447TH MEETING OF THE
MACKENZIE DISTRICT COUNCIL

TO THE MAYOR AND COUNCILLORS OF THE MACKENZIE DISTRICT COUNCIL

Membership of the Council:
Claire Barlow (Mayor)
Cr Russell Armstrong
Cr Murray Cox
Cr Noel Jackson
Cr James Leslie
Cr Graham Smith
Cr Evan Williams

Notice is given of an Extraordinary Meeting of the Mackenzie District Council to be held on Thursday, May 7, 2015, at 9.30am.

VENUE: Council Chambers, Fairlie

BUSINESS: As per the attached agenda.

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

MACKENZIE DISTRICT COUNCIL

Agenda for Extraordinary Council Meeting Thursday May 7, 2015, at 9.30am

OPENING AND APOLOGIES

DECLARATIONS OF INTEREST

REPORTS:

A) LILYBANK ROAD SPOT METALLING PROPOSAL
B) EXTERNAL LIABILITY MANAGEMENT POLICY
C) LONG TERM PLAN SUPPORTING INFORMATION-FOUL SEWER, WATER SUPPLY
D) SIGNIFICANT FORECASTING ASSUMPTIONS
E) FINANCIAL STRATEGY
F) LONG TERM PLAN SUPPORTING INFORMATION-INFRASTRUCTURE,TRANSPORT, STORMWATER
G) LTP 2015-25 CONSULTATION DOCUMENT

ADJOURNMENTS:

10.30AM MORNING TEA
12.00PM LUNCH
3.00PM AFTERNOON TEA

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: LILYBANK ROAD SPOT METALLING PROPOSAL

MEETING DATE: 7TH MAY 2015

REF: 2/6/13

FROM: ROADING MANAGER

ENDORSED BY: CHIEF EXECUTIVE OFFICER

PURPOSE OF REPORT:

To present to the Mackenzie District Council a report requesting extra funding to compete a wearing course on the worst section of Lilybank Road between the Skifield turn off to Mount Gerald Station

STAFF RECOMMENDATIONS:

1. That the report be received.

2. That Council adopts option 4 and completes a full wearing course on 2.4km on Lilybank Road, between the Ski field turn off to Mt Gerald Station

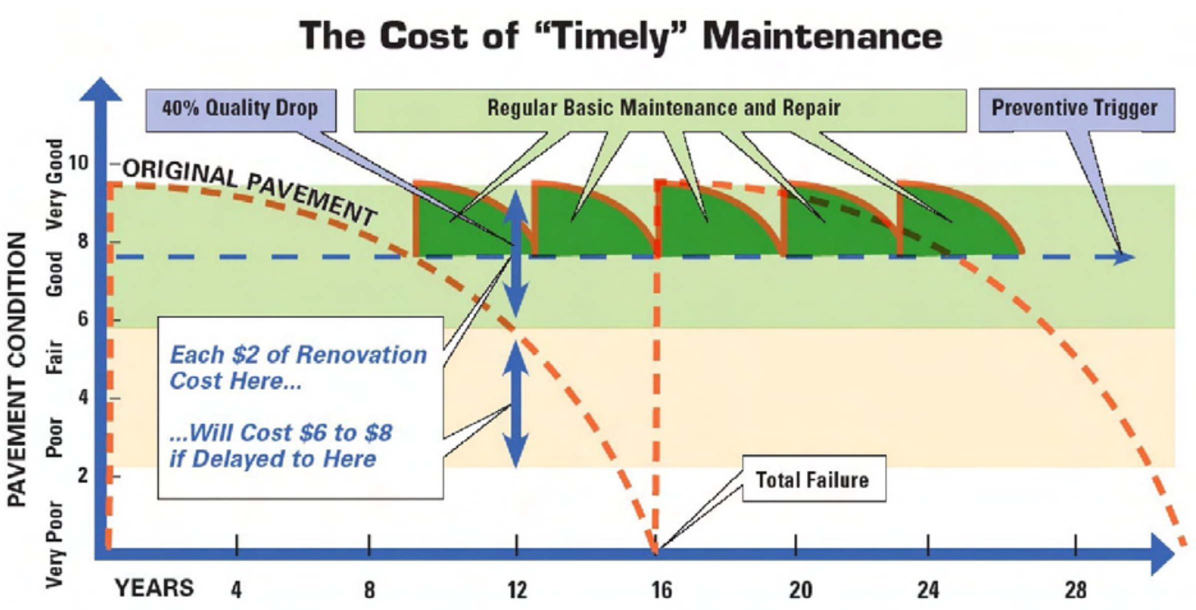
SUZY RATAHI	**WAYNE BARNETT**
MANAGER – ROADING	**CHIEF EXECUTIVE OFFICER**

INTRODUCTION

Due to constrained approved funding from NZTA our unsealed maintenance metalling budget has been limited for some time. Lilybank Road, in particular, past the Ski field turn off has not received any significant amounts of metal for 11 years.

The graph below shows the importance of timely intervention and demonstrates the need for regular metalling in order to keep the pavement in a useable condition.

Figure 1.



Due to limited funding the Roading Managers both past and present have been unable to complete "timely" maintenance on a number of roads, however due to the changed traffic mix and land use intensification this has had the biggest effect on Lilybank Road.

The section between Round Hill Ski field turn off and Lilybank Station has a rough ride, weak subgrade at the road surface and is at risk of some frost heave over the coming winter/spring months. In between Mount Gerald through to Lilybank Station a section of road has entirely unraveled due to a lack of available funding to metal the road and through the change in land use and vehicle access types between the two stations.

Staff believe access could be severely limited this season due to significant frost heave, as a result of increased usage and inadequate pavement depth. If works are not undertaken prior to winter commencing any frost heave that occurs will need to be left to self-heal. This in turn could provide significant access issues for Lilybank Station.

Following discussion after the Asset Manager's report at the Assets and Services Committee meeting on the 28th of April, Councillors requested a full report into the application of maintenance material, to minimise this risk of failure on Lilybank Road.

Lilybank Road Current State

Real effect of frost heave on the Mackenzie District Council Network

ISSUES AND OPTIONS:

1. **Do nothing** - No Cost, however the road is at risk of being impassable to many vehicles/farm machinery that use this section of road. It is the only access to Lilybank Station and the Department of Conservation block across the Macaulay River. Whilst the risk of frost heave is likely and does cause significant access issues, it will "self-heal" and wearing course works could be undertaken under the Maintenance Metalling budget in the 2015/16 season. Under this option staff would have to work with Mt Gerald and Lilybank Station in regards to frozen condition access

2. **Wearing Course of the full 12.2km** from Ski field turn off to the Macaulay River (Lilybank Station) – $280,000- $300,000 best whole of life option for the road, will provide a safe and trafficable surface. However, it is unlikely that Contractor could resource up, acquire the required resource consent for gravel extraction and get adequate quantities of material crushed prior to winter setting in, this would likely need to be undertaken in September 2015

3. **Spot/Maintenance Metalling** - $40,000 this utilises the material already pulled up and crushed at Coal River, this work can commence immediately, however it is only a band aid and the road will need a wearing course (as in option 2 above) at a later date to provide appropriate access. The condition of the majority of that portion of Lilybank Road would mean that available supplies would be spread over the entire 12.2km, resulting in an average depth of approximately 25mm. As is demonstrated in Figure 1, we could be potentially putting $40,000 into a road that is already in "very poor" condition. With this cash injection of $40,000 it will really make no appreciable difference and in fact the benefit could be lost in one winter season.

4. **Wearing Course of 2.4km between Ski-field turn off to Mt Gerald Station**. This would provide appropriate access to all road users from Mount Gerald station. And would utilise the material already crushed and available on-site. This is also the portion of road that receives a number of tractor/silage wagon movements in a day as the farm pit is within this section of road. Cost to apply wearing course and dig-out unsuitable materials in isolated spots is approximately $90,000 with the remaining 9.9km to be completed as a wearing course in the 2015/16 year at a cost of approximately $200,000. Under this option staff would have to work with Lilybank Station in regards to access to over the balance of that section through to the Macaulay River to manage access for heavy vehicles when the road surface is frozen.

CONCLUSION:

Ideally the road would have never gotten to this state, the stretching of budgets due to NZTA's limited funding pool has meant that money has been directed to the areas of "greatest need" with higher traffic counts. Though this is the underlying theory of the One Network Road Classification, there is also a requirement to ensure all public roads do not create "undue risk" to the road user/public.

Therefore staff recommends that the best available solution is option 2, unfortunately due to the lateness in the season this is likely to be unachievable, making option 4 the next best solution. The risk to the balance of the road is lower due to it being purely for farm and recreational access. Whilst there is significant costs in undertaking this construction it provides the best use of the available material and will achieve lasting benefit to the that section of Lilybank Road. Whilst there are no guarantees, staff could approach NZTA for a part share as this option demonstrates the best whole of lifecycle cost for this particular section of road.

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: EXTERNAL LIABILITY MANAGEMENT POLICY

DATE: May 7 2015

FROM: Toni Morrison, Senior Policy Planner
Paul Morris, Finance Manager

REASON FOR REPORT

To provide an updated Liability Management Policy for adoption as supporting information for the Council's Long Term Plan 2015/2025 and Consultation Document.

RECOMMENDATIONS:

1. That the report be received.

2. That the draft Liability Management Policy be adopted by Council.

WAYNE BARNETT

CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

Attachment 1: Draft External Liability Management Policy

BACKGROUND:

The Council is currently finalising all of the supporting information that will form the basis of the 2015-25 Long Term Plan (LTP).

Investment Policy

Under the Local Government Act 2002 (LGA) the Council is required to have a Liability Management Policy. As part of the Long Term Plan (LTP) process, there is a need to review and update the Council's current policy, which was adopted in 2012.

The 2012 policy refers to up to $6 million of external debt being raised, which was the situation at that time. However this is no longer being proposed as part of the LTP, and the policy should be updated to reflect this. A footnote is also proposed to clarify that the Council itself doesn't hold external debt but it is a joint venture partner in the Downlands scheme, which may hold such debt.

Attached is a draft Policy showing suggested changes (highlighted in yellow), for the Council's consideration and adoption. Once adopted this will form part of the supporting information for the Consultation Document and LTP.

POLICY STATUS:

As noted above, the Council is required to have an Liability Management Policy. The proposal is to update the policy in accordance with recent Council decisions on the LTP.

There are no other applicable policies.

SIGNIFICANCE OF DECISION:

In accordance with Council's Significance and Engagement Policy, these matters have been assessed as significant because the decisions relate to supporting information for the Consultation Document and the Long Term Plan 2015-25.

ISSUES & OPTIONS:

This process is currently progressing under tight timeframes. Council is required to adopt all supporting information for the Consultation Document prior to adopting the Consultation Document itself. The CD will be presented to Council on 28 April, for public consultation during May.

This timeframe is necessary to ensure that the LTP is adopted by June 30. The consequences of not adopting the LTP by June 30 include a delay in striking the rates for the new financial year, resulting in a loss of income to Council.

The options available to Council are to either:

1. Approve the Liability Management Policy as contained in this report OR
2. Amend as appropriate and approve the Liability Management Policy.

CONSIDERATIONS:

Legal
This process is guided by the Local Government Act 2002.

Financial
As stated above there is a financial risk to Council if the Long Term Plan process does not meet its tight deadlines and adoption is delayed until after June 30, 2015.

CONCLUSION:

The Council is required to have adopted all supporting information for the Consultation Document prior to adopting the Consultation Document itself. This paper seeks the adoption of the Liability Management Policy.

Attachment 1

External Liability Management Policy

Currently the Council[1] does not hold any external debt ***and is not proposing to incur any over the period of the Long Term Plan 2015-2025.*** ~~but given the capital expenditure outlined in this Plan, Council will need to raise up to $6 million worth of debt~~. In the event of a major natural disaster, Council may ~~also~~ need to incur ~~additional~~ debt to qualify for Government emergency assistance.

General Policy
Council exercises its borrowing powers within the Local Government Act 2002, s113-122. The borrowing programme is approved by Council by way of resolution during the annual planning process. Resolutions of Council are not required in the cases of hire purchase, credit or deferred purchases of goods and services where:

- There is a period of less than three months indebtedness
- The goods and services are obtained in the ordinary course of operations, on normal terms, for amounts not exceeding in aggregate an amount determined by resolution of Council i.e. approved financial delegations as documented in Council's Delegations Manual.

When borrowing is required it is generally used for the following one purpose:

- To fund operational or infrastructural asset purchases that will benefit the Council and ratepayers over a long period of time.

Council may borrow through a variety of mechanisms. Council may obtain funding utilising the following methods:

- Bank debt
- Capital markets issuance comprising fixed rate bonds, medium term notes and floating rate notes.

When evaluating any new borrowing, the Finance Manager will take into account the following in relation to source, term, size and pricing;

- The size and economic life of the project
- The impact any new debt will have on the borrowing limits
- Council's overall debt maturity profile
- Interest rates prevailing relative to term for both stock issuance and bank borrowing
- Management's view, after consultation with qualified advisors, of future interest rate movements
- Term available from bank and stock issuance
- Legal documentation and financial covenants required

Borrowing Limits
These limits are covered in Council's Financial Strategy.

Fixed Rate Hedging Percentages

	Minimum Fixed Rate Amount	**Maximum Fixed Rate Amount**
0 to 2 years	50%	100%
2 years to 5 years	30%	80%
5 years to 10 years	0%	60%

[1] The Council itself does not hold external debt. However it is a joint venture partner in the Downlands Water Supply scheme, and as such is responsible for its share (4%) of any external debt raised by that scheme.

Debt Repayment
Council has agreed that any external debt should be repaid over a term no greater than 25 years. Most debt will be repaid using funded depreciation, but where necessary this will be supplemented by direct rate funding to meet the 25 year limitation.

Liquidity and Credit Risk Management
Council is able to attract borrowing at cost effective rates due to its ability to maintain a strong balance sheet and its ability to rate.

Council ensures debt is spread over a band of maturities to minimise the risk of large concentrations of debt maturing or being reissued in periods where credit margins are high by ensuring that not more than 75% of existing and forecast borrowing is subject to refinancing in any financial year.

Interest Rate Risk Management
The Chief Executive Officer approves interest rate risk management, as recommended by the Finance Manager, who seeks the appropriate advice and monitors interest rate markets on a regular basis.

Any borrowing done by Council gives rise to exposure to interest rate movements. Council's preference, to avoid adverse impact on interest rates, is to have a preference for a high percentage of long term fixed rates.

The use of interest rate risk management instruments requires Council approval.

Security
This is covered by Council's Financial Strategy.

Local Government Funding Agency
Despite anything earlier in this liability management policy, the Council may borrow from the New Zealand Local Government Funding Agency Limited (LGFA) and, in connection with that borrowing, may enter into the following related transactions to the extent it considers necessary or desirable:

- Contribute a portion of its borrowing back to the LGFA as an equity contribution to the LGFA;
- Provide guarantees of the indebtedness of other local authorities to the LGFA and of the indebtedness of the LGFA itself;
- Commit to contributing additional equity (or subordinated debt) to the LGFA if required;
- Subscribe for shares and uncalled capital in the LGFA; and
- Secure its borrowing from the LGFA and the performance of other obligations to the LGFA or its creditors with a charge over the Council's rates and rates revenue.

Liability Management Policy

Adopted by:	**Council**
Adopted date:	xx
Review date:	As necessary

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: LONG TERM PLAN SUPPORTING INFORMATION

DATE: 7 May 2015

FROM: Toni Morrison, Senior Policy Planner
Paul Morris, Finance Manager

REASON FOR REPORT

To provide and adopt the Foul Sewer and Water Supply Activity Management Plans as supporting information for the 2015-2025 Long Term Plan and consultation document.

RECOMMENDATIONS:

1. That the report be received.

2. That the Foul Sewer Activity Management Plan be adopted by Council as supporting information for the Consultation Document and Long Term Plan.

3. That the Water Supply Activity Management Plan be adopted by Council as supporting information for the Consultation Document and Long Term Plan.

WAYNE BARNETT

CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

Attachment 1: Foul Sewer Activity Management Plan
Attachment 2: Water Supply Activity Management Plan

BACKGROUND:

As part of its Long Term Plan (LTP) process, the Council puts together activity management plans (AMPs) for each of its groups of activities. AMPs form part of the supporting information during the consultation phase in developing the LTP.

Attached are the Foul Sewer and Water Supply AMPs which describe current activities and levels of service, and identify future proposals with associated performance measures and targets, and financial information.

The Council is asked to consider and adopt the Foul Sewer and Water Supply AMPs as a basis for activities to be included in the Long Term Plan.

POLICY STATUS:

N/a.

SIGNIFICANCE OF DECISION:

In accordance with Council's Significance and Engagement Policy, these matters have been assessed as significant because the decisions relate to supporting information for the Consultation Document and the Long Term Plan 2015-25.

ISSUES & OPTIONS:

This process is currently progressing under tight timeframes. Council is required to adopt all supporting information for the Consultation Document prior to adopting the Consultation Document itself. The CD will be presented to Council on 7 May, for public consultation.

This timeframe is necessary to ensure that the LTP is adopted by June 30. The consequences of not adopting the LTP by June 30 include a delay in striking the rates for the new financial year, resulting in a loss of income to Council.

The options available to Council are to either:

1. Approve the AMPs as attached to this report OR
2. Amend as appropriate and approve the AMPs.

CONSIDERATIONS:

Legal
This process is guided by the Local Government Act 2002.

Financial
As stated above there is a financial risk to Council if the Long Term Plan process does not meet its tight deadlines and adoption is delayed until after June 30, 2015.

CONCLUSION:

The Council is required to have adopted all supporting information for the Consultation Document prior to adopting the Consultation Document itself. This paper seeks the adoption of the two remaining AMPs, to enable the adoption of the Consultation Document.

ACTIVITY MANAGEMENT PLAN
For Water Supply

VERSION 5

April 2015

Mackenzie District Council Activity Management Plan for Water Supply

Mackenzie District Council Adopted --

Date --

Prepared By --
B Haar
Asset Manager

Telephone: +64 3 6859010

Reviewed By --
G Horler
Utilities Manager

Date: April 2015

Status: FINAL

MACKENZIE DISTRICT COUNCIL

ACTIVITY MANAGEMENT PLAN FOR WATER SUPPLY

Prepared By: ____
Bernie Haar, Asset Manager
Mackenzie District Council

Reviewed By: ____
Geoff Horler, Utilities Manager
Mackenzie District Council

Document Approved: ____
Chief Executive Officer,
Mackenzie District Council

Adopted by Council: ____
Mayor (on behalf of Councillors)

Document No

File No ....

Mackenzie District Council – Activity Management Plan for Water Supply

UPDATE REGISTER

Number	Date	Description of Update	Updated by
Version 1	April 2006	Revision of the second AMP produced by MDC	Waugh Consulting
Version 2	2004	Revision of the first AMP produced by Waugh Consulting	MDC
Version 3	April 2006	Revision of the second AMP produced by MDC	MDC
Version 4	April 2013	Full update to Version 3	MDC
Version 5	February 2015	Revision to incorporate the issues determined by the 30 year Infrastructure Strategy and Environment Canterbury's Land and Water Regional Plan.	MDC

CIRCULATION LIST

Number	Issued to (*name & organisation*)

CONTENTS

The following terms and acronyms (in brackets) are used in this Plan.

ACCRUAL ACCOUNTING
The recognition of revenues as they are earned and expenses as they are incurred.

ANNUAL PLAN
A document produced annually by an organisation to inform stakeholders of its objectives, intended activities, performance, income and expenditure required for a period of one financial year. It may also indicate anticipated future short-term income and expenditure

ASSET
A physical component of a facility, which has value, enables services to be provided and has an economic life of greater than 12 months. Dynamic assets have some moving parts, while passive assets have none.

ASSET MANAGEMENT (AM)
The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

ASSET MANAGEMENT PLAN
A plan developed for the management of one or more infrastructure assets that combines multidisciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long-term cashflow projection for the activities.

ASSET MANAGEMENT STRATEGY
A strategy for asset management covering the development and implementation of plans and programmes for asset creation, operation, maintenance, rehabilitation/replacement, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.

ASSET REGISTER
A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.

BENEFIT-COST RATIO (B/C)
The sum of the present values of all benefits (including residual value, if any) over a specified period, or the lifecycle, of the asset or facility, divided by the sum of the present value of all cost.

CAPITAL EXPENDITURE (CAPEX)
Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of asset stock.

COMPONENTS
Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

CURRENT REPLACEMENT COST
The cost of replacing the service potential of an existing asset, by reference to some measure of capacity with an appropriate modern equivalent asset.

DEFERRED APPROACH
The shortfall in rehabilitation work required to maintain the service potential of an asset.

DEPRECIATED REPLACEMENT COST (DRC)

The replacement cost of an existing asset less an allowance for wear or consumption having regard for the remaining economic life of the existing asset.

DEPRECIATION
The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the cost (or revalued amount) of the asset less its residual value over its useful life.

DETERIORATION RATE
The rate at which an asset approaches failure.

DISPOSAL
Activities necessary to dispose of decommissioned assets.

ECONOMIC LIFE
The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life; however obsolescence will often ensure that the economic life is less than the physical life.

FACILITY
A complex comprising many assets (e.g. a hospital, water treatment plant, recreation complex, etc) which represents a single management unit for financial, operational, maintenance or other purposes.

FINANCIAL STATEMENTS
Balance sheets, profit and loss accounts, statements of changes in financial position, notes and other statements which collectively are intended to give a true and fair view of the state of affairs and profit or loss for an entity for a defined period.

GAP ANALYSIS
A method of assessing the gap between a business's current asset management practices and the future desirable asset management practices. Also called needs analysis or improvement planning.

INFRASTRUCTURE ASSETS
Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised ordinary assets as components.

LEVELS OF SERVICE
The defined service quality for a particular activity (i.e. water supply) or service area (i.e. water quality) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.

LIFE
A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.

LIFECYCLE
The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset i.e. from planning and design to decommissioning or disposal.

LIFECYCLE COST
The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.

LIFECYCLE COST ANALYSIS
Any technique which allows assessment of a given solution, or choice from among alternative solution, on the basis of all relevant economic consequences over the service life of the asses

MAINTENANCE
All actions necessary for retaining an asset as near as practicable to its original condition,

but excluding rehabilitation or renewal. Fixed interval maintenance is used to express the maximum interval between maintenance tasks.

On-condition maintenance is where the maintenance action depends upon the item reaching some predetermined condition.

MAINTENANCE PLAN

Collated information policies and procedures for the optimum maintenance of an asset or group of assets.

MAINTENANCE STANDARDS

The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practise, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.

OPERATION

The active process of utilising an asset, which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the lifecycle costs of an asset.

OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC)

The optimised replacement cost after deducting an allowance for wear or consumption to reflect the remaining economic or service life of an existing asset. ODRC is the surrogate for valuing assets in use where there are no competitive markets for assets, or for their services or outputs.

PERFORMANCE MONITORING

Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.

PLANNED MAINTENANCE

Planned maintenance activities fall into three categories:

i) Periodic – necessary to ensure the reliability or to sustain the design life of an asset.
ii) Predictive – condition-monitoring activities used to predict failure.
iii) Preventive – maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition based.

REHABILITATION

Works to rebuild or replace parts or components or an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset to deliver its original level of service (i.e. heavy patching of roads, slip-lining of sewer mains, etc.) without resorting to significant upgrading or renewal, using available techniques and standards.

RENEWAL

Works to upgrade refurbish or replace existing facilities with facilities of equivalent capacity or performance capability.

REMAINING ECONOMIC LIFE

The time remaining until an asset ceases to provide the required service level or economic usefulness.

REPAIR

Action to restore an item to its previous condition after failure or damage.

REPLACEMENT

The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.

REPLACEMENT COST

The cost of replacing an existing asset with a substantially identical new asset.

RESIDUAL VALUE
The net market or recoverable value that would be realised from disposal of an asset or facility at the end of its life.

RISK MANAGEMENT
The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

ROUTINE MAINTENANCE
Day-to-day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventive maintenance.

SERVICE POTENTIAL
The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.

STATEMENT OF FINANCIAL PERFORMANCE
A report on the net surplus/deficit, and its components, arising from activities or events during a given period, that is significant for the assessment of both past and future financial performance.

STRATEGIC PLAN
A plan containing the long-term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long-term survival, value and growth of the organisation.

UNPLANNED MAINTENANCE
Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

USEFUL LIFE
May be expressed as either:
a) The period over which a depreciable asset is expected to be used, or
b) The number of production or similar units (i.e. intervals, cycles) that is expected to be obtained from the asset.

VALUATION
Assessed asset value, which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels, market value for lifecycle costing and optimised deprival value for tariff setting.

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

This Activity Management Plan for Water Supply (AMP) has been developed to provide the Mackenzie District Council (MDC) with a long term management tool for the Water Supply asset. It sets out the current asset condition, what issues are currently and likely to impact on the asset and the costs associated with maintaining, operating, renewing, developing and disposing of the asset.

In terms of population, the Mackenzie District is the third smallest territorial authority in New Zealand with a normally resident population of approximately 4,000, with limited growth. In contrast to its small population, the area of the District is large, comprising 745,562 hectares. Fairlie, Lake Tekapo and Twizel are the main towns and there are villages at Albury, Kimbell, Burkes Pass and Mount Cook.

1.2 PURPOSE OF WATER SUPPLY ASSET MANAGEMENT PLANNING

The purpose of this AMP is to provide a tool combining management, planning, financial, engineering and technical practices to ensure that the level of service required by customers is provided at the lowest long term cost to the community. The plan is intended to demonstrate to customers that Council is managing the assets responsibly and that they will be regularly consulted over the price/quality trade-offs resulting from alternative levels of service.

1.3 PLAN LEVEL

MDC considers the required sophistication of their plan in the short to medium term need not progress beyond a **"Core"** planning level, as:

- the cost at this time to move to an advanced plan would provide little significant benefit to Council or its' customers
- the size, complexity and use of the assets is consistent with a rural sparsely populated district
- the risks associated with failure are low

This AMP is one of the Council's suite of plans that together describe the services and workload that the community sees as important for the Council to provide and sustain. They outline the basic methodologies Council will use to achieve the strategic objectives promoted in the MDC LTP 2015 – 2025 and thus move towards achieving the "outcomes" and the citizens' "vision" of the society they wish to be a part of.

1.4 SCOPE OF ASSET MANAGEMENT PLAN

This revision provides an update to Version 4 of the AMP produced and adopted by Mackenzie District Council in March 2013. It provides a medium to long term indication of asset management requirements and specific work programmes over the planning period from 1 July 2015 to 30 June 2025.

The plan will continue to be periodically reviewed to incorporate, as appropriate new asset information and improved knowledge of customer expectations. The objective is to optimise life cycle asset management activities and provide a greater degree of confidence in financial forecasts.

1.5 WATER SUPPLY ASSET MANAGEMENT ACTIVITY

Council is responsible for the management of Water Supply assets with an optimised depreciated replacement cost of $20,807,057 (July 2013 valuation). For 2014/15 Council has budgeted to spend $3,881,833 on maintaining, operating and renewing these assets (including staff, overhead costs and depreciation).

The following list summarises the MDC Asset Management activities:

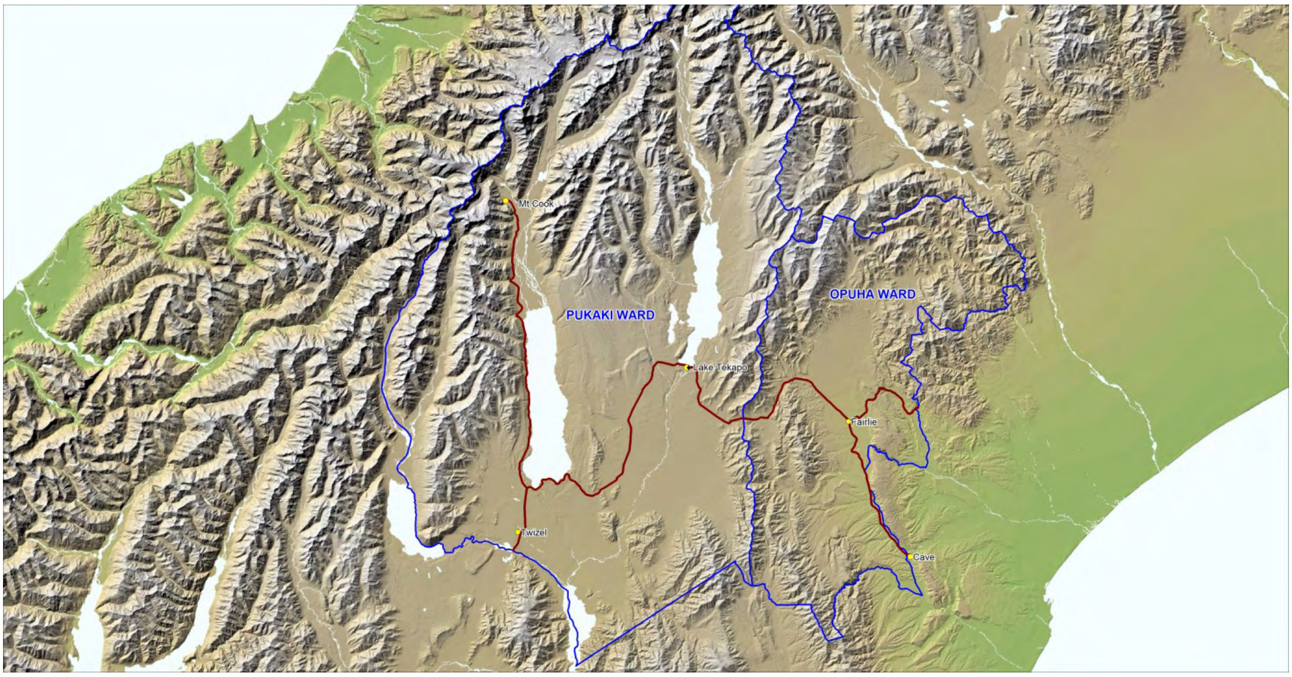
- Asset Management
- Safety Management
- Water Supply Maintenance
- Water Supply Data Management
- Project Management
- Environmental Management
- Network Inspections
- Legislative Compliance Management
- Network Management
- Customer Management

1.6 ASSET DESCRIPTION

1.6.1 LOCATION

Figure 1.1 shows the location of the district within the Canterbury Region

Figure 1.1 – Map of Mackenzie District



The Mackenzie District is bounded in the north and east by the Timaru and Waimate Districts, in the south by the Waitaki District and to the West by the Southern Alps/ Westland District boundary. There are two wards: **Pukaki** which in effect takes in the Mackenzie Basin and **Opuha** being the remaining area to the west of a line following the upper reaches of the Hakataramea River through Burkes Pass to Mt Musgrove in the Two Thumb Range.

The backbone of the roading network in the district is provided by the following State Highways which are the responsibility of the New Zealand Transport Agency (NZTA).

State Highway 8	Timaru - Fairlie - Lake Tekapo - Twizel - Omarama
State Highway 79	Fairlie - Geraldine
State Highway 80	Twizel - Mt Cook Village

The Mackenzie District Water Supply consists of a network of pipes and swales in the towns of Fairlie, Tekapo and Twizel. Water Supply is discharged either to ground or water after being flushed through treatment facilities. These are generally grassed swales or vegetated treatment areas.

1.6.2 THE ASSET

The Water Supply asset includes all Council owned pipelines, valves, hydrants, treatment facilities and related infrastructure within the District as shown in Table 1.1.

Table 1.1 – Water Supply assets included in this plan

Asset Description	Sub-Asset Description	Quantity
Mains		237,814m
Service lines		11,737m
Break Pressure Tanks		4
Hydrants		426
Meters		258
Valves and Air Valves		802
Plant		97
Water Races		114,685m

1.7 KEY STAKEHOLDERS AND CUSTOMERS

Key Stakeholders

The Council as the ultimate owner of assets. Other key stakeholders of the Water Supply network include:

- Regional council
- Owners and operators of inter-connecting or separate Water Supply networks.

Funding Partners

Funding is provided by several parties and in particular the following are significant contributors:

- Ratepayers – Rates provide funding for maintenance and operation of the networks
- Developers – By constructing infrastructure and vesting it in the Council plus providing the required financial contributions

Customer Groups
MDC's customers fall into three different groups: associated service providers, users and the wider community. These are detailed in Table 1.2.

Table 1.2 – MDC Water Supply Customer Groups

Customer Group	Description	Customers
Associated Service Providers	These are other service providers who rely on the Water Supply network	• Contractors • Commercial operators
Users	Those who directly benefit from the service	• Ratepayers • Residents and holiday home owners • Commercial properties • Industrial users
The Wider Community	Non-users that are affected if the service is not provided	• Ratepayer and residents • Tourists • Local businesses

Other Parties
Other parties with an interest in MDC's AMP include Council employees, consultants and contractors who manage and work on the asset.

1.8 LEVEL OF SERVICE

Council's current and target levels of service as defined in the 2012-2022 LTP are summarised in Table 4.1 and are summarised below.

- Water supplies are available and reliable.
- Water is safe to drink
- Water quality is maintained or improved

These show how levels of service contribute to the community outcomes and provides a technical measure that enables Council to monitor current levels of service against target levels of service.

The current LOS are documented as a combination of:
- LTP LOS documentation based on real or perceived customer feedback
- Contract processes which describe some elements of the quality of service provided, mainly travelling surfaces and intervention levels

The current LOS can be improved by:
- Augmentation of existing information e.g. clearer relationships between alternative service levels for pipeline rehabilitation and their associated costs. Cost comparisons for greater or lesser irrigation water provision to the householder.

- Utilisation of a LOS model defining quality, quantity, location, and timeframe. This would be based on the IIMM and define the Water Supply service in terms of Accessibility, Health and Safety, Quality, Reliability and Responsiveness, Sustainability, Functionality.

1.9 FUTURE DEMAND

The Mackenzie District Water Supply network caters for the three towns of Fairlie, Tekapo and Twizel. The districts population of approximately 4,000 is low and the growth at approximately 9.3% (since the 2006 census) this is a significant change from the 2001-2006 period where the population grew by a modest 2.3%.

Future demand on the network will be driven by residential subdivision and commercial development.

These areas sustained considerable growth during the period 2003-2009, but since then have slowed down significantly. That period of growth created a large number of sections in Twizel that will take some time to develop. As Twizel's infrastructure was designed for the total population when the town was at its height in the 1970's there is more than adequate capacity to cater for the growth expected.

In Tekapo planning during that period catered for large areas to be developed and infrastructure was designed and installed to cater for that. Resource consents were also obtained for that growth area. Therefore it is unlikely that there will be an increase in demand outside those already planned for.

1.10 RISK MANAGEMENT

Risk management is "the systematic application of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or plans, or from complying with its legal obligations".

There is currently no formal Risk Management process being implemented for the water supply activity within council. This in itself is a significant risk. A risk management strategy has been described in Section 8 of this AMP. The use of this strategy as outlined in the Improvement Plan should be completed with high priority. In particular issues surrounding emergency management and insurance require full review and inclusion in this plan.

1.11 LIFE CYCLE MANAGEMENT PLANS

Life cycle management plans outline what is work planned to keep the assets operating at the current levels of service defined in Section 4 while optimising lifecycle costs. The overall objective of the Life Cycle Management Plan is:

> ***To maintain performance measures to ensure that the current strategies do not consume the asset leading to an unexpected increase in maintenance/renewal expenditure in the future.***

In this AMP the lifecycle management plan has been separated into asset groups. Each Lifecycle Management plan covers the following:

- **Background Data** including current capacity and performance, current condition and historical data including costs.

- **Operations and Maintenance Plan** covering planning for on-going day to day operation and maintenance to keep assets serviceable and prevent premature deterioration or failure.

- **Renewal/Replacement Plan** covering Major work which restores an existing asset to its original capacity or its required condition (e.g. pipeline replacement, replanting treatment facilities).

- **Asset Development Plan** covering the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations.

- **Disposal Plan** covering activities associated with the disposal of a decommissioned asset.

1.11.1 ASSET CONDITION AND PERFORMANCE

The basis of the lifecycle management plans is the current condition and performance of the asset. This allows comparison with the prescribed level of service, and from this a gap analysis can be completed to determine future work requirements.

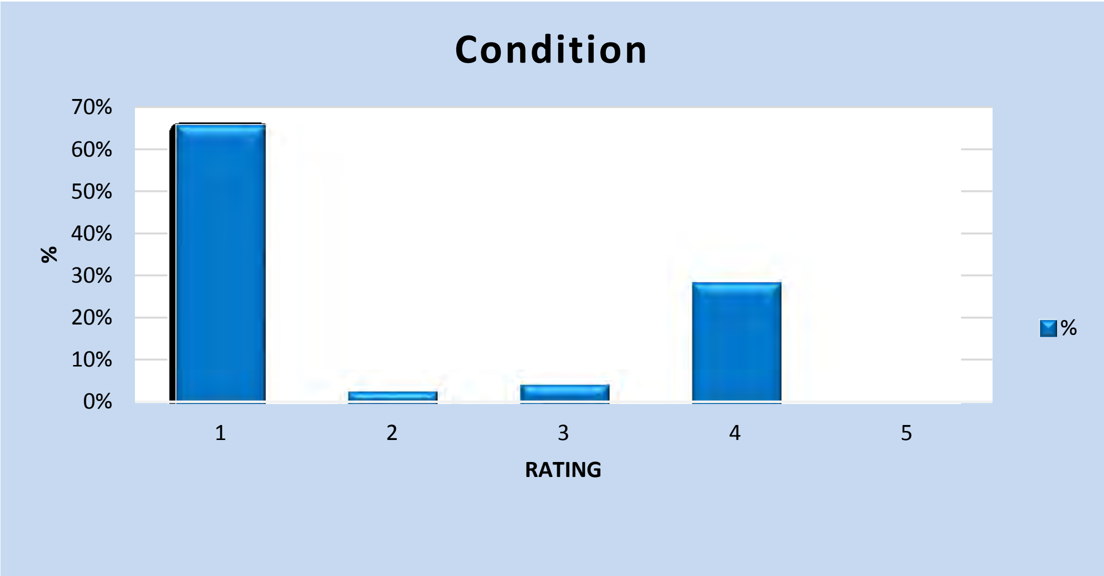
Currently MDC undertakes some condition and performance analysis of the network relying on internal CCTV inspections and the practical experience and knowledge of the engineering staff to provide a gauge of the networks overall performance. This knowledge is used extensively for planning purposes. Although adequate for the purpose, it would useful to extend the new Asset Register in ArcGIS and Asset Finda to record and analyse the condition and performance of the network to be more objective in its planning methodology.

Ongoing condition surveys of the asset components are undertaken and results recorded within the Asset Register. Council needs to keep up the internal CCTV inspection programme and the regular sampling of water mains, so that the sample results can be extrapolated out across the other similar pipe networks. Intermediate and long term planning of asset renewal is then be based on the results of these surveys, the performances obtained compared to that desired, the remaining expected life of the asset component and the decision making processes outlined (see appendix VI) within this plan. Recently samples of Asbestos Cement pipe have also been analysed to confirm the level of deterioration and predicted replacement.

1.11.1.1 Asset Condition

Specific condition for each asset is not able to be internally inspected like other pipe networks but as repairs are carried to various sections of the pipe network the condition is analysed and the results extrapolated out to form an opinion of the like pipes in the network. Number of breaks and repairs are a good indicator of condition. Random flow monitoring also gives a good guide on pipeline performance. There is good condition information for Water Supply assets with the majority of assets graded at 2 or better (89%). Only 3% of the network is graded as having a rating of 4 and no asset is graded as requiring replacement. However Fairlie has a programme to replace all the pipework installed in the 1940s as this has defective rubber sealing rings allowing significant leakage.

Figure 1.2 – Condition Data for Water Supply Assets



Notes: 1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Regular maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

1.11.2 ROUTINE MAINTENANCE PLAN

Current practice is to apply a combination of “reactive” condition driven and network lifecycle depreciation techniques to determine the work necessary to maintain the network within pre-determined financial constraints (see charts in Appendix I). The majority of maintenance is reactive so budgets have been based on historical expenditure. Increases to costs for some asset groups are projected in future due to vested assets from developers.

1.11.3 RENEWAL/REPLACEMENT PLAN

DWSNZ compliance is a major impact on water supplies across the district in the next 10 years.

Fairlie

- Continue with the replacement programme of 1940s pipes, started in 2000. $120,000 budget annually until completion in 2020/21.
- Complete investigations on a possible new source for the water supply and implement the treatment upgrade to meet Ministry of Health guidelines. $2,600,000 budgeted in 2017/18.
- Install SCADA telemetry monitoring across all facilities. $40,000 allowed in 2016/19.

Burkes Pass

- Install flow meter and new chlorinator - $5,200
- Install SCADA telemetry monitoring - $15,000

Tekapo

- Install SCADA telemetry monitoring across all facilities - $46,000
- Upgrade reservoir controls alarms etc - $35,000

Twizel

- Complete treatment upgrade in 2015
- Reline and cover reservoir
- Start 20 year AC watermain replacement programme in 2015 – average of $200,000 annually

Manuka Terrace

- Survey the ratepayers to determine acceptance of the project
- If approved complete construction at a cost of $1,400,000

Allandale

- Install SCADA telemetry monitoring at intake and Spur Rd pump station – $20,000

1.11.4 ASSET DEVELOPMENT PLAN

This plan is recommending improvement works to allow compliance with the Health (Drinking Water) Amendment Act 2007 as noted above.

1.11.5 ASSET DISPOSAL PLAN

In general Council has no specific plans for disposal of components of the Water Supply asset.

1.12 FUNDING IMPACT STATEMENT

As at 1 July 2013 the total optimised replacement cost of the Water Supply Infrastructure was assessed to be $32,041,873. The total optimised depreciated replacement cost was assessed to be $20,807,057. The annual depreciation has been determined to be $418,931 per annum.

Mackenzie District Council											
Funding Impact Statement for 10 Years to 30 June 2025 for Water											
	Annual Plan 2014/15 ($000)	**LTP Year 1 2015/16 ($000)**	**LTP Year 2 2016/17 ($000)**	**LTP Year 3 2017/18 ($000)**	**LTP Year 4 2018/19 ($000)**	**LTP Year 5 2019/20 ($000)**	**LTP Year 6 2020/21 ($000)**	**LTP Year 7 2021/22 ($000)**	**LTP Year 8 2022/23 ($000)**	**LTP Year 9 2023/24 ($000)**	**LTP Year 10 2024/25 ($000)**
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	855	773	787	790	884	962	946	1,015	1,166	1,118	1,163
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	110	103	108	105	106	113	106	104	110	103	102
Internal charges and overheads recovered	29	6	6	7	9	11	11	13	17	21	24
Local authorities fuel tax, fines, infringement fees, and other receipts	86	160	163	167	172	179	185	192	199	207	216
Total operating funding (A)	**1080**	**1042**	**1064**	**1069**	**1171**	**1265**	**1248**	**1324**	**1492**	**1449**	**1505**
Applications of operating funding											
Payments to staff and suppliers	465	509	531	547	563	586	606	632	690	715	746
Finance costs	-	3	11	19	25	28	36	46	49	49	49
Internal charges and overheads applied	168	22	21	20	20	20	20	20	19	18	18
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**633**	**534**	**563**	**586**	**608**	**634**	**662**	**698**	**758**	**782**	**813**
Surplus (deficit) of operating funding (A - B)	**447**	**508**	**501**	**483**	**563**	**631**	**586**	**626**	**734**	**667**	**692**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	159	-	-	342	-	-	1,023	1,691	-	308	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**159**	**0**	**0**	**342**	**0**	**0**	**1023**	**1691**	**0**	**308**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service*	2,914	1,451	421	2,879	550	585	444	1,930	321	372	361
to replace existing assets	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in reserves	-2308	-943	80	-2054	13	46	1165	387	413	603	331
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**606**	**508**	**501**	**825**	**563**	**631**	**1609**	**2317**	**734**	**975**	**692**
Surplus (deficit) of capital funding (C - D)	-447	-508	-501	-483	-563	-631	-586	-626	-734	-667	-692
Funding balance ((A - B) + (C - D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

*A full breakdown of the capital expenditure and the reason for each project can be found on pages 50 to 52 of the 30 Year Infrastructure Strategy.

The forecast total Mackenzie District and Community Board expenditure Water Supply for 2014/15 for operations, maintenance renewals and development totals $3,881,833 (inclusive of all administration costs and professional service fees). 45% ($331,000) of budgeted expenditure is to be spent on maintenance and operation with $,982,000 to be spent on renewals. The remaining 14% is used to fund depreciation and administration costs. The full budget and forecast are shown in Appendix II.

A check of the annual renewal expenditure against the Annual Depreciation (AD) for each asset component gives an indication whether the renewal expenditure is appropriate for the age and condition of the network. For asset components nearing the end of their expected lives a figure greater than the depreciated costs would be expected to be spent. For situations where the asset component is new or only partially through the expected life the budgeted expenditure would be expected to be less than the AD with the balance banked so as funding will be available when required. Table 1.3 shows the 2014/15 renewal expenditure compared to the AD.

Table 1.3 – Comparison between Forecast Expenditure and Annual Depreciation

Asset Type	2014/15 Renewals	Annual Depreciation Cost
New Treatment	$2,982,000	$407,000

1.13 ASSET MANAGEMENT PRACTICES

MDC employs an Asset Manager, a Utilities Manager and an Engineering Technician who are responsible for the management of the Water Supply asset.

Management planning is actioned in-house generally based on the knowledge of the Asset Manager/Utilities Manager assisted by the council's contractors and by such planning tools as the ArcGIS Asset Register software and Asset Finda (asset management software)

Occasionally elements of the management of the network may be competitively tendered to consultancy services.

Physical works are managed in accordance with the procedures documented in appendix I. Routine maintenance is undertaken through a competitively tendered contract of normally 3 to 5 year duration.

MDC accounts for revenue and expenditure on an accrual basis. All works are identified through a job cost ledger with appropriate breakdown level to be able to monitor and report on revenues and expenditure. All external reports are prepared in compliance with Generally Accepted Accounting Principles.

1.13.1 ASSET MANAGEMENT PROCESSES

Council uses the LTP process to identify community concerns and issues which are incorporated into levels of service that are expressed by performance measures written into the professional services and physical works contracts. The satisfactory execution of these performance measures result in levels of service compliance that ensures the MDC's outcomes are achieved and the community vision of a district they wish to live in is accomplished.

