2.5	2.4	2.3	2.6
June 2026	2.4	2.6	2.5	2.4	2.6
June 2027	2.4	2.7	2.5	2.4	2.7
June 2028	2.5	2.8	2.7	2.6	2.8
20 year average % pa	2.3	2.5	2.4	2.3	2.6

BERL also consolidates the above adjustors into a consolidated Local Government Cost Index (LGCI) which is further split between operating and capital expenditure.

Year ending	OPEX	CAPEX	TOTAL
	annual average % change		
June 2017	1.5	1.5	1.52
June 2018	1.8	1.8	1.80
June 2019	2.0	2.0	2.06
June 2020	2.2	2.2	2.12
June 2021	2.2	2.2	2.17
June 2022	2.2	2.2	2.21
June 2023	2.3	2.3	2.35
June 2024	2.3	2.4	2.29
June 2025	2.4	2.4	2.41
June 2026	2.5	2.5	2.53
June 2027	2.5	2.6	2.55
June 2028	2.6	2.7	2.64

Level of Uncertainty

Medium to high.

NB: The forecast increases for Capital Expenditure are generally higher than operating cost increases and it is the Capital Expenditure that has historically driven rates increases.

Risk

There is a risk that the local inflation rates may be higher or lower than the national averages forecast by BERL.

Financial Impact

Should local inflation exceed the national average, this could result in either an increase in rates and debt servicing or deferral of capital projects which may impact upon the level of service that can be provided.

Interest Rate on Council Borrowings

Assumption

Council has assumed a long term interest rate on internal loans of 5.5% for the entire 10 years covered by the Long Term Plan. External interest rates may vary depending on the term of the debt and prevailing market conditions.

Level of Uncertainty

Medium.

Risk

As a result of the continuing impact of the Global Financial Crisis and the expectation of increased interest rates in the future, Council has adopted a conservative position compared to current market rates to mitigate the risk associated with interest rate movements. Council has adopted this approach as interest rates can increase significantly within short timeframes, as has happened in the past. Council will attempt to mitigate the impact of interest rate rises with a prudent hedging programme that operates in accordance with its Treasury Policy. However, because of Council's current low debt level, its ability to hedge significant amounts of its forecast debt is limited.

Financial Impact

Increases in interest rates above 5.5% will result in higher debt servicing costs and rates funding requirements. Council only debt (internal and external) is currently forecast to peak at approximately $225 million. As a result a 1% increase in interest rates above the 5.5% forecast would result in increased interest costs of $2.3 million.

Population Growth

Assumption

In preparing the Long Term Plan Council has assumed population growth will occur at slightly above the Department of Statistics medium population growth projection. Population growth is further discussed in the Key Issues and Infrastructure Strategy sections of the Long Term Plan.

Level of Uncertainty

Low.

Risks

Population growth occurs at rates above or below the level forecast with corresponding impacts on the revenue received from rates and development contributions.

Financial Impact

If population growth occurs at a slower rate than forecast, then the level of development contributions received will be lower than expected. However, there is the opportunity to mitigate the financial impact by slowing the Capital Expenditure programme. It is not expected that levels of service will be impacted upon significantly.

Economic Life

Assumption

Council has made a number of assumptions about the useful lives of its assets. The detail for each asset category is shown in the Statement of Accounting Policies. The useful lives are consistent with Council's experience with respect to its ongoing replacement programme.

Level of Uncertainty

Low — above ground.

Medium — below ground.

Risk

Assets wear out and need to be replaced earlier than anticipated.

Financial Impact

Depreciation and borrowing costs would increase if replacement Capital Expenditure was required earlier than anticipated. However, these impacts could be mitigated in part by reprioritising the Capital Expenditure programme. There may also be an increase in maintenance costs to keep the asset operational until it is decided to proceed with replacement.

Subsidy Rates

Assumption

The New Zealand Transport Agency (NZTA) has recently reviewed its financial assistance policy and it is assumed that Council will retain, for the period of the Plan, its current subsidy rate of 51% for road maintenance and construction works.

Level of Uncertainty

Low.

Risk

NZTA will either reduce the subsidy rate and/or toughen the criteria for the inclusion of works in the qualifying programme.

Financial Impact

If the subsidy rate is reduced, either a reduction in the level of service or an increase in rates would be required. Council is already receiving very good pricing for road maintenance compared to other Local Authorities, through its collaboration with NZTA in the form of Marlborough Roads.

Natural Disasters

Assumption

Should a major natural disaster occur the District could be faced with significant repair and reconstruction costs. Council has estimated the maximum probable loss (MPL) cost as a result of a major earthquake, flood or tsunami at approximately $485 million, following a joint Treasury supported exercise with AON and Tonkin and Taylor. It is assumed that this forecast is accurate. It is also assumed that:

- The forecast contributions from the Local Authority Protection Programme (LAPP), insurance, Government and the NZTA will be received.
- Through a combination of Council's reserves, investment realisation, credit facilities and rescheduling capital and other works, Council can meet the remaining costs associated with a major disaster over a seven year period.

- As a result of a second earthquake occurring in Christchurch, Council has also modelled the financial impact of second significant event. Through the use of the same mechanisms identified in the two bullet points above, Council could meet the remaining costs associated with a second major disaster over a seven year period post the second event.

The LAPP fund is a mutual pool set up to assist councils cover their share of damage to "below ground" and river protection assets resulting from a significant natural event. At the time the fund was formed commercial insurance alternatives for these assets was not available. There was also a clear requirement from Central Government that any assistance given to rebuild infrastructure following a disaster will only be made available if Council has made adequate financial provisions to cover its own repair obligations.