Well documented standards and processes exist for an on-going inspection programme.

Maintenance and renewal costs are recorded in the general ledger.

There is no formal risk management process.

1.13.2 ASSET MANAGEMENT SYSTEMS

The ArcGis Geographic Information System database is used as the inventory management system and should be the depository for all the available asset data.

Council also uses Asset Finda (linked to ArcGis) which is a complete system for designing and managing solutions through the application of geographic knowledge. Data can be manipulated within Asset Finda, ArcGIS or exported to excel to assist in the decision making process for the water supply network management.

Other systems operated by the Council are:

- NCS Corporate financial management system
- NCS electronic plan record system
- Hardcopy plan filing systems

The Council has moved its GIS platform from MapInfo to ArcGis from 24th October 2011. This continues to provide a good Asset Register.

1.14 PLAN IMPROVEMENT AND MONITORING

This AMP has previously been reviewed and updates incorporated including improvements to move towards “Core” level Asset Management. Council is committed to a continual improvement as outlined in Section 10. A key objective is to dovetail the asset management planning process with the other key planning processes particularly the Long Term Plan (LTP).

1.15 KEY ASSUMPTIONS AND CONFIDENCE LEVEL

There are a number of significant assumptions that have been made in the development of this AMP as outlined below.

1.15.1 ASSET DATA

In preparing the plan, data in the ArcGis database has been taken as the verified network asset. As a result of the recent revaluation and the move to ArcGis, significant validation checks were carried out on the data.

Table 9.1 gives the assessed data confidence quality of the MDC asset register as described in the 2013 Water, Wastewater, Stormwater and Solid Waste Assets “Mackenzie District Infrastructure Revaluation” report.

1.15.2 LEVELS OF SERVICE

These have been based on Levels of Service (LOS) outlined in the 2012-2022 LTP and updated in the 2014/15 Annual Plan. It is assumed that customer consultation completed as part of the LTP process has been taken into account in the development of these LOS.

Changes in government requirements in future may affect future LOS.

1.15.3 DEMAND

Although the population remains static within the district, other demand factors are based on limited information. No specific consultation or research has been completed to determine future demand on the network. There is a moderate level of confidence in future demand based on limited input information.

1.15.4 LIFE CYCLE MANAGEMENT

The knowledge of the practitioners directly providing this activity, both on a day-to-day basis and historically, has been relied upon. These practitioners include Council's engineering staff Council's consultants and staff of the various physical works contractors.

1.15.5 FINANCIAL FORECASTS

Key assumptions made in the financial forecasts are as follows:

(Inflation figures have been provided by Business and Economic Research Limited.)

Table 3: Adjustors: % per annum change

	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private Sector Wages
Year Ending	% pa change								
Jun 12	5.2	3.3	6.0	15.4	2.3	1.4	4.7	3.1	2.1
Jun 13	1.1	1.7	-2.8	-1.8	2.1	2.9	2.1	-2.7	1.9
Jun 14	0.7	1.9	-2.1	1.3	1.9	1.8	2.8	-2.5	1.7
Jun 15	0.4	1.9	4.7	4.2	1.6	1.5	1.7	1.8	1.7
Jun 16	1.2	2.2	5.2	3.5	1.8	2.3	1.8	2.1	1.7
Jun 17	1.4	2.4	3.8	3.8	1.9	2.5	2.6	2.5	1.8
Jun 18	2.2	2.5	3.0	3.9	2.0	2.6	2.4	2.6	1.9
Jun 19	2.4	2.6	3.2	4.1	2.1	2.7	2.0	2.8	2.0
Jun 20	2.5	2.8	3.3	4.3	2.2	2.9	2.1	2.9	2.1
Jun 21	2.7	2.9	3.5	4.5	2.3	3.0	2.3	3.1	2.1
Jun 22	2.8	3.0	3.7	4.7	2.4	3.1	2.4	3.2	2.2
Jun 23	3.0	3.2	3.8	4.9	2.5	3.3	2.5	3.4	2.3
Jun 24	3.1	3.3	4.0	5.1	2.6	3.4	2.9	3.5	2.4
Jun 25	3.3	3.4	4.2	5.3	2.7	3.6	3.1	3.6	2.5
20-year ave %pa	3.2	2.9	3.5	4.7	2.4	3.0	3.0	3.0	2.2

- Council will continue to fund the level of service currently set out in this AMP
- The dollar values shown in this Plan are October 2014 dollars adjusted for inflation applicable to this Activity.
- Some renewal costs are rough order of cost estimates that will need to be further researched and refined
- No account has been taken of the impacts related to the development, acceptance and implementation of the Risk Management Plan
- Assumptions made on Total Useful Life and Residual Useful Lives of the assets in relation to the asset valuation.

- The asset data is considered to be reliable and fit for the purpose for developing the long term financial forecasts.
- Any other specific assumptions

2. INTRODUCTION

2.1 PURPOSE OF THE PLAN

The objective of Asset Activity Management planning is:

"To provide the required level of service, in the most cost effective manner, through management of assets for existing and future customers."

Activity Management Planning is a management tool that provides the link between strategic planning and managerial areas of Council's business and community's desired outcomes.

The need for Activity Management Plans for Council's major infrastructure and other major assets is an implied requirement of the Local Government Act 2002 and the Long Term Plan (LTP). Such Activity Management Plans define agreed levels of service, and the expenditure required to maintain these agreed service levels for the period of the plan.

Levels of service are the definitions of service quality resulting from operation of the particular asset against which the assets service performance may be measured. Levels of Service are one of the key outputs from the strategic planning process and typically comprise the following elements.

- Quantity
- Quality
- Cost
- Timescales
- Performance Measures
- Sustainability

2.2 RELATIONSHIP WITH OTHER PLANNING DOCUMENTS

The Activity Management Planning process analyses the impact of the Levels of Service on the business and should be structured to be compatible with other key planning mechanisms and documents, including:

LTP: Council's LTP 2012 – 2022 set out the broad strategic direction for the period of the plan, defining the District Vision, Outcomes, Strategic Objectives, Projects and Tasks and the Financial Framework. The outcomes are directly related to Governance, Community Well-Being, Environment Protection, Sustainability, Economic Development, and Organisation Performance. These will remain relevant in the upcoming LTP.

District Plan: The Mackenzie District Plan assists the Council in carrying out its functions under the Resource Management Act 1991 so that it may achieve the purpose of the Act which is to "promote the sustainable management of natural and physical resources." The Plan was developed in consultation with local communities and interest groups. The Plan controls such activities as:

- Erection, relocation, or demolition of structures, buildings, network utilities and signs.
- Commercial activities.
- Earthworks.
- Use of hazardous substances.

- Planting, trimming or removing vegetation.
- Subdivision of land.

Other Related Activity Management Plans: Council has other activities each managed through the production and use of Activity Management Plans. Of particular relevance to the Water Supply activity are the Roading, Stormwater and Sewer Activity Management Plans. Cooperation with these activity groups is required as their works in the road corridor will have impact on roading assets.

Annual Plan and Budget: The works identified in this AMP will form the basis on which future annual plans are prepared.

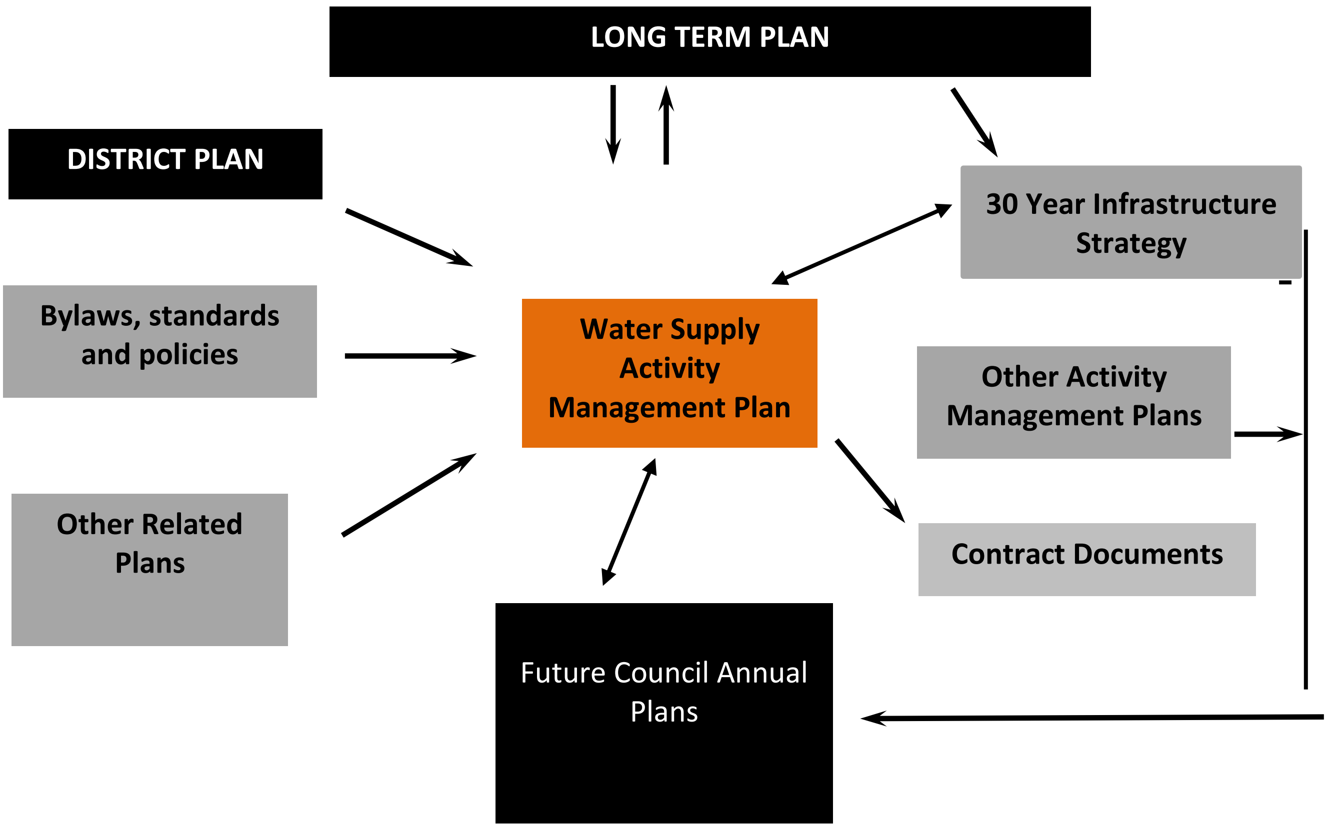
Contracts: The levels of service, strategies and information requirements contained in AMP's are translated into contract specifications and reporting requirements.

Bylaws, standards and policies: These tools for asset creation and subsequent management are needed to support AM tactics.

Other Water Supply Related Plans: These include:

- National Policy Statements
- Regional Policy Statements
- Canterbury Water Strategy and Zone Implementation Plan

Figure 2.1 – Relationship between the Water Supply Activity Management Plan and Other Plans



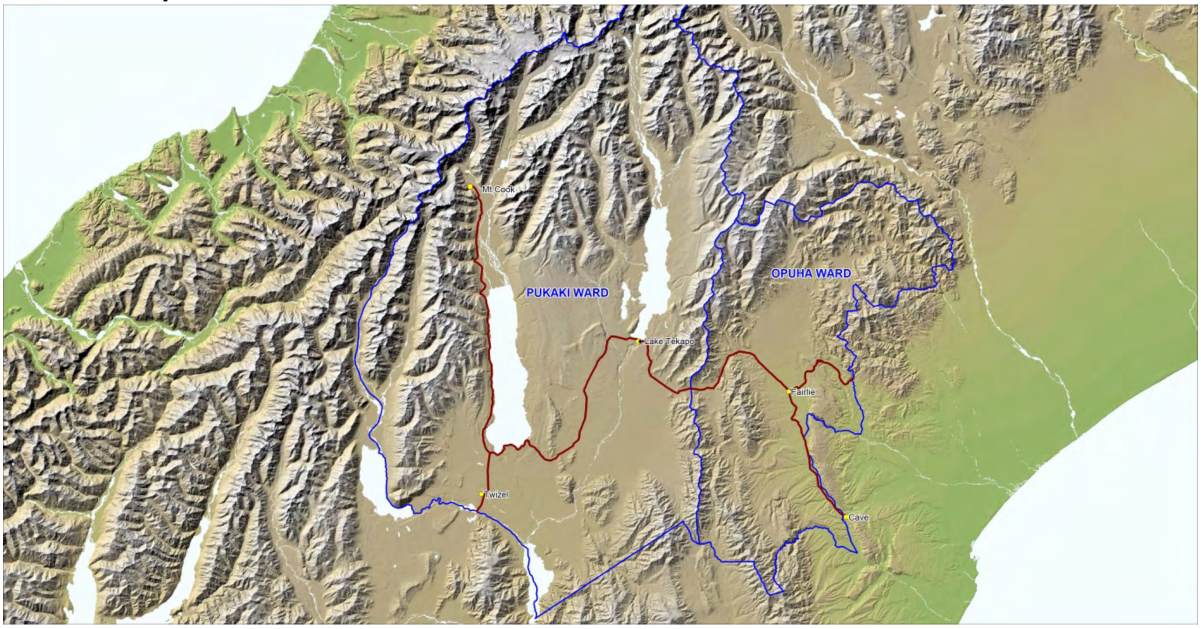
2.3 ASSETS INCLUDED IN THIS PLAN

2.3.1.1 Location

Figure 2.2 shows the location of the district within the Canterbury Region

The Mackenzie District is bounded in the north and east by the Timaru and Waimate Districts, in the south by the Waitaki District and to the West by the Southern Alps/ Westland District boundary. There are two wards: **Pukaki** which in effect takes in the Mackenzie Basin and **Opuha** being the remaining area to the west of a line following the upper reaches of the Hakataramea River through Burkes Pass to Mt Musgrove in the Two Thumb Range.

Figure 2.2 – Map of Mackenzie District



2.3.1.2 The Asset

The Water Supply asset includes all Council owned pipelines, manholes, treatment facilities and related infrastructure within the District as shown in Table 2.1.

Table 2.1 – Water Supply assets included in this plan

Asset Description	Sub-Asset Description	Quantity
Mains		237,814m
Service lines		11,737m
Break Pressure Tanks		4
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Meters		258
Valves and Air Valves		802
Plant		97
Water Races		114,685m

2.4 KEY STAKEHOLDERS AND CUSTOMERS

Key Stakeholders
The Council as the ultimate owner of assets.

- Regional council
- Owners and operators of inter-connecting or separate Water Supply networks.

Funding Partners
Funding is provided by several parties and in particular the following are significant contributors:
- Ratepayers – Rates provide funding for maintenance and operation of the networks
- Developers – By constructing infrastructure and vesting it in the Council plus providing the required financial contributions

Customer Groups
MDC's customers fall into three different groups: associated service providers, users and the wider community. These are shown in Figure 2.3 and further detailed in Table 2.2.

Figure 2.3 – Customer Groups (Ref IIMM Figure 2.1.5)

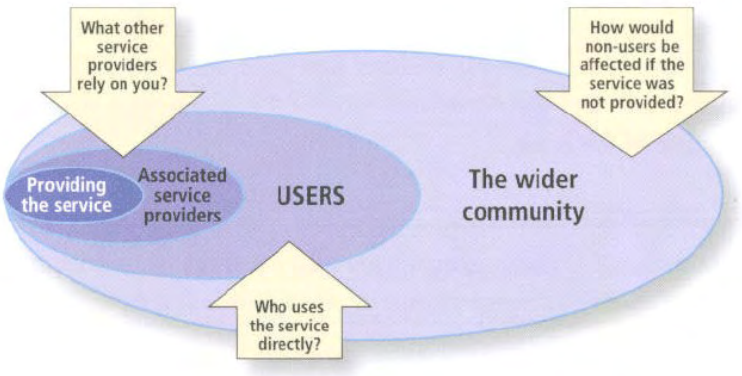


Table 2.2 – MDC Water Supply Customer Groups

Customer Group	Description	Customers
Associated Service Providers	These are other service providers who rely on the Water Supply network	• Contractors
Users	Those who directly use the service	• Rate Payers • Residents • Commercial business owners/operators • Industrial users • Farmers
The Wider Community	Users that are affected if the service is not provided	• Citizens • Tourists • Visitors • Stock

Other Parties

Other parties with an interest in MDC's AMP include Council employees, consultants and contractors who manage and work on the asset.

2.5 ORGANISATION STRUCTURE

Mackenzie District Council's organisation structure is shown in Figure 2.4. This AMP covers activities included under Essential Services, led by the council Asset Manager and Utilities Manager.

Figure 2.4 – MDC Organisation Structure

CHIEF EXECUTIVE OFFICER
WAYNE BARNETT

ESSENTIAL SERVICES

Bernie Haar
Asset Manager

Geoff Horler
Utilities Manager

Suzy Ratahi
Roading Manager

Angie Taylor
Solid Waste Manager

Matthew Wade
Assets Technical Assistant

PLANNING & REGULATIONS

Nathan Hole
Manager Planning & Regulations

Steve McLellan
Building Control Manager

Christine Scannell
Building Control Officer

Denis Lenihan,
Building Control Officer

Judith Gray,
Building Administration Officer

Anastasia Blignaut
Planner

Ray Gardner
Civil Defence Officer

Vacant
Policy Planner, District Plan Review

PROJECTS & ADMINISTRATION

David Rae
Manager Projects and Administration

Arlene Goss
Committee Clerk

Christine O'Connell
Regulatory Assistant

Nic Guerin
Receptionist

Stephen Barlow
IT Manager

Terry Sharples
GIS Officer

Jana Kaeppler
GIS Officer Twizel

Julie Hadfield
Catherine Johnson
Executive Assistants

Toni Morrison
Senior Policy Planner

FINANCE

Paul Morris
Manager Finance and Administration

Tania Hoefsloot
Accountant

Pauline Jackson
Revenue Officer

Julie Hadfield
Payroll/Payments Officer

COMMUNITY FACILITIES

Garth Nixon
Community Facilities Manager

Barbara McGartland
Summer McDougall
Jane Nicholls
Heather McKendrick
Twizel Office Staff

Colleen Brien
Mackenzie Community Centre Cleaner

Kevin McDonald
Twizel Events Centre Caretaker

Seasonal Staff:

Strathconan Swimming Pool Supervisor and five attendants

Twizel Swimming Pool Supervisor and three attendants

2.6 GOALS AND OBJECTIVES OF ASSET OWNERSHIP

Purpose of Ownership
Council provides a safe, effective and sustainable Water Supply system to ensure that adequate potable supplies are provided (by either private or public) means for all residential , commercial and industrial buildings and also to ensure that adequate water supplies are available for fire fighting purposes.

The Council's overriding goal is:

"The outcome desired by the community is to have safe, effective and sustainable water, waste communication, energy and transport systems in place when required, through sound long term planning and funding"

Review of Activities and Funding
The LTP identifies planned activities, defines the rationale for justifying these activities, and identifies the appropriate funding source.

Legal Authority for Council Action
The ***Local Government Act 2002*** gives local authorities the full capacity, and full rights, powers and privileges, to carry on or undertake any activity or business, do any act, or enter into any transaction wholly or principally for the benefit of its district.

Along with these wide sweeping powers comes the requirement to identify all reasonably practicable options before making a decision, and to assess the benefits and costs of each option against the likely economic, environmental, social and cultural impacts.

Local authorities are also required to consult widely, effectively and appropriately with the community to determine the communities' wishes and to seek feedback on all potentially significant activities – not only when a particular course of action is proposed, but at the various stages of the decision-making process.

A significant aspect of this consultation process is the development of the LTP, which forms the long-term (not less than ten years) direction for all Council's activities.

2.7 LINKS TO ORGANISATION VISION, MISSION, GOALS AND OBJECTIVES

VISION
Mackenzie will be a district in which:

- We foster the unique attributes and strong sense of community that makes the Mackenzie District special.
- Our natural environment is protected and enhanced in balance with achieving social and commercial objectives.
- A dynamic economy provides employment and investment opportunities consistent with the quality of life aspirations of existing and future generations.
- Democracy is respected and equal opportunity and the rights of the individual are upheld.
- A variety of sporting, recreational, cultural, spiritual, welfare and educational resources are available to enrich the lives of our people.

- Safe, effective, sustainable water, waste, communication, energy and transport systems are in place.
- People are encouraged to use their skills and talents for the benefit of the community.

MDC's outcomes and objectives for the water supply network are stated in the LTP 2012 – 2022.

These outcomes and objectives have been translated into various targets for maintenance and renewals to be achieved in each financial year. The outcomes are reported in each Annual Report.

The principle goal is to provide an effective, efficient, accountable and sustainable range of services that meet the actual needs of the residents. The water supply provides ratepayers with access to wholesome water to each residence and commercial proper in those communities served and provides for fire fighting in those communities as well.

The over-riding management strategy is that the Water Supply infrastructure as it presently exists will be maintained in the same state in perpetuity.

Table 2.3 – Community outcomes

Community Outcome	Contributions of the Water Supply Activity towards the Outcomes
'Safe, effective and sustainable infrastructure' ***'An attractive and highly valued natural environment'*** ***'A thriving economy'***	By ensuring that public water supplies provide wholesome drinking water and that private supplies are monitored and that adequate supply is provided in "on demand" schemes for firefighting. By endeavouring to provide adequate public supplies to allow for irrigation of gardens and green areas in schemes where a treatment system that will meet the drinking water standards for New Zealand can economically treat the volume of water required. By ensuring that adequate public supplies are provided for household and industrial use at an affordable cost.

2.8 ASSET MANAGEMENT DRIVERS

The business drivers, which define the need, priority and scope for improved AM practices within Council may be summarised as follows:

Customer Service
Customers require that agreed levels of service be delivered reliably, efficiently and economically. The use of AM techniques provides the following benefits in satisfying these demands:

- focuses on identifying and satisfying customer requirements
- provides a basis for customer consultation when determining levels of service preferences by identifying the range and cost of service level and service delivery options

- enhances customer confidence that funding is being allocated in an equitable and cost effective manner; that assets are being well managed and improves understanding of service level options and requirements

Financial Responsibility
The Local Government Act requires Local Authorities to:

- prepare and adopt, every three years, a long term (10 years plus) financial strategy for all infrastructural assets which takes into account asset creation, realisation, and loss of asset service potential
- determine their long term financial strategy, consider all relevant information and assess the cost/benefit of alternatives
- adopt a financial system consistent with generally accepted accounting practices
- manage assets prudently in the interests of the district and its inhabitants
- fund or otherwise provide for loss of service potential (deferred maintenance or depreciation) from July 1999

The implementation of the optimised work programmes and resulting long-term cash flow projections contained in AMP's will aid compliance with these requirements.
AMP's (supported by appropriate processes, systems and data) should provide clear justification for forward works programmes (and associated funding programmes) and provide the ability to even out peak funding demands and account for changes in asset service potential.

Environmental Responsibility
Asset Management (AM) Planning demonstrates how MDC is addressing sustainable management of its physical resources while enhancing the protection of the environment as required under the provisions of the Resource Management Act.

Safety
AM planning addresses MDC's safety obligations through:

- adoption of appropriate design standards for the creation of new assets
- development of risk management practices

Economic Efficiency
The techniques incorporated into this AMP support economic efficiency by:

- providing a basis for monitoring asset performance and utilisation
- enabling asset managers to anticipate, plan and prioritise asset maintenance and renewal expenditure
- identifying under-funding of asset maintenance and renewal
- quantifying risk, leading to minimisation of high impact (financial and service level) failures and environmental effects and resulting in savings where asset renovation is less than the cost of replacement
- extending the life of an asset by optimising maintenance programmes and demand management

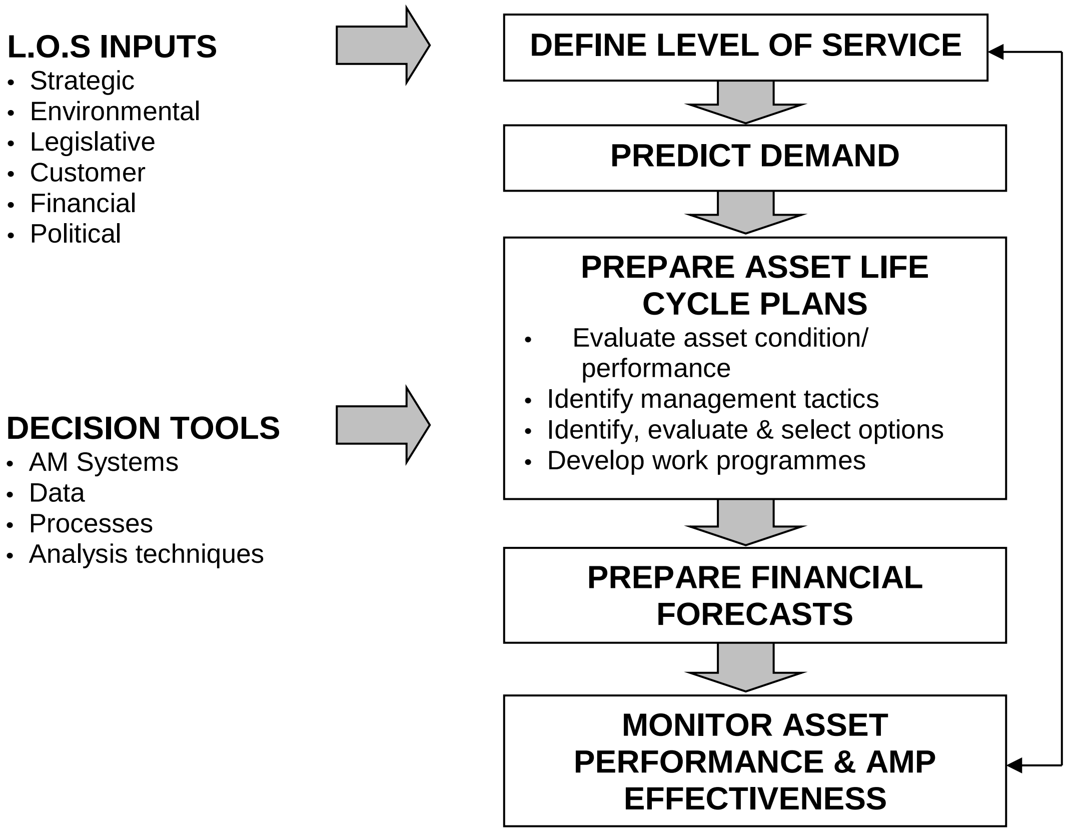
Achieve Strategic Goals
MDC has a strategic intent to "achieve sustainable development" and other goals relating to growth, building communities, protecting the environment, supporting the economy and providing quality customer service.

2.9 PLAN FRAMEWORK

This AMP is structured around the current asset inventories, the existing levels of service and consequential financial management plan for the next ten years. It includes Maintenance requirements, Renewals, and Capital improvements in terms of Council requirements.

This AMP generally follows the format recommended in the National Asset Management Steering Groups (NAMS) Infrastructure Asset Management Manual to a core level. Figure 2.5 shows the framework of this AMP.

Figure 2.5 – Water Supply AMP Framework



This AMP assumes that the current water supply will be maintained in perpetuity.

2.10 APPROPRIATE LEVEL OF ASSET MANAGEMENT

The International Infrastructure Management Manual (IIMM) provides a summary of the different degree asset management complexity: Minimum, Core, Intermediate and Advanced. The degree of complexity differs according to an organisation's corporate needs. The level of complexity of Asset Management is dependent on the following:

- The costs and benefits to the organisation
- Legislative and other mandated requirements
- The size, condition and complexity of the assets
- The risks associated with failures
- The skills and resources available to the organisation

- Customer expectations

A core Activity Management Plan will meet minimum legislative and organisational requirements for financial planning and reporting. It provides basic technical management outputs such as statements of current levels of service, forward replacement programmes and associated financial projections.

MDC considers the required sophistication of their plan in the short to medium term need not progress beyond a **“Core”** planning level, as:

- the cost at this time to move to an advanced plan would provide little significant benefit to Council or its’ customers
- the size, complexity and use of the assets is consistent with a rural sparsely populated district
- the risks associated with failure are low

The current Activity Management Plan generally meets “Core” requirements. By implementing improvement planning Council can assess the asset management performance and identify gaps to drive the improvement actions.

3. DESCRIPTION OF WATER SUPPLY ASSET

3.1 DESCRIPTION OF ACTIVITY

Water Supply management is the largest of three water activities with an annual expenditure of $3,881,833 (2014/15)

There are un-sophisticated networks in Fairlie, Tekapo, Twizel and Burkes Pass only, with a rural water supply for Allandale. In every case the water is obtained from ground water (Allandale is supplemented by the South Opuha River) and are generally treated with chlorine only (UV in Tekapo as well).

The Water Supply asset is made up of the following components, which are described in more detail in the sections below.

- Mains
- Service lines
- Break Pressure Tanks
- Restricted Supply Points
- Hydrants
- Meters
- Valves and Air Valves
- Plant
- Water Races

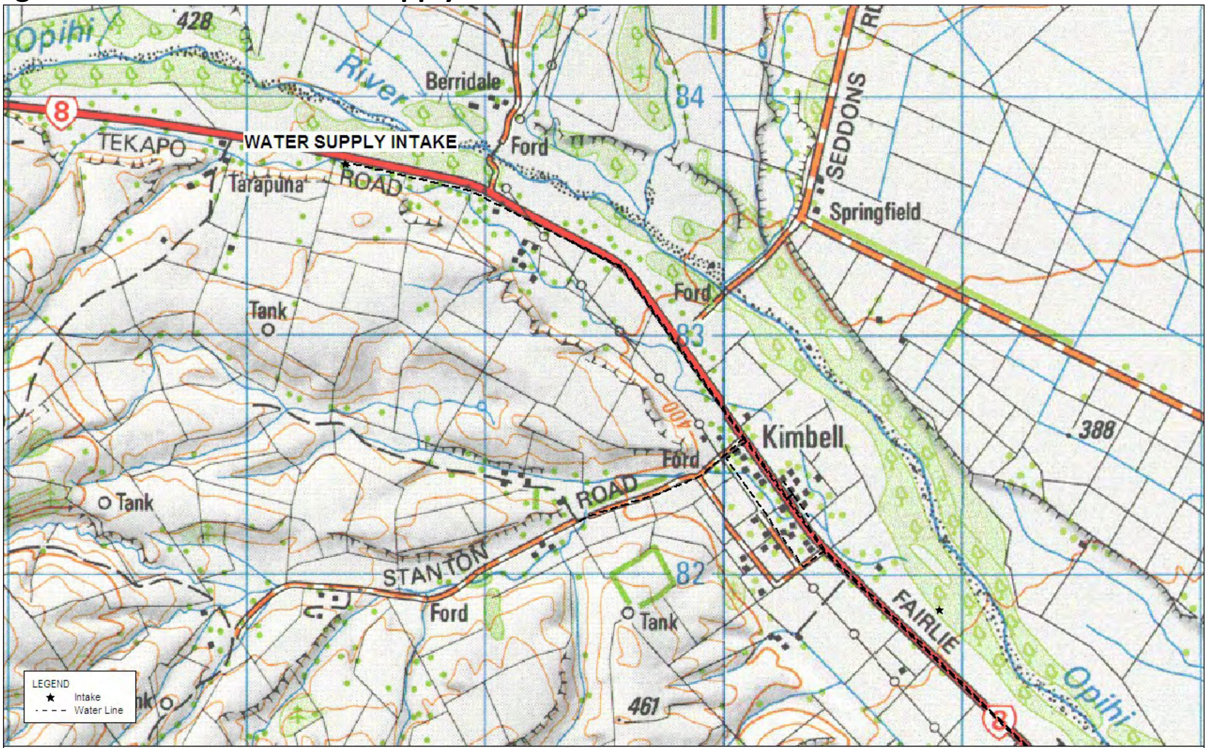
3.2 FAIRLIE

3.2.1 GENERAL

a)	Total population (2013)	
	Permanent	693
	At Holiday times	900
b)	Number of properties in area of benefit	
	Connectable	527

3.2.2 WATER SOURCE

Figure 3.2.2a - Fairlie Water Supply Intake Location



FAIRLIE WATER SUPPLY INTAKE

Figure 3.2.2b - Fairlie Water Supply Source and Intake Structure

The source for the Fairlie Water Supply is a spring adjacent to the Opihi River and beside State Highway 8 approximately 2.2kms North West of Kimbell township. The original intake structure at the spring was constructed in 1940 along with a 75mm diameter pipeline to the reservoir.

In 1961 another intake structure was constructed along with a 225mm concrete pipe line to the chlorination plant and a 150mm pipeline from the chlorination plant to the reservoir. The pipelines are connected at the chlorination plant to ensure all the water is chlorinated. The pipelines between the spring and the chlorination plant became blocked by tree roots in about year 2000. The 225mm line was unblocked and its replacement was budgeted for in 2007. The 75mm pipe remains blocked. In 2007 Council did replace the Trunk Main from the intake to the Chlorinator shed with a fusion welded pipeline (DN 250 PE PN6.3).

A report in 1973 estimated that the spring is capable of supplying 45,000 m^3/day.

The bacteriological concentration and turbidity of the spring water appear to be closely linked to the Opihi River water. The water has a low pH which may cause corrosion of household plumbing and consequent leaching of metals (blue stain on baths).

The spring has been fenced but it only provides a low level of security. Improvements to the security of the spring should be addressed.

Figure 3.2.2a shows the location of the source and Figure 3.2.2b is a view of the intake structure in the spring.

3.2.3 WATER TREATMENT PLANT

The Disinfection plant is situated adjacent to SH 8 approximately 1 km from the intake.
The WTP building is of concrete block construction. Photograph below shows the outside of the building. The building is well maintained.

Figure 3.2.3a - Chlorination Building

Figure 3.2.3b - Water Treatment Plant

Inside one half of the building is the Chlorination unit, which provides the residual disinfection for the reticulation.

In the other half of the building there is a turbidity meter which is measuring the degree of turbidity of the water. This will be important in the event that data is required for the design of a Water Treatment Plant. There is also a Magflow water meter in the line to measure and record the water use.

During periods when the power is interrupted to the site a standby generator is used to power the chlorination system to maintain the water treatment required.

3.2.4 RESERVOIRS / STORAGE – TREATED WATER

The Service Reservoir is at an elevation of 350m. The Top Water Level of the reservoir is 354m and it has a volume of 140m3. The service reservoir is incapable of providing sufficient storage for the township.

It was some leakage around the joints, but this is controlled to a degree by a Butynol liner inside the tank and the joints being repaired with Humebond.

There is also a 25,000 litre storage reservoir on Nixons road and a booster pump that feeds another 25,000 litre storage reservoir on School Road. This provides a potable supply to sections on School Road that would be unable to access the supply without it.

Figure 3.2.4a- Reservoir / Break Pressure Tank

A float valve on the inlet pipework controls the flow into the reservoir. One of the recommendations in the Fairlie Township Water Supply Strategic Study was to replace this service Reservoir with a capacity of 2000m3 as soon as possible.

3.2.5 TRUNK MAINS AND RETICULATION

The trunkmain route is within the grass verge running parallel and adjacent to SH 8. The Trunk Main running from the reservoir into Fairlie is 300mm uPVC. This is a new main installed in 2011 to replace the original 200mm concrete main.

The trunkmain also supplies a number of metered rural properties on the route into town, which may not have backflow preventers installed. Rural properties are known to contain contaminants that are dangerous to people and during high flows and low pressures backflow from these types of properties may occur.

There is approximately 21 kilometres of pipework. The remaining concrete pipe is understood to be the original material for the reticulation and is reaching the end of its life expectancy. It is noted that the rubber ring joints cause the major problem with the concrete pipes. During maintenance of the reticulation, samples of the pipework are recovered and the remaining life expectancy estimated. During periods of high demand and consequent low pressure the areas of Struthers Street loses water. Struthers St is provided with “Tank Supply”. On-property storage is required to meet demand during these periods. No evidence was found of air valves present in these positions to release trapped air.

Fairlie experiences a number of high demand periods during the summer months and this can cause pressure loss within the reticulation, therefore allowing the introduction of contamination into the reticulation. It is essential from a public health point of view that backflow is contained at the point of contamination.

Hosing restrictions are imposed during periods of very high demand to maintain reasonable pressure in the reticulation and to comply with conditions imposed by Environment Canterbury in the Resource Consent for the water take.

The charts below show the network layout, pipe material, age, diameter and condition.

DESCRIPTION OF WATER SUPPLY ASSET

Fairlie Water Network - Overview

0 500 1,000 2,000 metres

Scale 1:60,000

Property boundaries, 20m Contours, road names, rail line, address & title points sourced from Land Information NZ. Crown Copyright reserved. Property boundaries accuracy: +/-1m in urban areas, +/-30m in rural areas. Census data sourced from Statistics NZ. Postcodes sourced from NZ Post.
Assets, contours, water and drainage information shown is approximate and must not be used for detailed engineering design. Other data has been compiled from a variety of sources and its accuracy may vary, but is generally +/- 1m.

MAP PRODUCED BY:
MacKenzie District Council
PO Box 52, Main Street
FAIRLIE, NZ

ORIGINAL MAP SIZE: A4
DATE: 26/03/2015

DESCRIPTION OF WATER SUPPLY ASSET

Fairlie Water Network - Detail 1

0 75 150 300
metres
Scale 1:10,000

Property boundaries, 20m Contours, road names, rail line, address & title points sourced from Land Information NZ. Crown Copyright reserved. Property boundaries accuracy: +/-1m in urban areas, +/-30m in rural areas. Census data sourced from Statistics NZ. Postcodes sourced from NZ Post.
Assets, contours, water and drainage information shown is approximate and must not be used for detailed engineering design. Other data has been compiled from a variety of sources and its accuracy may vary, but is generally +/- 1m.

MAP PRODUCED BY:
MacKenzie District Council
PO Box 52, Main Street
FAIRLIE, NZ

ORIGINAL MAP SIZE: A4
DATE: 26/03/2015

Filepath: J:\Jana\Projects\Assets\AMP_2015\Fairlie_Detail1.mxd

DESCRIPTION OF WATER SUPPLY ASSET

3.2.6 RETICULATION

Summary of Fairlie Urban Water Supply System

Asset Type	Fairlie
Pipelines	41461m
Hydrants	111
Valves	125

Reticulation Description

The following tables have been compiled to show the extent and make-up of the systems.

Figure 3.2 – Pipe Size Distribution

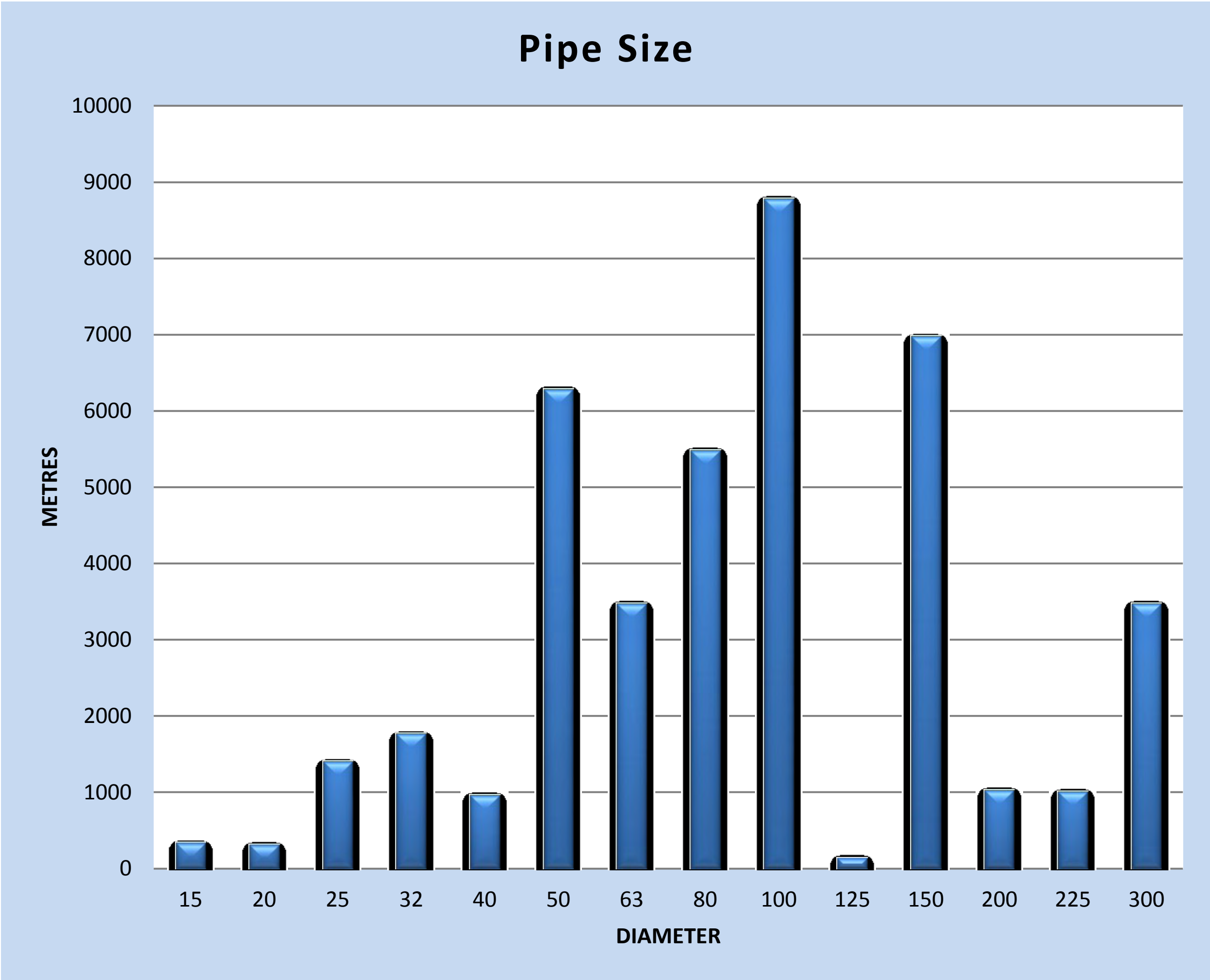


Figure 3.3 – Pipe Age Distribution

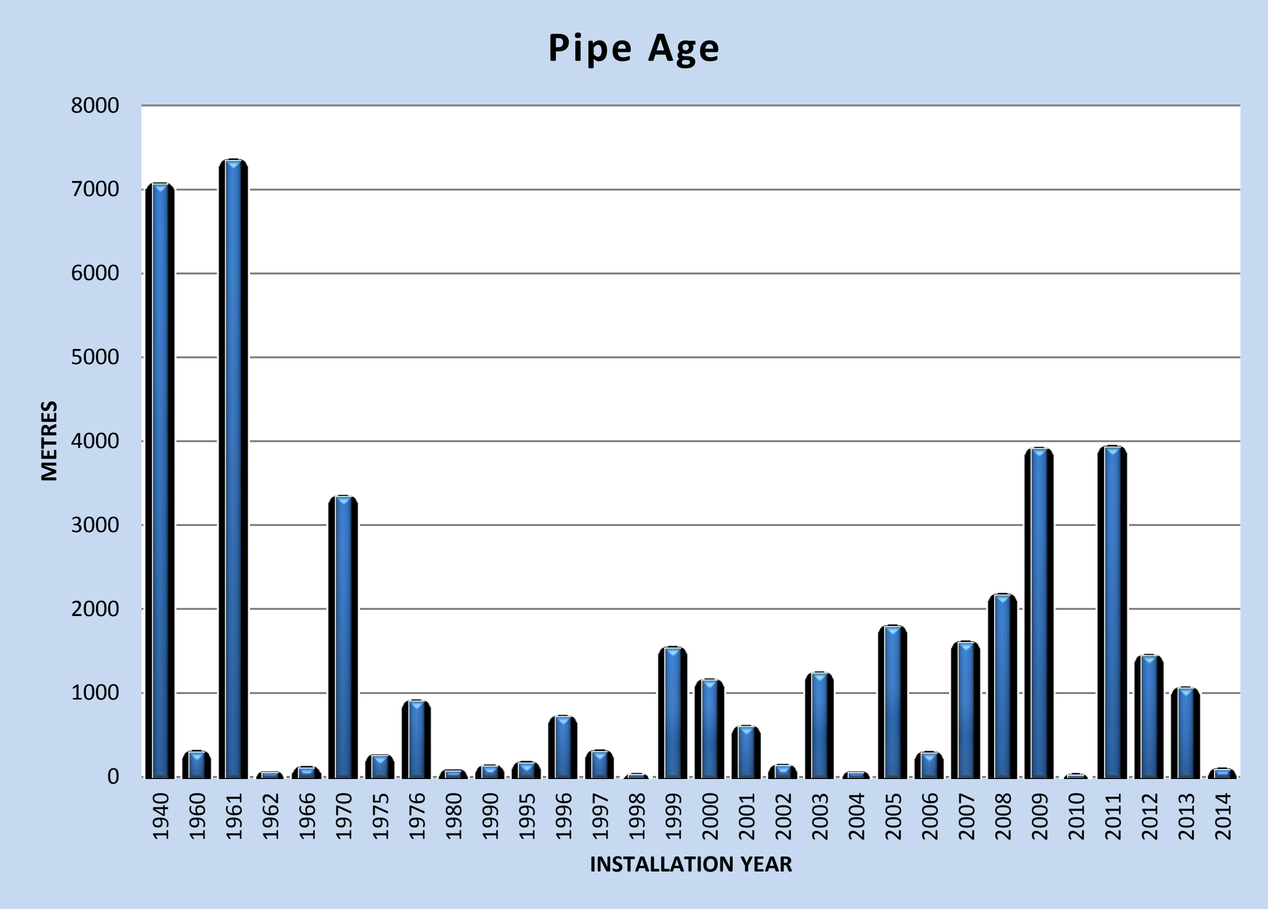


Figure 3.4 – Pipe Material Type Distribution

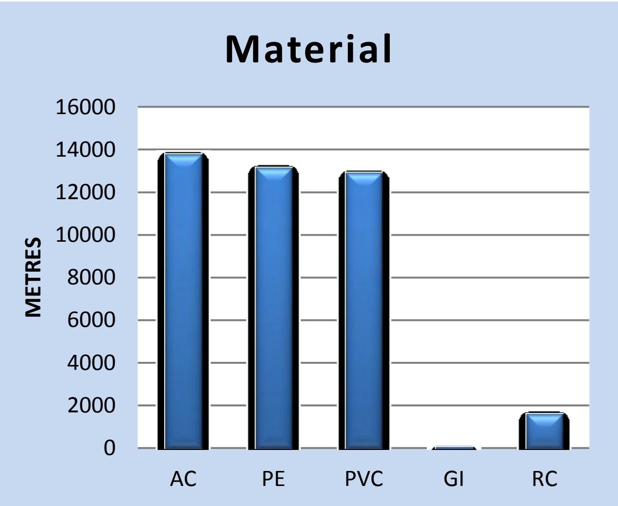
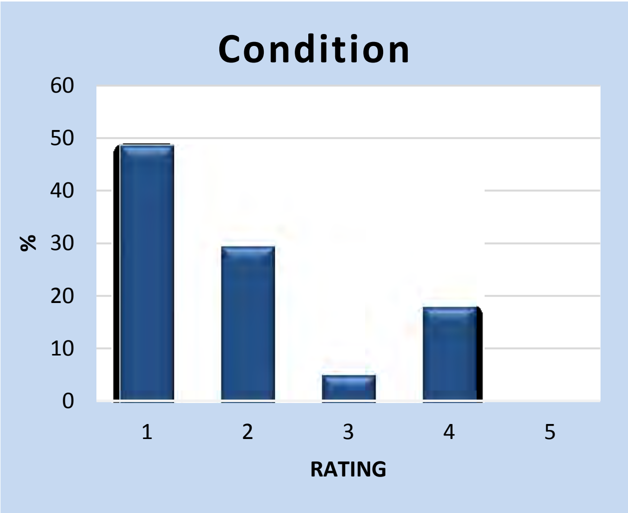


Figure 3.5 Current Condition Profile



Notes:

1 = **Very Good Condition** - Only normal maintenance required

2 = **Minor Defects Only** - Minor maintenance required (5%)

3 = **Maintenance Required to Return to Accepted Level of service** - Regular maintenance required (10-20%)

4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)

5 = **Asset Unserviceable** - Over 50% of asset requires replacement

A number of pipes are shown as condition 3 or 4, these are regularly monitored including visual inspection and sampling. This gives us the information to decide on a replacement programme.

3.2.7 WATER QUALITY

Most recent water supply grading	Ee
Target water supply grade	CC
Fluoridation	Nil
Disinfection	Chlorine Gas
Quality issues	During times of flooding in the Opihi the turbidity rises in the raw water. There is no recognised barrier for Giardia and Cryptosporidium.

3.2.8 RESOURCE CONSENTS HELD

Fairlie Water Supply	Consent No.	Type	Expiry Date
Fairlie	CRC040921	Water Permit	19-August-2044

The intake structure and pipe configuration limit the take to 28 litres/sec under normal operating conditions. As there is very little storage the water take closely follows the demand. A take of 28 litres/sec is sometimes reached during periods of high demand. Hosing restrictions are imposed when the demand exceeds 28 litres/sec or when there are low flows in the Opihi due to dry conditions and as a consequence restrictions in line with the Resource Consent are imposed.

3.2.9 FIRE FIGHTING CAPACITY

The Eversley Reserve area (which is within the Fairlie Urban Fire District) is zoned 'Rural' and has very low density housing. Most of the properties are supplied with small diameter pipes and there are no fire hydrants available except 3 fire hydrants on the trunk main on State Highway 8 and one on the corner of Railway and Gordon Streets.

The Fire Service occasionally tests the flows at fire hydrants and have not reported any serious deficiencies within the Fairlie Urban Fire District.

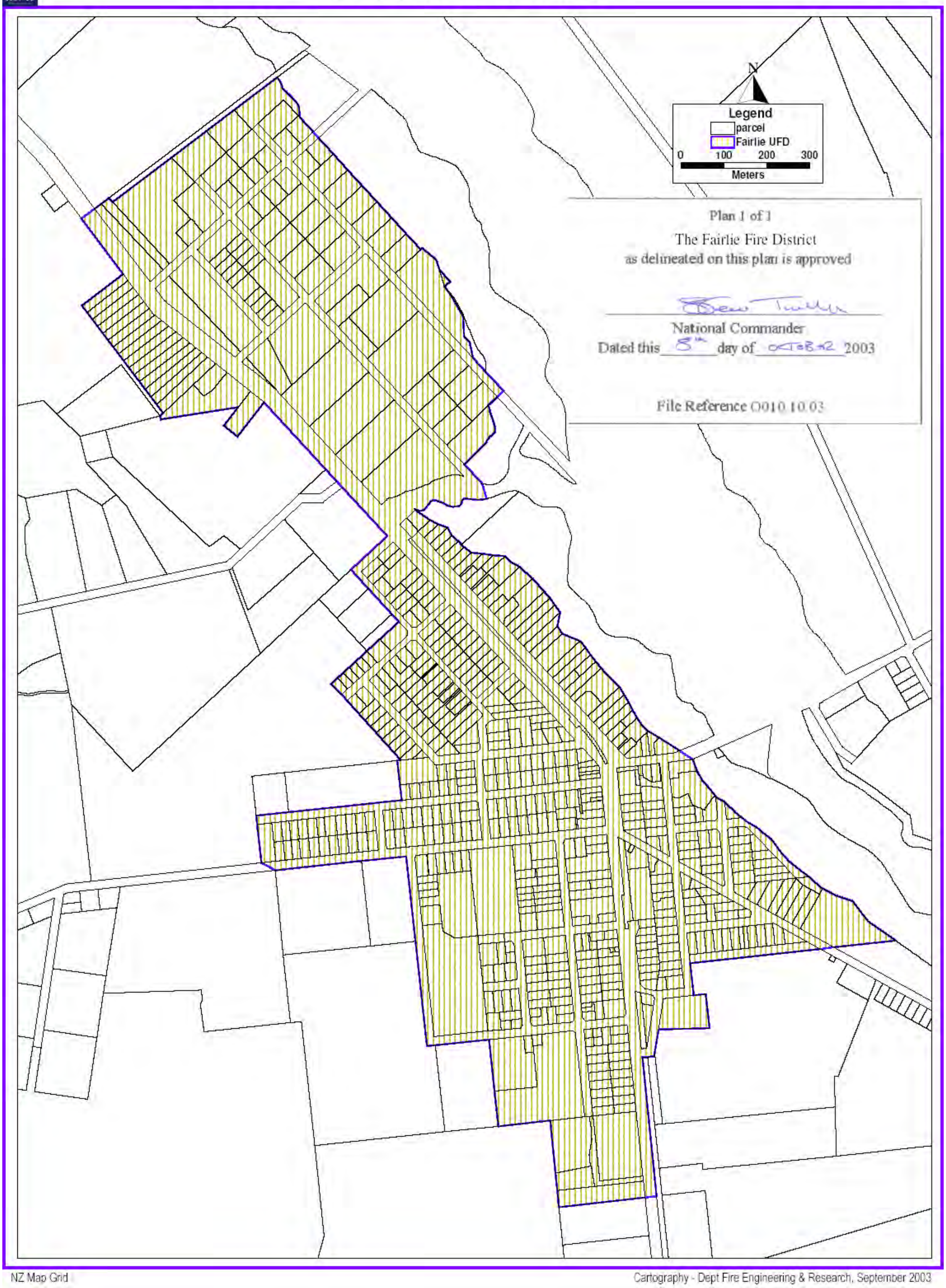
However, a hydraulic model of the reticulation indicates that it is not able to supply residential fire flows throughout a large part of the reticulation on top of other demand.

The fire flows could be improved in these areas by turning off other parts of the town while a fire is being fought.

There are fire hydrants on pipelines outside the Fairlie Urban Fire District which are incapable of delivering a fire flow eg: Allandale Road and the lower end of Talbot Rd. Other areas outside the Fairlie Urban Fire District which are supplied with small diameter pipe eg: Struthers St and Nixons Rd do not have fire flow capacity.

NEW ZEALAND FIRE SERVICE

Fairlie Urban Fire District



Note - Map to be reviewed in 2012

3.2.10 DAILY WATER USE / SYSTEM LOSSES

Council carries out regular leak detection programmes to determine the location of any system leaks. Any leaks that are located are then repaired thus reducing system losses. The initial survey in 2008 and follow up repair work reduced the line losses by 4 litres/sec.

3.2.11 FUTURE LIKELY WATER USE REQUIREMENTS

Historical data indicates a nil growth rate in Fairlie. The census figures between 1991 and 2013 also confirm this. It is conservatively assumed that the population will grow 0.5% per annum.

3.2.12 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The impact of this legislation is discussed in detail in Section 5

3.3 BURKES PASS

The small village of Burkes Pass currently is occupied by some permanent residents and some holiday homes. The scheme was first built around 1940 but over the years has been modified and extended.

3.3.1 GENERAL

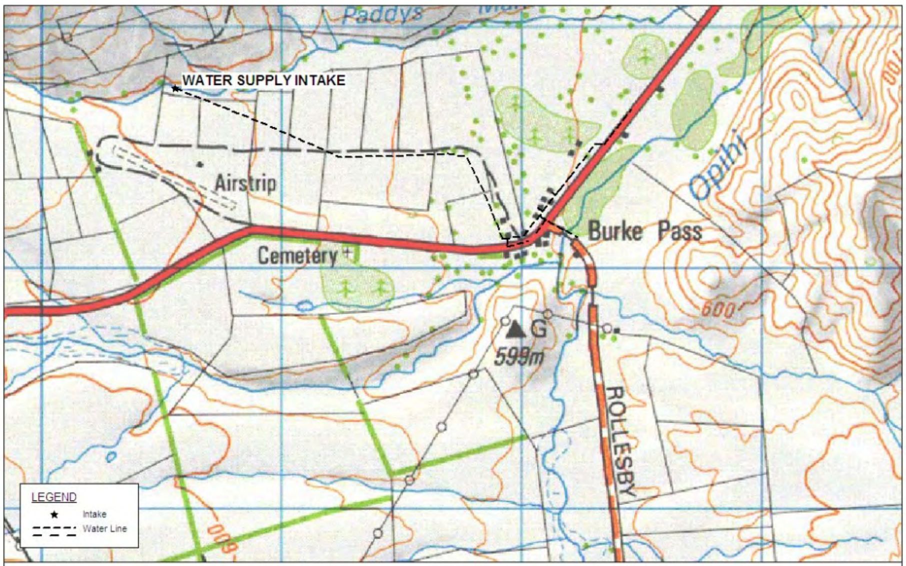
a)	Total population (2013)	
	Permanent	30
	At Holiday times	60
b)	Number of properties in area of benefit Connectable	18

3.3.2 WATER SOURCE

The source for the Burkes Pass water supply is an infiltration gallery in the bed of Paddy's Market Stream approximately north west of the village.

The infiltration gallery has been damaged and stock have access to the water course at the gallery. Council has a proposal to shift the gallery slightly upstream and fence off the creek bed for approximately 100m.

Figure 3.3.3a – Burkes Pass Water Supply Intake Location



BURKES PASS WATER SUPPLY INTAKE

3.3.3 WATER TREATMENT PLANT

The treatment is located adjacent to the intake gallery. It was upgraded in 2010 with the installation of two Dosatron dosing pumps.

The raw water is flow proportionally dosed with Calcium Hyperchloride solution using the two Dosatron dosing pumps. There is no mains power available at the site, the dosing pump is driven by water from the stream and the controls are powered by a 12 volt battery charged from a solar panel.

The water is filtered through an Arcle disk filter. This has to be regularly cleaned to eliminate blockage.

The treatment system is a low cost and generally reliable operation that requires regular inspection by the Contractor to ensure continuity of treatment.

3.3.4 RESERVOIRS / STORAGE – TREATED WATER

The reservoir for this supply is a 22,500 litre concrete tank.

3.3.5 TRUNK MAINS AND RETICULATION

Total length of reticulation. = 2984.

The pipe work is generally as shown however we believe there may be other material used as well on the trunk line to the township. This will be confirmed as maintenance is carried on the pipelines. The trunk main has been laid quite shallow and is at risk from farming operations.

The pipework is suitable only for tank supply however it is known that some properties have hose connections prior to the tank. If these supplies are used to any great degree it impacts on the service to the higher level properties. As the community is so small, this issue generally does not cause too many problems.

All new connections are supplied on a restricted supply basis.

DESCRIPTION OF WATER SUPPLY ASSET

3.3.6 RETICULATION

Summary of Burkes Pass Urban Water Supply System

Asset Type	Burkes Pass
Pipelines	2984 m

Reticulation Description

The following tables have been compiled to show the extent and makeup of the systems.

Figure 3.2 – Pipe Material Type Distribution

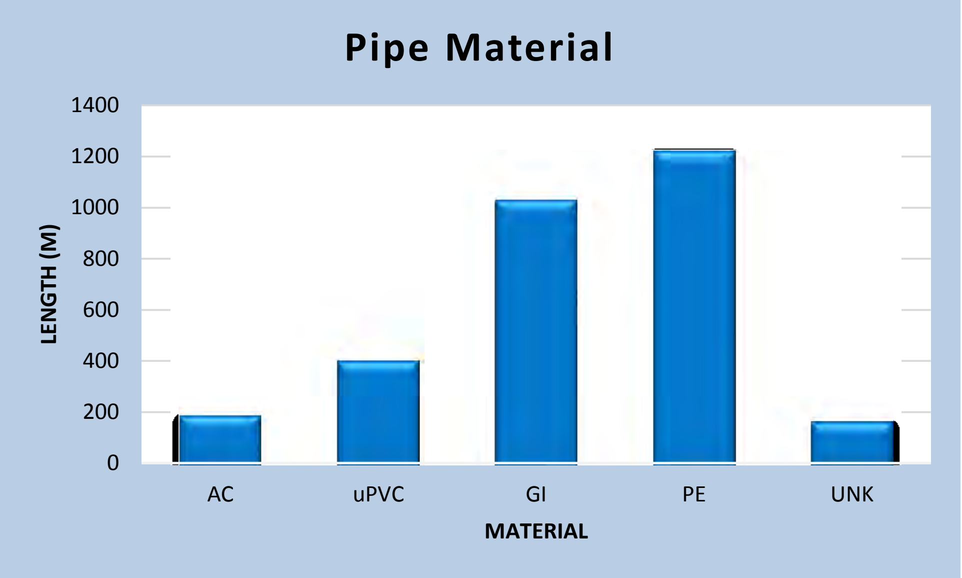


Figure 3.3 – Pipe Age Distribution

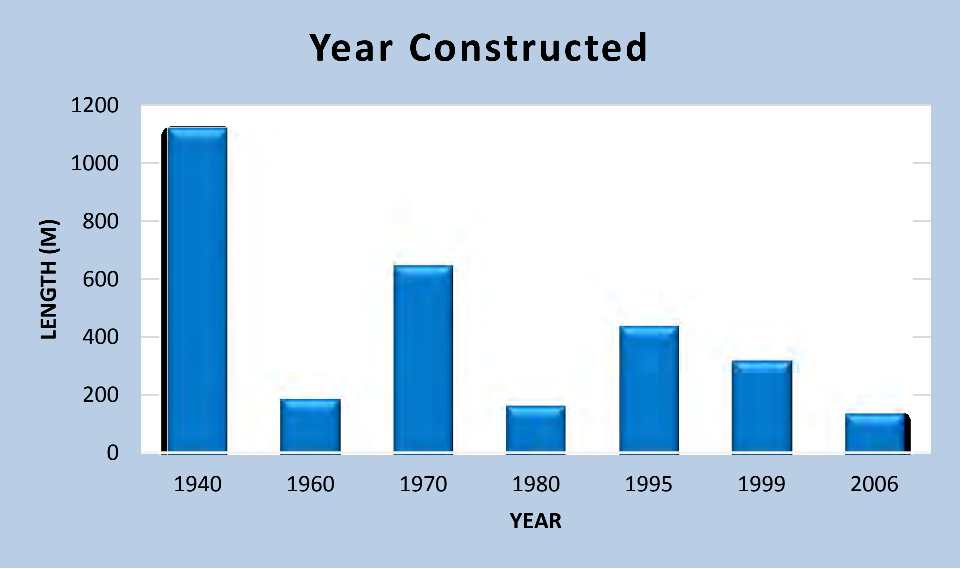
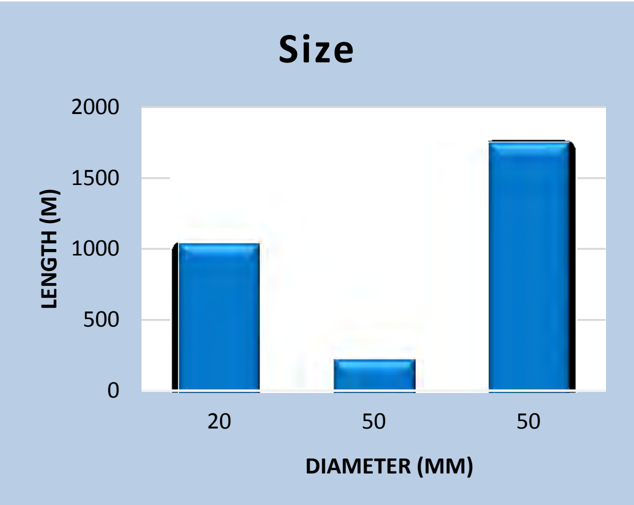
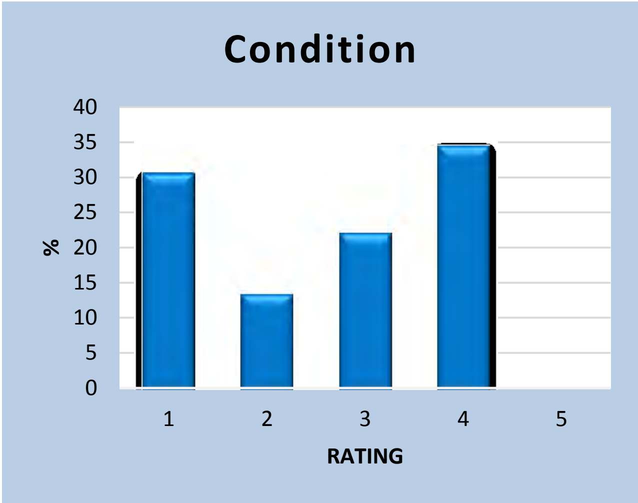


Figure 3.4 – Pipe Size Distribution **Figure 3.5 Current Condition Profile**





Notes:
1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Regular maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

A number of pipes are shown as Fair or Poor, these are regularly monitored including visual inspection and sampling. This gives staff valuable information to decide on replacement time frames.

3.3.7 WATER QUALITY

Most recent water supply grading	Ee
Target water supply grade	Cc
Fluoridation	Nil
Disinfection	Calcium Hyperchloride
Quality issues	Water take is from a surface stream that stock have access to.

3.3.8 RESOURCE CONSENTS HELD

Water Supply	Consent No.	Type	Volume Able to be Taken per Day (M3	Expiry Date
Burkes Pass	CRC971594	Water Permit	6 litres / sec (520 m3/day)	29-Oct-2032
Burkes Pass	CRC971593	Water Permit		29-Oct-2032
Burkes Pass	CRC971595	Water Permit	6 litres / sec (520 m3 daily)	29-Oct-2032

3.3.9 FIRE FIGHTING CAPACITY

The scheme has no fire fighting capability being a small bore scheme. There is a hydrant in front of the old café used only for scouring the line and drawing off small quantities of water.

3.3.10 DAILY WATER USE / SYSTEM LOSSES

On average each property uses 800 m3 per annum. Like all the communities in the Mackenzie a significant proportion of this is used for irrigation. A meter has been installed to better monitor the water use.

3.3.11 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The Ministry of Health agrees with a **4 log protozoal treatment** being appropriate as indicated in the catchment assessment using table 5.1a.

The following improvements are recommended for preventing, reducing or eliminating the identified public health risks in the Burkes Pass drinking water supply.

i) Treatment — Indications are that the supply will need to remain chlorinated, most likely go through a filtration process followed by UV disinfection.
ii) Storage — new reservoir for one day's storage
iii) Reticulation Renewal — Reticulation is renewed as required.

A Public Health Risk Management Plan has been completed and submitted to the Ministry for consideration.

3.4 LAKE TEKAPO

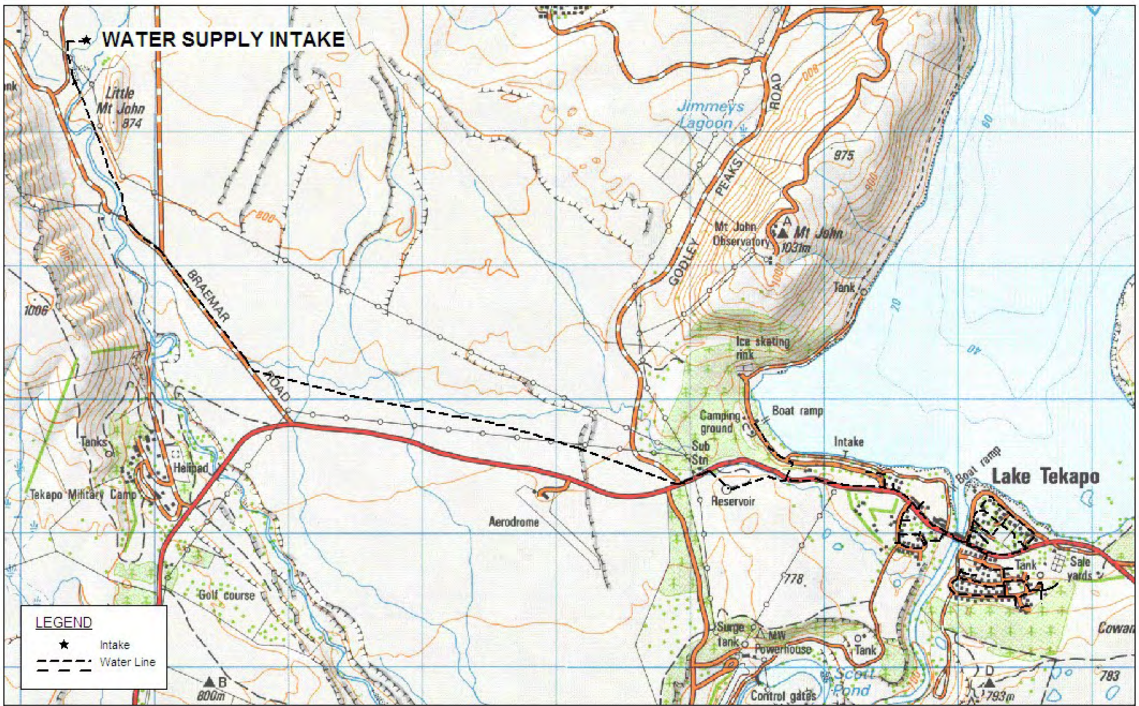
3.4.1 GENERAL

Tekapo is built on the shores of Lake Tekapo to build the original dam construction and power station. It now has developed into a holiday / tourist destination.

a)	Total population (2013)	
	Permanent	369
	At Holiday times	1050
b)	Number of properties in area of benefit	
	Connectable	687

3.4.2 WATER SOURCE

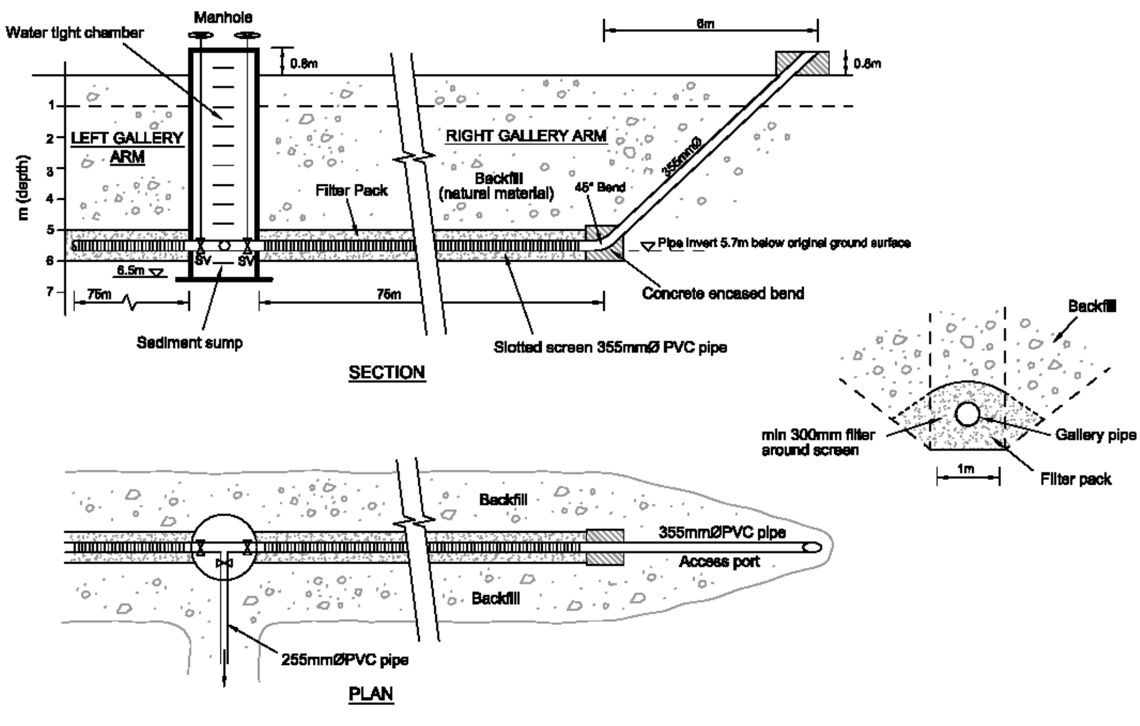
Figure 3.4.2a - Tekapo Water Supply Intake Location



TEKAPO WATER SUPPLY INTAKE

Figure 3.4.2b – Site layout

Figure 3.4.2c - Infiltration Gallery Layout



The source of the Tekapo water supply is a shallow aquifer besides the Forks River west of Little Mount John.
For further information see Paddle Dalamore report on y:\Asset Management\Reports.

3.4.3 WATER TREATMENT PLANT

3.4.3.1 Chlorination

The location of the Chlorine Dosing plant is shown on figure 3.4.2b Infiltration Gallery Layout off Braemar Rd. The building is well maintained.

Figure 3.4.3a - Chlorination Building

Note 1

The WWTP building is concrete tilt slab construction, photograph 3.4.2a shows the outside of the building. The treatment facility was constructed in 1998.

Inside one half of the building is the Chlorination unit, which provides the residual disinfection for the reticulation.
In the other half of the building there is a turbidity meter which is measuring the degree of turbidity of the water. Flow, FAC and ph is also measured on this site.

3.4.3.2 UV Treatment

The location of the UV treatment is located in a shed off State Highway 8 west of Tekapo. The treatment uses a Trogan UV reactor model D03 complete with all controls and Magflow metering.

3.4.4 RESERVOIRS / STORAGE – TREATED WATER

The reservoir construction is a poured in situ reinforced concrete storage tank of 1100m3, at an elevation of 780m.

Figure 3.2.4a- Reservoir / Break Pressure Tank

The reservoir provides only one days storage at the current average daily demand. This does not cause any problems as the supply is reliable and the turbidity is constantly within guidelines. The delivery of water to the reservoir is currently (flow can be boosted by a pump [not installed] if required) by gravity which also gives certainty to supply.

A float switch at the reservoir operates a diaphragm valve on the supply line beside SH 8 to control the water level in the reservoir.

The tank condition is consistent for its age with a little leakage which will need monitoring in the future.

With increased demand and development additional storage may be required. The elevation of the reservoir restricts supply to possible development in some areas without inline boosting.

3.4.5 TRUNK MAINS AND RETICULATION

The trunkmain route is overland through Mt John Station, crossing SH 8 near the sub-station then directly to the reservoir. This pipeline is a 225 dia uPVC. There are numerous air relief valves on the line including intermediate line valves or washouts on the trunkmain.

The trunkmain also supplies water to the Tekapo Airfield (metered) and the Horse Trekking operation (restricted) on Godley Peaks Rd.

There is approximately 6.8 kilometres of pipework in the trunkmain, this pipework is in excellent condition being only installed in 1998.

Tekapo reticulation is generally in good condition with initial pipework installed in 1955 and progressively since then.

There are 5885m of Asbestos Cement pipework within the reticulation that will need testing to confirm its condition and remaining life.

The charts below show the network layout, pipe material, age, diameter and condition.

Flow is boosted to the higher elevations in the Lochinver subdivision by an in ground booster pump set on Lochinver Avenue.

DESCRIPTION OF WATER SUPPLY ASSET

Tekapo Water Network

0 100 200 400 metres

Scale 1:12,000

Property boundaries, 20m Contours, road names, rail line, address & title points sourced from Land Information NZ. Crown Copyright reserved. Property boundaries accuracy: +/-1m in urban areas, +/-30m in rural areas. Census data sourced from Statistics NZ. Postcodes sourced from NZ Post.
Assets, contours, water and drainage information shown is approximate and must not be used for detailed engineering design. Other data has been compiled from a variety of sources and its accuracy may vary, but is generally +/- 1m.

MAP PRODUCED BY:
MacKenzie District Council
PO Box 52, Main Street
FAIRLIE, NZ

ORIGINAL MAP SIZE: A4
DATE: 19/03/2015

Filepath: J:\Jana\Projects\Assets\AMP_2015\Tekapo_Water.mxd

3.4.6 RETICULATION

Summary of Tekapo Urban Water Supply System

Asset Type	Tekapo
Pipelines	22432 m
Hydrants	61
Valves	136

Reticulation Description

The following tables have been compiled to show the extent and make-up of the systems.

Figure 3.2 – Pipe Size Distribution

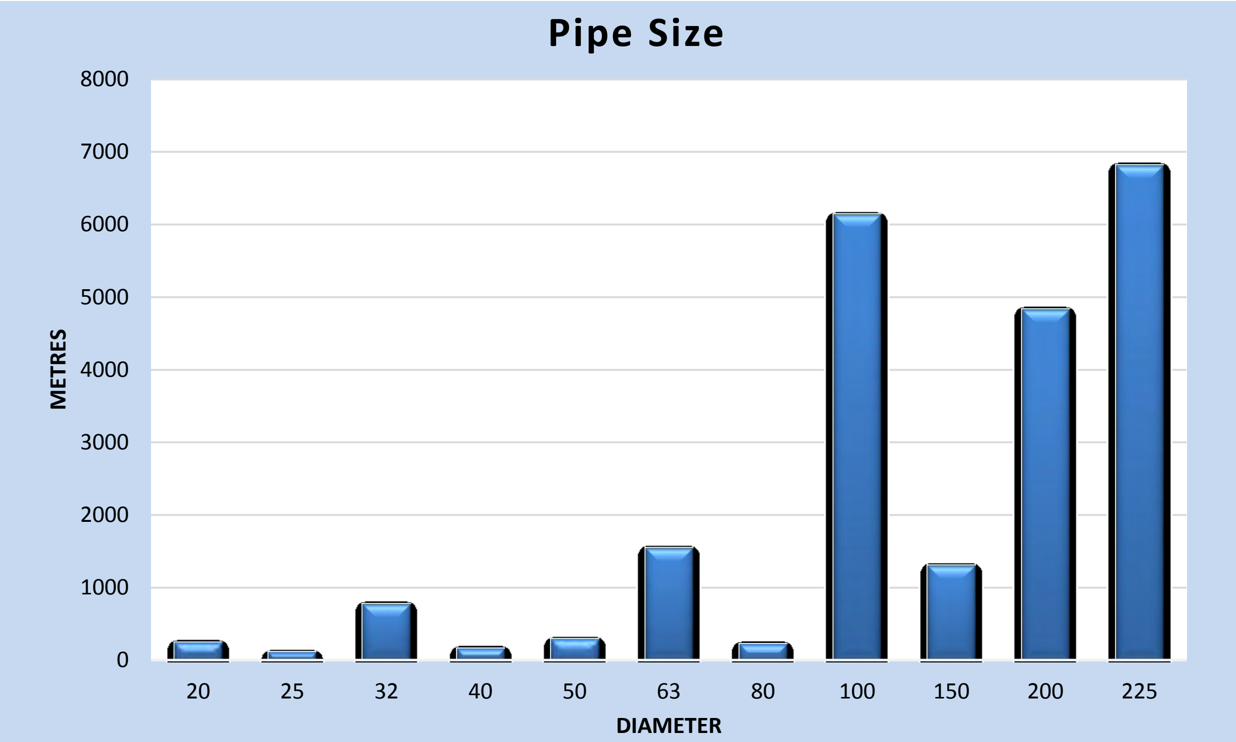


Figure 3.3 – Pipe Material Type Distribution

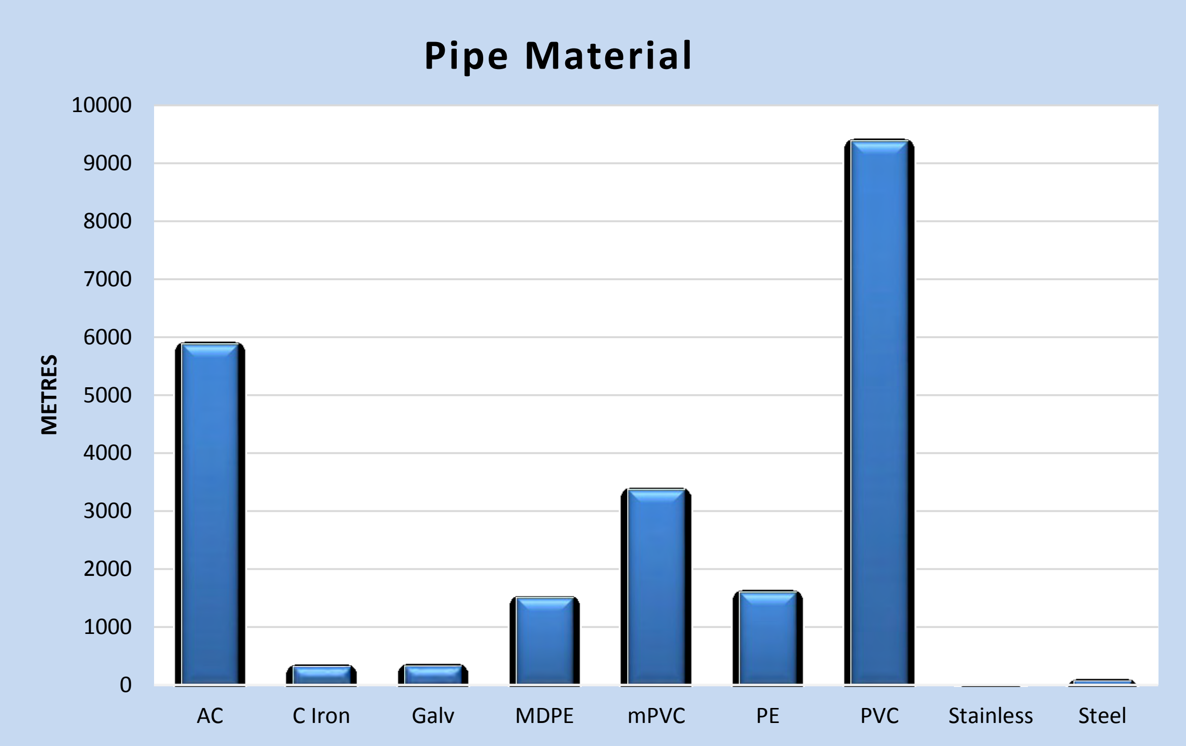


Figure 3.4 – Pipe Age Distribution

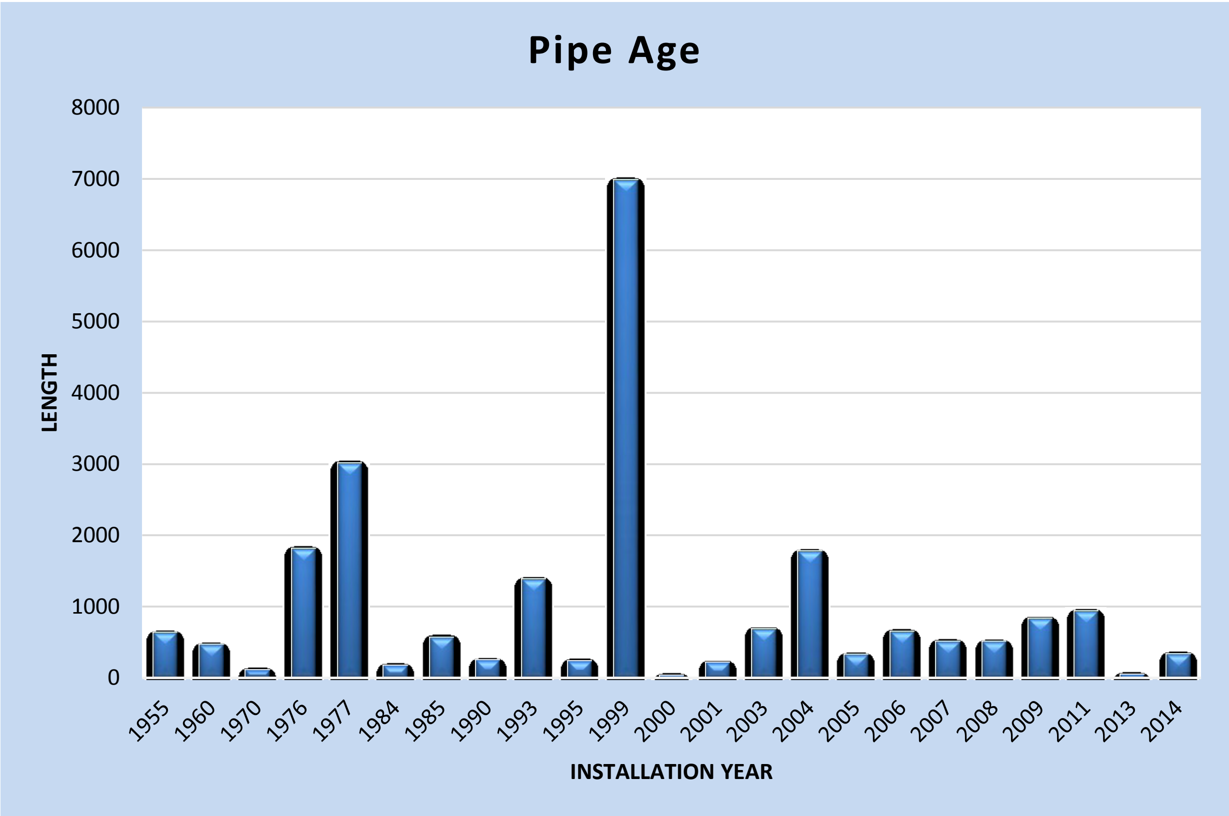
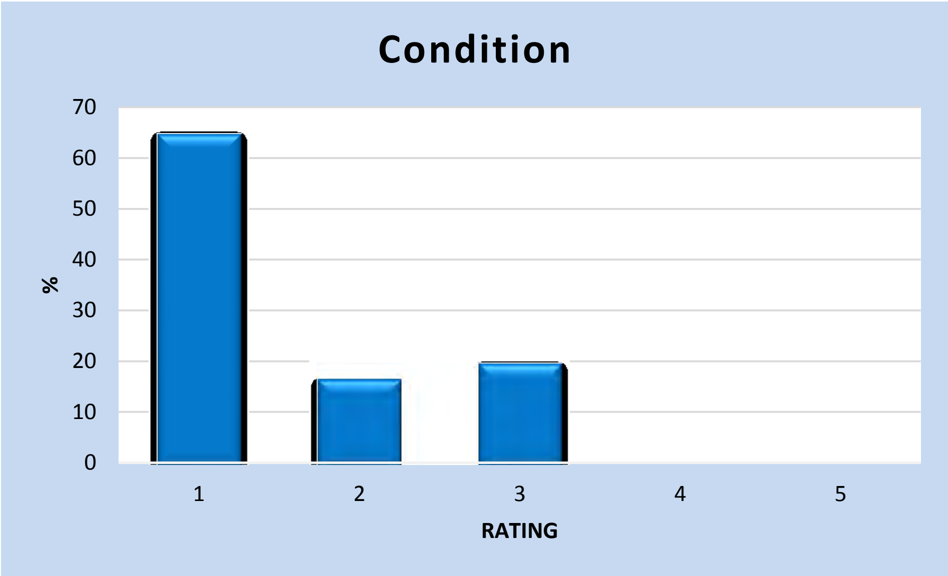


Figure 3.5 Current Condition Profile



Notes:
1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Regular maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

The majority of pipes (65%) are in very good condition with only 18% requiring maintenance to maintenance to keep them operational.

3.4.7 WATER QUALITY

Most recent water supply grading	Eb
Target water supply grade	CC
Fluoridation	Nil
Disinfection	Chlorine Gas
Quality issues	There are no water quality issues. Plant is fully NZDWS compliant.

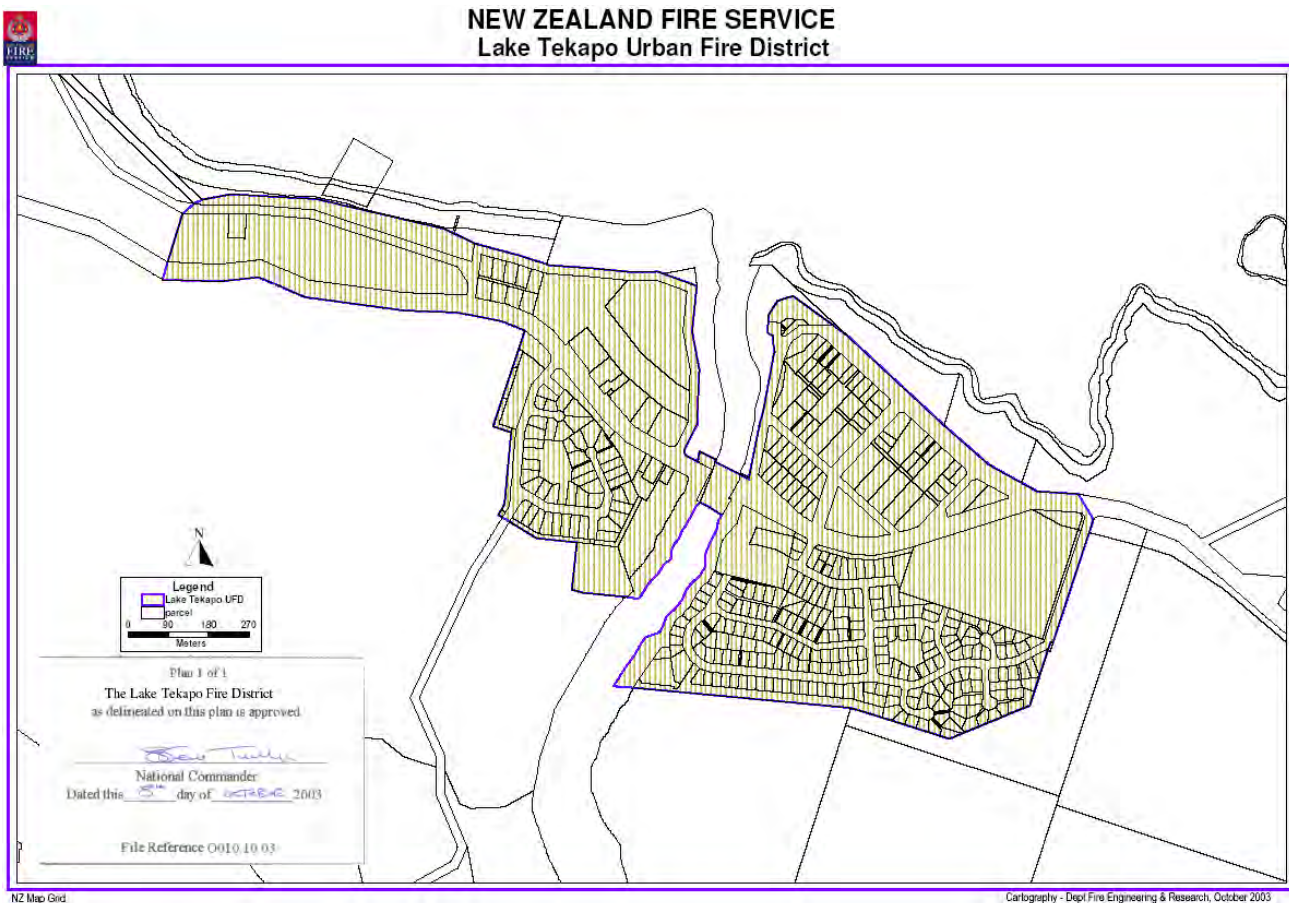
3.4.8 RESOURCE CONSENTS HELD

Water Supply	Consent No.	Type	Volume Able to be Taken per Day (M3	Expiry Date
Lake Tekapo	CRC971414	Water Permit	40 Litres / sec	13-Aug-2033
Lake Tekapo	CRC971413	Water Permit		13-Aug-2033

3.4.9 FIRE FIGHTING CAPACITY

The NZ Fire Service test flows and pressures at fire hydrants on a regular cycle and notify defects to Council for repair etc. There have been no flow or pressure issues notified.

All new water supply reticulation is required to meet the standards as defined in SNZ PAS 4509:2008, New Zealand Fire Fighting Code of Practice



Note - Map to be reviewed in 2012

3.4.10 DAILY WATER USE / SYSTEM LOSSES

Council carries out a regular leak detection programme to determine the location of any system leaks. Any leaks located will be repaired under the normal maintenance regime.

The daily water use per head is quite high due to the amount of irrigation required to maintain the landscaped areas within Tekapo.

3.4.11 FUTURE LIKELY WATER USE REQUIREMENTS

The census figures between 1991 and 2006 The census figures from 1991 to 2001 indicate a reasonably strong growth, for this area, in the Lake Tekapo Township. This is calculated as equating 4.5% per annum over the ten year period. This however should be treated with some caution as this reflects only the resident population.

The recent design for a new water source predicted a design population of 3,500 by 2017. This design population reflects the peak tourist population, not the resident population. It is anticipated that the resident population will increase at a lesser rate than the peak tourist population. Developments such as motels/hotels and subdivisions where the properties are purchased as holiday homes do not increase the resident population but have a significant effect on the peak tourist population capacity.

It is estimated that the resident population will increase at 5% to serve the peak tourist population. However the cost of housing in the township is at a level that a lot of workers serving the tourist industry can not afford to live there.