Above ground assets are insured through commercial insurance. These costs are in addition to LAPP contributions. Insurance costs have increased over recent years as a direct result of national and international disasters. Council has mitigated the effect by joining with Nelson City and Tasman District councils and a pool of over 600 Australian Local Authorities.

2016 Kaikoura Earthquake. Council is still investigating the damage caused by the November 2016 Kaikoura earthquake. Evidence suggests the earthenware sewerage network pipes in Blenheim and Picton have sustained extensive damage. The LTP includes a provisional $12.0 million for their replacement over 10 years. Council is working with Government officials and its insurers to reduce the amount it must fund itself. Strengthening work is also required for a number of Community Facilities. These allocations have reduced the dedicated Emergency Events Reserve to a forecast balance of just over $9 million at 30 June 2018. Council had intended to rebuild this Reserve using the surpluses from the General Revenues Account, but the forecast balance in 2028 is still only $3 million. This is because of the expected ongoing funding demands from Road and River damage following rainfall events and the reduction in revenue into the account resulting from the decision to reduce the interest rate assumption. While Council would like to increase this balance over time, it is also aware of its ability to reprioritise its capital works programme, probable insurance and Government funding and its total Reserve position. As a result Council believes that it has sufficient capacity to meet its obligations should a significant natural disaster occur without the need for an immediate rates increase.

Level of Uncertainty

Low.

Risks

The actual costs of recovery from a major natural disaster are higher than the forecast MPL of approximately $485 million.

Financial Impact

Should Council's current estimate of MPL and existing arrangements prove inadequate, either an increase in debt and corresponding increase in rates or a slowing in the rebuild would need to occur.

Taxation Framework

Assumption

Council has assumed that existing taxation framework for the Marlborough District Council group will continue for the period of the Long Term Plan.

Level of Uncertainty

Low.

Risk

That the Inland Revenue Department (IRD) takes a view that Council's Holding Company structure is inconsistent with taxation legislation resulting in an increase in associated tax costs.

Financial Impact

Council has mitigated the potential for this to happen by obtaining independent legal advice and a "Binding Ruling" from the IRD on the establishment of MDC Holdings Ltd. Council has not deviated from the principles determined at establishment, so the risk and financial impacts should be low.

Asset Ownership and Valuation

In the preparation of the Long Term Plan it has been assumed that Council will retain:

- Ownership of MDC Holdings Limited and its subsidiaries:
- Its ownership share (88.5%) in Marlborough Regional Forestry, with Kaikoura District Council owning the remaining 11.5%.
- Ownership of all substantial assets currently owned.

It has also been assumed that Council will revalue its major assets annually.

Level of Uncertainty

Low.

Risk

The asset values shown in the Long Term Plan have been adjusted based on the BERL indices. The risk is that the results of actual revaluations may be higher or lower than those disclosed in the Long Term Plan.

Financial Impact

If asset revaluations are higher than forecast, this will increase the resulting depreciation cost and rates as Council moves to provide for asset replacement.

Sources of Funds for Capital Expenditure

The Financial Strategy identifies the expected sources of funds for Council's Capital Expenditure programme. It has been assumed that the funds identified for each of these sources will be received.

Level of Uncertainty

Low.

Risk

That the forecast funding will not be received as forecast.

Financial Impact

As it is proposed to fund Capital Expenditure from a range of sources it should be possible to compensate a funding shortfall from one source with funding from another i.e. borrowing. If it is decided to increase borrowing a debt servicing cost and a corresponding increase in rates will arise. The alternative is to slow Capital Expenditure especially if the project is growth related and the funding shortfall relates to Development Contributions.

Climate Change

Council has assumed that the climate changes in relation to rainfall, temperature and sea level will occur as predicted. It has been further assumed that climate change will have minimal impact over the period of the 2018–2028 Long Term Plan. This topic is considered in greater depth in Council's Infrastructure Strategy. This is appropriate given this Strategy covers a longer 30 year period.

Level of Uncertainty

Low.

Risk

That asset and hazard planning has not adequately assessed climate change.

Financial Impact

For the period of the Long Term Plan, the financial impact is assessed as low as climate change on the whole is occurring very slowly, providing extended lead times for mitigation measures if required.

Emissions Trading Scheme (ETS)

Any direct impacts of the ETS through potential price increases are assumed to be covered by Council's inflation assumptions and thus factored into the forecasts.

Specific ETS costs relating to waste and landfill have been incorporated into those estimates, together with the increased revenue that will be received.

Pre 1990 forestry has been registered. Any costs associated with the ETS will be minimal given Council's rotation and replanting policy.

Level of Uncertainty

Low.

Risk

The impact and scope of the ETS may be more than assumed.

Financial Impact

The Council will face increased compliance and operating costs, which if significant enough, may require higher fees and charges or increased rating requirements to fund them. However, Council had already taken steps to reduce the landfill liability and fix the price of the Emission Trading Units that will be required to be surrendered for the first three years of the Scheme's operation.

Resource Consents

Council has assumed that it will continue to hold and comply with appropriate resource consents to enable it to continue its activities, especially in relation to sewerage and stormwater.

Level of Uncertainty

Low.

Risk

Appropriate consents are either not renewed or require improvements in level of service before being granted. The trends in Resource Consent requirements are covered more fully in the Infrastructure Strategy.

Financial Impact

The main financial impact could occur if levels of service require improvement before a resource consent renewal is granted. The resulting increase in costs will likely require an increase in borrowing which in turn will impact on rates