The only possible concern is the current trend to extensively landscape new subdivisions that require significant volumes of water to irrigate these features.

3.4.12 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The Ministry of Health agrees with a 3 log protozoal treatment being appropriate as indicated in the catchment assessment using table 5.1a.

The following improvements were implemented for preventing, reducing or eliminating the identified public health risks in the Tekapo drinking water supply.

i) Treatment — Indications are that the supply will need to remain chlorinated, be disinfected by UV.

This work was completed in 2012.

A Public Health Risk Management Plan has been completed and approved by the Ministry of Health.

3.5 TWIZEL

3.5.1 GENERAL

Twizel was constructed in 1970 to service the Upper Waitaki Hydro Development and was not supposed to survive the project. However extensive lobbying by the various groups ensured its survival and is now a significant holiday and tourist destination in its own right.

a) Total population (2013)

	Permanent	1,137
	At Holiday times	3500

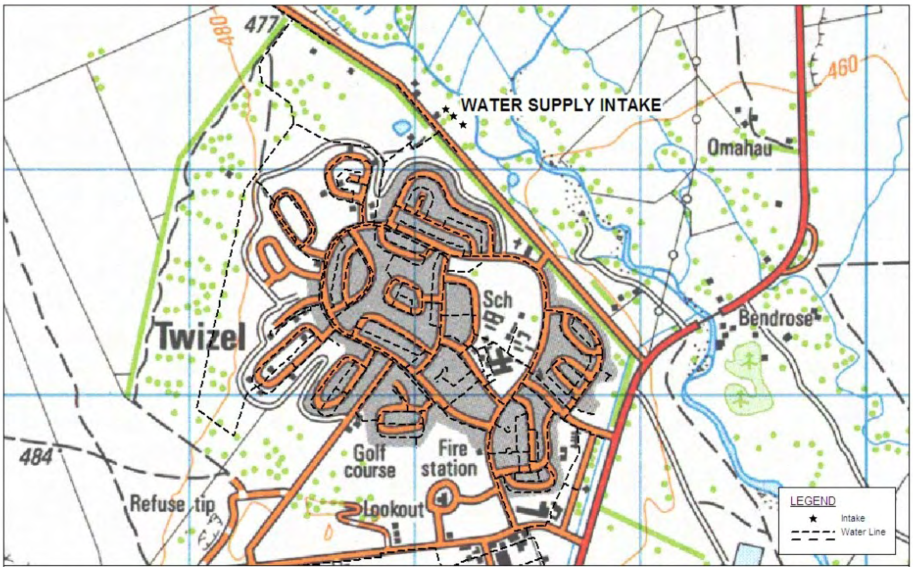
b) Number of properties in area of benefit

	Connectable	1769

3.5.2 WATER SOURCE

The source of the Twizel water supply is three wells (200mm dia pipe, 16.75m long, within a 1200mm Benoto bore 21.5m deep) drawing from a shallow unconfined aquifer besides the Fraser Stream adjacent to Glen Lyon Rd. The space between the bore and the 200mm dia pipe has been filled with washed gravels 8-25mm

Figure 3.2.2a - Twizel Water Supply Intake Location



TWIZEL WATER SUPPLY INTAKE

Figure 3.2.2b – Twizel Well Number 1

3.5.3 WATER TREATMENT PLANT

Until December 2011 the Twizel water supply was not treated. However at that time the Community Board installed a temporary a Sodium Hyperchloride solution proportional flow dosing plant to disinfect the supply as a result of an approach by the Medical Officer of Health. This system had some initial setup problems with odour due to die off of the biofilm build up. This was expected and after line flushing and time the odour and taste issues have been corrected.

The temporary system will be in place until the existing water supply is upgraded. There is also a 25 micron screen in the delivery line to filter out all matter larger than the screen apertures.

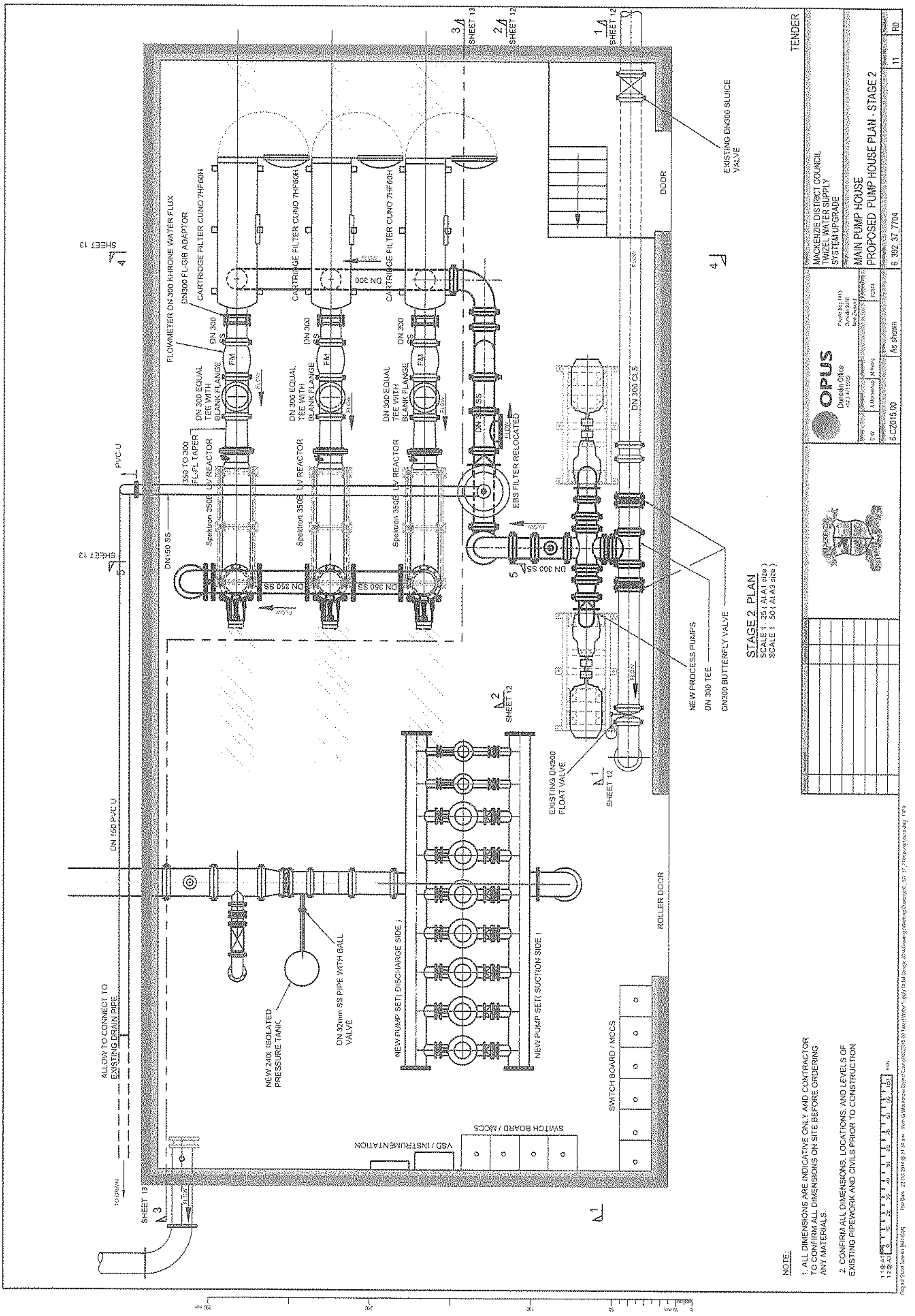
On a weekly basis the reservoir is hand dosed with Calcium Hyperchloride to suppress algae growth.

Note. During the project days the water supply was disinfected with Chlorine Gas and Fluoridated. The equipment was housed in the current pumphouse, built in 1970 and is located on Glen Lyon Rd adjacent to the reservoir.

In 2014/15 the existing pump set that provides pressure to the town has been completely replaced and all controls modernised. The treatment is also being upgraded to meet the DWS.

Figure 3.2.3a – Twizel Pumphouse

3.5.4 PUMPING SYSTEM



3.5.5 RESERVOIRS / STORAGE – TREATED WATER

There are two reservoirs serving Twizel. The open reservoir (7000m3) is an earth structure, waterproofed with a Butynol liner. Repairs were carried on the liner in 1992 and there is evidence that the liner needs further repair or replacement.

There is a covered reinforced concrete reservoir (500m3) beneath the pumphouse.

As noted earlier regular dosing of the uncovered reservoir is required with Calcium Hyperchloride to suppress algae growth.

The lack of cover is a potential source of contamination both from windblown material and wildlife.

The reservoir is programmed to be re-lined and covered in 2015/16.

Figure 3.2.4a- Uncovered Reservoir

Council and the Community Board have approved the complete rebuild of the existing water supply for Twizel. Based on various technical reports from its advisors - Opus International Consultants.

Twizel Water Supply Investigation (Issues and Options)
Twizel Water Supply Investigation (Issues and Options) ADDENDUM
Twizel & Manuka Tce Water Supplies (Implementation Issues and Options)
Twizel Water Supply Options – 1 October 2013

3.5.6 TRUNK MAINS AND RETICULATION

Total length of reticulation. = 62751m

The rising main takes a direct route from the wells to the uncovered reservoir. This pipeline is a 300 dia AC with spiral welded steel pipe above ground.

Twizel reticulation is generally in good condition with the majority of pipework installed in the early 1970s and progressively since then. The initial pipework (100 mm dia and greater) for the village is Asbestos Cement pipe. This pipework has been the subject of recent specialist testing on various samples to determine its remaining life. Those tests have shown some alarming results with some sections of water main at risk of eminent failure due to softening of the pipe wall. As a consequence, a replacement programme has been devised that will see all the small diameter AC pipe replaced during the period 2015-35 at a cost of $3.7m (2015 dollars). This replacement programme is detailed in section six. Smaller rider mains are PVC and also in good condition.

There are also some small diameter galvanised iron pipe serving individual properties that have corroded so much as to restrict the flow to those properties. Council has an ongoing replacement programme for these service connections.

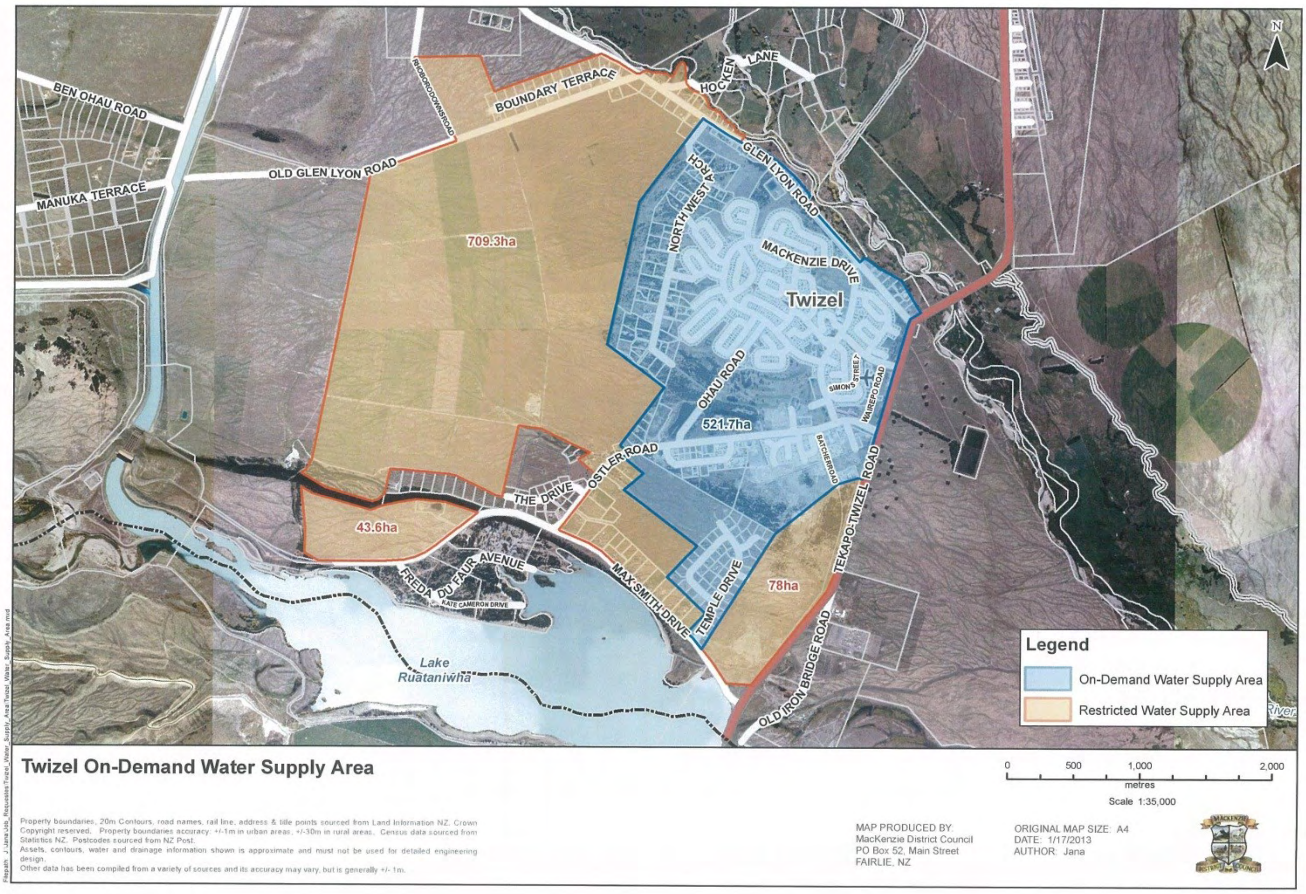
The network layout plan below shows the area where Council provides an “on-demand” supply in the residential area. Those areas outside that zone, but supplied with water from the Twizel water supply are only supplied as a restricted supply. Those properties are restricted to one unit (1820 litres/day) of water.

This is because those properties are generally larger than a residential section with the potential to use a large amount of water. The use of the restrictor eliminates the peak demand for those properties.

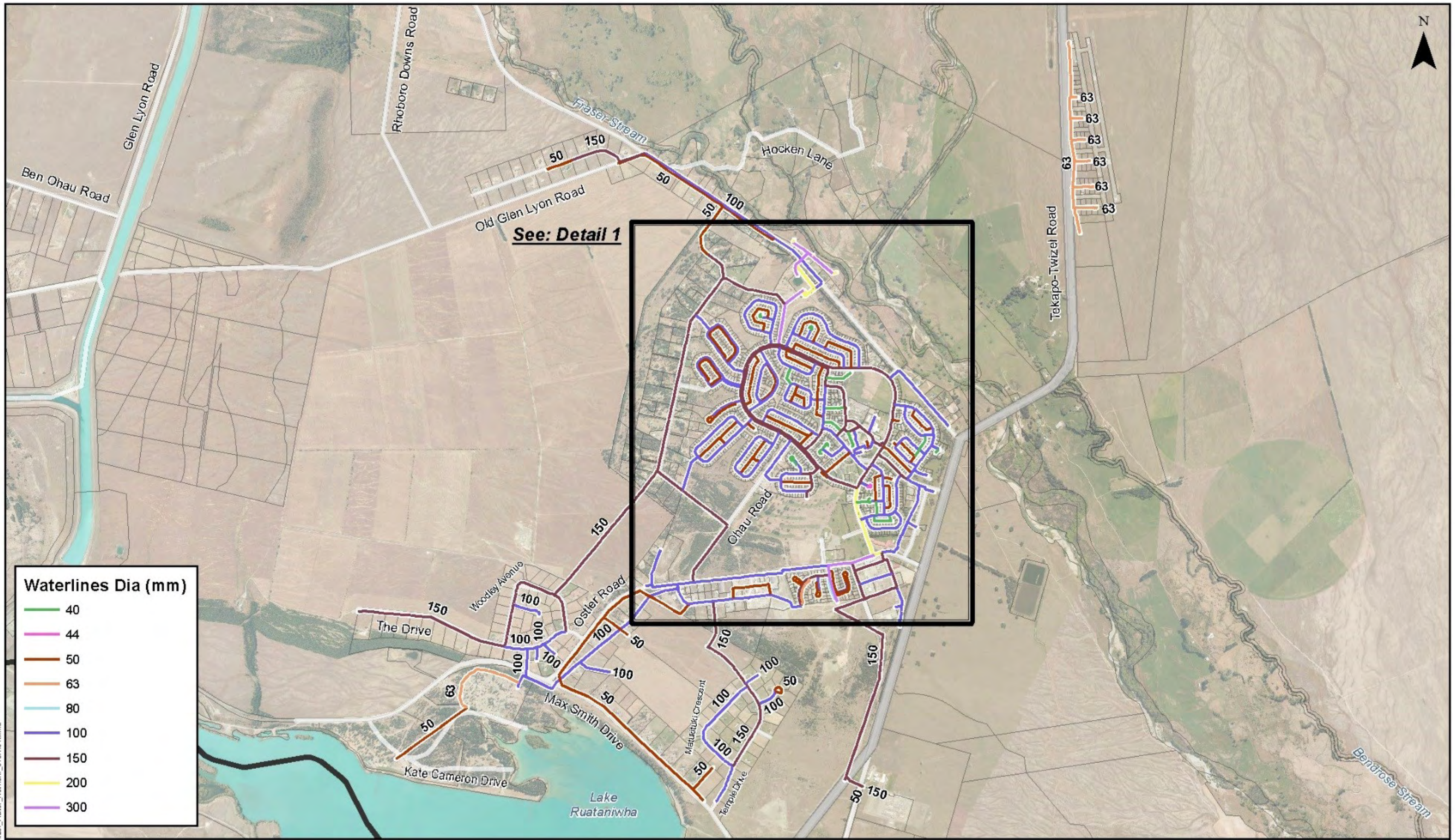
3.5.7 PUKAKI AIRPORT

There is also a stand alone water supply that serves the Pukaki Airport. It comprises a well, pumps and reticulation that provides to each section on a restricted basis. The asset registers are being updated to include this network.

Figure 3.5.6a- On-Demand Area



DESCRIPTION OF WATER SUPPLY ASSET



Twizel Water Network

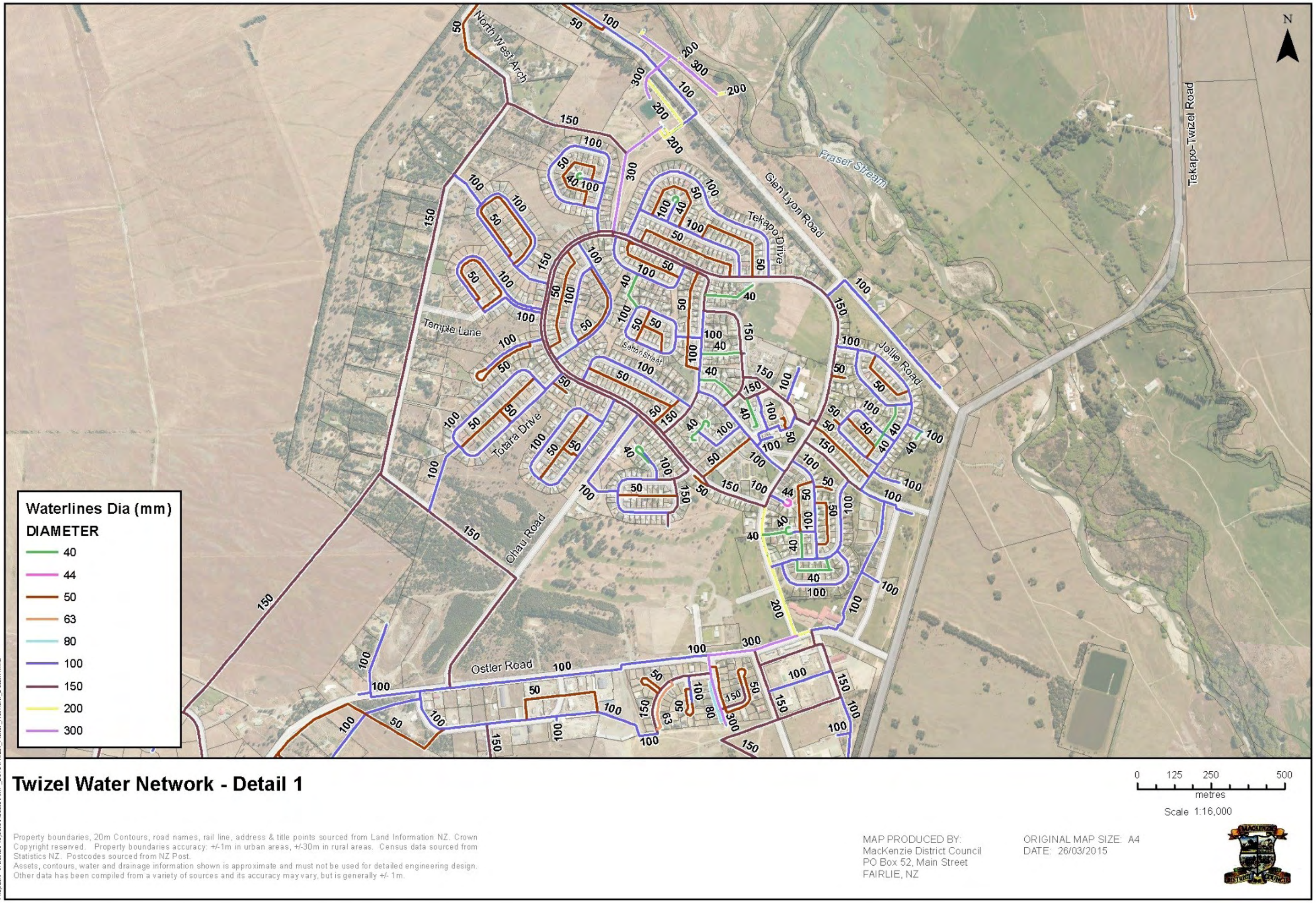
Property boundaries, 20m Contours, road names, rail line, address & title points sourced from Land Information NZ. Crown Copyright reserved. Property boundaries accuracy: +/-1m in urban areas, +/-30m in rural areas. Census data sourced from Statistics NZ. Postcodes sourced from NZ Post.
Assets, contours, water and drainage information shown is approximate and must not be used for detailed engineering design. Other data has been compiled from a variety of sources and its accuracy may vary, but is generally +/- 1m.

0 250 500 1,000
metres
Scale 1:34,000

MAP PRODUCED BY:
MacKenzie District Council
PO Box 52, Main Street
FAIRLIE, NZ

ORIGINAL MAP SIZE: A4
DATE: 26/03/2015

DESCRIPTION OF WATER SUPPLY ASSET



3.5.8 RETICULATION

Summary of Twizel Urban Water Supply System

Asset Type	Twizel
Pipelines	62751 m
Hydrants	243
Valves	421

Reticulation Description

The following tables have been compiled to show the extent and make-up of the systems.

Figure 3.2 – Pipe Size Distribution

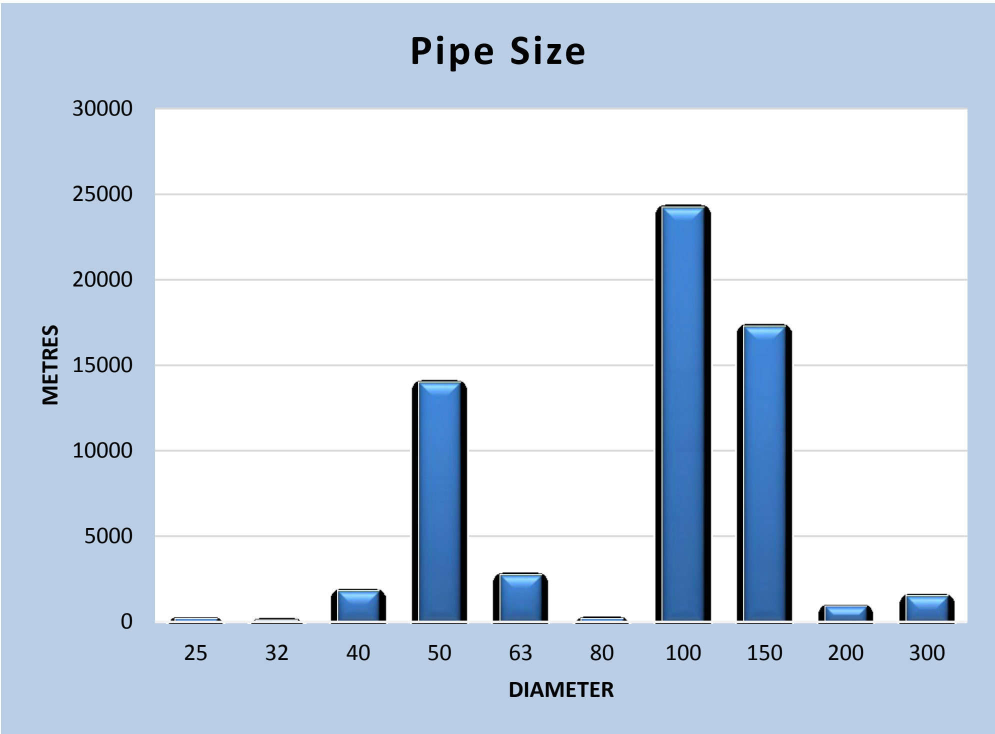


Figure 3.4 – Pipe Age Distribution

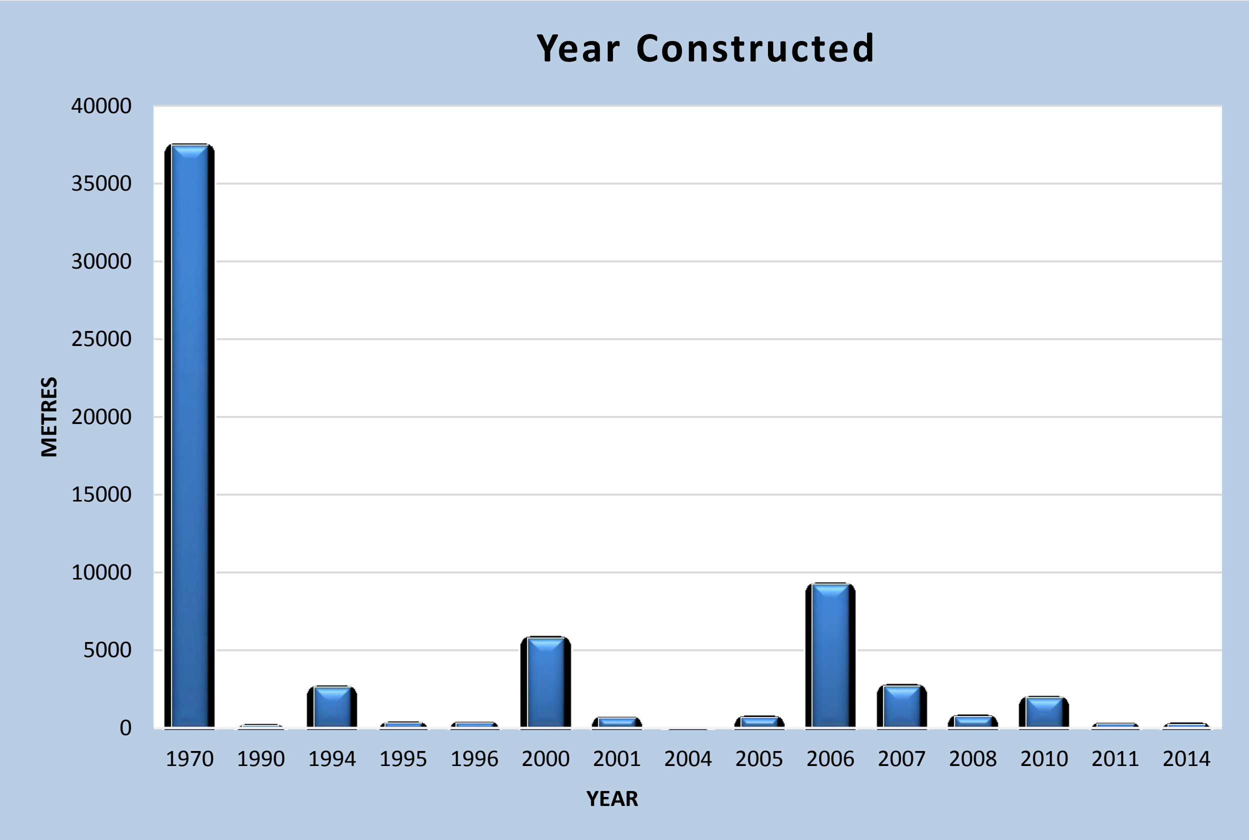


Figure 3.4 – Pipe Material Type Distribution

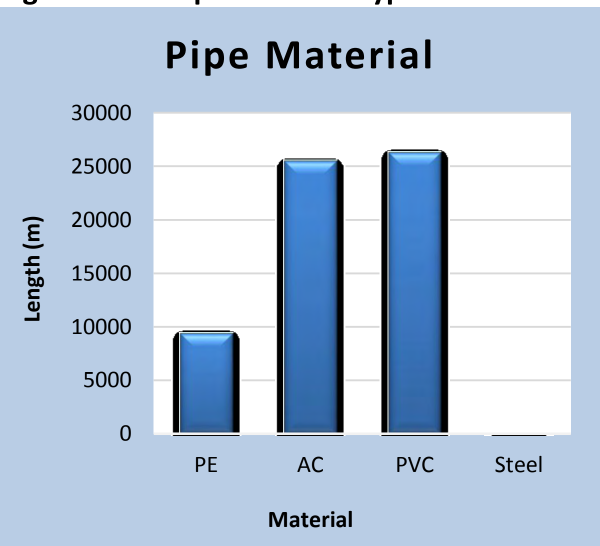
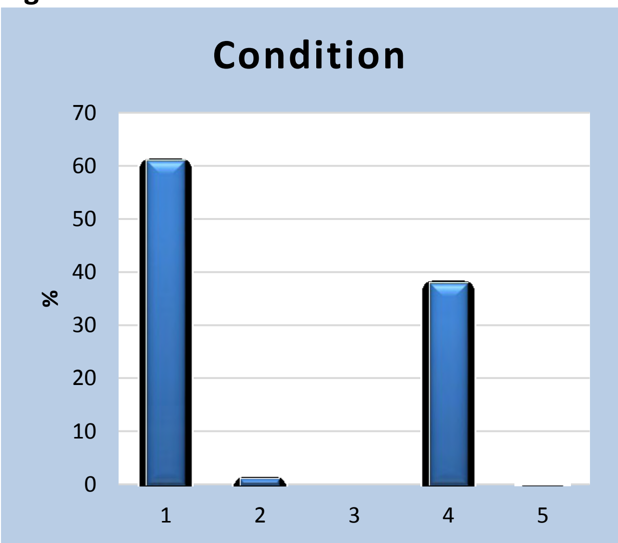


Figure 3.5 Current Condition Profile



Notes:

1 = **Very Good Condition** - Only normal maintenance required

2 = **Minor Defects Only** - Minor maintenance required (5%)

3 = **Maintenance Required to Return to Accepted Level of service** - Regular maintenance required (10-20%)

4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)

5 = **Asset Unserviceable** - Over 50% of asset requires replacement

The majority of pipes (54%) are in very good condition with less than 3% requiring maintenance to maintenance to keep them operational.

3.5.9 WATER QUALITY

Most recent water supply grading	Ee
Target water supply grade	CC
Fluoridation	Nil
Disinfection	Chlorinated
Quality issues	There is no recognised barrier for Giardia and Cryptosporidium.

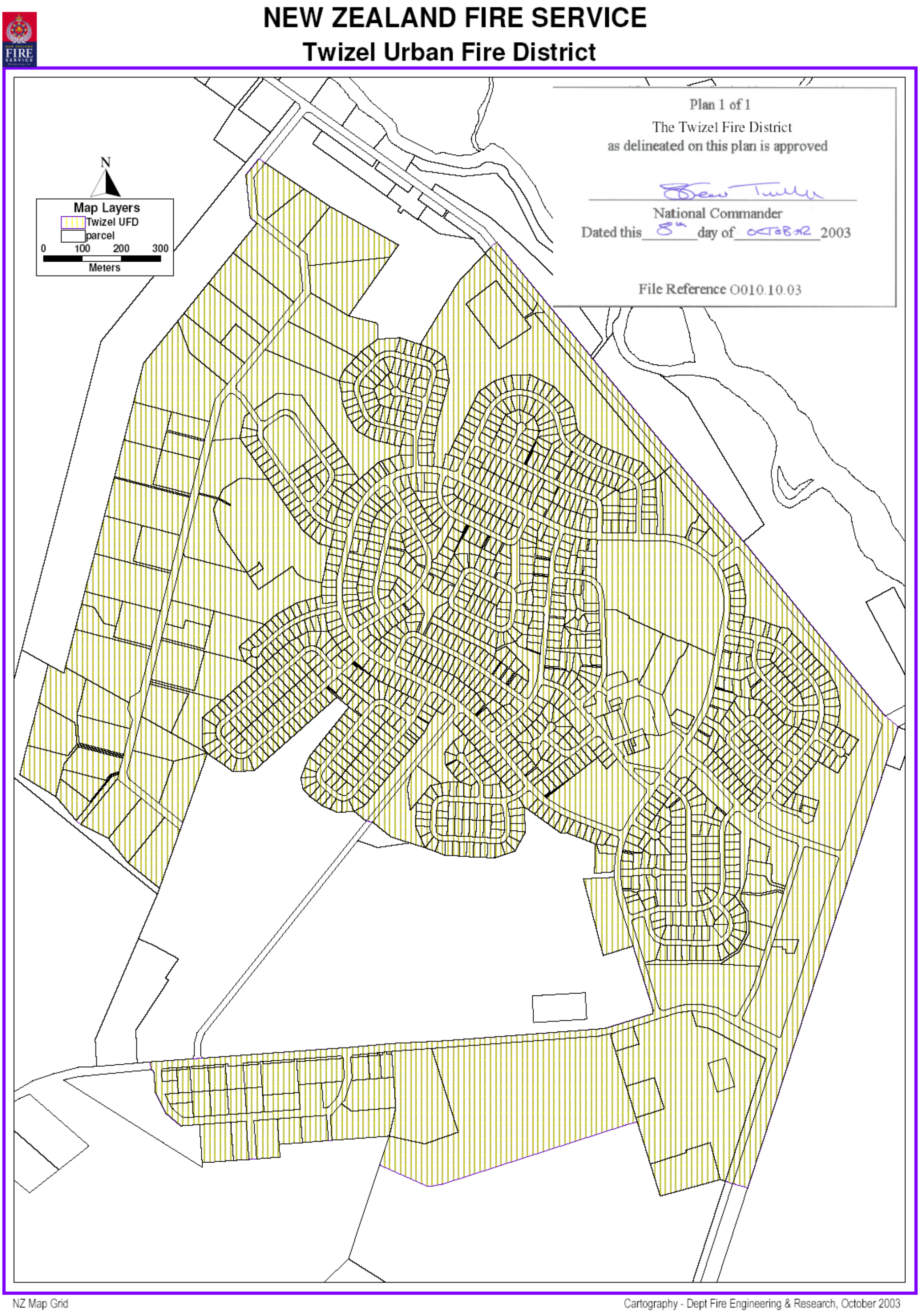
3.5.10 RESOURCE CONSENTS HELD

Water Supply	Consent No.	Type	Volume Able to be Taken per Day (M^3)	Expiry Date
Twizel	CRC042741	Water Permit	3,974m3 per day	20August 2047

3.5.11 FIRE FIGHTING CAPACITY

The NZ Fire Service test flows and pressures at fire hydrants on a regular cycle and notify defects to Council for repair etc. There have been no flow or pressure issues notified.

All new water supply reticulation is required to meet the standards as defined in SNZ PAS 4509:2008 New Zealand Fire Fighting Code of Practice



Note - Map to be reviewed in 2012

3.5.12 DAILY WATER USE / SYSTEM LOSSES

Council is carrying out a leak detection programme to determine the location of any system leaks. Any leaks located will be repaired under the normal maintenance regime.

The daily water use per head is very high due to the amount of irrigation, both private and public, required to maintain the landscaped areas within Twizel. During the peak day in February 2005, 8491m3 were consumed. This represents a daily demand of approximately 6m3 per property per day. NZS 4404:2004 suggests a figure of 1.5m3 per property per day.

3.5.13 FUTURE LIKELY WATER USE REQUIREMENTS

Census figures indicate that growth has remained static over the ten year period from 1991 to 2001. However, it is anticipated that a growth rate of 2% should be allowed in anticipation of the continued development as is currently being experienced.

Twizel is experiencing a growth in demand in a number of areas close to Twizel. These are creating rural/residential blocks on restricted supply.

Twizel experiences significant fluctuations in peak tourist population and in water demand largely due to sporting events such as rowing and skiing and the summer holiday tourists. Twizel has experienced peaks of up to 7000 people during rowing events.

Recent rezoning around Twizel has bought with it an expectation that water supply will be available. Council has completed its investigations into a possible new source and determined that the only viable option is to rebuild the current plant using the existing source. What this means is that all those areas outside the original Twizel area will either have to receive water on a restricted basis without full or any fire fighting capacity or the supply to those areas will require boosting to supply the required flows and pressures.

3.5.14 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The Ministry of Health agrees with a **4 log protozoal treatment** being appropriate for the existing source as indicated in the catchment assessment using table 5.1a using the catchment risk approach. The raw water cryptosporidium monitoring approach is being undertaken to determine if 3 log credit protozoal treatment is adequate for the current source.

Council has prepared and lodged a Water Safety Plan for this supply with the Ministry of Health. That WSP has been approved. As Twizel is growing further westward it is becoming more difficult to supply potable water to those new areas as an on demand supply and some form of in-line booster will be required.

Council is rebuilding the existing treatment plant to modernise the equipment provide for an improved supply and also meet the DWS.

This is covered in greater detail in Section 6.

3.6 ALLANDALE

3.6.1 GENERAL

The Allandale rural water supply is a 'Restricted Flow' supply. A restricted flow supply is where a small continuous flow is supplied by a flow control device across an air gap separation, and storage is provided by the customer to cater for his/her demand fluctuations.

a)	Total population (2006)	
	Permanent	291
b)	Number of properties in area of benefit	
	- Connected (inc Spur Rd)	524

3.6.2 WATER SOURCE

The water source for this supply is an infiltration gallery adjacent to the South Opuha River where it emerges from the gorge. This is a new intake constructed in 2003 has silted up over time and struggles to supply the required flow. The gallery is enhanced by two free draining gravel trenches to the edge of the river. Recently these trenches have silted up and a surface water take connection from the Ashwick supply has had to be installed. Didymo in the Opuha River is causing blockage to the inlet filters necessitating regular cleaning.

Figure 3.2.2a - Allandale Water Supply Intake Location

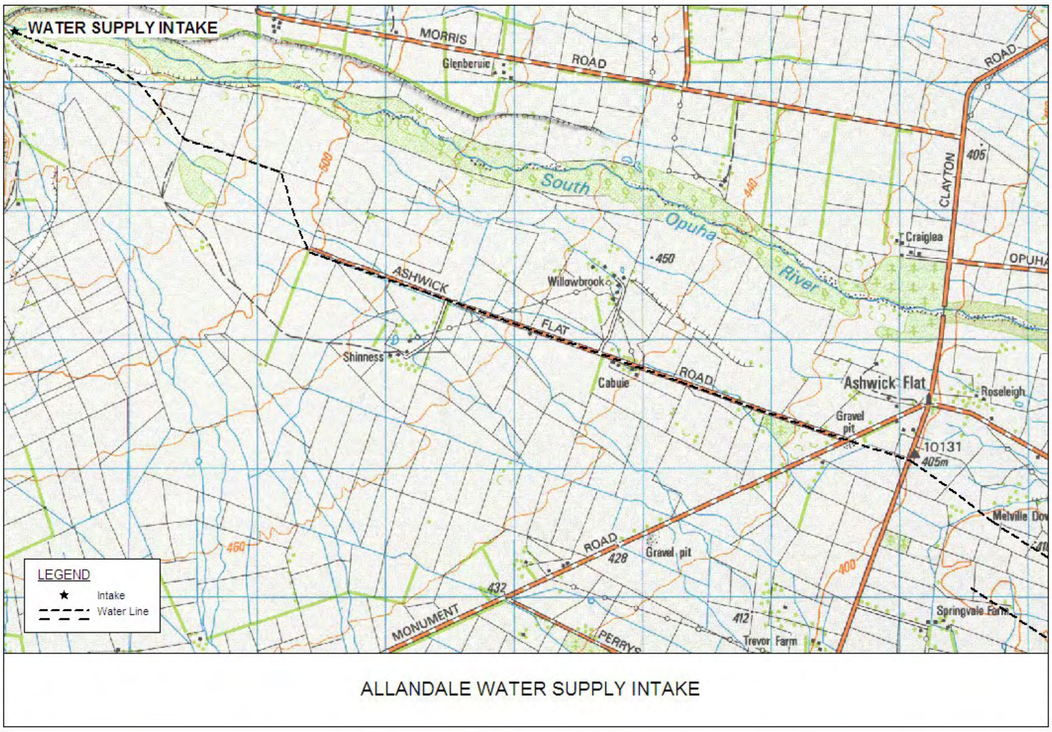


Figure 3.2.2b – Intake Gallery Site 1

3.6.3 WATER TREATMENT PLANT

Figure 3.5.2a– Allandale Water Treatment Site

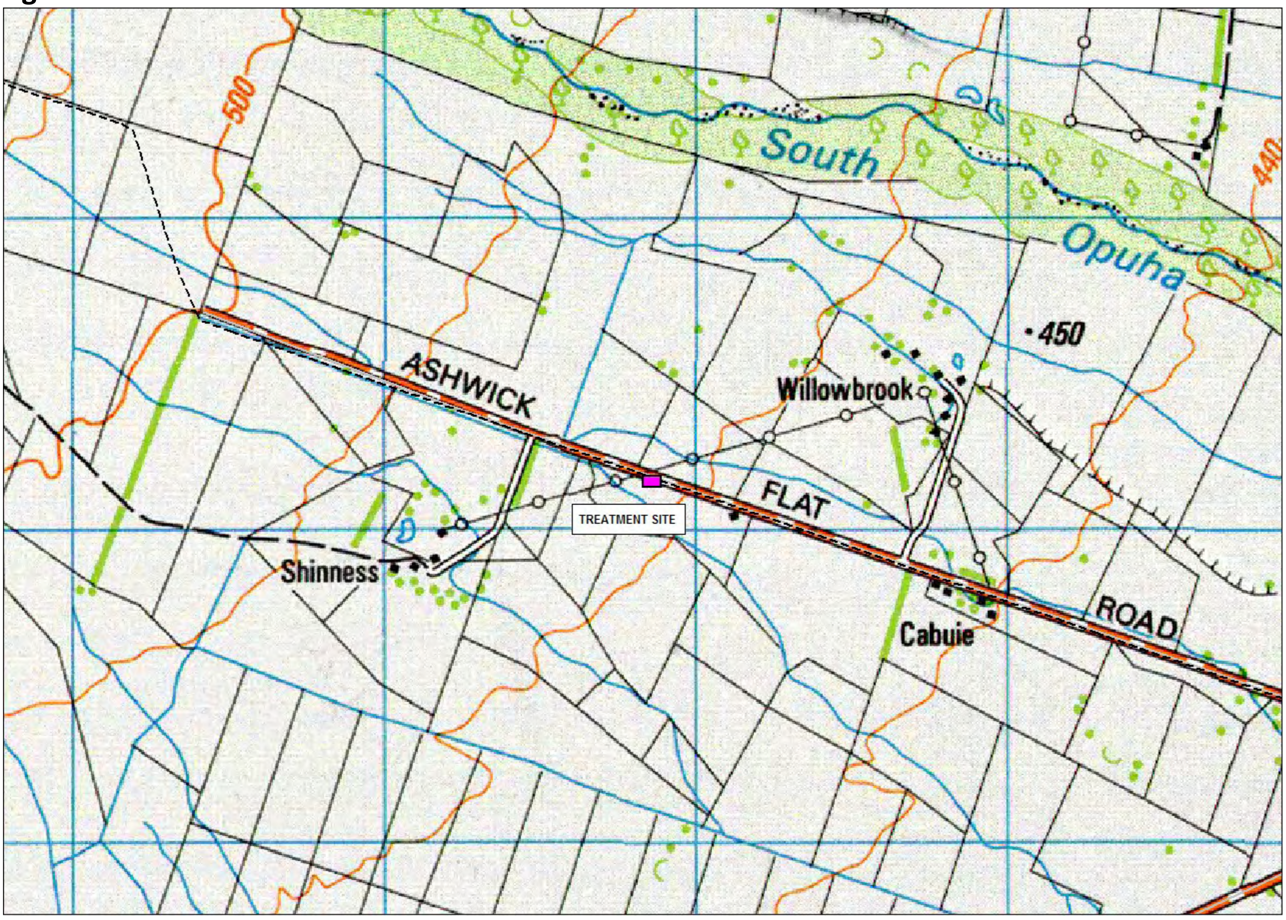


Figure 3.2.3a – Allandale Water Treatment Building

The water treatment plant was built as part of the Headwork's upgrade in 2003 and as such it is in excellent condition.

At the time there was some debate about to type of disinfection to be used for the scheme and the building has been set up to allow enough room to treat the water with UV. This issue has not yet been resolved. In the meantime a Sodium Hyperchloride solution proportional flow dosing system has been installed to provide the necessary disinfection.

The water supply becomes turbid during periods of high river flow. More research on this issue, needs to be undertaken prior to considering improved treatment

3.6.4 RESERVOIRS / STORAGE – TREATED WATER

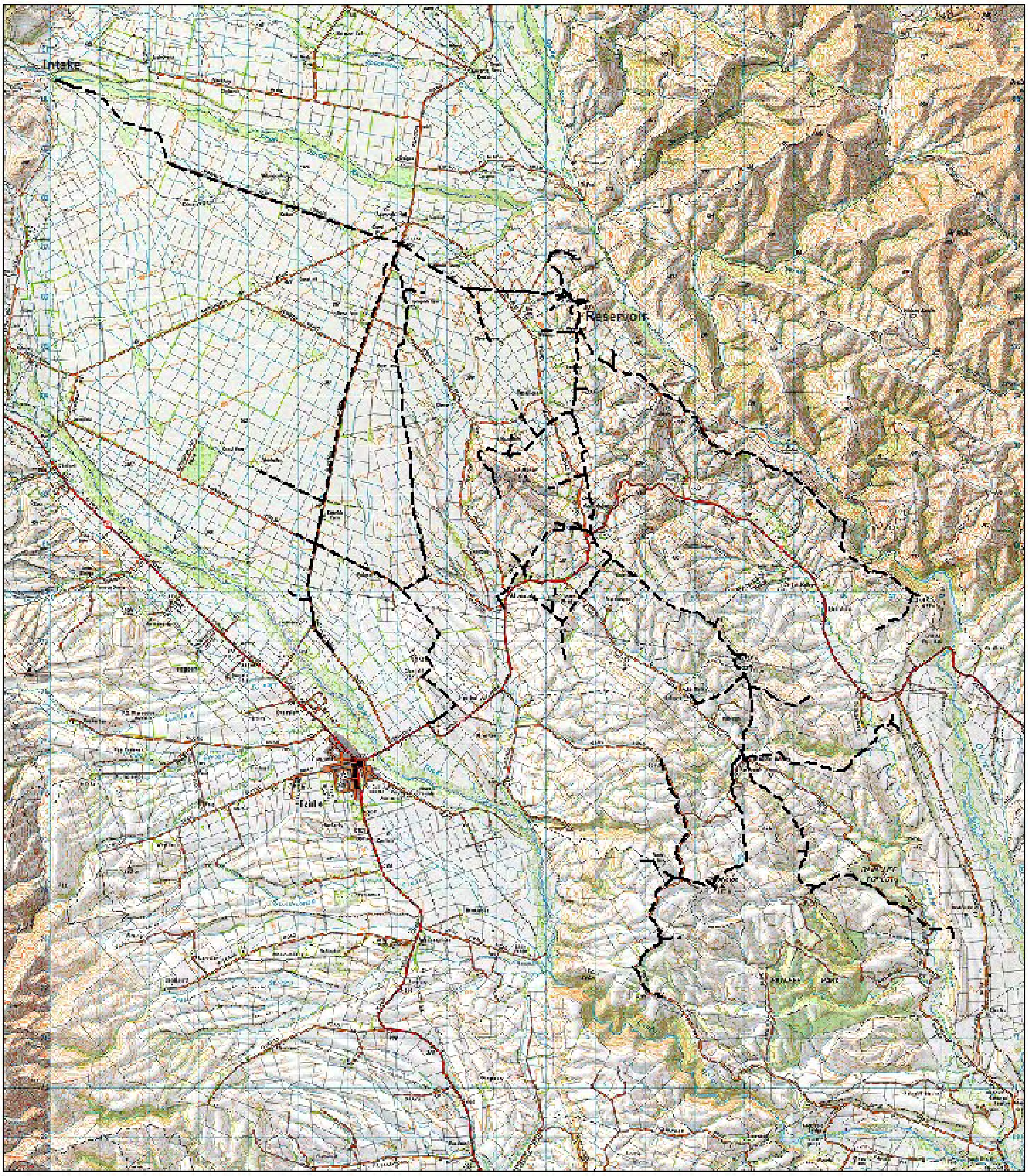
Figure 3.5.3a – Allandale Reservoir

The reservoir built for the original scheme in 1966 and was supplied from pumps beside the Opuha River.

With the new gravity source the reservoir is largely redundant but is kept in service for emergency storage. As the scheme is a restricted supply with a constant flow and on property storage, additional scheme storage is not required.

The existing reinforced concrete structure is in average condition with some leakage that will require attention. The timber framing for the roof has deteriorated significantly.

3.6.5 TRUNK MAINS AND RETICULATION



ALLANDALE WATER SUPPLY LINES

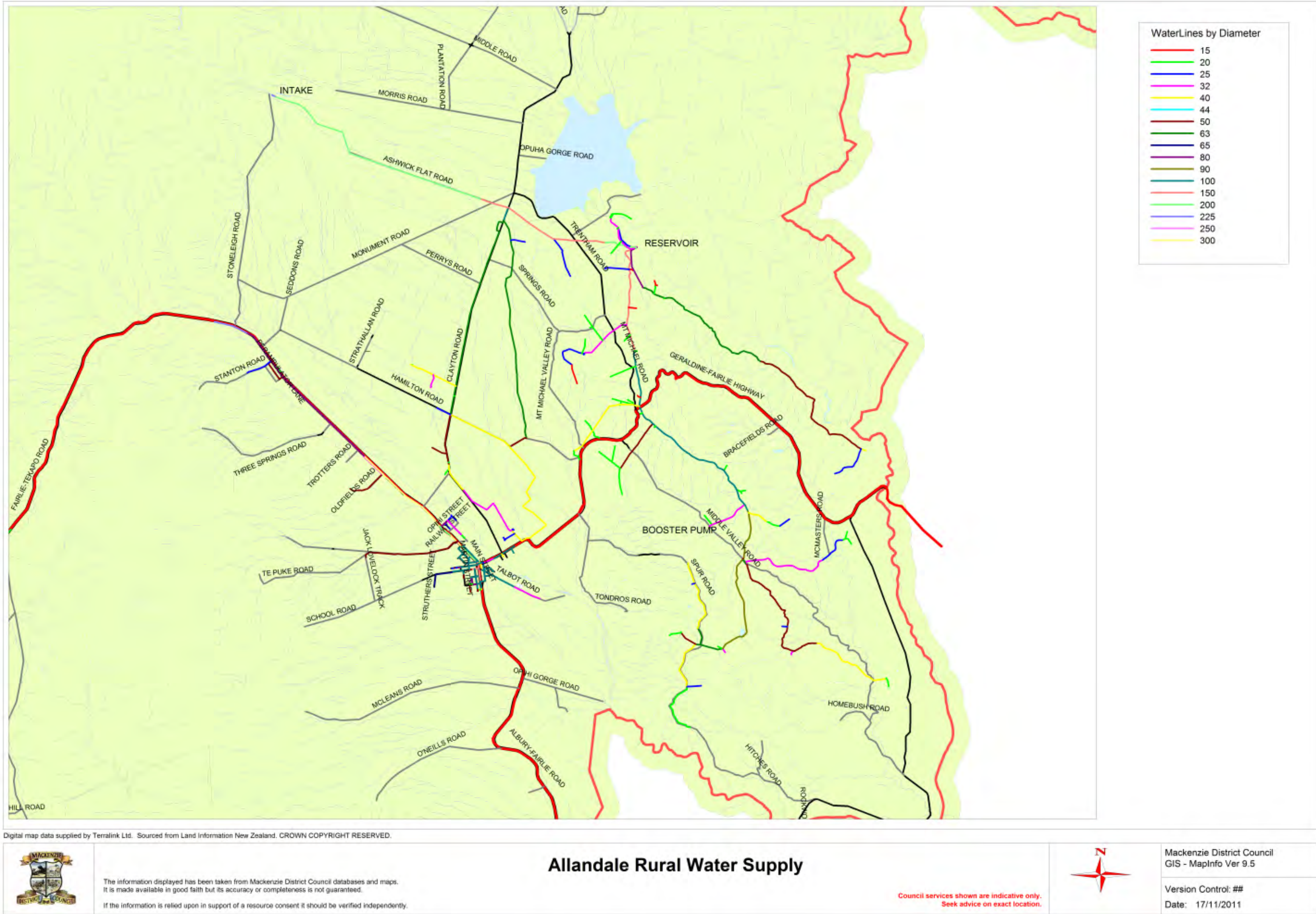
N

Scale 1:500 @ A4

The information displayed has been taken from Mackenzie District Council databases and maps.
It is made available in good faith but its accuracy or completeness is not guaranteed.

If the information is relied upon in support of a resource consent it should be verified independently.

Date: 19/02/2009
Mackenzie District Council
GIS - MapInfo Ver 9.5
Council services shown are indicative only.
Seek advice on exact location.


WaterLines by Diameter
15
20
25
32
40
44
50
63
65
80
90
100
150
200
225
250
300
INTAKE
RESERVOIR
BOOSTER PUMP
MORRIS ROAD
ASHWICK FLAT ROAD
OPUHA GORGE ROAD
MONUMENT ROAD
PERRYS ROAD
SPRINGS ROAD
TRENTHAM ROAD
STONELEIGH ROAD
SEDDONS ROAD
STRATHALLAN ROAD
CLAYTON ROAD
HAMILTON ROAD
MT MICHAEL VALLEY ROAD
MT MICHAEL ROAD
GERALDINE-FAIRLIE HIGHWAY
BRACEFIELDS ROAD
STANTON ROAD
THREE SPRINGS ROAD
TROTTERS ROAD
OLDFIELDS ROAD
FAIRLIE-TEKAPO ROAD
MCMASTERS ROAD
MIDDLE VALLEY ROAD
SPUR ROAD
TONDROS ROAD
TALBOT ROAD
TE PUKE ROAD
SCHOOL ROAD
JACK LOVELOCK TRACK
STRUTHERS STREET
MCLEANS ROAD
O'NEILLS ROAD
ALBURY-FAIRLIE ROAD
HOMEBUSH ROAD
HITCHES ROAD
HILL ROAD
MIDDLE ROAD
PLANTATION ROAD
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Allandale Rural Water Supply
The information displayed has been taken from Mackenzie District Council databases and maps.
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Council services shown are indicative only.
Seek advice on exact location.
N
Mackenzie District Council
GIS - MapInfo Ver 9.5
Version Control: ##
Date: 17/11/2011

Total length of reticulation. = 111,381m

The 13km long trunkmain was ploughed in through difficult country in 2003. It is a RRJ uPVC 150 to 200mm diameter pipeline in excellent condition.

The trunkmain and gallery was designed to supply 12 litres/sec at a point 10 metres above the existing Allandale reservoir. The design also allowed for a further 12 litres/sec on Ashwick Flat Rd for a possible future piped water supply to cover some of the area currently serviced by the Ashwick Opuha water race.

The scheme was upgraded in 2007 and amalgamated with the Spur Rd supply. Part of the process was to significantly enhance the scheme and sell extra units up to the maximum of the allowed take, 12 litres/sec. The new scheme supplies 597 units to the enlarged area.

The reticulation upgrade abandoned a significant amount of existing scheme pipe, replacing it with larger pipe to supply the additional units.

The original Spur Road supply was abandoned as part of the upgrade and connected to the Allandale supply. Water is boosted into this area by an in-line booster pump.

3.6.6 RETICULATION

Summary of Allandale Rural Water Supply System

Asset Type	Allandale
Pipelines	111381 m
Hydrants	2
Valves	41

Reticulation Description

The following tables have been compiled to show the extent and make-up of the systems.

Figure 3.2 – Pipe Size Distribution

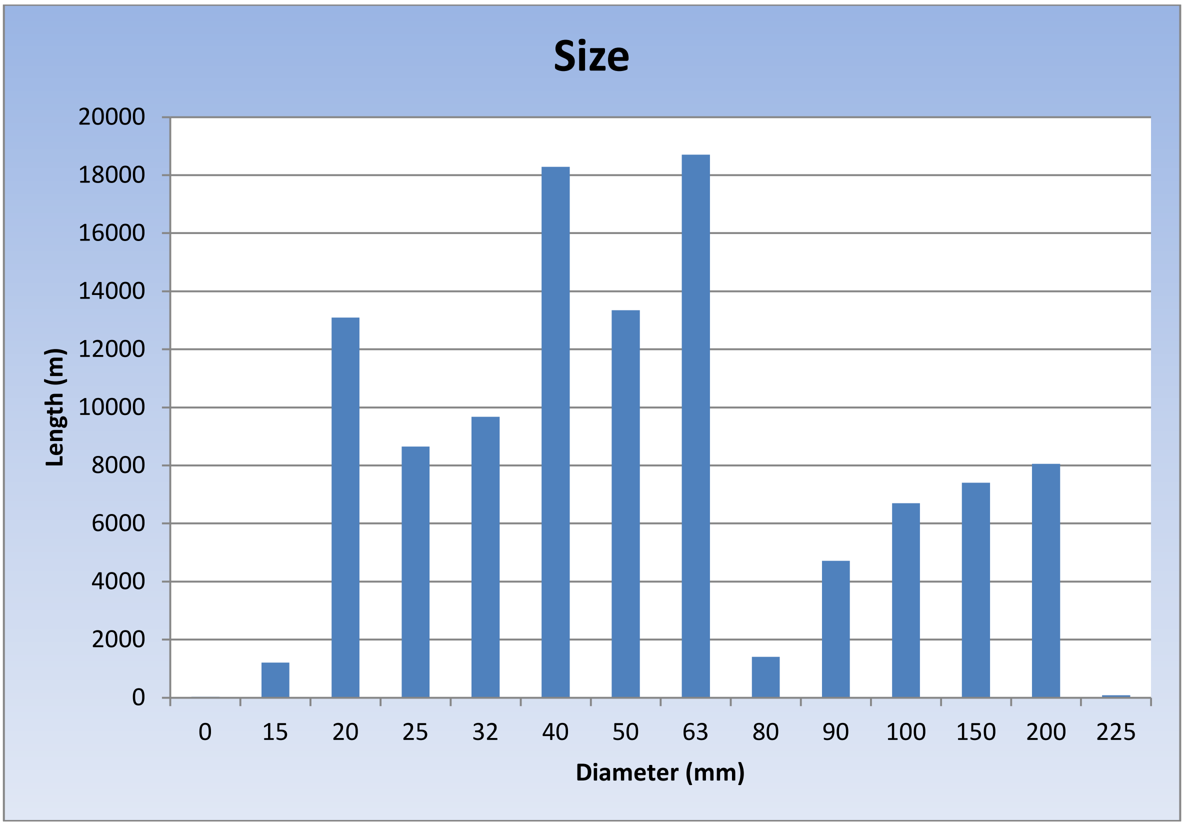


Figure 3.3 – Pipe Age Distribution

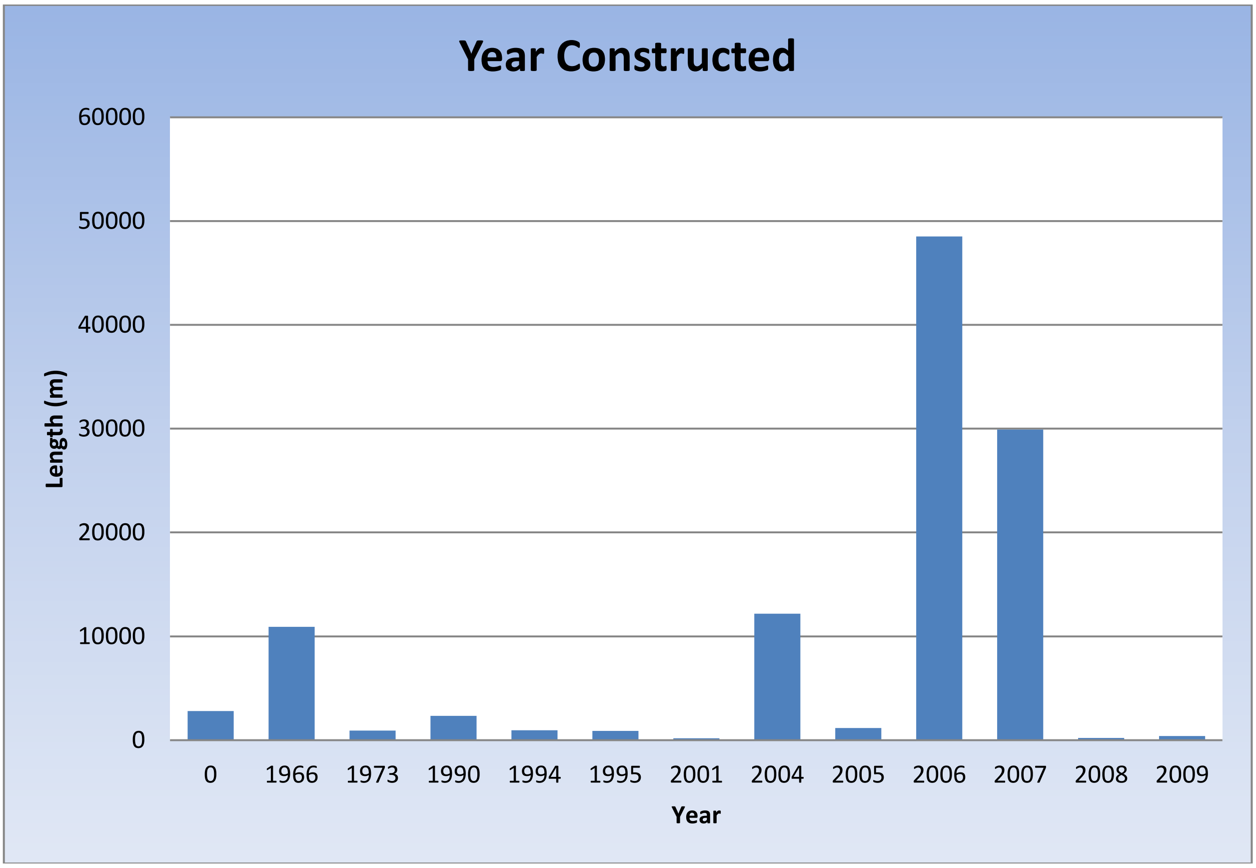


Figure 3.4 – Pipe Material Type Distribution

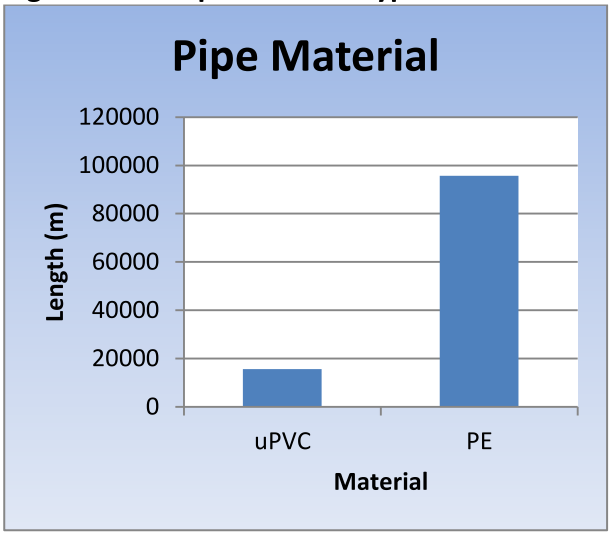
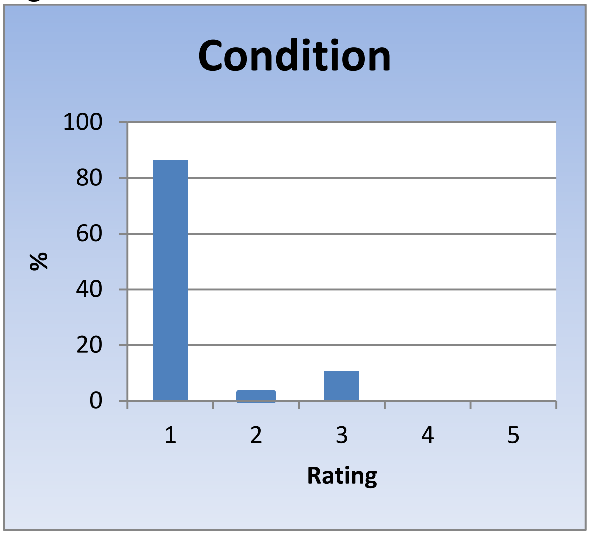


Figure 3.5 Current Condition Profile



Notes:
1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Significant maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

All pipe are rated as very good or good with only a very small 11% being graded as requiring regular maintenance to provide the service.

3.6.7 WATER QUALITY

Current water supply grading	Un-Graded, as a new supply
Target water supply grade	Cc
Is the supply fluoridated	No
Quality issues	The water supply is basically a surface take with most of the flow coming from a pipe in the Ashwick intake. The catchment above the intake has very low stocking rates therefore is not subject to significant contamination.

3.6.8 RESOURCE CONSENTS HELD

Water Supply	Consent No.	Type	Volume Able to be Taken per Day (M^3	Expiry Date
Allandale	CRC 020124	Water Permit	12 litres / sec	19-Oct-2030
Allandale	CRC030006			10-Sep-12

3.6.9 FIRE FIGHTING CAPACITY

The scheme has no fire fighting capability being mainly a small bore scheme. There are two hydrants used only for scouring the line and drawing off small quantities of water

3.6.10 DAILY WATER USE / SYSTEM LOSSES

The scheme is a restricted supply delivering 532 units to the Allandale area, plus a further 65 units are pumped to the higher area serving Spur Road. . Flow to each property is controlled by Marac flow controllers that deliver the nominated flow with an accuracy of +/- 10%.
There is a meter at the treatment plant which can be used to reconcile water produced and water sold to identify possible line losses.

3.6.11 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The Ministry of Health have not assigned **a log** credit for protozoal treatment as Council has not yet confirmed if it requires the scheme to be assessed under Section 5, 10 or Section 12. Section 12 is of the DWSNZ “Rural Agricultural Drinking Water Supplies” is still in the course of preparation and consultation.

It is anticipated that compliance will come under Section 10 'Small Water Supplies, Alternative Compliance Criteria'.

Council has assumed that UV disinfection will be added to the existing chlorine disinfection. Some form of filtration is likely to be required for periods when the source water is not suitable for UV disinfection.

A draft Public Health Risk Management Plan has been completed.

3.7 ALBURY

3.7.1 GENERAL

The scheme is owned by Mackenzie District Council but managed by the Albury Rural Water Supply Society Inc. The Council has a formal agreement with this group to control the direction of the scheme but the operation and management is all carried by that group. **Data on upgrades and pipeline condition has not been supplied to Council for some years. As such little is known about the current condition of the scheme and the size of the asset.**

a) Total population (2006)
Permanent APPROX

b) Number of properties in area of benefit
-

3.7.2 WATER SOURCE

The water source for this supply is from the headwaters of the Opawa River.

Figure 3.2.2a - Albury Water Supply Intake Location

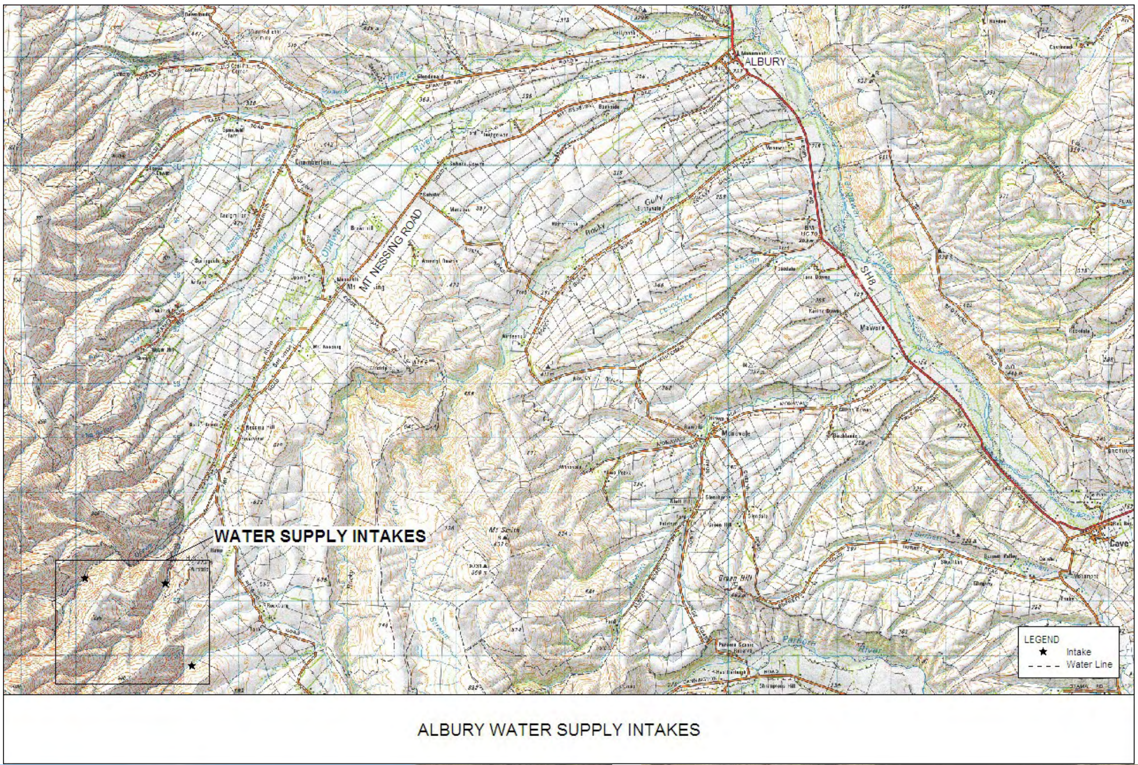


Figure 3.7.1a -

Figure 3.7.1b

Figure 3.7.1c

Figure 3.7.1d

Figure 3.7.1e

Figure 3.7.1f

3.7.3 WATER TREATMENT PLANT

The water supply is not disinfected. It regularly returns a low E Coli count and as such the scheme has a permanent "Boil Water" notice in place. Water paces through a Rapid Sand Filter which is regularly back washed with un-filtered water.

3.7.4 RESERVOIRS / STORAGE – TREATED WATER

The reservoir is a tank farm consisting of eight 22,500 litre concrete tanks.

3.7.5 TRUNK MAINS AND RETICULATION

Total length of reticulation. = ??????m

3.7.6 RETICULATION

Summary of Albury Rural Water Supply System

Asset Type	Albury
Pipelines	m
Hydrants	
Valves	

3.7.7 RETICULATION DESCRIPTION

The scheme was built in 1971 with various additions since. As such the pipework is generally in good condition.

3.7.8 WATER QUALITY

Current water supply grading	Ee
Target water supply grade	
Is the supply fluoridated	No
Quality issues	The water supply is a surface take. The catchment above the intake has very low stocking rates therefore is not subject to significant contamination.

3.7.9 RESOURCE CONSENTS HELD

Water Supply	Consent No.	Type	Volume Able to be Taken per Day (M^3	Expiry Date
Albury	CRC990685	Water Permit	6 litres / sec	20-Jan-2034
Albury	CRC990686	Water Permit	12.6 litres / sec	20-Jan-2034
Albury	CRC991431	Construct Structures		20-Jan-2034
Albury	CRC991418	Water Permit	6 litres / sec	20-Jan-2034

3.7.10 FIRE FIGHTING CAPACITY

The scheme has no fire fighting capability being mainly a small bore scheme. There are hydrants used only for scouring the line and drawing off small quantities of water

3.7.11 DAILY WATER USE / SYSTEM LOSSES

The scheme is a restricted supply delivering 368 units with capacity of 616 units. Flow to each property is controlled by Marac flow controllers that deliver the nominated flow with an accuracy of +/- 10%.

3.7.12 THE LIKELY IMPACT OF THE PROPOSED NEW WATER SUPPLY STANDARDS

The Health (Drinking Water) Amendment Act (2007) was passed into legislation in October 2007. This Act replaces a mainly voluntary approach to ensuring compliance with the Drinking Water Standards for New Zealand 2005 (Revision 2008)

The Albury Supply has not had a catchment risk assessment completed.

For Albury, the supply can be assessed as either a small supply against Section 10 of the DWSNZ or against Section 5 (the same as larger schemes). Section 5 indicates a protozoal removal requirement of Log 4. This could potentially be reduced to Log 3 if the supplies are designated small supplies and assessed against Section 10. A further option may be Section 12, “Rural Agricultural Drinking Water Supplies” which is still in the course of preparation.

3.7.13 DEPRECIATION

The scheme does not fund depreciation on the network but relies on volunteers and user contributions when renewals or upgrades are required.

4. ASSET MANAGEMENT PRACTICES

4.1 INTRODUCTION

MDC has an Asset Manager, Utilities Manager and a Technician responsible for the maintenance management of the Utilities network. Occasionally some elements of the work are tendered to consultancy services to manage (e.g. Pipeline replacements etc). The Utilities Manager and the Maintenance Contractors regularly inspect and monitor the network. Any work identified is directly tasked to the incumbent maintenance contractor or, if it is beyond the scope of the maintenance contract, tendered using Competitive Pricing Procedure guidelines. This may or may not need the involvement of consultants depending on the nature or extent of the work.

MDC accounts for revenue and expenditure on an accrual basis. All work under the Works Programme is identified through a job cost ledger with a significant level of breakdown using analysis codes. The costs are summarised into the general ledger where operational/maintenance costs are identified separately to capital/renewal items.

The majority of the work (physical works and professional services) carried out as part of the total management of all Utilities Asset functions is actioned under either physical works or consultancy contracts.

All contract works are claimed monthly against each of the contract item numbers by the physical works and professional services contractors. MDC and/or consultants confirm the payment value for all physical works and the MDC confirms the payment of any professional services. The accounts job number and account codes are included on the payment certificate. These certificates are forwarded to MDC for payment. The types of work that this system relates to are maintenance, renewals and capital expenditure.

There are a range of reports prepared in order to comply with the requirements of Council, and the Auditors. All external reports are prepared in compliance with Generally Accepted Accounting Principles (GAAP).

4.2 ASSET MANAGEMENT PROCESSES AND SYSTEMS

4.2.1 PROCESSES

4.2.1.1 Levels of Service

The LTP process is used to determine the level of customer satisfaction and identify community concerns and issues. Council has incorporated the mandatory performance measures imposed by the Department of Internal Affairs as the measures for this activity.
The performance measures are:

Performance measure 1 (safety of drinking water)

The extent to which the local authority's drinking water supply complies with:

(a) *part 4 of the drinking-water standards (bacteria compliance criteria), and*

(b) *part 5 of the drinking-water standards (protozoal compliance criteria).*

Performance measure 2 (maintenance of the reticulation network)

The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this).

Performance measure 3 (fault response times)

Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:

(a) *attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and*

(b) *resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.*

(c) *attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and*

(d) *resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.*

Performance measure 4 (customer satisfaction)

The total number of complaints received by the local authority about any of the following:

(a) *drinking water clarity*

(b) *drinking water taste*

(c) *drinking water odour*

(d) *drinking water pressure or flow*

(e) *continuity of supply, and*

(f) *the local authority's response to any of these issues expressed per 1000*

connections to the local authority's networked reticulation system.

Performance measure 5 (demand management)

The average consumption of drinking water per day per resident within the territorial authority district.

4.2.1.2 Knowledge of Assets

The process of capturing as-built records for the on-going enhancement of asset registers is included as a requirement of the maintenance contracts. The information is supplied to Council staff for them to upgrade the relevant registers. Projects undertaken outside the maintenance contracts have a requirement within their contract for the relevant information to be collected and forwarded to Council for them to upgrade the registers. There are some observed gaps in the securing of data for new infrastructural assets (e.g. subdivisions).

4.2.1.3 Accounting/Economics

Maintenance and renewal costs are recorded against broad activities in the general ledger. Valuations are currently based on straight line depreciation and assumed effective lives.

4.2.1.4 Condition and Performance Monitoring

Well documented standards and processes exist for an on-going inspection programme of all water supply assets. Other assets are inspected irregularly.

Processes for regularly monitoring the performance water supplies, (e.g. quality, pressure and flow) the information is used for identifying and prioritising upgrading and development of projects. The monitoring of other assets is informal and mostly reactive.

4.2.1.5 Risk Management

Although processes are in place for the monitoring of some critical assets (e.g. reservoirs), risk management is generally practised informally based on the knowledge of experienced staff.

4.2.1.6 Operations

Operational processes are documented in service delivery contracts and are subjected to regular review.

4.2.1.7 Maintenance

Competitively tendered contracts are entered into annually for major budget items.

4.2.1.8 Optimised Life Cycle Strategy

Work optimisation for other assets is based on the judgement of experienced staff, internal inspection of pipelines and renewal projections are based on assumed economic lives.

4.2.1.9 Design, Project Management

There are no documented project management procedures for MDC, however there is confidence that suitable procedures are used during the project evaluation and design phase. Sound contract management procedures are in place. The supervision of assets constructed within sub-divisional development and subsequently taken over by MDC is considered to be adequate.

4.2.1.10 Quality Assurance/ Continuous Improvement

Audit NZ annually audits performance measures reported in the annual plan. All recommendations for improvement are adopted and implemented as resources permit.

4.2.2 SYSTEMS

Council uses Asset Finda which is a complete system for designing and managing solutions through the application of geographic knowledge. Data can be manipulated within AssetFinda, ArcGIS or exported to excel to assist in the decision making process for Water Supply network issues.

4.2.2.1 Asset Finda

AssetFinda is an advanced Assets Management System designed to assist Councils in whole of life management of their assets. AssetFinda is designed to meet Council's long term and statutory asset management requirements.
It is has three main components:

Asset Register: An accurate asset register is critical to any asset management system. It controls a database that utilizes GIS, Web and iPad to view, edit, analyse and add data – faster, easier and more accurately than ever before.

Asset Maintenance: Maximizes the useful lifespan of assets by managing past, present and future maintenance requirements of your assets.

Asset Reporting: There is wide variety of reports, including Asset Revaluations, Monthly & Annual Depreciation Calculations, and Predictive Modelling.
AssetFinda utilizes a Web front end, GIS interfaces and iPad apps, thus creates a flexible and user friendly interface that even the newest of users can navigate quickly. The iPad App is designed to give real-time access to data in the field. View, analyse, edit & add data, capture images, run inspections, complete works requests from anywhere in the field with in either Online or Offline mode.

Council uses AssetFinda to manage the following:

- Water
- Drainage
- Wastewater
- Parks (to be added)
- Buildings (to be added)

The Asset Register contained within AssetFinda/ArcGIS (previously MapInfo) is contained within separate databases. Each database records the attribute of each asset to component level including age, condition, performance etc. An example of the information is shown in Fig 1 below.

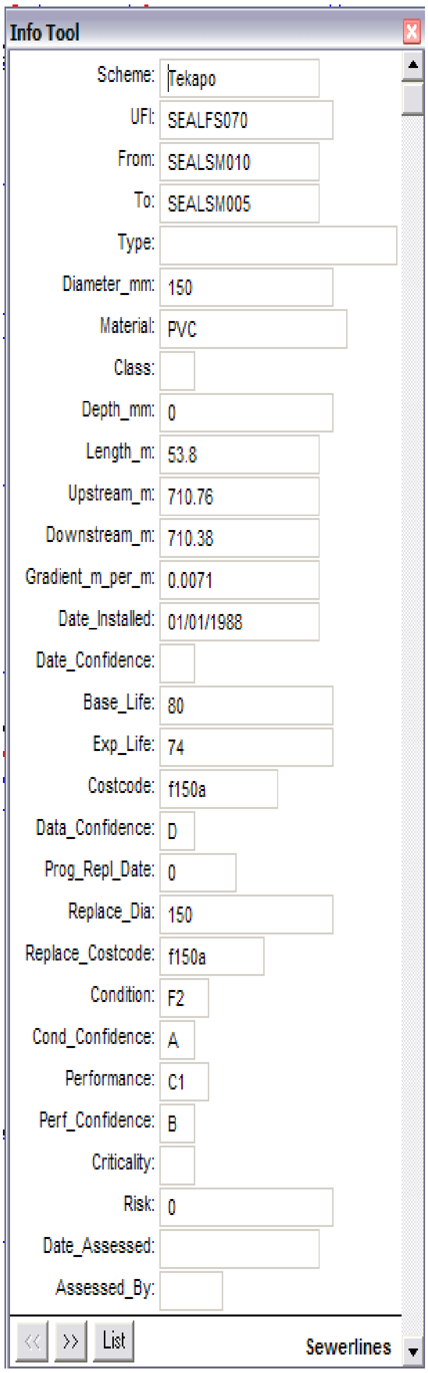
Depending on what type of asset is identified there are varying amounts of information recorded for that asset. There are gaps in the information for each asset, but we are continually gathering information on these to complete the Asset Register.

4.2.3 SCADA

SCADA (supervisory control and data acquisition) is a system operating with coded signals over communication channels so as to provide control of remote equipment. The control system may be combined with a data acquisition system.

The term SCADA (Supervisory Control and Data Acquisition) usually refers to centralized systems which monitor and control entire sites, or complexes of systems spread out over large areas. Most control actions are performed automatically by RTUs or by PLCs. Host control functions are usually restricted to basic overriding or supervisory level intervention.
Council is rolling out SCADA to all its remote sites across the district. This will not only control the operation of the site but actively monitor and send the operational data back to the Fairlie in real time via telemetry.

Figure 1



Info Tool
Scheme : Defines the scheme the infrastructure is part of
UFI : Unique identifier
From : Defines from where the pipe came from
To : Defines to where the pipe exits
Type :
Diameter_mm ; Diameter expressed in millimeters
Material: Material from which the pipe is made
Class : Class of pipe used
Depth_mm : Depth of pipe in millimeters
Length_m ; Length of pipe
Upstream _m : Upstream invert level
Dowstream_M : Downstream invert level
Gradient_m_per_m: Gradient of pipe
Date_Installed : Date pipe installed
Date_Confidence : How sure of date when installed
Base_Life : Initial life of the pipe
Expected_Life: Life expectancy of pipe
Costcode : This is a code assigned to replace the current pipe
Data_Confidence :
Prop_Repl_Date: Date proposed for replacement
Replace_Dia: Optimised replacement diameter
Replace_Costcode : Optimised replacement cost code
Condition: Condition rating of the pipe
Cond_Confidence : Degree of certainty of the condition
Performance : Performance rating of the pipe in the network
Perf_Confidence : Degree of certainty of the performance of the network
Criticality
Risk
Date_Assessed: : Date of latest assessment
Assessed_By : Name of person completing the assessment of the pipe

This is an example of the information we hold on any section of water main, for other assets a different set of information is available.

Table 9.1 gives the assessed data confidence quality of the MDC Asset Register tables.

Table 9.1 – Data Confidence Levels

Valuation Element	Pipelines
Asset Registers or Databases	H
Attribute Details	G
Asset Categorisation	H
Optimisation Information	A
Useful Lives Information	G
Condition	H

The table Data Confidence Levels are:

VH very high confidence H high confidence G good confidence
A average confidence P poor confidence

4.2.3.1 CCTVs role in Asset Management

The aim of asset management is to manage assets, such as water systems, in a way that provides the required level of service in the most cost-effective manner through the creation, operation, maintenance, renewal and disposal of assets to provide for existing and future customers.
CCTV inspections can help organisations gain an understanding of the existing condition of their piped assets. This understanding can help organisations make decisions such as which pipelines are:

- Undersized and need to be upsized to meet future flows.
- In risk of collapse.
- In need of maintenance works such, as root cutting.

Council is then able to prioritise works and prepare a timetable and budget for any required rehabilitation works.

Water pipelines are not generally inspected by CCTV

4.2.3.2 Pipeline - Condition Assessments

Pipeline failures are inspected and reported to The Utilities Engineer for assessment of the likely remaining life of the asset. In some cases the section of pipe removed during the repair process is sent away for detailed analysis of the remaining life of the asset.

By taking this information on selected pipelines the data can be used to infer the condition of similar aged and type pipes to give a complete picture of the network.

4.3 INFORMATION FLOW REQUIREMENTS AND PROCESSES

General maintenance work is continuous throughout the year and responds to the needs of the network. The data from the repairs carried out is reported to Council and recorded in MDCs systems on a regular basis.

New subdivisions in the District result in additions to the pipeline infrastructure. In the past there have been difficulties in capturing the resulting updated and additional asset information. Processes need to be established to ensure that this data is provided electronically so that it can easily recorded in the Asset Register and available for ongoing effective Asset management.

4.3.1 PROGRAMMING OF WORKS AND FUNDING

Planning for the physical works programme involves the preparation of a 10 year programme and collating information required for the funding application to Council (The Annual Plan Process).

All the information obtained from network inspections, maintenance inputs and Asset Register analysis are used to develop the 10 year capital works programmes.
The total funds required are based on the current requirements identified and the previous year's expenditure.

4.3.2 STANDARDS AND GUIDELINES

The management of the pipeline assets are constrained by the funding available to maintain the network as a viable entity.

Another key manual is the International Infrastructure Management Manual which provides guidelines on the structure and format for Asset Management Plans and practice.

4.3.2.1 Levels of Service

The LTP process is used to determine the level of customer satisfaction and identify community concerns and issues. A good range of performance measures in keeping with NAMS guidelines are in use.

4.3.2.2 Knowledge of Assets

The process of capturing as-built records for the on-going enhancement of asset registers is included as a requirement of the maintenance contracts. The information is supplied to Council staff for them to upgrade the relevant registers. Projects undertaken outside the maintenance contracts have a requirement within their contract for the relevant information to be collected and forwarded to Council for them to upgrade the registers. There are some observed gaps in the securing of data for new infrastructural assets (e.g. subdivisions). The Contractors staff use IPads in the field to check and capture data for updating the asset registers. This information is confirmed by Council staff prior acceptance into the asset register.

4.3.2.3 Accounting/Economics

Maintenance and renewal costs are recorded against broad activities in the general ledger. Valuations are currently based on straight line depreciation and assumed effective lives.

4.3.2.4 Risk Management

Although processes are in place for the monitoring of some critical assets (e.g. reservoirs), risk management is generally practised informally based on the knowledge of experienced staff.

4.3.2.5 Operations

Operational processes are documented in service delivery contracts and are subjected to regular review.

4.3.2.6 Maintenance

Competitively tendered contract is entered into approximately every five years to deliver the maintenance of this activity. Major new pipeline construction or replacement is tendered individually for larger budget items.

4.3.2.7 Optimised Life Cycle Strategy

Work optimisation for other assets is based on the judgement of experienced staff, internal inspection of pipelines and renewal projections are based on assumed economic lives.

4.3.2.8 Design, Project Management

There are no documented project management procedures for MDC, however there is confidence that suitable procedures are used during the project evaluation and design phase. Sound contract management procedures are in place. The supervision of assets constructed within sub-divisional development and subsequently taken over by MDC is considered to be adequate.

4.3.2.9 Quality Assurance/ Continuous Improvement

Audit NZ annually audits performance measures reported in the annual plan. All recommendations for improvement are adopted and implemented as resources permit.

5. LEVELS OF SERVICE

5.1 DEFINING THE LEVEL OF SERVICE

Asset management planning requires a clear understanding of customer needs and preferences and the minimum obligations that must be met. A key objective of this activity plan is to match the level of service provided by the asset with the expectations of the customers given legislative, financial, technical and safety constraints. Service standards, set to meet this objective, provide the basis for the life cycle management strategies and work programmes identified in Section 7.

The service standards defined in this section will be used:

- to ensure legal and legislative requirements are met
- to inform customers of the type and level of service offered
- as a focus for the asset management strategies developed to deliver the required level of service
- as a measure of the effectiveness of this Plan
- to identify costs and benefits of the services offered
- to enable customers to assess the suitability, affordability and equity of the services offered

The MDC levels of service for Water Supply reflect current industry standards and are based on:

- **Customer Research and Expectations:** Information gained from the community on their expectations of quality and price of services
- **Strategic and Corporate Goals:** Provide guidelines for the scope of current and future services offered, the manner of service delivery and define specific levels of service which the MDC wishes to achieve
- **Legislative Requirements:** Environmental standards, regulations and acts that impact on the way assets are managed (i.e. resource consents, building regulations, health and safety legislation, Local Government Act)
- **Demands on the Network:** Service demands that are placed on the network.

5.2 CUSTOMER RESEARCH AND EXPECTATIONS

The Council utilises the following methods to determine and measure customer expectations:

- Public meetings
- Consultation via the Annual Plan and LTP process
- Feedback from customers and elected representatives
- Publicity

The public expect water to be available at the tap at all times with sufficient pressure to operate all systems within the home and be wholesome to drink and that adequate supplies are available for fire fighting purposes.

Customer expectations are one of the key considerations used to determine the acceptable target levels of service prescribed for the MDC Water Supply Network.

The community's expectations can be summarised as being:

- Water Supply networks are provided to provide a high quality water treatment and distribution service.
- To anticipate the time when it may be necessary to extend, upgrade or renew the various water supply systems and plan accordingly.

In order to achieve the above community expectations there are three specific strategies that the MDC will implement:

- Water supply networks are replaced to ensure that they continue to operate efficiently and maximise the life of the asset.
- Water Supply networks are maintained in perpetuity, so that there is no diminution in value and to forecast the estimated future cost of so doing.
- The Council will employ preventative maintenance and monitoring systems to protect the network and ensure compliance with resource consent conditions.

5.3 STRATEGIC AND CORPORATE GOALS

The Water Supply network must be operated to meet Council policy, objectives and various Environment Canterbury requirements. Council's goals and the community's expectations are stated in the LTP which provides the framework for the operation and development of the Water Supply infrastructural assets.

Organisation Mission, Goals and Objectives

The Council's mission statement is: ***"FOSTERING OUR COMMUNITY"***. The particular aspects of the overall mission that relate to the water supply activity are:

SERVICE
We are a service organisation. Providing efficient and cost-effective services is our prime responsibility.

SUSTAINABILITY
We are committed to the sustainable management of all the resources of the district.

Water Supply Activity Goal and Principal Objectives

As outlined in Council's Long Term Plan (LTP) Council, the water supply contribution to achieving Council's governance goal and the community outcomes identified in Section 2 is through the **Water Supply Activity Goal**:

To ensure that adequate potable supplies of water are provided (by either private or public means) for all residential, commercial and industrial buildings (other than single buildings on a single property).

The specific **Objectives** of the Water Supply activity are as follows:

- To ensure all of the public systems provide a high quality water treatment and distribution service;
- To assess the quality and adequacy of all existing private water supply systems (serving more than single premises) in the District;
- To anticipate the time when it may be necessary to extend, upgrade or renew the various existing public water supply schemes, and to plan accordingly;
- To anticipate the time when it may be necessary to provide public water supply schemes in communities at present not serviced, and to plan accordingly;
- To ensure the maintenance of the public infrastructural assets in perpetuity, so that there is no diminution in value, and to forecast the estimated future cost of so doing; and
- To put in place a sound management regime for all matters relating to the supply of potable water

5.4 LEGISLATIVE REQUIREMENTS

Legislative requirements set the framework for the minimum standards of service that Council has to meet. The key legislation relating to the Council's responsibility to manage the Water Supply asset is:

- The Local Government Act 2002.
  Especially
  - Part 7.
  - Schedule 10.
  - The requirement to consider all options and to assess the benefits and costs of each option.
  - The consultation requirements.
- The Climate Change Response Act.
- The Civil Defence Emergency Management Act 2002 (Lifelines).
- The Health Act 1956.
- The Health (Drinking Water) Amendment Act 2007
- The Resource Management Act 1991.
- The Local Government (Rating) Act 2002.
- The Health and Safety in Employment Act 1999.
- The Building Act 2004.
- The Local Authority's District Plan.
- The Council's Engineering Design Standards for Subdivisions and Development. SNZ 4404:2010
- Any existing established policies of the Council (outside those contained in this Activity Management Plan itself) regarding this activity.
- New Zealand Standard SNZHB 4360:2000 'Risk Management for Local Government'.
- Natural Resources Plan – Environment Canterbury
- Canterbury Water Management Strategy
- Land and Water Plan – Environment Canterbury

The ***Local Government Act 2002*** gives local authorities the full capacity, and full rights, powers and privileges, to carry on or undertake any activity or business, do any act, or enter into any transaction wholly or principally for the benefit of its district.

Along with these wide sweeping powers comes the requirement to identify practicable options before making a decision, and to assess the benefits and costs of each option against the likely economic, environmental, social and cultural impacts.

Local authorities are also required to consult widely, effectively and appropriately with the community to determine the communities' wishes and to seek feedback on all potentially significant activities – not only when a particular course of action is proposed, but at the various stages of the decision-making process.

The MDC has determined that it will consult its communities where practical, reasonable and within the resources available to it. A significant aspect of this consultation process is the development of the LTP, which forms the long-term (not less than ten years) direction for all Council's activities.

The ***Resource Management Act 1991*** requires Council to:

- sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of current and future generations
- comply with the District and Regional Plans
- avoid, remedy or mitigate any adverse effect on the environment and structures (e.g. adverse effect of surface run-off)
- control the use of land for the purpose of the maintenance and enhancement of the quality of water in water bodies and coastal water;
- manage discharges of contaminants into water and discharges of water into water
- control the taking, use, damming and diversion of water, including:
    - the setting of any maximum or minimum levels or flows of water;
    - the control of the range, or rate of change, of levels or flows of water; and
- control the discharges or contaminants into water and discharges of water into water.

The ***Building Act 2004*** requires Council to:

- Ensure all buildings and facilities constructed comply with the Act
- Produce Project Information Memoranda (PIM's) which supply all available information relating to an individual property. For the water supply network the relevant information may include details of the location of the services to the property and any known issues with regard to pressure fluctuation or type of supply, etc

- The ***Health (Drinking Water) Amendment Act 2007*** requires Council to:
- Take all practicable steps to ensure Council provides an adequate supply of drinking water that complies with the DWSNZ.

The ***Health and Safety in Employment Act 1992*** requires Council to:

- Ensure that its employees, contractors are protected from injury as a result of its activities
- Notify the Occupational Safety and Health Department of serious harm or fatal accidents as a result of its activities within 7 days

The ***Civil Defence Emergency Management Act 2002*** requires Council to:

- Establish and be a member of a Civil Defence Emergency Management Group
- Co-ordinate, through regional groups, planning, programmes and activities related to civil defence emergency management across the areas of reduction, readiness, response and recovery, and encourage co-operation and joint action within those regional groups

- Improve and promote the sustainable management of hazards in a way that contributes to the well-being and safety of the public and also to the protection of property

Natural Resources Regional Plan – Environment Canterbury
Chapter 5: Water Quantity
5.1 Introduction
Water is a vital resource to all of Canterbury. Rivers and lakes are home to many species of birds and fish, some unique to the region. To Ngāi Tahu water is a taonga, a treasure left by ancestors to provide and sustain life. The region's water resources are used for a wide range of recreational activities, as a source of food, for irrigation, electricity generation, industry and community and stock water supplies. While water is a renewable resource, it is not unlimited. This is because renewable resources can be used in a way that threatens their long-term sustainability, thus risking their eventual exhaustion or permanent changes to their characteristics. This relates both to physical resources, such as the processes that form a braided river, or to the natural environment, such as habitats of plant or animal species. Managing the competition for water between the different needs and demands is the primary focus of this chapter.

With more water being abstracted from rivers and groundwater, the risks to instream values increase. Environment Canterbury, through the Canterbury Natural Resources Regional Plan (NRRP), sets out the regulatory/non-regulatory framework to provide an adequate level of protection that is effective for sustaining the life-supporting capacity of surface water and groundwater systems, and sustain Ngāi Tahu and other instream values. At the same time, it enables abstractions, damming or storage by those who wish to use water for economic purposes.
This chapter:
(a) provides certainty that instream values receive an adequate level of protection;
(b) provides consistency and transparency in decision-making about water management; and
(c) enables those making business decisions to be better informed about how water management will affect their business.
For administrative ease, the NRRP has been divided into several chapters dealing with different water issues, for example water quantity and effects of afforestation on low flows, water quality, beds of rivers and lakes, and wetlands. However, it is important to recognise that although environments and ecosystems can be described independently, they are always connected in nature. Promoting sustainable management will require these inter-relationships to be considered in an integrated way when making resource management decisions.
This chapter deals with five major water management topics:
(i) the strategic protection of some highly valued natural water bodies;
(ii) setting flow and/or level regimes for the management of rivers, lakes and groundwater to protect instream/intrinsic values;
(iii) the management of vegetation change to maintain surface flows and instream values;
(iv) the allocation of water above any set flow or level regime to out-of-stream/consumptive uses, and its efficient use; and
(v) water storage, augmentation and/or transfer.

Ngāi Tahu values
Ngāi Tahu perceive water as the source of life and sustenance. It is held that water contains a mauri (life essence) that joins physical and spiritual elements and links water to every other part of the natural world. Water is viewed as a taonga (treasure) because it carries the lifeblood of the land; the well-being of all living things depends on it. Maintaining water quality in the best possible condition so that a water body and its ecosystems are in a healthy state is an issue of major concern for Ngāi Tahu. The use of water bodies for certain types of activities can impact on

their spiritual and cultural values. For example, the discharge of effluent to water, especially human waste, is considered an offensive activity, that defiles the spiritual and cultural values of the water.
Ngāi Tahu have sought the following outcomes:

- maintenance of the mauri of natural and physical resources, and to restore mauri where it has been degraded by the actions of humans.
- recognition of tangata tiaki as kaitiaki of water;
- protection of wahi tapu sites from inappropriate activities.
- the integrity and cultural uses of water bodies are protected by prohibiting "unnatural" mixing of waters from different water bodies.
- maintain or enhance water quality by controlling the discharge of point and non-point sources of contaminants to water, and prohibiting the direct discharge of human effluent to water.
- the discharge of water containing industrial and agricultural effluent be required to pass through land before it enters a water body.
- the restoration of wetlands and riparian margins is encouraged because of their pollution abatement function.

Wider community
With increasing land-use intensification comes increasing demand for water across Canterbury. The region's water resources need careful management and protection to ensure their sustainable use.
While some of Canterbury's streams, rivers, lakes and groundwater are of high quality and are still largely in their natural state, in some places pressure from rural and urban land-use discharges, and increasing water demand, is placing stress on ground and surface water systems. There is conflict over the allocation of water for abstraction and maintenance or improvement of instream values and water quality. This has implications for ecosystems, business and primary industry, sources of drinking water, health and recreation, e.g. swimming. Safeguarding sources of mahinga kai and protection of wahi tapu and wahi taonga are important issues for tangata whenua and Maori. Environment Canterbury is required to set limits for both environmental flows and water quality.

The regional economy is increasingly dependent on a reliable supply of water, driven by land use intensification and a variable climate.

Land use intensification and discharge of contaminants such as nitrates are affecting Canterbury's water quality in some areas. Protecting water quality requires a combination of management of urban and rural land use, stormwater, subdivision sediment control, wastewater and septic tanks.

Successful water resource management requires Environment Canterbury to work in partnership with communities. This involves working collaboratively with land occupiers, territorial authorities, Government agencies and community groups to develop solutions to issues. This is underpinned by regulations.

Public Works Act 1981
This Act would be used if necessary to procure land for Water Supply activities but has no specific reference to Water Supply.

Local Government (Rating) Act 2002 No 6

The purpose of this Act is to promote the purpose of local government set out in the Local Government Act 2002 by—

- (a) providing local authorities with flexible powers to set, assess, and collect rates to fund local government activities:
- (b) ensuring that rates are set in accordance with decisions that are made in a transparent and consultative manner:
- (c) providing for processes and information to enable ratepayers to identify and understand their liability for rates.

Bylaws

These are permitted under the Local Government Act for a range of purposes including preserving public health, well being, and safety. However amendments in 1991 restrict its use to ensure the Building Act over rules a bylaw in that area of activity.

District Plan

The District Plan requires all new subdivision areas make provision for Water Supply control infrastructure, encourages the retention of natural open water ways for Water Supply disposal and requires Water Supply disposal to be carried out in a manner that avoids inundation of land within or adjoining the subdivision. The District Plan provides means of compliance for Water Supply control works, which includes reference to Mackenzie District Council Code of Practice. This Code is based on the Code of Practice for Urban Land Subdivision (NZS 4404:2004).

Other Legislation and Regulations

The following additional legislation or regulations affect the operation of the Urban Water Supply Systems:

- Water Supplies Protection Regulations 1961
- Dangerous Goods Act 1974

In addition to the above legislation the following is applicable to the Fairlie and Burke Pass Water Supply discharge.

- Environment Canterbury, Opihi River Regional Plan

Legislation (e.g. Resource Management Act) requires Council to consult with the Tangata Whenua and take into account the principles of the ***Treaty of Waitangi*** in the management of infrastructural assets.

5.5 CURRENT AND TARGET LEVELS OF SERVICE

Council's current and target levels of service as defined in the 2012-2022 LTP are summarised in Table 5.1. These show how levels of service contribute to the community outcomes and provides a technical measure that enables Council to monitor current levels of service against target levels of service.

These Levels of Service will be no longer used from 1 July 2015 onwards, instead they will be replaced by the mandatory performance measures as required by Audit NZ.

Levels of Service	Measure of Service	Baseline Information	Target
Water supplies are available and reliable	Time for reinstatement of service for on-demand supplies from notification to contractor: - During working hours - 6 hours. - Outside working hours – 9 hours. For restricted supplies: - 24 hours.	Last measured YE June 2011 where we achieved 99%. New measure and contractor is required to provide data. New measure and we have no prior year data.	90% 90% 90%
Water is safe to drink	No detectible E Coli in water leaving water treatment plants or in the distribution network as identified during scheduled monitoring. Response to any E Coli identified in drinking water leaving the treatment plant (transgression): 1. Take remedial action. 2. Issue “Boil Water” notice if transgression is likely to exceed 24 hours to rectify.	Last measured YE June 2011, nil E Coli was detected. New measure and we have no prior year data. Last measured YE June 2011, no ‘Boil Water’ notices were triggered.	100% 100% 100%
Water quality is maintained or improved	Time to respond to water demands including low pressure and flow from notification to contractor: - During working hours-6 hours - Outside working hours-9 hours % of ratepayers satisfied with the water supply service. Upgrading the treatment of the following water supplies to comply with the health requirements of the Drinking Water Standards for New Zealand 2008 in accordance with the Health (Drinking Water) Amendment Act 2007 to provide for growth and ensure continuity of supply **Target** Upgrade Tekapo water supply by June 2013 **Target** Upgrade Twizel water supply by June 2016 **Target** Upgrade Fairlie water supply by 1 June 2017	Last measured YE June 2011, this target was achieved. Last measured YE June 2011, this target was achieved. CINTA survey October 2011, 82% were satisfied. New measure and we have no prior year data. New measure and we have no prior year data. New measure and we have no prior year data. New measure and we have no prior year data.	100% 100% 80% Upgrade complete. Upgrade complete. Upgrade complete.

Further to the levels of Service in Table 4.1 there are requirements that form part of the maintenance contract specifications. These are detailed in the following sections.

5.5.1 SECONDARY LEVELS OF SERVICE

These are technical measures included in the Infrastructural Services Contract

Table 4.2

MDC Event	Service Standard
Response	Provide a 24 hour, 365 day per year call out service
Response Times	Repairs completed within two working days
	Time for reinstatement of service following call out. During working hours – 6 hours. Outside working hours – 9 hours.
Availability / ***Disruption to Service***	No disruption exceeds 8 hours. Percentage of disruptions where service is out for less than 6 hours.
	(It should be noted the above duration would not apply for an extraordinary event such as a major earthquake or flood)
Quantity	Flow at point of supply: • Fairlie – 15 l/min • Lake Tekapo – 25 l/min • Twizel – 25 l/min Pressure • Fairlie – 70 kpa • Lake Tekapo –200 kpa • Twizel – 250 kpa Tank Supply • All – 1800 l/day

5.5.2 ASSET PRESERVATION MEASURES

MDC is committed to maintaining and improving the network where current levels of service may not be being met. Analysis of the network condition over time provides an indication of asset behaviour and performance achievement. Table 4.3 outlines the measures that will be used to determine the network condition and performance.

Table 4.3 - Asset Preservation Measures

Measure	Explanation	Method of Measurement	Target Values	Response Times
All water supply facilities functioning satisfactorily	Water supply facilities, such as: - Pipelines - Valves - Hydrants - Restricted supplies - Treatment Facilities	Visual inspection Operation Measurement	Dead end pipelines Flushed. Valves operated to ensure operation annually. Hydrants operated to ensure operation annually. Occasional monitoring of tank and other restricted supplies. Treatment facilities regularly checked for correct operation	As required Annually Annually Inspected at least annually. Weekly

5.6 GAP ANALYSIS

5.6.1 LEVELS OF SERVICE DEVELOPMENT WITH USERS AND STAKEHOLDERS

The current LOS being provided has been established through Council's LTP process. This would suggest there is approval with the current regime, although this could also be interpreted as an over provision of service in the context of Council's broader service profile.

Options to further examine this issue in the future could include:

(a) Monitor and interpret customer feedback through customer feedback and complaints. This information can be analysed for any trends or common factors related to current service levels (e.g. number of complaints received)

(b) Engage customers in a formal process. There are a number of mechanisms to achieve this from public meetings to surveys to focus groups. This may include the use of documented feedback processes. In all methods the clear description of different LOS options, fully costed, is a prerequisite to meaningful feedback

(c) Engagement with key stakeholders. These include the Regional Council, and others. Again good input information to these engagements will produce valuable feedback.

5.6.2 LEVELS OF SERVICE DEFINITION

The current LOS are documented as a combination of:

- LTP LOS documentation based on real or perceived customer feedback
- Contract processes which describe some elements of the quality of service provided, mainly travelling surfaces and intervention levels

This can be improved by:

(a) Augmentation of existing information e.g. clearer relationships between alternative service levels for quality, pressure etc and their associated costs.

(b) Utilisation of a LOS model defining quality, quantity, location, and timeframe. This would be based on the IIMM and define the water supply service in terms of Accessibility, Health and Safety, Quality, Reliability and Responsiveness, Sustainability, Functionality.

These would form the basis for a consultative process as outlined above.

5.6.3 PERFORMANCE MEASURES

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2015-25 Long Term Plan and no other measures will be used.

Water Supply

Performance measure 1 (safety of drinking water)

The extent to which the local authority's drinking water supply complies with:

(c) part 4 of the drinking-water standards (bacteria compliance criteria), and

(d) part 5 of the drinking-water standards (protozoal compliance criteria).

Performance measure 2 (maintenance of the reticulation network)

The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this).

Performance measure 3 (fault response times)

Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:

(e) *attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and*

(f) *resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.*

(g) *attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and*

(h) *resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.*

Performance measure 4 (customer satisfaction)

The total number of complaints received by the local authority about any of the following:

(g) *drinking water clarity*

(h) *drinking water taste*

(i) *drinking water odour*

(j) *drinking water pressure or flow*

(k) *continuity of supply, and*

(l) *the local authority's response to any of these issues expressed per 1000*

connections to the local authority's networked reticulation system.

Performance measure 5 (demand management)

The average consumption of drinking water per day per resident within the territorial authority district.

5.6.4 AFFORDABILITY AND WILLINGNESS TO PAY

Hand in hand with the current LOS vs. Desired LOS is the issue of cost. This needs to be addressed at two levels:

(a) Cost for different Levels of Service options within the Water Supply Activity
(b) Cost of the Water Supply activity within the total Council programme.

The first level can be addressed using the options outlined above where fully described and costed service level options are consulted with the community.

The second level needs to be addressed as an assessment of the relative contribution the Water Supply Activity makes towards the achievements of Community Outcomes at the current level vs. greater or lesser levels of service.

6. FUTURE DEMAND

6.1 DEMAND DRIVERS

The significant future demands affecting water supplies in Mackenzie District to be considered are:

➔ **Growth Trends –** Trends in population growth or decline give a good indication of future growth and in turn demand on the network.

➔ **Economic Changes** – Changes in land use, industry, economic climate and tourism can all affect the demand on the Water Supply asset.

➔ **Improvements to Levels of Service** - Continual demand for improvements in the levels of service. This can result from:
- Advances in available technology
- A greater understanding of customers' perceptions and expectations
- A higher level of public expectations
- Changing legislative requirements
- Government organisations setting higher standards

6.2 DEMAND FORECASTS

6.2.1 GROWTH TRENDS

6.2.1.1 Population Projections

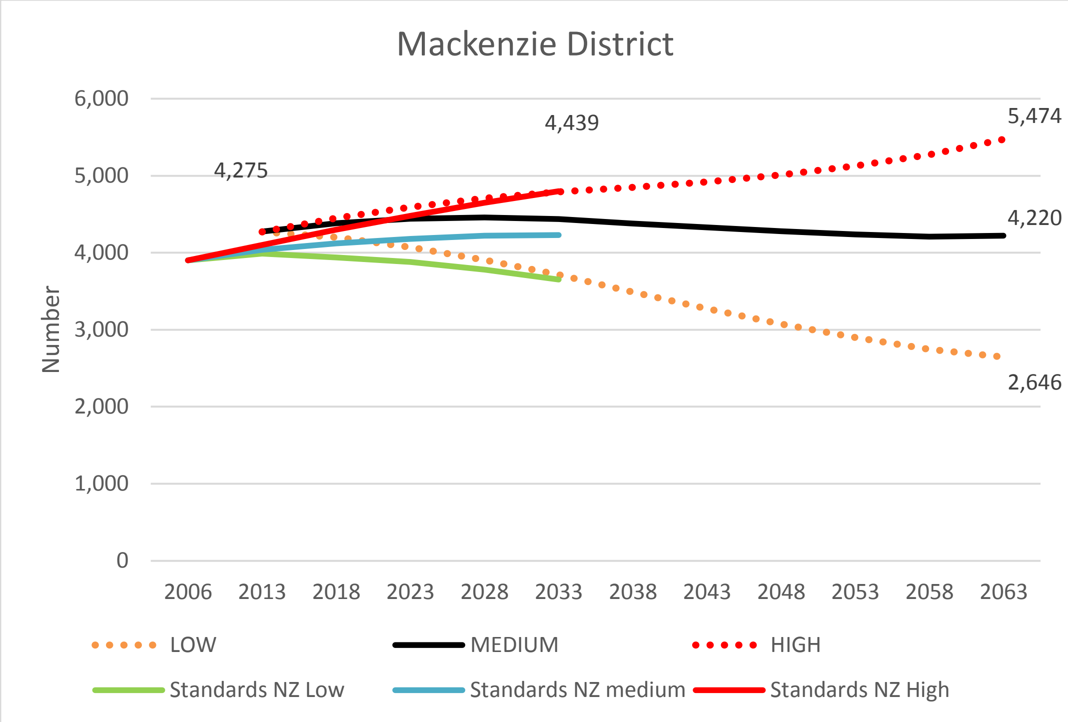
The Mackenzie District has seen an increase in population of 9.3% since 2006. This is a significant change from the 2001-2006 period where the population grew by a modest 2.3%.

As we cannot predict the future population level and when it will occur, it will be inappropriate to extrapolate this trend to a 20 – 25 year horizon.

The projected population trends (2013) from a collaborative study completed for the three South Canterbury Councils is demonstrated in Figure 6.1. This shows that a medium population projection indicates that the population will remain stable. As, we have identified, the Mackenzie District has had a 9.3% increase in normal resident population, therefore are tracking slightly above the medium growth projection, however, the results are slightly skewed due to the longer period between census surveys.

Consequently the following graph predicts a relatively static population growth over the period of this asset management plan. As a result there will not be any significant increase or decrease in demand for Council services based on change in population.

Figure 6.1 Estimated and projected population (Statistics NZ)



6.2.1.2 Development

Analysis of the future urban and rural residential subdivision over the next 4 years shows an average of 10 sections per year, along with associated infrastructure, to be vested in Tekapo and an average of 46 per year in Twizel.

During the 2015/17, 1,950m of Water Supply network, including valves and Hydrants etc, will be vested in Council. Whilst developers have to construct this to Councils standard before vesting the ongoing maintenance and depreciation costs have to be allowed for.

It is assumed that this level of development will slow down to about a third of this but continue at that rate for the duration of this strategy.

6.2.2 ECONOMIC CHANGES

The economy of the District is built on tourism, farming and hydroelectric development.

The District is fortunate in having Lake Tekapo, Lake Pukaki and Aoraki Mount Cook, the international tourist icons, within its boundaries. They provide an excellent platform from which to develop the tourism potential of the District.

Land use intensification, due in part to increased irrigation, such as dairying, cropping, horticulture and forestry are becoming increasingly common and offer considerable scope to grow the local economy.

Change in land use is ongoing and something that is hard to predict. The following factors influence those land use changes.

- Tourism
  - Mt John Tourism along with the Night Sky Reserve are putting increasing pressure on Godley Peaks Rd as people want to travel to the top of Mt John.
  - Lake Alexandrina. Having been to the top of Mt John and observed the lake the tourist wants to visit these scenic attractions. Challenge here is keeping them on the “right” side of the road, along with the associated wear of the sealed and un-sealed pavements.
  - Haldon Camp. This is on the shore of Lake Benmore and puts high summer traffic on Haldon Road.
  - Ski Fields. As these open the traffic on the feeder roads can increase by 1200%
  - Alp2O cycle trail. This new attraction is starting to put increased demands on Mt Cook Station Road and Hayman Road creates conflict with other road users especially the logging operations.
- Tenure Review
  - There are a number of High Country Stations still to go through tenure review. Historically this has involved part of the station passing into the public estate and being opened up for access. There is a higher expectation from the Department of Conservation and other road users for better access to be made available with no extra funding from either NZTA or DoC. Staff are working with DoC to try to minimise this effect so significant allowance has been made for this.
- Land Use Intensification
  - Godley Peaks Station – New water take consent obtained and it is projected to significantly add to the 30,000 lambs that come off the property and the 1500 tonnes super applied to the property last year. 250 HCV movements on and off the property, all towed through the Cass River by a dozer.
  - Dairy Conversions
  - Mt Cook Station 50yr forestry programme
  - Primary Produce increase as the result of increased irrigation

Due the difficulty in predicting where this demand might be over the next 30 years, it is important to recognise that it will happen and plan for it as early as the knowledge and effects become better understood.

6.2.2.1 Tourism

Local Government and the Tourism Strategy

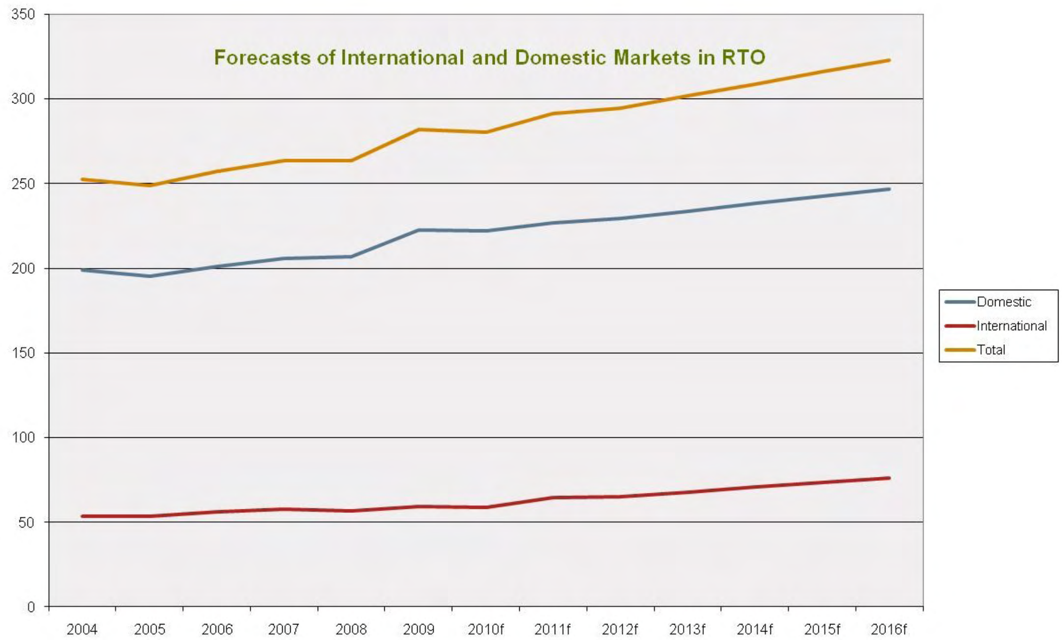
Outcome Four of the New Zealand Tourism Strategy 2015 is, “The Tourism Sector and Communities to Work Together for Mutual Benefit”. The Strategy states that the role of local government is to provide:

- Infrastructure and facilities, such as roads, water, waste management, lighting, and, in some areas, public transport. Many local authorities also operate attractions such as museums, art galleries, gardens, sports venues, and events for the enjoyment of both locals and visitors
- Visitor information and marketing services through the i-SITE network, signs and the Regional Tourism Organisations
- Planning support for the tourism sector, including regional tourism strategies, destination-management plans, Long-Term Plans and District Plans.

Tourism makes up a large component of transportation demand within the district. The Ministry of Tourism states that total visits by travellers to Mackenzie RTO (Mackenzie District) are forecast to rise from 960,377 in 2009 to 1,075,079 in 2016 - an increase of 11.9% or 1.6% per annum. Growth is shown in Figure 5.2.

The influx of domestic holiday-makers into the district, particularly the Mackenzie Basin, has significant impact on the Water Supply network, increasing the demand substantially. As development occurs, the developers are required to develop their own Water Supply system to cope with the expected increase in demand and provide for the domestic use and fire suppression requirements of the subdivision.

Figure 5.2 – Forecast Tourism for Mackenzie District (Ministry of Tourism)



6.2.2.2 Changes in Land Use, Practices and Resource Use

Rural change can take several different dimensions, which might include:

- Land cover (e.g. grass, indigenous vegetation)
- Land use (e.g. development)

The change in land use will not adversely affect the District's Water supplies as they are generally protected by MDC owning lands around the catchments or by water supply protection zones being put in place.

Development is likely to have some impact on the Water Supply for Burkes Pass as there is only a gentlemen's agreement to keep cattle out of the catchment at time of calving (the most at risk time for cryptosporidium)

6.2.3 IMPROVEMENTS TO LEVELS OF SERVICE

6.2.3.1 Changes in Customer Expectations

In recent years there has been an increasing awareness on the part of owners with respect to Water Supply issues. With rate of growth in the rating base reducing, the following factors may need to be considered:

- Increased level of awareness of water quality
- Increasing demand for better pressure and flow

6.2.3.2 Changing Level of Service Demands

The intended Levels of Service defined in Section 3 are considered to be representative of the service demands of the current and the future community. With the lack of growth in the rating base the following factors may need to be considered:

- reduction in maintenance of some facilities that have little impact on the overall service delivery (if possible)

6.2.3.3 Policy or Management Changes

Changes to Water Supply policies may be driven from a number of directions. They could be internally driven (e.g. Development Impact Levy policies) or externally driven (e.g. changes driven by regional or national organisations like Environment Canterbury). Monitoring and being aware of possible implications of these changes enables the impacts of such changes to be anticipated and predicted. While there is no certainty, it is important to consider them when developing asset management risk forecasts and strategies.

National Infrastructure Plan 2011
The second National Infrastructure Plan was released on Monday 4 July 2011. The Plan outlines the government's 20 year vision for New Zealand's infrastructure:
By 2030, New Zealand's infrastructure is resilient, coordinated and contributes to economic growth and increased quality of life.
It also outlines a 3 year programme of work to progress this vision.

FUTURE DEMAND

The overall purpose of this Plan is to improve investment certainty for businesses by increasing confidence in current and future infrastructure provision.

Three-Year Action Plan
Government is committing to the following actions to give effect to the vision and principles and to move towards the next edition of the Plan in 2014.
Transport
Ensuring a stable regulatory environment. Supporting growth in Auckland. Improving the overall effectiveness and efficiency of the network.
Telecommunications
Public and private sector take up UFB infrastructure. Greater efficiency in telecommunications networks.
Energy
Further develop and improve the electricity regulatory regime. Improve the information base available to support further investments in petroleum and minerals sectors.
Water
Better demand management practices and consistent performance criteria for water infrastructure. Promote partnerships and activities within the sector. Ensure that management of water assets contributes to improved social, economic, environmental and cultural wellbeing of communities.
Social
Alternative approaches to the funding delivery and management of assets and associated services. Improved spatial consideration of social infrastructure to support growing communities. Greater use of shared services by local government.
Strategic Opportunities
The following is a snapshot of the strategic opportunities that will help achieve vision and goals that have been identified in each sector.

1. Central government will commit to developing and publishing a ten year Capital Intentions Plan for infrastructure development to match the planning timeframe required of local government.
2. Increase understanding of and encourage debate on the use of demand management and pricing in infrastructure sectors.
3. Improve access to information on current infrastructure performance to create certainty about when, where and how infrastructure development is occurring, including consideration of whole of life costs.
4. Develop performance indicators for each sector on the stock, state and performance of central and local government infrastructure assets as well as those managed by the private sector.
5. Work with regions to develop more strategic infrastructure planning at a macro-regional level. Consider where adoption of spatial planning would produce optimum outcomes, particularly in metropolitan areas.
6. Improve scenario modelling to more accurately project likely infrastructure investment requirements from the short to very long term.
7. Use lessons from Christchurch to significantly enhance the resilience of our infrastructure network. This may include developing improved seismic design standards, reviewing organisation culture to improve performance in emergencies and identifying ways to quickly return services to full operational capacity.

8. Explore alternative sources of funding, and implement funding tools that can be used to manage the current portfolio more effectively.

Financial Contributions

Financial Contributions are another means of funding network infrastructure, reserves or community infrastructure. Mackenzie District Council has prepared a 'Financial Contribution Policy'. The contribution policy includes a methodology for calculating the cost of the impact a development will have on existing community infrastructure including Water Supply. This ensures that the negative impact of development is in part funded by the developer rather than the ratepayer.

The policy uses the following formula to calculate the level of contribution:

ASSET VALUATION – DEBT LOADING / THE NUMBER OF CONNECTABLE PROPERTIES TO THE SCHEME.

For 2015/16, the financial contribution payable on each lot created at the time of subdivision is calculated at $4288. This amount is GST exclusive.

The financial contribution figures are reviewed annually.

6.3 DEMAND IMPACTS ON ASSETS

Overall implications for the network of continual demand for improvement in levels of service tied to an effectively static population are:

- An increasing level of treatment caused by outside DWS requirements.
- An increasing focus water quality and pressure
- An increased level of expenditure to attain those desired controls/requirements
- A static ratepayer base to fund Mackenzie District Council's contribution to the separate community based water supply budget. Council has resolved to harmonise the water supply budgets across Fairlie, Burkes Pass, Tekapo and Twizel. This will have the benefit of sharing the capital expenditure and target that where most needed.

6.4 DEMAND MANAGEMENT PLAN

There are two recognised components to a demand management strategy:

6.4.1 ASSET BASED DEMAND MANAGEMENT

Asset Based demand management on the system really can only be focused on removing reducing the demand in particular for irrigation water in the urban areas..

In Twizel where the environment is naturally arid there is a high demand for water to make this a green oasis in the region. Of real concern is the larger life style blocks around Twizel that the Council has determined that they be "on-demand" supplies and no real restriction on the volume that can be used.

In Fairlie the maximum water take is determined by limits in the Opihi River Regional Plan and puts severe restrictions on this supply when the un-modified flow in the Opihi as measured at the State Highway One Bridge falls to 8.1 m^3/sec- first trigger and then second trigger of 2.5 m^3/sec or less.

There are minimal asset based demand options that do not have a significant cost attached.

6.5 UPCOMING ISSUES IN THE NEXT TEN YEARS

Health (Drinking Water) Amendment Act 2007

The Health (Drinking Water) Amendment Act 2007 requires water suppliers to take all practical steps to comply with the (previously voluntary) NZ Drinking Water Standards. To comply with the Act, Council must have in place, a Water Safety Plan which is approved by the Ministry of Health for each water supply. Dates for compliance with the Act are staggered depending on the size of the Community.

For Fairlie, Tekapo and Twizel the compliance date is 1 July 2014. For Burkes Pass, Allandale and Albury, the compliance date is 1 July 2016. (The Albury Water Supply is managed by the Albury Rural Water Supply Society Inc Committee under an agreement with Council, and expenditure on this scheme is not included in the LTP).

There are a number of areas where Council currently does not comply with the drinking water standards, but the standard which will requires a large capital investment and greater on-going operational cost is 'Protozoal Compliance'.

Protozoa are free-living aquatic unicellular organisms which are larger and more complex than bacteria. Cryptosporidium and Giardia are the protozoa of public health significance. Chlorine does not in-activate cryptosporidium.

The Drinking Water Standards uses a risk-based criteria for removal of protozoa depending on the potential for contamination of the source water, termed log-removal efficacy'. Each water source is categorised depending on its protozoal risk category according to the following table:

Table 5.1a: Log credit requirements for different catchment and groundwater categories

Catchment or groundwater protozoal risk category	Log Credit
Surface Waters	
Water from pastoral catchment with frequent high concentrations of cattle, sheep, horses or humans, or a waste treatment outfall nearby or upstream	5
Water from pastoral catchment that always has low concentrations of cattle, sheep, horses or humans in immediate vicinity or upstream	4

Water from forest, bush, scrub or tussock catchments with no agricultural activity	3
Groundwaters	
Springs and non-secure bore water 1-10m deep are treated as requiring the same log credit as the surface water in the overlying catchment	3-5
Bore water drawn from an unconfined aquifer 10-30m deep, and satisfies groundwater security criteria 2	3
Bore water drawn from deeper than 30m, and satisfies bore water security criteria 2	2
Secure, interim secure, and provisionally secure bore water	0

Each type of treatment process is allocated log credits. The sum of the log credits for each process in the treatment chain must be equal to or greater than the log risk category of the source water. Log credits for the various treatment processes vary from 0.5 log credits to 3.0 log credits. UV disinfection is dose-dependent and can be allocated up to 3 log credits. If the source water is suitable, UV disinfection is the most economical treatment for up to 3.0 log credits.

Catchment Risk Assessments

Catchment Risk Assessments which are the first steps in preparing the Water Safety Plans as required by the Health (Drinking Water) Amendment Act 2007 have been completed and sent to the Ministry of Health for approval for the Fairlie, Allandale and Burkes Pass Water Supply Schemes. As noted above, by agreeing a Log Credit for a particular scheme will determine the level of treatment required in the future.

Water Safety Plans

Water Safety Management Plans have been submitted and approved by the Ministry of Health for Fairlie, Tekapo and Twizel. Draft WSPs have been prepared for Burkes Pass and Allandale.

FAIRLIE

The Ministry of Health agrees with a **4 log protozoal treatment** being appropriate as indicated in the catchment assessment using table 5.1a.

The following improvements are recommended for preventing, reducing or eliminating the identified public health risks in the Fairlie drinking water supply.

iv) Treatment — Indications are that the supply will need to remain chlorinated, go through a filtration process followed by UV disinfection.

v) Storage — new reservoir for one day's storage

vi) Reticulation Renewal — all town reticulation which was laid in the 1940's will have been replaced after the 2020/21 year if the attached programme is followed.

TEKAPO

The Ministry of Health agrees with a 3 log protozoal treatment being appropriate as indicated in the catchment assessment using table 5.1a.

The following improvements are recommended for preventing, reducing or eliminating the identified public health risks in the Tekapo drinking water supply.

ii) Treatment — Indications are that the supply will need to remain chlorinated, be disinfected by UV.

This was completed in 2012.

BURKES PASS

The Ministry of Health have not assigned a log credit for protozoal treatment as Council has not yet confirmed if it requires the scheme to be assessed under Section 5 or Section 10 of the DWSNZ. It is anticipated that compliance will come under Section 10 'Small Water Supplies, Alternative Compliance Criteria'.

If section 10 compliance is considered then the source best fits the category describing a "Partially protected catchment" and would require three log credit and also bacterial treatment.

Council has assumed that UV disinfection will be added to existing chlorine disinfection. Additional storage is likely to be required to accommodate periods when the source water quality is not suitable for UV disinfection. Converting the scheme to a fully restricted supply scheme would provide that storage on each property.

A Public Health Risk Management Plan has been completed and submitted to the Ministry for consideration.

ALLANDALE

The Ministry of Health have not assigned a log credit for protozoal treatment as Council has not yet confirmed if it requires the scheme to be assessed under Section 5, 10 or Section 12. Section 12 is of the DWSNZ “Rural Agricultural Drinking Water Supplies” is still in the course of preparation and consultation.

It is anticipated that compliance will come under Section 10 'Rural Agricultural Drinking Water Supply Guidelines – 2015.’

Council has assumed that UV disinfection will be added to the existing chlorine disinfection. Some form of filtration is likely to be required for periods when the source water is not suitable for UV disinfection.

A draft Public Health Risk Management Plan has been completed.

TWIZEL

The Ministry of Health agrees with a 4 log protozoal treatment being appropriate as indicated in the catchment assessment using table 5.1a.

The following improvements are recommended for preventing, reducing or eliminating the identified public health risks in the Twizel drinking water supply.

i) Treatment — Install a barrier to protozoa, planning in place to use UV for disinfection and cartridge filtration.
ii) Storage — reline and cover reservoir
iii) Reticulation Renewal — all town Asbestos Cement water pipes to be replaced by 2035.

This work is currently underway and due for completion by October 2015.

As part of the investigations required to meet the DWS, Council decided it was prudent to look at a new source further west of Twizel where the water would be pumped once from new wells up into a new reservoir on the hill on Ben Ohau Station and then flow by gravity to serve the whole of Twizel, including the expansion happening to the west. Sufficient water was not found in this area and this idea was abandoned.

After considering the report from Opus Consultants Ltd “Twizel Water Supply Options – October 2013” Council resolved to rebuild and upgrade the existing water supply as this had the most certainty of outcome and was also the most cost effective solution.

ALBURY

The Albury Supply has not had a catchment risk assessment completed.

For Albury, the supply can be assessed as either a small supply against Section 10 of the DWSNZ or against Section 5 (the same as larger schemes). Section 5 indicates a protozoal removal requirement of Log 4. This could potentially be reduced to Log 3 if the supplies are designated small supplies and assessed against Section 10. A further option may be Section 12, “Rural Agricultural Drinking Water Supply Guidelines - 2015” which is still in the course of preparation.

MANUKA TCE

Council recognised the need for a treated water supply to be provided on a restricted basis, for the new Manuka Tce sub zone. This area has some two hundred sections with all potentially drawing water from bores on those sections and disposing sewage via septic tanks to ground also on those same sections.

Preliminary investigations, including test pumping, have been completed. A suitable source has been found at the west end of the site but unfortunately it has added to the cost. Opus International Consultants has completed a review of the project and produced a report on their findings (Manuka Terrace – Twizel, Water supply Review – Nov 2014).

This report is the basis of further consultation with the benefiting rate payers. Council is still to consider the submissions received on this issue.

6.5.1 NON-ASSET BASED DEMAND MANAGEMENT

There are some options to affect reduced demand on the water supply networks that are not asset based. Generally these all limit the amount of irrigation that can be applied to domestic properties or the encouraging consumers to purchase energy efficient appliances in relation to water use.

6.6 INFRASTRUCTURE IMPROVEMENTS

Council is rolling out SCADA telemetry monitoring system across all water supplies to allow real time monitoring of them in Fairlie.

In order to have a more accurate idea of the impacts of demand on the network and managing any growth, Council has modelled the existing Water Supply network provided definitive information the ability of the existing network to cope with increased development at the top end of the pipe networks.

6.6.1 FAIRLIE

The Fairlie Water Supply does not currently meet the Health (Drinking Water) Amendment Act (2007). Investigations are underway on another spring to the west of the current source to monitor the turbidity of the flow over time. The hope is that the turbidity will remain generally below 1 Ntu and as a consequence will not require extra filtration to meet the DWS. If this is not successful then the well on the Guerin property will be further evaluated to see if it remains clear when the current source is turbid.

The estimate for the upgrade of this supply to meet the DWS is $2,600,000 based on positive outcomes of the current monitoring programme of the new spring source. The upgrade is programmed for 2017/18.

Fairlie embarked on a replacement programme of its old concrete pipe network in 1998 and have generally spent $100,000 per year on this initiative The replacement programme will be complete by 2020/21 at the current rate of $120,000 per year.

There is 13773 m of Asbestos Cement water pipes in Fairlie. A testing programme is required to confirm the remaining life and the eventual replacement.

6.6.2 TEKAPO

There is 5885 m of Asbestos Cement water pipes in Tekapo. A testing programme is required to confirm the remaining life and the eventual replacement.

6.6.3 TWIZEL

The Twizel water Supply is being upgraded in 2014/16. The work involves a complete rebuild of the pump set that provides water at pressure to Twizel. At the same time the treatment plant is being upgraded so that water provided complies with the Health (Drinking Water) Amendment Act (2007). No significant change is expected to the normal operation of this activity once the treatment upgrade is complete. Scada telemetry will be installed in 2015 as part of the head works upgrade.

Having completed the treatment upgrade the only outstanding item to address is replacing the reservoir liner ($70,000) and covering the reservoir ($210,000). Replacement of the liner is essential and this has been allowed for in 2015/16. Covering the Reservoir is not as straight forward as the reservoir contains raw water and it is unnecessary to cover it for water quality. However recent discussions with both Council and the Twizel Community Board indicate a desire to have it covered. In anticipation of this it is proposed to programme the covering of the reservoir in 2015/16. Both the Twizel Community Board and Council will consider this as part of the 2015-25 LTP preparation.

There is 25.5km of Asbestos Cement pipe in the Twizel (2.0k is privately owned), all installed in early 1970s. AC pipe is affected by both water and soil conditions and this causes premature failure of the asset. Several samples have been analysed to predict the remaining life of these pipes. Whilst there have been few actual failures yet, the analysis shows that the AC network is at risk of failure from now to 2020 and all the AC pipe should be replaced by 2020. The cost to replace the AC pipe network is $4,050,000. A replacement programme based on a predictive failure model form the various pipe samples has been prepared.

The model takes into account the following

- Existing and future demand
- Roading replacement programme, both footpath and roadway
- Ability to fund
- Availability of contractors
- Refurbishment method

Due to the scale of the replacement programme and the narrow failure timeframe it is not recommended “sweating the asset” due to the criticality of these assets both for domestic supply and fire suppression.

It is likely that pipe should be replaced prior to any observed failure to fit in the five considerations above.

FIGURE 6.1 - SAMPLING LOCATION AND REPLACEMENT DATE

Township	Location	Pipe purpose	Diameter	Replacement Date
Twizel	37 Sefton St	Water	100	2022
Twizel	Nuns Veil & Mackenzie	Water	150	2043
Twizel	Wairepo Rd	Water	100	2037
Twizel	Fraser Crs	Water	100	2024
Twizel	Mt Cook St	Water	150	Now
Twizel	Jollie & Dobson	Water	100	2022
Twizel	Ohau	Water	100	2023
Twizel	Glenbrook Crs	Water	100	2029
Twizel	Omahau Crs	Water	100	2036
Twizel	226 Mackenzie Dr	Water	150	2021
Twizel	Rata Rd	Water	100	Now
Twizel	16 Glencairn Crs	Water	100	2034
Twizel	Hooker Crs	Water	100	2023
Twizel	4 Mt Cook St	Water	100	2024
Twizel	193 Mackenzie Dr	Water	150	Now
Twizel	46 Tekapo Dr	Water	100	Now
Twizel	51 Maryburn Rd	Water	150	Now
Twizel	Glen Lyon Rd	Water	300	2100
Twizel	67 Irishman Dr	Water	100	2027
Fairlie	Fairlie-Tekapo	Water	75	Now

Analysis of these test results shows that the large diameter pipe in the reticulation has very good remaining life (80 years), but the 100mm and 150 mm diameter pipe has a varying remaining life, being at risk of serious failure from now on for the next 20 years.

This strategy recommends that Council start the replacement programme in 2015/16 and continue to replace the rest of the AC pipe over the next 20 years. The average cost per year is $225,000 starting with the most at risk or critical pipelines first. It would be sensible to complete each street fully so the actual cost per year will vary.

Initial programme is:

Location	Programmed Replacement	Estimate $ (2015)
Mt Cook Street and Maryburn Road	2015/16	211,000
Tekapo Drive, Godley Street and MacAuley Place	2016/17	208,000
Rata Road and Ohau Road	2017/18	190,000
Part Mackenzie Drive, Sealy Street and Fraser Crescent	2018/19	223,000
Jollie Road, Hunter Cres, Falstone Cres, Huxley Pl and Dobson Pl	2019/20	249,000
Market Place	2020/21	149,000
Ostler Road and Hooker Crescent	2021/22	132,000

This will be reviewed over time as pipes start to fail and also to fit in with footpath resurfacing. It is recommended that the footpath be resurfaced with Asphalt on completion of the rehabilitation in each street. This will be a better long term whole of life solution than the current chip seal.

With the steady growth of Twizel to the west, the impact of Plan change 15 allowing for low density residential areas and the Council policy of only supplying water on a restricted basis may put off the need for a large trunk water main to be laid into this area. However this will need to be monitored over time as development and demand increases in this area. Reports provided to Council by Opus International Ltd have recommended the construction of a 300mm trunk main to be laid from the headwork's to the Res 4 zoned land west of Twizel. The cost of this is estimated at $315,000. This work could be funded in part or wholly by developers by way of development contribution.

The area to the west of Twizel known as The Drive is zoned Res 4 and Rural Residential 1, these zones allow for low density sections. Council has determined that this area is to be serviced by an on-demand water supply. In times of high demand, the flow and pressure drops off markedly to the point where water flow is non-existent. An undertaking has been given to those residents in that area that an in-line booster pump will be installed in 2015/16 to address this problem.

7. RISK MANAGEMENT

7.1 INTRODUCTION

The following outlines a suggested risk management procedure for the MDC infrastructure networks. The procedure establishes the basic parameters within which risks must be managed and sets the scope for the risk management process.

The risk management process proposed is based on the Guidelines in AS/NZS 4360:2004, "Risk Management" and SNZ HB 4360:2000 New Zealand Handbook "Risk Management for Local Government" that defines the risk management process as:

> ***"The systematic application of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or Plans or from complying with its legal obligations".***

These plans may include the Long Term Plan, Activity Management Plan, Annual Plan, Financial Strategies, corporate plans and policy documents.

It is important for Council and it's stakeholders to understand and appreciate that the risk management structure for any asset management system will inevitably be different from that which is appropriate for capital works projects, and will be greatly influenced by the structure of existing asset management systems. With capital projects, risk management systems are very much focussed on the early identification of live or emerging risks and then developing treatments or strategies to minimize or mitigate their negative effects.

Because the capital project has a beginning and an end, the identification of these risks is a dynamic process that must focus on actively managing known risks, and also expending resources on identifying those risks that were unanticipated. In the capital project, one would expect a significant number of unanticipated events that may affect the completion date or the financial performance of the project, but the majority of these risks then decline to zero as the project nears completion.

In contrast, asset management and network operations are ongoing activities that have been functionally providing expected results to Council for many years. Within this environment, the risk management practitioner is likely to find fewer emerging risks, particularly because existing systems have been established to minimize their occurrence.

Managing infrastructural assets and network operations as a management activity has evolved as it has matured as an industry and the modus operandi has been structured over time to minimize the risk of unexpected events. In many cases these existing controls were likely implemented with risk being one of several motivators for the control. In most cases, these controls will materialise as a set of policies, procedures, and detailed systems that manage some of the network risks in more detail. One tenet within "Risk Management" is "once the risk actually occurs, it ceases to be risk management, and becomes incident management". While incidents continue to occur, in the asset management case, many of these incidents will have occurred early in the industry's history. Policy, procedure and micromanagement have therefore already been developed to minimize their frequency and consequences.

From the asset manager's perspective, the existing system for managing risk to a standard level will be reliant on a defined level of funding, and further investment and effort will be required to allow for an increase in the level of control of existing risk exposure.

The risk management system requires a reporting function that informs management personnel, who are likely to be outside the day-to-day activities of asset management, of the impact their existing decisions have on their risk exposure, along with the effective communication of emerging risks that may be exceptional. This reporting function should be composed of both a standardised format at a defined frequency in addition to an exceptional reporting mechanism that will occur at a higher frequency as the need arises. It is through this reporting mechanism that Council can be:

- Informed of current risk levels given the existing funding regime
- Appraised of emerging risks that may require immediate or exceptional attention and resources

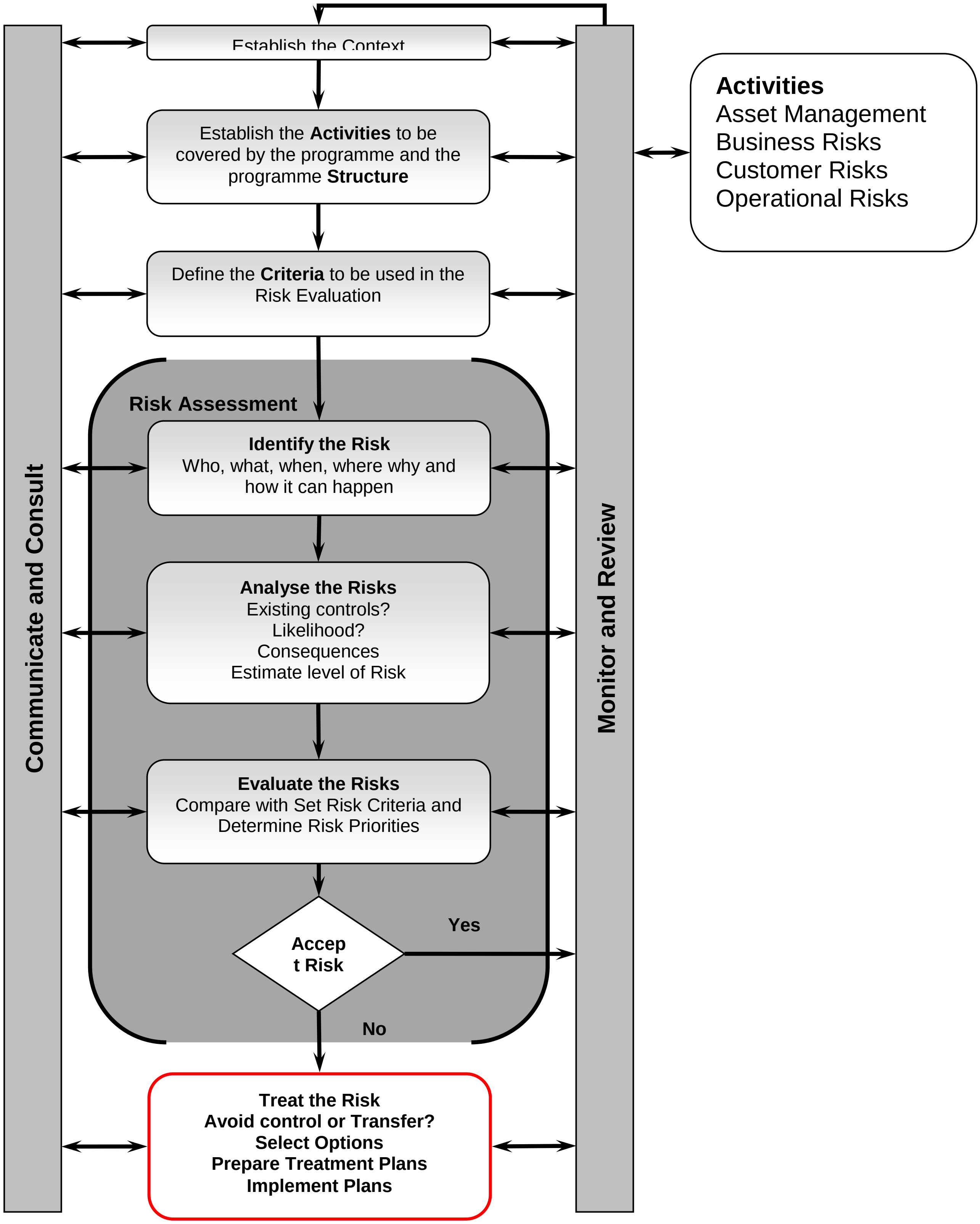
This information will assist Council personnel to assess where risk reduction efforts should be focussed based on their corporate accepted risk level. The reporting mechanism will also allow the asset management teams the opportunity to provide alternatives to decrease the current risk levels based on Council's priorities and assist with the development of preferred strategies which can be effectively implemented at the functional level.

Assessment of risks is initially based on a qualitative analysis. More sophisticated analysis or quantitative risk analysis may be carried out as part of the risk treatment plan for specific high risk events.

The overall risk management process is illustrated in Figure 7.1.

RISK MANAGEMENT

Figure 7.1 – Risk Management Process



7.2 THE RISK MANAGEMENT PROCESS

7.2.1 UNDERSTANDING THE CONTEXT

As for the levels of service, the context for the application and development of risk must be set to ensure that risk development is not completed in isolation, as the identification analysis and treatment of risk will impact at all levels in the management of the asset; from community outcomes through to service level delivery, strategic goals and operational delivery.

Context refers to strategic context, organisational context and risk management context.

7.2.1.1 Strategic Context

This AMP for Water supply sets out the strategic context as it relates to risk management. It outlines the relationship to identified community outcomes, activity goals, strategic result and strategic action. Further the plan sets out the relationship to other plans, legal requirements, financial strategies, regulatory and policy obligations of this infrastructural activity.

7.2.1.2 Organisational Context

The organisational context is approached through the identified activities of managing the asset, as the activity identifies the risk associated with staffing, the elected representatives and work areas, location and IT systems.

7.2.1.3 Risk Management Context

The risk management context refers to the risk-related activities undertaken within the activity. The remainder of this section sets out the risk management context in terms of risk management activities, likelihood scale, and consequence scale. A risk assessment matrix and risk register are introduced, as are the required analysis and format for a risk treatment plan.

7.2.2 ESTABLISHING THE ACTIVITIES

Table 6.1 sets the areas of activity associated with the MDC water supply activity. Under each heading is a process that might occur within these activities (not an exhaustive list). These processes have associated with them a number of risks. By setting the activity and their associated processes the development of the risk register and all associated risks can be considered and analysed and related to the AMP for Roading.

Table 6.1 – Risk Management Activities

Water Supply Risk Management Activities				
	Asset Management	**Business**	**Customer Services**	**Operational**
Processes	Forward Planning	Funding Provision	Public Request Management	Routine Maintenance
Processes	Council Maintenance Programme	Governance	Managing Response Times	Planned Maintenance
Processes	Information Management	Legislation Compliance	Customer Expectation - Raise/Reduce	Routine Maintenance

Water Supply Risk Management Activities				
	Asset Management	Business	Customer Services	Operational
	Standards and Guidelines	Policy Development	Level of Service change	Planned Maintenance
	Demand Change	Service Provision Purchasing	Customer not understanding service levels	Routine Maintenance
	Data Storage	Employment	Customer Consultation	Capital/Renewal Physical Works (QA, Management, Timeliness)
	Information Systems	Financial Reporting /Management		Routine Inspections - (Contractor/Consultant/ Asset Owner)
	Consultant	Political – Elected Representative		Contract Administration
	Contractor	Council Staff		Routine Maintenance

7.2.2.1 Relationship of Risk

The relation of risk in the AMP is achieved through the risk management activities. The activities relate to the plan in the following way:

Table 6.2 – Relating Risk to Water Supply Activity Plan Sections

Risk Management Activity	Plan Section
Activity Management	Life Cycle Management, Future Demand, Level of Services, Asset Management Practice
Business	Financial Summary, Level of Service, Asset Management Practice, Plan Improvement and Monitoring
Customer Services	Levels of Service, Life Cycle Management, Plan Improvement and Monitoring
Operational	Life Cycle Management, Asset Management Practice

Risks apply across all processes in the management of the asset. The risk register holds the identified risk and which activity the risk impacts on.

The outcome of the process, illustrated in Figure 6.1, will be development and on-going maintenance of a Water Supply Risk Register. This register will contain a prioritised list of all of the identified risk within each of the above four Risk Management Activity areas.

7.2.3 RISK CRITERIA

Criteria are used to evaluate the level of risk. They may be measured by key performance indicators. Risk is a function of consequence and probability/likelihood of an adverse event. Risk management procedures set out in AS/NZS 4360:2004 provide a general frame work for different organisations and activities. The following tables suggest criteria for the MDC water supply network.

7.2.3.1 Likelihood (L) Scale

Likelihood Scale applicable for water supply activities are based on frequency or return period, rather than an absolute probability. These are set out in Table 6.3 below.

Frequency and probability of occurrence in 10 years are indicative only. Values are rounded off where appropriate to avoid giving a greater impression of accuracy than is justified by the qualitative analysis that is undertaken. The prime objective of this process is to determine a set of applicable likelihood criteria which are also reasonable within the context of managing the water supply network.

Table 6.3 – Likelihood Scale

Likelihood Scale (L)				
Level	**Descriptor**	**Description**	**Indicative Frequency**	**Probability of at least one occurrence in 10 years**
A	**Probable**	The threat is expected to occur frequently	> 1 year	>99.9%
B	**Common**	The threat will occur commonly	1 to 5 years	90% to 99.9%
C	**Possible**	The threat occurs occasionally	5 to 10 years	65% to 90%
D	**Unlikely**	The threat could occur infrequently	10 to 50 years	20% to 65%
E	**Rare**	The threat may occur in exceptional circumstances	>50 years	<20%

7.2.3.2 Consequence (C) Scale

The scale of consequence is focused around a quantitative approach and includes categories of health and safety, image/reputation, annual costs, obligations, network condition and serviceability.

The following provides explanatory notes for each consequence type:

- **Health and Safety**: Self explanatory
- **Image Reputation**: Self explanatory
- **Environment**: The possible impact on the environment from an event taking place
- **Annual cost**: The risk assessment for annual cost is the whole cost of negative events, without considering the potential subsidies from Central Government for reducing the risk or dealing with the potential consequences. This is something that maybe taken into account at 'Treatment Plan' stage.

- **Obligation**: Relates to those issues of sound governance and includes the ability of the Council to meet identified Community Outcomes as stated in the LTP in relation to the LGA2002's four well beings
- **Network Condition**: Is the net reduction of the asset value in the case of an event occurring. This is a subjective measure and is used to indicate the unexpected loss of service potential in the asset.
- **Serviceability**: Relates to accessibility and the impact on accessibility from an event.

Where an event may impact upon more than one outcome area, then the one scored as having the highest level should be used for the risk rating calculation.

Table 6.4 – Consequence Scale

Level	Descriptor	Consequence Scale (C)						
		Health and Safety	Image / Reputation	Environment	Annual Cost	Obligations	Network Condition	Serviceability
I	**Severe**	Multiple fatalities	International media cover	Permanent widespread ecological damage	>$10M	Central government takeover	Net reduction to asset value > $10 million	Prolonged (> 1 Month) disruption to major facility or large area
II	**Major**	At least one fatality	Sustained national media cover	Heavy ecological damage	$1M to $10M	Government or independent commission of Inquiry	Net reduction to asset value $2 to $10 million	Temporary (5 Days – 1 Month) disruption to large area or prolonged disruption to smaller area
III	**Moderate**	Serious injury	Regional media cover or short term national cover	Significant, but recoverable, ecological damage	$100k to $1M	Abatement Notice, RMA prosecution, Audit tags	Net reduction to asset value $0.5 to $2 million	Temporary disruption to small area and significant reduction in Levels of Service. Detour > 10 km
IV	**Minor**	Minor Injury	Local media cover	Limited, medium term, ecological damage	$10k to $100k	Minor claims, excessive rate payer complaints.	Net reduction to asset value $100 to $500 thousand	Moderate reduction in Levels of Service. Significant traffic delay or short detour in place for < 1 day.
V	**Negligible**	Slight Injury	Brief local media cover	Short term damage	< $10k	Occasional rate payer complaints	Net reduction to asset value < $100,000	Minor traffic delay (< 2 hours)

7.2.3.3 Risk Rating

The risk ratings have been assigned 4 categories, based upon the actions required to mitigate the risk set out in Table 6.5. These actions are:

- For risks in the **Very High** category are considered intolerable and immediate action is required to reduce the likelihood or consequence to reduce the risk to a lower category. Risk treatment options may be required that are not justifiable on strictly economic grounds. Safety, legal and social responsibility requirements may override financial considerations. As a minimum there must be a specific risk treatment plan for each entry in the “very high risk” category.
- **High Risks** are undesirable, but may be accepted if they cannot be reduced or avoided. All reasonable measures should be undertaken to reduce these risks to as low a level as possible, regardless of cost, inconvenience or other factors. As a minimum there must be a specific risk treatment plan for each entry in the “high risk” category.
- Items in the **Medium Risk** category should be evaluated on a case by case basis. Action to reduce these risks will be undertaken only when the potential benefits of the risk treatment outweigh the expected costs. Normal project evaluation criteria can be used to asses potential risk treatment measures for medium risks.
- No action required for **Low Risks**, other that monitoring to ensure they do not progress into higher risks.

Table 6.5 – Risk Rating Categories

Rating	Description
Very High	**Intolerable. Urgent action required. Mitigation plan required for each risk**
High	**Take actions to reduce risk to as low as reasonable possible. Mitigation plan required for each risk.**
Medium	**Tolerable. Consider mitigation measures on case by case basis. Measures to reduce risk if justified.**
Low	Business as usual.

Table 6.6 summarises the outcome of the various likelihood x consequence (LxC) combinations producing a risk rating matrix. When the analysis of the risk is undertaken any item on the register that receives a rating of high or very high will require further work according to the rating outcome.

Table 6.6 – Risk Rating Matrix

Likelihood (L)		Consequence (C)				
		I	II	III	IV	V
		Severe	Major	Moderate	Minor	Negligible
A	Probable	Very High	Very High	High	High	Medium
B	Common	Very High	High	High	Medium	Medium
C	Possible	High	High	Medium	Medium	Low
D	Unlikely	High	Medium	Medium	Low	Low
E	Rare	Medium	Medium	Low	Low	Low

7.2.4 RISK ANALYSIS

The next steps in the risk management process are to develop a comprehensive list of risks (Identify the Risks), analyse the risks and to evaluate each one against the criteria defined above. The risks will be entered in a risk register, Appendix iii, in the form shown on example table 6.7. Ideally, a risk should be identified in the following terms:

Table 6.7 – Example Risk Register

Ref	Name	Description	Existing controls	Likelihood (L)	Consequence (C)	Risk Rating (LxC)	Treatment option	Treatment cost

(Something happens) leading to a (negative outcome). The description should include additional information, such as:

- the source of the risk
- what are the existing controls or influences on the risk
- what (specifically) are the consequences
- is it dependent on other risks or conditions

The risk may trigger several categories of consequence, or if it has a range of probability/likelihood and consequence, it should be rated according to the combination that gives the highest risk rating.

Risks fall under the general headings of the Activities as outlined in table 5.1 “Risk Management Activities”:

- Asset Management (Ref A for example placed under “Management Activity” in the Risk register)
- Operational (Ref; O)
- Customer Services (Ref; C)
- Business (Ref; B)

The reference is then used to relate the identified risk to the Asset Management Plan for Water Supply.

An event leading to a negative outcome to Council's objectives is regarded as a **Threat.** However the process of risk analysis can also occasionally identify positive outcomes or **Opportunities**, and it is quite appropriate to use this register as a means of recording these in addition to the more common approach of only just considering the Threats.

The description should include additional information, such as: the source of the risk, what are the existing controls or influences on the risk, what **(specifically)** are the consequences, is it dependent on other risks or conditions.

Residual Risk

The Consequence and Likelihood values applied to derive Risk Rating on the register need to reflect the level of residual risk remaining after the Risk Treatment Plans have been developed and implemented and their effectiveness in mitigating or eliminating the initial level of risk has been assessed.

7.2.5 TREAT RISKS

A risk treatment plan should be created for all risks rated high or very high in the form shown in Figure 6.2, to document how the risk treatment options will be implemented.

Risk treatment options generally fall into the following categories:

- Avoid the risk by deciding not to start or continue with the activity that gives rise to the risk. This includes considering the possible risks within a project when a project is being considered
- Reduce the likelihood of the negative outcomes
- Reduce the consequences
- Sharing or transferring the risk with other organisations
- Retaining the risk, after all reasonable treatment measures have been considered.

Some risks may be rated high initially due to uncertainty in the likelihood or effects and the risk treatment plan may consist of further investigations or assessments to better define the level of risk. Other risk treatment options may consist of financial controls (e.g. insurance), operational improvements, contingency planning or physical works to reduce risks.

Figure 6.2 – Risk Treatment Plan

Risk Treatment Plan			
Risk:			**Ref:**
Summary			
Proposed actions			
Resource Requirements			
Responsibility			
Timing			
Reporting and Monitoring			
Compiled By:	Date:	Reviewed By:	Date:

7.2.6 RISK TRANSFER

A fundamental concept in Risk Management is that the Risk Treatment activities should be the responsibility of, and carried out by, the party who is in the best position to manage them; which may be Council staff, Consultant(s), the Maintenance Contractor(s) or other third parties. To assist with this understanding, Council is encouraged to seek and evaluate as much information as possible on the spectrum of risk associated with all practical alternatives along with their associated costs.

Through this process of risk/cost trade off they will be able to then determine an appropriate balance of accepted risk and associated cost. In some situations the Council may feel that it is appropriate for them to carry a higher level of risk rather than bare a much higher level of expenditure that would otherwise be necessary to see the risk transferred to another party.

7.3 IDENTIFIED RISKS

7.3.1 CRITICAL RISKS

The most critical risks are:

- Identifying and agreeing the risk management context, i.e. consequence/likelihood frame work. Without this agreement the risk rating process may lead to an extensive number of high to very high risks requiring funding to mitigate or fix
- The changing legislative environment requirements
- Incomplete management and supervision of this activity due to limited staff resources

7.3.2 CONSIDERED RISKS

MDC Contract Procedures Manual

- The various contracts for the operation and maintenance of this activity require the contractors to provide Quality Plans for the execution of the contract requirements. The Quality Plans include procedures for work to be carried out. The risk is that the MDC and contractors procedures are not followed.

Health and Safety

- Council has a comprehensive Health and Safety Programme for its operations. Internally there is no risk in the implementation of this Programme.
- The various contractors involved in this activity have Health and Safety Programmes in operation. Reports are received from the contractors about any incidents relating to health and safety. Council's risk is that no inspection of work sites is undertaken by Council staff or their consultant to ensure that the requirements of the Council's and the contractors' Health and Safety Programmes are being carried out on site.

General Management Issues

- **Contract Observation** - The various contractors are not being observed sufficiently to ensure that all aspects of the contracts are being carried out or met.

- **Legislative Compliance -** Council staff practitioners supported by their experience and training, believe that all legislative requirements that impact on this activity are being complied with.

- **Resources -** The financial provisions shown in this Plan should be sufficient to provide the service required for this activity.

- **Service Agreements -** There are no specific service agreements in place between each department to ensure everyone is aware of their roles in this activity. However being a small Council with a small staffing level, interdepartmental discussion in relation to any facet of this activity is normal practice.

- **Council Policies Clear** - Council's policies are held in the Policy Manual. The activities for road policies are under review and will be put to Council for approval as they are completed.

Financial

- **Cost 'Overruns' -** Council staff manage expenditure by:
  - ordering work only if finance is available and approved
  - reviewing expenditure monthly
  - reporting exceptions

- **True Costs – Costs Not 'Manipulated' -** The financial forecasts that have been made in this Plan portray the true cost of this activity, given the assumptions made in making those forecasts.

7.4 INSURANCE

All above ground infrastructural assets are currently insured by Council. The below ground assets are not insured and Council is relying on its strong balance sheet to borrow sufficient funds to replace those assets in the unlikely event that there is widespread damage to those assets.

Council is not a member of LAPP, but have considered becoming a financial member but due to the Christchurch earthquake there is a significant buy in cost. Council is also concerned that another event like the Christchurch earthquake in another main centre would fully deplete the fund to the point there would not be enough funds available to repair our assets if they were damaged at the same time.

7.5 EMERGENCY MANAGEMENT

Operational Risks are those associated with the day to day operation of the District. The most prevalent of these are snow events followed by flooding and serious wind events. Initial response to all these events is managed through the Utilities Services Maintenance Contract, and is covered in our specifications. These specifications covers response times, liaison, notifications, plant and personnel requirements.

Council has held discussions on the "Life Lines" philosophy with the various groups that provide services within the district and is reviewing its "Disaster Resilience Summary". Council has participated in an Engineering Lifelines project, Earthquake Hazard Assessment, and the summary of the assessment is tabled below.

7.6 EARTHQUAKE DAMAGE ASSESMENT

Reference Report

The attached chart has been compiled for use with the Waimate, Mackenzie and North Waitaki Districts Engineering Lifelines Project, Earthquake Hazard Assessment, Report to Environment Canterbury, May 2008, (Ecan Report no. U/08/18) prepared by Geotech Consulting Ltd. It should be read in conjunction with Sections 6, 7 and 8 of that report. Section 9 outlines three earthquake scenarios, and it is recommended that these also be read to provide a perspective on the chart contents.

Chart Zones

The chart has been set out for each of the three Ground Shaking Zones as shown in Figure 6.13 of the above report. Because of the large area of the Districts, and the range of expected earthquake shaking intensities for any single earthquake event, or on a probabilistic basis, indicative damage is shown for a range of shaking intensities for each zone. The damage is indicative only and a wide variation can be expected within each zone due to variations in subsurface conditions, geology, terrain and orientation of the site with respect to the earthquake source.

Chart Limitation

The Damage Assessment Chart is an indicative guide only. This table is derived from a similar chart originally prepared for the Christchurch Engineering Lifelines Study (Risks and Realities, 1997). It is based on damage reports from historical earthquakes in New Zealand and overseas. There is little information on damage ratios for structures or infrastructure other than buildings, (this particularly applies to in ground pipework) and the relative damage is necessarily somewhat subjective. The damage to structures should be read in conjunction with the description of damage in the Modified Mercalli Intensity Scale, Appendix C of the Report. It may be used for coarse screening of effects, but must not be used as the basis for any design. Any decision involving expenditure or engineering design requires a more detailed evaluation of the conditions pertaining at that particular site.

Liquefaction

The Damage Assessment Chart does not include reference to liquefaction. Areas of significant liquefaction hazard in the Districts are limited. The majority of the areas are underlain with alluvium are older Pleistocene surfaces. Both the relatively old age and the predominantly coarse grading of this gravel make widespread liquefaction very unlikely. Liquefaction is more likely to occur within the ground shaking Zone 3 areas. If liquefaction occurs, the damage outlined in the chart could be significantly greater. For an indication of the effect of liquefaction, refer to Table 2.2, page 28 of Risks and Realities, report of the Christchurch Engineering Lifelines Group, CAE, 1997.

A - Structures

IMPORTANT: Refer notes page 1

Zone	Shaking Intensity	Structures	Fixings designed for seismic loads	Equipment not fixed or fittings not designed for seismic loads
1	MM VI	Slight damage to Type I buildings	Little to no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable. Some settlement damage possible	Considerable damage, 30 - 40% failure	80% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse. Settlement damage probable.	Widespread damage 50 - 60% failure	90 - 100% failure
2	MM VI	Slight damage to Type I buildings	Little to no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable.	Considerable damage, 25% failure	70% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse.	Widespread damage 40% failure	90% failure
3	MM VI	As for Zone 2, with some small reduction in severity possible		
	MM VII			
	MM VIII			
	MM IX			

B - In Ground Pipework

IMPORTANT: Refer notes a e 1

Zone	Shaking Intensity	Welded Steel polyethylene	Moderately ductile pipes Concrete with rubber joints Steel and cast iron with rubber joints	Low strength/ low ductiliity pipes Earthenware with rubber joints Asbestos cement Cast iron with lead joints	Non-ductile pipes Ceramic with cement joints Brick
1	MM VI	Should be OK	Should be OK	Occasional mains damage and entry and junction failure	Minor mains damage 10% entries and junctions fail
	MM VII	Should be OK	some mains damage, 10% entries and junctions fail	Some mains damage, 25% of entries and junctions fail	Mains damage possible 40% entries and junctions fail
	MM VIII	Should be OK, minor damage and permanent distortion	mains damage, 30% entries and junctions fail	Mains damage probable 60% entries and junctions fail	Mains damage widespread
	MM IX	Distortion to mains, Damage possible at entry to structures and at junctions	Mains damage likely, 50% entries and junctions fail	Mains damage 80% entries and junctions fail	Major mains damage
2	MM VI	Should be OK	Should be OK	Occasional mains damage and entry and junction failure	Minor mains damage 5% entries and junctions fail
	MM VII	Should be OK	little mains damage, 5% entries and junctions fail	Little mains damage, 10% of entries and junctions fail	Mains damage possible 20% entries and junctions fail
	MM VIII	Should be OK, minor damage	Some mains damage, 15% entries and junctions fail	Mains damage likely 40% entries and junctions fail	Mains damage widespread
	MM IX	Damage possible at entry to structures and at junctions	Mains damage likely, 40% entries and junctions fail	Mains damage probable 60% entries and junctions fail	Mains damage
3	MM VI	As for Zone 2 but with 30% reduction in severity			
	MM VII				
	MM VIII				
	MM IX				

C - Transport

IMPORTANT: Refer notes øaae 1

Zone	Shaking Intensity	Roading	Railway	Bridge Structure	Bridge Abutments
1	MM VI	Little to no damage	Little to no damage	Refer section A - Structures	Little to no damage
	MM VII	Minor damage to kerbs and cracking of seal	Minor damage to alignment		Minor slumping
	MM VIII	Some damage to kerbs. Some distortion and cracking of seal.	Distortion of rail lines, some fissuring and spreading of embankments		Some slumping of abutment fill common
	MM IX	Widespread damage to kerbs, Distortion and cracking of seal, some ground fissuring. Permanent ground distortion and settlement.	Marked distortion of rail lines, both horizontal and vertical, significant embankment damage		Slumping of abutment fill at nearly all bridges, many of significant magnitude. Translational or rotational movement at some abutments.
2	MM VI	Little to no damage	Little to no damage		Little to no damage
	MM VII	Minor damage to kerbs and cracking of seal. Small slips on steep batters.	Minor damage to alignment		Minor slumping
	MM VIII	Some damage to kerbs. Some distortion and cracking of seal. Slips in batters	Distortion of rail lines, some spreading of embankments		Some slumping of abutment fill common
	MM IX	Damage to kerbs, distortion and cracking of seal, Landsliding in steep slopes and batters, cracking of ground	Distortion of rail lines, both horizontal and vertical, significant embankment damage		Slumping of abutment fill at most bridges, many of significant magnitude. Translational or rotational movement at some abutments.
3	MM VI	Little to no damage	Little to no damage		Little to no damage
	MM VII	Rockfall and small slips on steep batters.	Minor damage to alignment		Minor slumping
	MM VIII	Rockfall and slips in steep batters	Distortion of rail lines, some spreading of embankments		Some slumping of abutment fill common
	MM IX	Landsliding in steep slopes and batters, cracking of ground, large volume rockfall possible	Distortion of rail lines, both horizontal and vertical, significant embankment damage		Significant slumping of abutment fill at most bridges. Translational or rotational movement at some abutments.

7.7 FUTURE IMPROVEMENTS

Development of Risk Management

It is important to have input from a broad range of people and organisations so that the risk register is as comprehensive as possible. Often the greatest risks arise from events that were not anticipated or considered beforehand. Initially the risk register and assessment should be created in a workshop environment from a number of stake holders including Council staff and input from other stakeholders (e.g. contractors). Once the risks have been identified these should then be analysed in the consequence / likelihood frame work to assess the validity of the scales. If the risk outcome for all identified areas of risk is too great then the consequence and likelihood scales may need to be adjusted. At this stage a second review of the scales and reassessment of the identified risk can be completed.

After rating the risks and creating the risk register, Council will need to determine which parties are in the best position to carry out risk treatment planning for each of the high and very high risks, so that the appropriate actions may be taken.

Cross-Asset Risk Management Process

Risk Management procedures set out in AS/NZS 4360:2004 and SNZ HB 4360:2000 are generic for a wide range of activities and organisations. The Risk Management system proposed in this Activity Management Plan is based on the assessment of Council values and goals for its road Water Supply network. Council will need to review the risk management process and provide feedback on the proposed risk rating criteria.

To ensure a robust and fair approach is taken with all of these assets, it is recommended that Council consider the development of a Cross-Asset Risk Management process in the future. This would then provide a greater level of assurance to Council that the prioritisation of the risks associated with its entire asset base, along the allocation of Council funds required to manage them, has been based upon an approach that is both rational and equitable.

On-Going Review

To ensure that emerging risks are identified and captured and that the Risk Treatment Plans are monitored for effectiveness over time, both the register and treatment plans must be reviewed on a regular basis by Council and other stake holders. The frequency for these reviews should be agreed and included in the Councils Operating Procedures.

Any significant additions or changes to the risk register will be noted as they occur through regular reporting procedures. It is recommended that the risk register should have a comprehensive update at each AMP review.

8. LIFECYCLE MANAGEMENT PLANS

8.1 LIFECYCLE MANAGEMENT – AN OVERVIEW

This section of the AMP outlines what is work planned to keep the assets operating at the current levels of service defined in Section 5 while optimising lifecycle costs. The overall objective of the Life Cycle Management Plan is:

> ***To maintain performance measures to ensure that the current strategies do not consume the asset leading to an unexpected increase in maintenance/renewal expenditure in the future.***

This lifecycle management plan covers the following:

➔ **Background Data** identifying where possible:

- Physical parameters of the assets as outlined in the description of the Water Supply asset included in Section 3
- Current capacity and performance of the asset relative to the levels of service defined in Section 5 and demand projections of Section 6
- Current condition of assets
- Asset valuations
- Historical data

➔ **Operations and Maintenance Plan**: This covers planning for on-going day to day operation and maintenance to keep assets serviceable and prevent premature deterioration or failure. This plan includes:

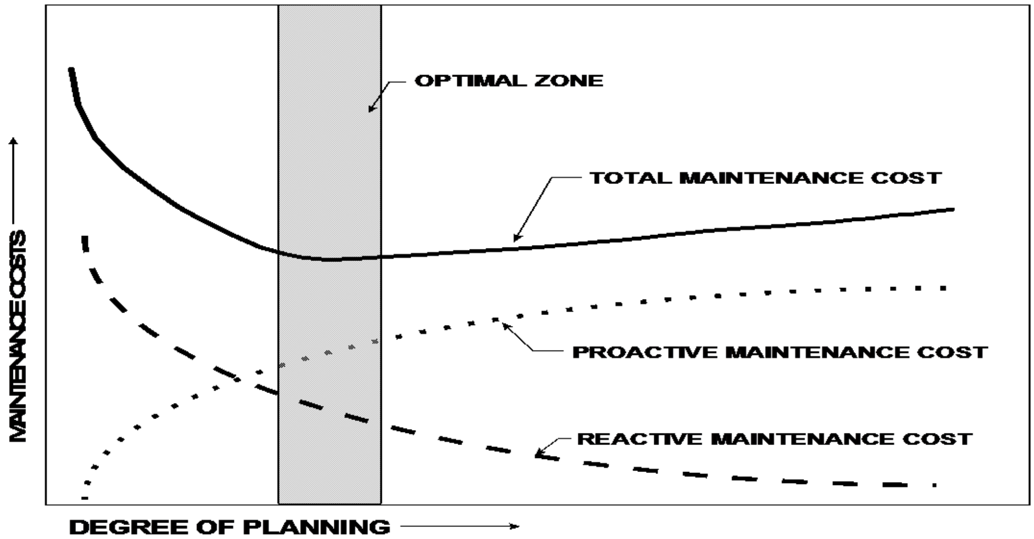
- Current trends and issues
- Maintenance decision making process
- Strategies required to meet levels of service
- How tasks are prioritised
- Summary of future costs
- Any deferred work and associated risks

Two categories of maintenance are carried out:

- Unplanned Maintenance: Reactive work carried out in response to reported problems or defects (e.g. repair broken water mains, respond to low chlorine alarms or pump failure alarms)
- Planned Maintenance: Proactive work carried out to a predetermined schedule (e.g. water main replacement, chlorine plant refurbishment, routine pump inspections and refurbishment etc).

A key element of asset management planning is determining the most cost effective blend of planned and unplanned maintenance as illustrated in Figure 7.1.

Figure 7.1 – Balancing Proactive and Reactive Maintenance



➔ **Renewal/Replacement Plan**: This covers Major work which restores an existing asset to its original capacity or its required condition (e.g. pipeline replacement, pump replacement or reconditioning). This plan includes:

- End of life projections
- Renewal decision making process
- Renewals strategies and methods to meet required LOS
- How renewals are identified, prioritised and to what standard they are replaced
- Summary of future costs

➔ **Asset Development Plan**: This section of the plan covers the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations (e.g. development demand). This plan includes:

➔ **Disposal Plan**: This covers activities associated with the disposal of a decommissioned asset. Assets may become surplus to requirements for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Uneconomic to upgrade or operate
- Policy change
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social, vandalism).

8.2 MANAGEMENT PROGRAMME

8.2.1 METHOD OF SERVICE DELIVERY

Council staff manages the Water Supply network with some assistance from consultants. The maintenance on the network is maintained through a competitively tendered multi-year contract. The current contracts let are included in Table 7.2.

The Utilities Services contracts (3 year + 1 yr + 1 yr) place considerable onus on the contractors to self-manage all utilities maintenance activities; this involves regular inspection of the various components of the networks, locating maintenance requirements and carrying them out.

Table 7.2 – 2011 Physical Works Contracts

Contract No.	Contract Name	Length (Years)	Responsibilities	Contractor
1163	Utilities Services Contract 2013-2016	3+1+1	**Water Supplies** The contract includes the complete operation and maintenance of the following water supplies ▪ Fairlie ▪ Lake Tekapo ▪ Twizel ▪ Burkes Pass ▪ Allandale **Waste Water Systems** The contract includes the complete operation and maintenance of the following waste water systems ▪ Fairlie ▪ Lake Tekapo ▪ Twizel ▪ Burkes Pass ▪ Mt Cook Lookout **Stormwater System** The contract includes the complete operation and maintenance of the following stormwater system ▪ Fairlie ▪ Lake Tekapo ▪ Twizel	Whitestone

8.2.2 FORWARD WORKS PROGRAMME

There is currently a detailed 10-year forward works programme for renewals.
This programme has been used as a basis for works included in this AMP. When the AMP is next reviewed the newly developed full FWP will be incorporated.

8.2.3 ASSET VALUATION

A valuation is undertaken every three years in order to assess the value of the network, the depreciated value and the annual depreciation. Details on Asset Valuation and Depreciation are held in Section 8 Financial Summary.

8.2.4 HISTORICAL DATA

Historical data is used to make an assessment of past performance and to see if future trends can be applied. At a network level, these trends can indicate if the condition of the network is deteriorating or improving. The different forms of historical data and their location are outlined in Table 7.3.

Table 7.3 – Historical Data

Type	Location	Comment
Visual Inspection	Asset Register	Pipelines are inspected whenever a pipeline is excavated for repair and rated for condition
Past Maintenance Costs	Contractor's Database	Provides summary of maintenance costs and works completed.
Past History	MDC	

8.3 WATER SUPPLY CONTROL

8.3.1 WATER SUPPLY BACKGROUND DATA

8.3.1.1 Water Supply Control Scope and Nature of Asset

Water Supply assets are main pipeline, valves, hydrants, wells, intake galleries, reservoirs and various treatment facilities. The "point of supply" for the individual customer is the customer's side of the toby, generally on the property boundary.

The key issues relating to water supply maintenance are:

- Leakage
- regular maintenance programmes
- monitoring
- chlorinator maintenance
- pump maintenance

8.3.1.2 Water Supply Current Condition

Council rates the condition of the Water Supply pipelines and other facilities. There is an ongoing inspection and maintenance regime under the routine maintenance contract. Council has a requirement in its maintenance contract, that any pipeline dug up for repair, the size, material location and condition is to be recorded and reported to Council. This information is used to estimate the condition of similar types of pipe in similar ground conditions.

8.3.1.3 Water Supply Current Performance and Capacity

The Water Supply networks are generally performing well with a few leakage problems in Fairlie. These are generally tied to older concrete pipes with perished rubber sealing rings. Specific condition for each asset is not currently measured, but as noted above, representative sections of the network are inspected and the results extrapolated across the network. There is good condition information for Water Supply assets with the majority of assets graded at 2 or better (89%). Only 3% of the network is graded as having a rating of 4 and no asset is graded as requiring replacement. However Fairlie has a programme to replace all the pipework installed in the 1940s as this has defective rubber sealing rings allowing significant leakage.

Overall the performance of water supply assets is adequate. The main concern is meeting DWS requirements.

8.3.1.4 Historic Maintenance Costs

The average expenditure over the three years 2008/09 to 2010/11 has totalled $335,000 per year for maintenance.

8.3.2 WATER SUPPLY OPERATIONS AND MAINTENANCE PLAN

Water Supply maintenance work is included under the main utilities services maintenance contract and covers:

- minimum maintenance standards
- frequency of routine inspections
- response times to correct defects

Water Supply maintenance is achieved by undertaking the following activities annually:

- Pipelines
    - Inspection and maintenance of all valves and hydrants
    - Repairs to pipeline leakage
    - Flushing of waterlines as required, to maintain service levels.
- Faclities
    - Intake maintenance
    - Pumps operation and maintenance
    - Small plant maintenance
    - Chlorination
    - Calibration and operation of monitoring equipment
    - Alarms monitoring and testing
    - Facilities maintenance
    - Reservoir maintenance
    - Compliance with resource consent conditions
    - Recording and reporting
    - Programming of maintenance not included in LS/mth Item

- Attend callouts

Maintenance Strategy

Condition inspections: The maintenance contractors are required to report any defects observed during day to day maintenance activity.

Unplanned condition assessment of critical drainage assets are required after each heavy downpour to assess the number of culverts, drains and sumps affected by blockages.

The Contractors are required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken within the specified response timeframes.

Planned maintenance: Damaged and malfunctioning water supply assets identified by public complaint or contractor reports are programmed for repair according to the following priority:

- Loss of Service
- Environmental impact
- public safety
- accelerated deterioration

Maintenance Standards

The maintenance standards to be achieved are set out in MDC specifications contained in the utility services maintenance contract.

All critical water supply assets are required to be inspected and maintained regularly.

Maintenance Programme
The majority of the water supply maintenance is reactive so budgets have been based on historical expenditure.

The financial forecasts are presented in Appendix II.

8.3.3 WATER SUPPLY RENEWAL/REPLACEMENT PLAN

The renewal programme is prioritised on the basis of overall condition.

Preventive Maintenance
Preventative maintenance includes non-routine work required to protect the serviceability of the network and minimise the threat of water leakage and interruption to supply.

Standards
The MDC standards for replacement infrastructure are based on NZS 4404:2010

8.3.4 WATER SUPPLY ASSET DEVELOPMENT PLAN

Most new assets are created as part of subdivisions and subsequently taken over by the Council.

The criterion used for justifying new/replacement construction undertaken by Council includes evidence of regular leakage and consequent interruption to supply or blockage due to tree roots or the like. There are a number of asbestos cement pipelines (19.6%) in the district that are deteriorating from the inside out and will prematurely start to fail in the next twenty to thirty years or so. It is proposed to commence sampling of the network and complete a deterioration model to determine more accurately the expected life.

Development Standards
MDC uses the Land Subdivision Standard NZS4404: 2010

Development Programme
The cost of pipeline renewal and development works is included in the Council Renewal Programme.

8.4 DISPOSAL PLAN FOR ALL ASSETS

In general Council has no specific plans for disposal of components of the Water Supply asset. Details for specific assets are included in Table 7.6.

Table 7.6 – Disposal of Assets Summary

Asset Description	Disposal Plan	Comments
Pipelines	**None**	Generally left in the ground for possible future use as duct pipe for telecommunications or are removed in pieces as part of the excavation to lay the replacement pipe.
Valves	**None**	Generally removed and disposed as scrap
Hydrants	**None**	Generally removed and disposed as scrap

9. FINANCIAL FORECASTS

9.1 INTRODUCTION

The total Water Supply budget from each of the three Community Boards for 2015/16 for operations, maintenance, renewals and improvements (capital) is $1,087,000. Administration, Consultancy, Interest charges and Funded Depreciation account for a further $301,000.

The first priority is to maintain and operate the existing network in its current condition then allow for renewal expenditure that revitalises a component of the network that has worn out. In the 2014/15 year 9% ($323,000) of budgeted expenditure is to be spent on maintenance and operation with 84% (2,985,000) requirement for renewals. The remaining 6% is used to fund depreciation and administration costs.

This section sets out the funding forecast required for the Mackenzie District Council over the next 10 years Cash flow forecasts by year.

9.1.1 10-YEAR FUNDING FORECAST

Table 8.1 sets out the 10 year funding forecast for the Water Supply activity.

9.1.2 CAPITAL WORKS

DWSNZ compliance is a major impact on Fairlie's water supply in the next 10 years.

Fairlie is planning on completing the upgrade on their water supply to meet the DWSNZ in years 3 at an estimated cost of $2.42m. The work involved is:

- Construct new treatment plant

Fairlie will also complete the replacement programme of 1940s pipes, started in 2000, by 2020/21. $720,000 has been budgeted for this over six years.

The only work programmed for Tekapo in the next 10 years is install SCADA telemetry across the various sites. There is a section of AC water main, 5,895m that will need evaluation to determine the level of deterioration prior to developing a replacement programme. This is the oldest length of water pipe in the town.

Twizel will complete the upgrade on their water supply to meet the DWSNZ in years 1.The work involved is:

- Replace pump set in the existing plant room
- Install UV and cartridge filtration
- Re-line and cover reservoir

FINANCIAL FORECASTS

Twizel will also embark on a 20 year programme to replace the Asbestos Cement water mains at a cost of approximately $200,000 annually. There will also be an in-line booster pump installed in the water main that feeds the area known as The Drive.

The Council is still consulting on providing a restricted potable supply for Manuka Tce. The estimated cost is $1,400,000.

Capital Expenditure Report

Mackenzie District Council											
Capital Expenditure Report											
For the 10 Years to 30 June 2025											
	Actual	**Budget**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**	**LTP**
	Actual	**Budget**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
	(000)	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**	**(000)**
Water												
Rural Water												
Capex												
0158211. Treatment	-	5	-	-	-	-	-	-	-	-	-	-
0158980. Comm Assets - Water Supply	-	-	-	10	11	-	-	-	-	-	4	3
0168980. Community Assets - Water	-	-	-	-	-	-	57	-	-	-	-	-
0238210. Headworks	-	-	-	-	-	55	-	79	1,526	-	-	-
0238807. Resource Consent & Land Use	-	-	-	-	-	-	21	-	-	-	-	-
Total Capex	**-**	**5**	**-**	**10**	**11**	**55**	**78**	**79**	**1,526**	**-**	**4**	**3**
Total Rural Water	**-**	**5**	**-**	**10**	**11**	**55**	**78**	**79**	**1,526**	**-**	**4**	**3**
Urban Water												
Capex												
0118201. Town Reticulation - Renewal	141	110	-	-	-	-	-	-	-	-	-	-
0118206. Service Connections - Renewal	1	26	-	-	-	-	-	-	-	-	-	-
0118211. Treatment - New	26	35	-	-	-	-	-	-	-	-	-	-
0118215. Plant	4	-	-	-	-	-	-	-	-	-	-	-
0118982. Water Meters	-	3	-	-	-	-	-	-	-	-	-	-
0118999. Transfer to Assets	- 172	-	-	-	-	-	-	-	-	-	-	-
0128211. Treatment - New	19	37	-	-	-	-	-	-	-	-	-	-
0128212. Service Connections - Renew	-	1	-	-	-	-	-	-	-	-	-	-
0128216. Vested Assets	-	77	-	-	-	-	-	-	-	-	-	-
0128251. Reticulation - Renewal	-	5	-	-	-	-	-	-	-	-	-	-
0128981. Water Meters	-	3	-	-	-	-	-	-	-	-	-	-
0128999. Transfer to Assets	- 19	-	-	-	-	-	-	-	-	-	-	-
0138201. Town Reticulation - Renewal	6	-	-	-	-	-	-	-	-	-	-	-
0138204. Headworks - Renewal	58	-	-	-	-	-	-	-	-	-	-	-
0138206. Service Connections - Renewal	42	26	-	-	-	-	-	-	-	-	-	-
0138210. HeadWorks - New	-	200	-	-	-	-	-	-	-	-	-	-
0138211. Treatment - New	77	2,450	-	-	-	-	-	-	-	-	-	-
0138251. Fire Hydrant Markers	3	10	-	-	-	-	-	-	-	-	-	-
0138984. Water Meters	1	3	-	-	-	-	-	-	-	-	-	-
0138999. Transfer to Assets	- 187	-	-	-	-	-	-	-	-	-	-	-
0248193. Vested Assets	-	-	-	-	525	-	-	1,512	-	-	471	-
0248201. Town Reticulation - Renewal	-	-	1,441	382	374	453	467	365	394	279	335	303
0248205. Treatment - renewal	-	-	-	-	-	-	40	-	-	-	-	21
0248206. Service Connections - Renewal	-	-	-	-	-	-	-	-	-	32	33	34
0248207. Town Reticulation - New	-	-	-	-	-	-	-	-	-	-	-	-
0248211. Treatment - New	-	-	-	-	2,459	-	-	-	-	-	-	-
0248212. Service Connections - New	-	-	-	-	-	-	-	-	10	10	-	-
0248215. Plant	-	-	-	29	19	39	-	-	-	-	-	-
0248807. Resource Consent Costs	-	-	-	-	-	-	-	-	-	-	-	-
0248980. Community Assets- Water Supply	-	-	10	-	16	3	-	-	-	-	-	-
Total Capex	**-**	**2,986**	**1,451**	**411**	**3,393**	**495**	**507**	**1,877**	**404**	**321**	**839**	**358**
Total Urban Water	**-**	**2,986**	**1,451**	**411**	**3,393**	**495**	**507**	**1,877**	**404**	**321**	**839**	**358**
Total Water	**-**	**2,991**	**1,451**	**421**	**3,404**	**550**	**585**	**1,956**	**1,930**	**321**	**843**	**361**

9.2 FUNDING IMPACT STATEMENT

Table 8.1

Mackenzie District Council Funding Impact Statement for 10 Years to 30 June 2025 for Water	Annual Plan 2014/15 ($000)	LTP Year 1 2015/16 ($000)	LTP Year 2 2016/17 ($000)	LTP Year 3 2017/18 ($000)	LTP Year 4 2018/19 ($000)	LTP Year 5 2019/20 ($000)	LTP Year 6 2020/21 ($000)	LTP Year 7 2021/22 ($000)	LTP Year 8 2022/23 ($000)	LTP Year 9 2023/24 ($000)	LTP Year 10 2024/25 ($000)
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	855	773	787	790	884	962	946	1,015	1,166	1,118	1,163
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	110	103	108	105	106	113	106	104	110	103	102
Internal charges and overheads recovered	29	6	6	7	9	11	11	13	17	21	24
Local authorities fuel tax, fines, infringement fees, and other receipts	86	160	163	167	172	179	185	192	199	207	216
Total operating funding (A)	**1080**	**1042**	**1064**	**1069**	**1171**	**1265**	**1248**	**1324**	**1492**	**1449**	**1505**
Applications of operating funding											
Payments to staff and suppliers	465	509	531	547	563	586	606	632	690	715	746
Finance costs	-	3	11	19	25	28	36	46	49	49	49
Internal charges and overheads applied	168	22	21	20	20	20	20	20	19	18	18
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**633**	**534**	**563**	**586**	**608**	**634**	**662**	**698**	**758**	**782**	**813**
Surplus (deficit) of operating funding (A - B)	**447**	**508**	**501**	**483**	**563**	**631**	**586**	**626**	**734**	**667**	**692**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	159	-	-	342	-	-	1,023	1,691	-	308	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**159**	**0**	**0**	**342**	**0**	**0**	**1023**	**1691**	**0**	**308**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service*	2,914	1,451	421	2,879	550	585	444	1,930	321	372	361
to replace existing assets	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in reserves	-2308	-943	80	-2054	13	46	1165	387	413	603	331
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**606**	**508**	**501**	**825**	**563**	**631**	**1609**	**2317**	**734**	**975**	**692**
Surplus (deficit) of capital funding (C - D)	-447	-508	-501	-483	-563	-631	-586	-626	-734	-667	-692
Funding balance ((A - B) + (C - D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

*A full breakdown of the capital expenditure and the reason for each project can be found on pages 50 to 52 of the 30 Year Infrastructure Strategy.

FINANCIAL FORECASTS

Requirement for Work		Budget 2015/16 $0	Forecast 2016/17 $0	Forecast 2017/18 $0	Forecast 2018/19 $0	Forecast 2019/20 $0	Forecast 2020/21 $0	Forecast 2021/22 $0	Forecast 2022/23 $0	Forecast 2023/24 $0	Forecast 2024/25 $0
	Fairlie										
I	SCADA				38						
R	Watermain Replacement	120	120	120	120	120	120				
R	Uprade Treatment			2420							
		120	**120**	**2540**	**158**	**120**	**120**	**0**	**0**	**0**	**0**
	Tekapo										
I	SCADA		28	18							
I & R	Upgrade Chlorine Monitoring, SCADA					32					
			28	**18**	**0**	**32**	**0**	**0**	**0**	**0**	**0**
	Twizel										
I	Re-line and cover Reservoir	762									
I	In-line Booster	120									
R	AC Pipe replacement	211	208	190	223	249	149	132	180	180	180
		1093	**208**	**190**	**223**	**249**	**149**	**132**	**180**	**180**	**180**
	TOTAL	**1213**	**351**	**2718**	**381**	**293**	**269**	**132**	**180**	**180**	**180**

9.3 FUNDING STRATEGY

The first priority is to maintain and operate the existing network in its current condition then allow for renewal expenditure that revitalises a component of the network that has worn out. In the 2014/15 year 9% ($323,000) of budgeted expenditure is to be spent on maintenance and operation with 84% (2,985,000) requirement for renewals. The remaining 6% is used to fund depreciation and administration costs.

Up until 2014/15, funding for the management and maintenance of the water supply network was provided from the respective Community Board. Capital projects are funded through the Council's Policy for Funding Capital Expenditure, which was adopted as part of the 2004-2014 Long Term Council Community Plan.

The policy is summarised as follows:

Capital Reserves

- A Capital Reserve has been established for each activity that the Council undertakes.
- All depreciation that has been funded from that activity will be lodged into the Capital Reserve on a quarterly basis when each instalment of rates is due.
- Funds from other reserves or financial contributions can also be deposited into the Capital Reserve.
- All capital expenditure will be paid from the Capital Reserve at the time of payment.
- Capital Reserves may go into overdraft at any stage with prior approval of Council.

Capital Expenditure

- All Capital Expenditure must be approved by Council through the budget process or by an explicit resolution.

Interest Component For Debt Incurred Prior to 30 June 2012:

- If the balance of the Capital Reserve is overdrawn, the community of interest for the relevant activity will be charged an interest rate set at 100 basis points greater than the Official Cash Rate determined by the Reserve Bank. Such interest will be charged as a cost to the activity operating expenses and be rated for.
- If the balance of the Capital Reserve is in funds, then the Council will pay the community of interest in the relevant activity an interest payment set at 25 basis points less than the Official Cash Rate determined by the Reserve Bank. Such interest will accrue to the activity's Capital Reserve.

Interest Component For Debt Incurred After 30 June 2012:

- For the component of the debt incurred after 30 June 2012 the interest rate will be set at a level equal to the Council's average bond portfolio rate applying at the previous 1 January. Such interest will be charged as a cost to the activity operating expenses and rated for.

In determining the projects to be undertaken the benefit/cost ratio is the governing criteria used with preference being given to projects which can be shown to be economically justified, attract subsidy and have the necessary Council funding available.

9.4 SUSTAINABILITY - LOOKING OUT SIXTY YEARS

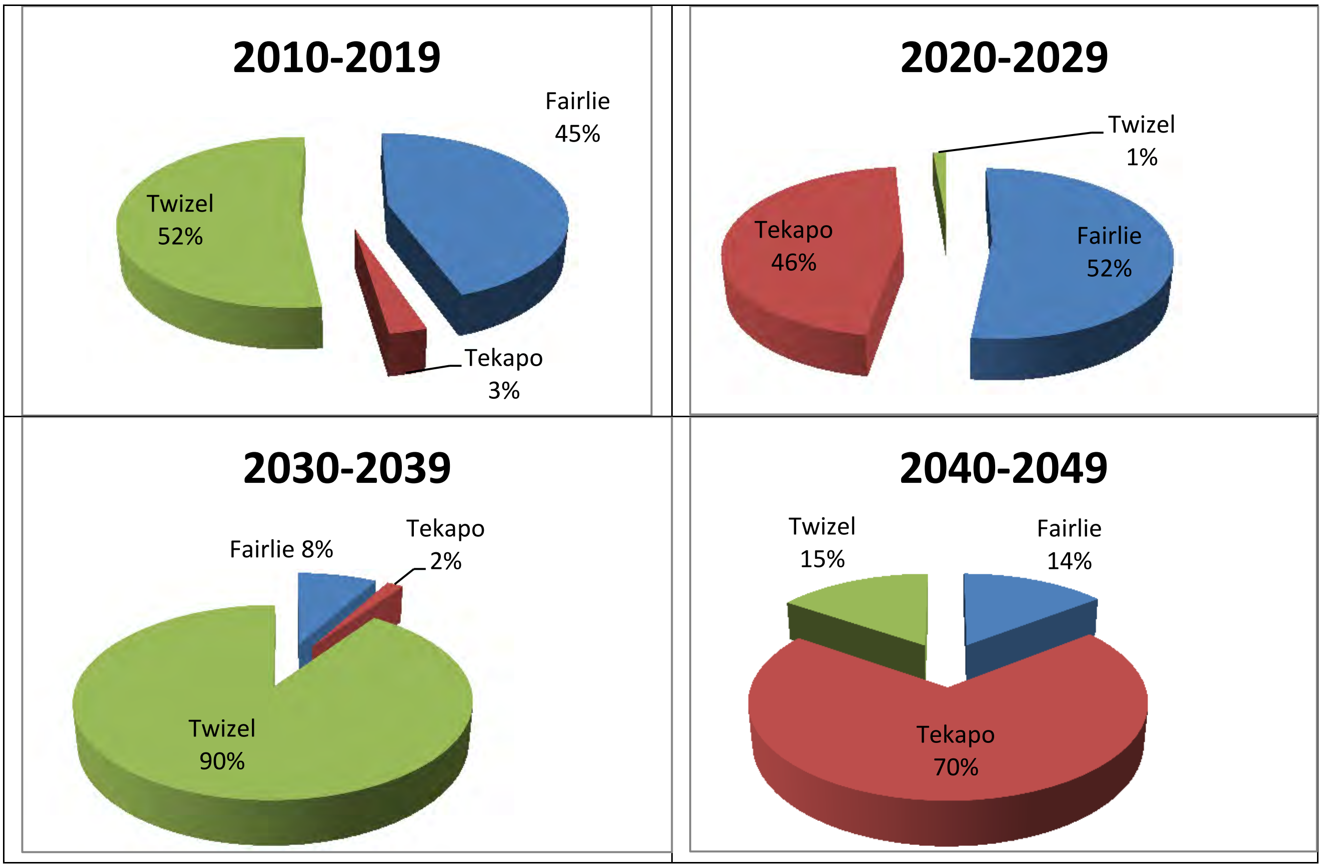
With these types of assets it is important to take a longer term view, perhaps forty to sixty years, especially considering the uniqueness of Twizel and to a lesser extent Tekapo. As Twizel was built in the seventies all assets are generally of the same level of deterioration and potential loss of service. Analysis of the initial construction date shows the following percentage of the overall network that will have to be replaced in a narrow timeframe:

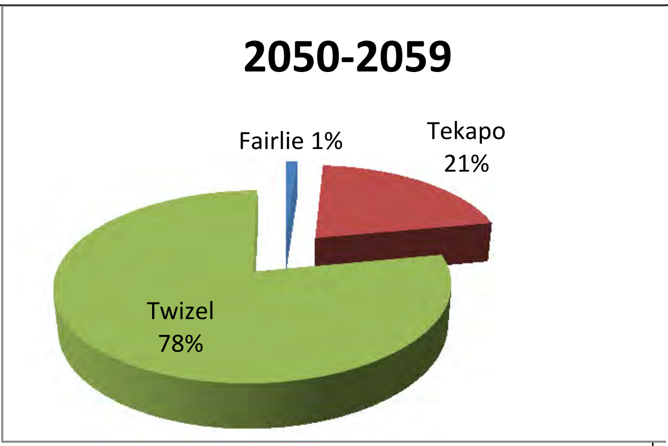
Water supply	63%
Sewer network	51%
Stormwater network	0%

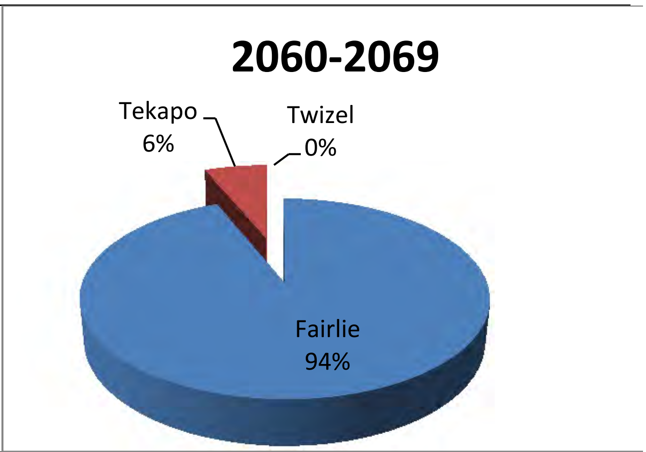
These water supply and sewer network issues are likely to present major hurdles that Twizel cannot afford long term. Tekapo has a similar issue with the early town reticulation completed in three specific years, namely 1955, 1970 and 1976. These original networks are likely to fail at the same time.

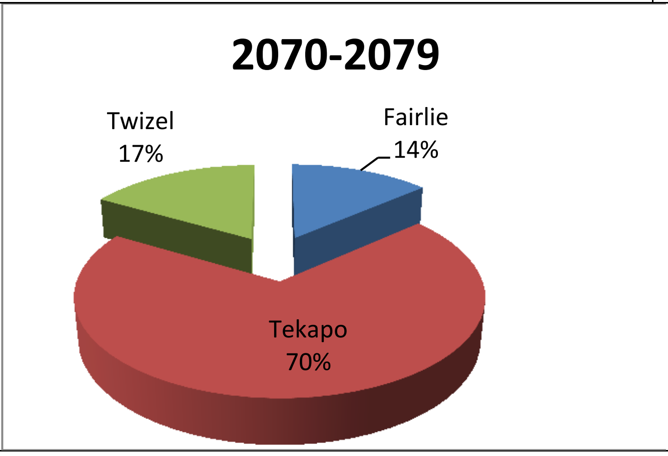
A major piece of work was completed for the current AMP, using 2009 pipe construction costs and industry standard base lives, to look out eighty years. As part of this LTP the Council has also prepared a 30-year Infrastructure Strategy, which identifies significant infrastructure issues facing the District over the next 30 years, and outlines how the Council intends to manage its infrastructure assets.

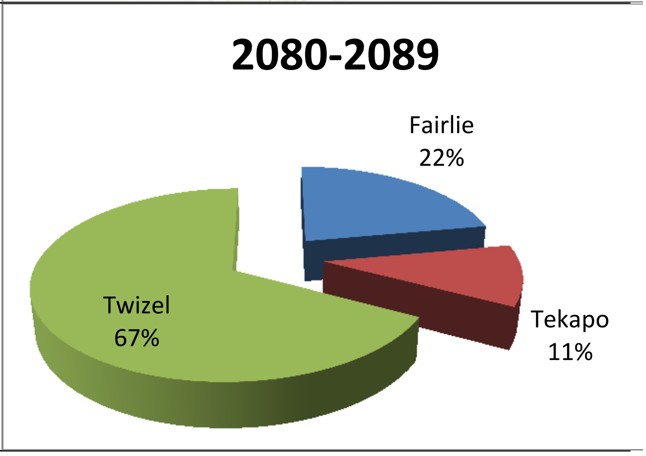
The graphs below show that results of that work clearly on a decade by decade basis.











Summary (in 2009 dollars)

Decade	**Fairlie**	**Tekapo**	**Twizel**	**Total**
2010-2019	3,663,882	233,563	4,284,476	8,181,921
2020-2029	748,697	665,001	19,721	1,433,419
2030-2039	395,175	80,924	4,477,966	4,954,065
2040-2049	102,203	494,540	108,876	705,619
2050-2059	14,341	258,291	965,371	1,238,003
2060-2069	40,749	2,665	0	43,414
2070-2079	303,495	1,551,259	369,945	2,224,699
2080-2089	873,358	415,134	2,660,333	3,948,825
Totals	**6,141,900**	**3,701,377**	**12,886,688**	**22,729,965**

The table and graphs confirm what we intuitively know, that for the water supply networks in the three communities, Fairlie will be generally have its network renewed in the first decade, Tekapo will be spread over the second, third and seventh decade with Twizel have a big spike in the third decade and again in the fifth decade.

This work has allowed the Council to ascertain where the peaks in replacement expenditure of these assets are, by community. Council has modelled this expenditure and has come to the conclusion that some towns cannot afford this level of expenditure alone. If the District as a whole is to be sustainable, the individual communities cannot be left to fund these large replacement costs.

Council has decided its preferred option is that each of the four urban water supplies, sewerage schemes and stormwater networks are amalgamated into single urban schemes for water, stormwater and sewerage, all paying the same rate for the provision of those services. Council is proposing that the cost of providing water services across the townships is funded universally across the users of those services. This is to ensure that water supply networks remain affordable to all ratepayers that benefit from the service, regardless of where they reside in the district.

With the combining of the water supplies, stormwater and the sewerage schemes, the Council will be able to set priorities on the key capital expenditure for the networks as a whole, and bring more resources to problems and remedy them more efficiently. This is also expected to provide lower operating costs and as a result, the Council will be able to control the overall rates increases rather than certain factors that will cause significant increases being recommended and endorsed by local boards.

This proposal is being consulted on during the 2015/2025 LTP process

9.5 WATER SUPPLY VALUATION

The last valuation of the Water Supply infrastructural network and associated assets was undertaken as at 1 July 2013 and is summarised in the Table 8.2. The valuation is updated 3 yearly to take into account capital works and additions to the water supply network.

The valuation consists of an assessment of the replacement cost, depreciated replacement cost and the annual depreciation or decline in service potential of the network. The annual depreciation or decline in service potential is the amount the asset declines in value over a year as a result of the remaining life of the asset reducing. Provision is required to be made to fund this depreciation so as to make suitable allowance for the future replacement or renewal of the asset.

Depreciation is provided on a straight-line basis on all physical assets at rates which write off the cost of the asset to the estimated residual value at the end of its assumed effective life.

Expenditure on renewing or improving the capacity of the asset is capitalised annually as are assets which are vested in Council by developers. Capital work in progress is not depreciated. The total cost of this work is capitalised at the end of the financial year in which it is completed and depreciated from then onwards.

Table 8.2 – Water Supply Infrastructure Valuation

ASSET TYPE	ORC 1 July 2013 ($)	ODRC 1 July 2013 ($)	**Annual** Depreciation ($)
Pipelines	25,202,490	17,071,486	315,637
Service lines	808,806	518,469	10,151

Break Pressure Tanks	22,000	12,283	367
Restricted Supply Points	-	-	-
Hydrant	750,420	424,331	9,380
Meters	21,643	17,872	866
Valves & Air Valves	831,717	513,650	10,396
Plant	2,160,125	916,520	47,048
Water Races	908,305	908,305	-
TOTAL	**$32,041,873**	**$20,807,057**	**$418,931**

The total optimised replacement cost of the Water Supply Infrastructure was assessed to be $32,041,873 as at 1 July 2013. The total optimised depreciated replacement cost was assessed to be $20,807,057.

The annual depreciation has been determined to be $418,931 per annum.

9.5.1 VALUATION METHODOLOGY

All assets have been valued using depreciated replacement cost (DRC). A DRC valuation requires:

- Determination of quantities of assets optimised to relate to those required for current service delivery and foreseeable demand
- Unit rates for replacement with modern engineering equivalent assets
- Effective lives that take account of local influences
- Depreciation that defines current value given a definable remaining life.

The NZ Infrastructure Asset Valuation and Depreciation Guidelines 2006 give direction as to the overall methodology applicable to a DRC valuation for water supply assets. This has been applied in this case to achieve a suitable valuation for MDC Improvements and Infrastructure Asset Valuation.

Borrowing costs were excluded from the valuation.

The primary data source for this revaluation was MDC's Asset Register.

9.6 KEY ASSUMPTIONS

Key assumptions made in the financial forecasts are as follows:

(Inflation figures have been provided by Business and Economic Research Limited.)

Table 9.5: Adjustors: % per annum change

FINANCIAL FORECASTS

	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private Sector Wages
Year Ending	**% pa change**								
Jun 12	5.2	3.3	6.0	15.4	2.3	1.4	4.7	3.1	2.1
Jun 13	1.1	1.7	-2.8	-1.8	2.1	2.9	2.1	-2.7	1.9
Jun 14	0.7	1.9	-2.1	1.3	1.9	1.8	2.8	-2.5	1.7
Jun 15	0.4	1.9	4.7	4.2	1.6	1.5	1.7	1.8	1.7
Jun 16	1.2	2.2	5.2	3.5	1.8	2.3	1.8	2.1	1.7
Jun 17	1.4	2.4	3.8	3.8	1.9	2.5	2.6	2.5	1.8
Jun 18	2.2	2.5	3.0	3.9	2.0	2.6	2.4	2.6	1.9
Jun 19	2.4	2.6	3.2	4.1	2.1	2.7	2.0	2.8	2.0
Jun 20	2.5	2.8	3.3	4.3	2.2	2.9	2.1	2.9	2.1
Jun 21	2.7	2.9	3.5	4.5	2.3	3.0	2.3	3.1	2.1
Jun 22	2.8	3.0	3.7	4.7	2.4	3.1	2.4	3.2	2.2
Jun 23	3.0	3.2	3.8	4.9	2.5	3.3	2.5	3.4	2.3
Jun 24	3.1	3.3	4.0	5.1	2.6	3.4	2.9	3.5	2.4
Jun 25	3.3	3.4	4.2	5.3	2.7	3.6	3.1	3.6	2.5
20-year ave %pa	3.2	2.9	3.5	4.7	2.4	3.0	3.0	3.0	2.2

- Council will continue to fund the level of service currently set out in this AMP
- The dollar values shown in this Plan are October 2014 dollars adjusted for inflation applicable to this Activity.
- Some renewal costs are rough order of cost estimates that will need to be further researched and refined
- No account has been taken of the impacts related to the development, acceptance and implementation of the Risk Management Plan
- Assumptions made on Total Useful Life and Residual Useful Lives of the assets in relation to the asset valuation.
- The asset data is considered to be reliable and fit for the purpose for developing the long term financial forecasts.
- Any other specific assumptions

10. IMPROVEMENT PLAN

10.1 STATUS OF AM PRACTICES

This section provides details of how Council plans to improve this version of the Water Supply AMP.

This AMP has previously been reviewed and updates incorporated including improvements to move towards “Core” level Asset Management. Council is committed to a continual improvement as outlined in this section of the AMP. A key objective is to dovetail the asset management planning process with the other key planning processes particularly the Long Term Plan (LTP).

10.2 IMPROVEMENT PROGRAMME

The review and improvement of this AMP requires resource and budget in order to complete the selected improvement tasks. Table 10.1 outlines the items for improvement, relative urgency, resource, priority, budget and the authority sought to give approval to complete each item.

WATER SUPPLY ACTIVITY MANAGEMENT IMPROVEMENT PLAN

Table 10.1 – Improvement Programme

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
3.0	**Description of Asset**								
3.1	Current age and remaining life of all assets needs to be reviewed and determined.		✓		Council	Medium	**To be Confirmed**	Council	Within 12 months
4.0	**Levels of Service**								
4.1	Augment existing LoS information		✓		Council or Consultant	Medium	**To be Confirmed**	Council	Within 12 months
4.2	Undertake customer surveys with defined performance targets.			✓	Council	Low	**To be Confirmed**	Council	Prior to next AMP revision
5.0	**Future Demand**								
5.1	Develop a strategy for analysing the condition of the AC pipe assets and produce a reliable deterioration model for Tekapo and Fairlie to more accurately predict replacement programmes.		✓		Council	**Medium**	**To be Confirmed**	Council	Three year study

Item	Task Name	Relative Urgency 1	2	3	Resource	Priority	Budget	Approval Sought	Timeframe
5.2	Conduct a research study, including the impact of District Plan changes, to assess future demand on the network, in particular identifying any expected change in land use and other demands on the asset within the MDC area, which potentially could impact on the roading asset.			✓	External Consultant	**Low**	**To be Confirmed**	Council	Prior to next AMP revision
5.3	Complete a Customer Survey, including local industry, to establish any changes in customer expectations as they relate to demand on the network.			✓	Council	**Low**	**To be Confirmed**	Council	Prior to next AMP revision
6.0	**Risk Management**								
6.2	All assets need to be assessed for criticality	✓			External Consultant	**High**	**To be Confirmed**	Council	Within 12 months
6.3	Risk management register needs to be developed. Assessed risks can then be linked to maintenance and renewals programmes.		✓		Workshop utilising External Consultant	**Medium**	**To be Confirmed**	Council	Within 12 months

IMPROVEMENT PLAN

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
6.4	Significant negative effects need to be identified and provide an input into the LTP. Also identify procedures for mitigating significant negative effects.		✓		External Consultant	**Medium**	**To be Confirmed**	Council	Within 12 months
6.5	Emergency management (including lifelines) requires full review and inclusion. Require procedures in place for rapid response to emergency failures.	✓			Council External Consultant	**High**	**To be Confirmed**	Council	Within 6 months
6.6	Corporate insurance policy/requirements and updating of asset insurance costs needs to be considered and incorporated.	✓			Council	**High**	**To be Confirmed**	Council	Within 6 months
7.0	**Life Cycle Management**								
7.1	Review and update the Asset Register database. Ensure all inventory data is captured.		✓		External Consultant	**Medium**	**Within Current PS Engineering Services Budget**	Utilities Manager	Within 12 months
7.2	Complete a full review of the network assets (using both the Asset Register and field inspections) and develop a detailed 10 year Forward Work Programme for all asset groups.	✓			Council External Consultant	Low		Asset Manager	Prior to next AMP review in 2016
								Asset Manager	

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
8.0	**Financial Forecasts**								
8.1	Produce Annual Plan Forecasts, adjust 10 year plan and add Year 10 to total programme		✓			Medium		Asset Manager Utilities Manager	
8.2	The assessment of annualised depreciation needs to be reviewed to ensure that the depreciation collected is realistic and comparable to the lifecycle renewal cost.			✓	Council	Low		Financial Manager Asset Manager	Prior to next Valuation in 2016
8.3	**Valuation**								
8.3.1	Review and update the Asset Register database. Ensure all inventory data is captured and up todate			✓	Council	Low		Asset Manager Financial Manager	Prior to next Valuation in 2016
8.3.2	The default construction date and the expected life of all assets need to be reviewed			✓	Council	Low		Utilities Manager	Prior to next Valuation in 2016
9.0	**Other Improvements**								
9.1	Sustainability Include further summary of sustainability measures that are in place, including details of Council Sustainability policy, strategies and operations enabling greater sustainability etc			✓	Council	Low	**To be Confirmed**	Council	Prior to next AMP revision

10.3 MONITORING AND REVIEW PROCEDURES

9.4.1 3 YEAR REVIEW

This AMP is to be reviewed on a 3-yearly basis, with the next full review taking place in 2012. During the three year period leading up to this review, the items in the Improvement Programme should be addressed within the timeframes provided. These improvements can then be incorporated into the next review of the AMP.

This AMP is also audited externally with the review including process, data integrity and Levels of Service.

9.4.2 ANNUAL REVIEW

At the completion of each annual budgeting period the financial forecasts are to be updated to include the new Yr 10 figures and any changes made to the intervening budgets by the Council.

11. APPENDICES

11.1 METHOD OF FORECASTING LONG TERM CAPITAL EXPENDITURE

Asset Records

Asset records are held in Council's GIS system which forms the Asset Register. Thus assets can be located and information obtained and displayed easily, either spacially or by text fields. The following is a list of fields in the spatial attribute table in the GIS system for the waterlines layer.

Scheme
UFI
From
To
Type
DN_mm_ID
Dia _actual_mm
Material
PN
Depth_mm
Length_m
Date_installed
Date confidence
Base life
Exp life
Cost code
Data confidence
Prog replacement date
Replace dia
Replace cost code
Condition
Condition confidence
Performance
Performance confidence
Critically
Risk
Date assessed
Assessed by
Grading confidence
Note 1
Note 2
Note 3
Alterations
Row number
Theo replace

Calculations and Predictions

APPENDIX I

Calculations using data in the attribute table and from other sources are carried out more conveniently in Excel, rather than directly in the attribute table.

The attribute tables from the GIS system are downloaded to Excel where information contained within the tables along with information from the latest valuation of the assets are used to determine expected life, theoretical replacement date and programmed replacement date. These attributes are imported back into the spatial attribute tables.

Estimates of capital expenditure for renewals and new work are also calculated in excel.

Expected Life

The calculation of the theoretical remaining lives of each asset feature is a modification of the method explained in Section 4 “The Toolbox” of the 1998 New Zealand Infrustructural Asset Management Manual. It goes through processes which predict the theoretical remaining life by applying factors to a standard base life for each class of asset.

a) Age Factor (F1)
Actuarial evidence shows that as assets age , their total life expectancy increases. This is best explained by drawing an anology with human beings – whilst at birth our life expectancy is 74 years, at age 70 our life expectancy is nearer 80 years if we are still enjoying good health. The age factor increases with age of the asset.

   Economic life from age alone = Base life x F1

b) Service Utilisation Factor (F2)

   The economic life of certain assets, eg pumps, is dependant on use (as measured on hours run) and not just age. The life of these assets is extended if they are used at less than their design capacity.

   Economic life from utilisation alone = Base life x F2

c) Combined effct of Age and Utilisation
The starting life expectancy is calculated from the age and utilisation predictions before analyising the effect of condition and performance of those assets.

   Starting economic life = Base life x F1 x F2

d) Condition Grading Factor (F3)
Each feature is graded according to its condition between C1 and C5. C1 being excellent condition and C5 requiring urgent replacement or rehabilitation. The F3 factor for condition grade C1 is 1 and for C5 is 0, with the factors varying uniformly in-between.

   The remaining economic life from condition = (starting economic life – age) x F3

e) Performance grading Factor (F4)

Each feature is graded according to its performance between P1 and P5. P1 being no performance problems, and P5 complete inadequate performance. The F4 factor for performance grade P1 is 1, and for P5 is 0, with the factors varying uniformly in-between.

The remaining economic life form performance = (starting economic life – age) x F4

f) Combined effect of Condition and Performance.
The remaining economic life is calculated by taking the lesser of the predictions for asset condition and performance. The economic life was extended by the age factor and reduced back by the condition or performance factors where the grade for condition or performance are less than "1".

g) Expected Life

Expected life = age + the lesser of the predictions of remaining economic life for condition and performance. The calculated expected lives are imported into the spatial attribute tables.

Capital Works Programme

a) Theoretical Replacement Date

Theoretical Replacement Date = Date installed + expected life. The theoretical replacement dates are imported into the spatial attributes table.

b) Programmed replacement Date.

All features that have a theoretical replacement date within the following 20 years are identified and assessed in more detail, with consideration given to factors which impact on the programmed replacement date, such as:

- Maintenance history
- Decay prediction
- Ability to rehabilitate
- Criticality
- Risk
- Demand
- Level of Service
- Maintenance Costs
- Operation Costs
- Management Costs
- Other Work Programmed such as road sealing

Programmed replacement dates are entered into the attribute tables for features where replacement is programmed within the following 10 years.

c) New Works

Proposed new works, where no asset currently exists are included in a separate Excel table and are not centre in the spatial attribute tables.

Financial Projections

a) Cost Codes

Cost codes are allocated for all asset classes. Pipes for example are allocated codes depending on size and ground conditions. Separate codes are allocated for pipes in sealed roads, in road berms, or in open country etc. On rural schemes the codes also distinguish between pressure classes. Unit values are attached to the cost codes at each three yearly valuation based on the optimised replacement costs.

The cost-codes for each asset feature are entered in the spatial attribute table.

b) Forecasting Future Demand

The likely future demand is considered for each asset feature.

The replacement asset and associated cost-code are entered in the spatial attribute table. Greater consideration is given to forecasting future demand for assets where the programmed replacement date is within the following 10 years period.

c) Calculations in Excel

As stated earlier the spatial attribute tables are downloaded to Excel. The “look-up” function in Excel attaches the most recent unit value (optimised replacement cost) to each asset feature and each replacement feature.

Renewal/new work expenditure is calculated on the optimised replacement costs of the existing asset and the proposed replacement asset. The forecast expenditure is separated into “Expenditure Renewal” which is the cost of replacing like with like, and “Expenditure New” which is the difference in cost between the existing asset and the proposed replacement asset.

Proposed new works, where no asset currently exists, are included in a separate table.

A long term capital expenditure programme is developed from the above information. The “Programmed Replacement Date”, when one has been allocated is used in preference to the “Theoretical Replacement Date”.

A pivot table is created for the 10 year programmed work which summarises the programmed works into years of expenditure.

The proposed expenditure amounts are not imported into the spatial attribute tables.

APPENDIX II

11.2 FUNDING IMPACT STATEMENT

Mackenzie District Council Funding Impact Statement for 10 Years to 30 June 2025 for Water	Annual Plan 2014/15 ($000)	LTP Year 1 2015/16 ($000)	LTP Year 2 2016/17 ($000)	LTP Year 3 2017/18 ($000)	LTP Year 4 2018/19 ($000)	LTP Year 5 2019/20 ($000)	LTP Year 6 2020/21 ($000)	LTP Year 7 2021/22 ($000)	LTP Year 8 2022/23 ($000)	LTP Year 9 2023/24 ($000)	LTP Year 10 2024/25 ($000)
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	855	773	787	790	884	962	946	1,015	1,166	1,118	1,163
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	110	103	108	105	106	113	106	104	110	103	102
Internal charges and overheads recovered	29	6	6	7	9	11	11	13	17	21	24
Local authorities fuel tax, fines, infringement fees, and other receipts	86	160	163	167	172	179	185	192	199	207	216
Total operating funding (A)	**1080**	**1042**	**1064**	**1069**	**1171**	**1265**	**1248**	**1324**	**1492**	**1449**	**1505**
Applications of operating funding											
Payments to staff and suppliers	465	509	531	547	563	586	606	632	690	715	746
Finance costs	-	3	11	19	25	28	36	46	49	49	49
Internal charges and overheads applied	168	22	21	20	20	20	20	20	19	18	18
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**633**	**534**	**563**	**586**	**608**	**634**	**662**	**698**	**758**	**782**	**813**
Surplus (deficit) of operating funding (A - B)	**447**	**508**	**501**	**483**	**563**	**631**	**586**	**626**	**734**	**667**	**692**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	159	-	-	342	-	-	1,023	1,691	-	308	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**159**	**0**	**0**	**342**	**0**	**0**	**1023**	**1691**	**0**	**308**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service*	2,914	1,451	421	2,879	550	585	444	1,930	321	372	361
to replace existing assets	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in reserves	-2308	-943	80	-2054	13	46	1165	387	413	603	331
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**606**	**508**	**501**	**825**	**563**	**631**	**1609**	**2317**	**734**	**975**	**692**
Surplus (deficit) of capital funding (C - D)	-447	-508	-501	-483	-563	-631	-586	-626	-734	-667	-692
Funding balance ((A - B) + (C - D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

*A full breakdown of the capital expenditure and the reason for each project can be found on pages 50 to 52 of the 30 Year Infrastructure Strategy.

APPENDIX III

11.3 RISK REGISTER

Management Activity	*Name*	*Description*	*Existing Controls*	*Assessment*				
				Consequence	**Likelihood**	**Risk**	**Treatment Option**	Treatment Cost

APPENDIX III

ACTIVITY MANAGEMENT PLAN
For Foul Sewer

VERSION 5

March 2015

Mackenzie District Council
Activity Management Plan
for Foul Sewer

Mackenzie District Council Adopted	--		
Date	--		
Prepared By	-- B Haar Asset Manager	Telephone:	+64 3 6859010
Reviewed By	-- G Horler Utilities Manager	Date:	March 2015
		Status:	FINAL

MACKENZIE DISTRICT COUNCIL

ACTIVITY MANAGEMENT PLAN
FOR FOUL SEWER

Prepared By: ____________________________________
Bernie Haar, Asset Manager
Mackenzie District Council

Reviewed By: ____________________________________
Geoff Horler, Utilities Manager
Mackenzie District Council

Document Approved: ____________________________________
Chief Executive Officer,
Mackenzie District Council

Adopted by Council: ____________________________________
Mayor (on behalf of Councillors)

Document No

File No ....

Mackenzie District Council – Activity Management Plan for Foul Sewer

UPDATE REGISTER

Number	Date	Description of Update	Updated by
Version 1	April 2006	Revision of the second AMP produced by MDC	Waugh Consulting
Version 2	2004	Revision of the first AMP produced by Waugh Consulting	MDC
Version 3	April 2006	Revision of the second AMP produced by MDC	MDC
Version 4	November 2012	Full update to Version 3	MDC
Version 5	February 2015	Revision to incorporate the issues determined by the 30 year Infrastructure Strategy.	MDC

CIRCULATION LIST

Number	Issued to (*name & organisation*)

CONTENTS

The following terms and acronyms (in brackets) are used in this Plan.

ACCRUAL ACCOUNTING
The recognition of revenues as they are earned and expenses as they are incurred.

ANNUAL PLAN
A document produced annually by an organisation to inform stakeholders of its objectives, intended activities, performance, income and expenditure required for a period of one financial year. It may also indicate anticipated future short-term income and expenditure

ASSET
A physical component of a facility, which has value, enables services to be provided and has an economic life of greater than 12 months. Dynamic assets have some moving parts, while passive assets have none.

ASSET MANAGEMENT (AM)
The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

ASSET MANAGEMENT PLAN
A plan developed for the management of one or more infrastructure assets that combines multidisciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long-term cashflow projection for the activities.

ASSET MANAGEMENT STRATEGY
A strategy for asset management covering the development and implementation of plans and programmes for asset creation, operation, maintenance, rehabilitation/replacement, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.

ASSET REGISTER
A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.

BENEFIT-COST RATIO (B/C)
The sum of the present values of all benefits (including residual value, if any) over a specified period, or the lifecycle, of the asset or facility, divided by the sum of the present value of all cost.

CAPITAL EXPENDITURE (CAPEX)
Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of asset stock.

COMPONENTS
Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

CURRENT REPLACEMENT COST
The cost of replacing the service potential of an existing asset, by reference to some measure of capacity with an appropriate modern equivalent asset.

DEFERRED APPROACH
The shortfall in rehabilitation work required to maintain the service potential of an asset.

DEPRECIATED REPLACEMENT COST (DRC)

The replacement cost of an existing asset less an allowance for wear or consumption having regard for the remaining economic life of the existing asset.

DEPRECIATION

The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the cost (or revalued amount) of the asset less its residual value over its useful life.

DETERIORATION RATE
The rate at which an asset approaches failure.

DISPOSAL
Activities necessary to dispose of decommissioned assets.

ECONOMIC LIFE
The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life; however obsolescence will often ensure that the economic life is less than the physical life.

FACILITY
A complex comprising many assets (e.g. a hospital, water treatment plant, recreation complex, etc) which represents a single management unit for financial, operational, maintenance or other purposes.

FINANCIAL STATEMENTS
Balance sheets, profit and loss accounts, statements of changes in financial position, notes an other statements which collectively are intended to give a true and fair view of the state of affairs and profit or loss for an entity for a defined period.

GAP ANALYSIS
A method of assessing the gap between a business's current asset management practices and the future desirable asset management practices. Also called needs analysis or improvement planning.

INFRASTRUCTURE ASSETS
Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised ordinary assets as components.

LEVELS OF SERVICE
The defined service quality for a particular activity (i.e. Foul Sewer) or service area (i.e. maintenance) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.

LIFE
A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.

LIFECYCLE
The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset i.e. from planning and design to decommissioning or disposal.

LIFECYCLE COST
The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.

LIFECYCLE COST ANALYSIS
Any technique which allows assessment of a given solution, or choice from among alternative solution, on the basis of all relevant economic consequences over the service life of the asses

MAINTENANCE
All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal. Fixed interval maintenance is used to express

the maximum interval between maintenance tasks.
On-condition maintenance is where the maintenance action depends upon the item reaching some predetermined condition.

MAINTENANCE PLAN
Collated information policies and procedures for the optimum maintenance of an asset or group of assets.

MAINTENANCE STANDARDS
The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practise, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.

OPERATION
The active process of utilising an asset, which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the lifecycle costs of an asset.

OPTIMISED DEPRECIATED REPLACEMENT COST (ODRC)
The optimised replacement cost after deducting an allowance for wear or consumption to reflect the remaining economic or service life of an existing asset. ODRC is the surrogate for valuing assets in use where there are no competitive markets for assets, or for their services or outputs.

PERFORMANCE MONITORING
Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.

PLANNED MAINTENANCE
Planned maintenance activities fall into three categories:

i) Periodic – necessary to ensure the reliability or to sustain the design life of an asset.
ii) Predictive – condition-monitoring activities used to predict failure.
iii) Preventive – maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition based.

REHABILITATION
Works to rebuild or replace parts or components or an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset to deliver its original level of service (i.e. heavy patching of roads, slip-lining of sewer mains, etc.) without resorting to significant upgrading or renewal, using available techniques and standards.

RENEWAL
Works to upgrade refurbish or replace existing facilities with facilities of equivalent capacity or performance capability.

REMAINING ECONOMIC LIFE
The time remaining until an asset ceases to provide the required service level or economic usefulness.

REPAIR
Action to restore an item to its previous condition after failure or damage.

REPLACEMENT
The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.

REPLACEMENT COST
The cost of replacing an existing asset with a substantially identical new asset.

RESIDUAL VALUE
The net market or recoverable value that would be realised from disposal of an asset or facility at the end of its life.

RISK MANAGEMENT
The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

ROUTINE MAINTENANCE
Day-to-day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventive maintenance.

SERVICE POTENTIAL
The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.

STATEMENT OF FINANCIAL PERFORMANCE
A report on the net surplus/deficit, and its components, arising from activities or events during a given period, that is significant for the assessment of both past and future financial performance.

STRATEGIC PLAN
A plan containing the long-term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long-term survival, value and growth of the organisation.

UNPLANNED MAINTENANCE
Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

USEFUL LIFE
May be expressed as either:
a) The period over which a depreciable asset is expected to be used, or
b) The number of production or similar units (i.e. intervals, cycles) that is expected to be obtained from the asset.

VALUATION
Assessed asset value, which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels, market value for lifecycle costing and optimised deprival value for tariff setting.

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

This Activity Management Plan for Foul Sewer (AMP) has been developed to provide the Mackenzie District Council (MDC) with a long term management tool for the Foul Sewer asset. It sets out the current asset condition, what issues are currently and likely to impact on the asset and the costs associated with maintaining, operating, renewing, developing and disposing of the asset.

In terms of population, the Mackenzie District is the third smallest territorial authority in New Zealand with a normally resident population of approximately 4,000, with limited growth. In contrast to its small population, the area of the District is large, comprising 745,562 hectares. Fairlie, Lake Tekapo and Twizel are the main towns and there are villages at Albury, Kimbell, Burkes Pass and Mount Cook.

1.2 PURPOSE OF FOUL SEWER ASSET MANAGEMENT PLANNING

The purpose of this AMP is to provide a tool combining management, planning, financial, engineering and technical practices to ensure that the level of service required by customers is provided at the lowest long term cost to the community. The plan is intended to demonstrate to customers that Council is managing the assets responsibly and that they will be regularly consulted over the price/quality trade-offs resulting from alternative levels of service.

1.3 PLAN LEVEL

MDC considers the required sophistication of their plan in the short to medium term need not progress beyond a **"Core"** planning level, as:

- the cost at this time to move to an advanced plan would provide little significant benefit to Council or its' customers
- the size, complexity and use of the assets is consistent with a rural sparsely populated district
- the risks associated with failure are low

This AMP is one of the Council's suite of plans that together describe the services and workload that the community sees as important for the Council to provide and sustain. They outline the basic methodologies Council will use to achieve the strategic objectives promoted in the MDC LTP 2015 – 2025 and thus move towards achieving the "outcomes" and the citizens' "vision" of the society they wish to be a part of.

1.4 SCOPE OF ASSET MANAGEMENT PLAN

This revision provides a update to Version 4 of the AMP produced by Mackenzie District Council. It provides a medium to long term indication of asset management requirements and specific work programmes over the planning period from 1 July 2015 to 30 June 2025.

The plan will continue to be periodically reviewed to incorporate, as appropriate new asset information and improved knowledge of customer expectations. The objective is to optimise life cycle asset management activities and provide a greater degree of confidence in financial forecasts.

1.5 FOUL SEWER ASSET MANAGEMENT ACTIVITY

Council is responsible for the management of Foul Sewer assets with an optimised depreciated replacement cost of $14,985,817 (July 2013 valuation). For 2014/15 Council has budgeted to spend $583,000 on maintaining, operating and renewing these assets (including staff, overhead costs and depreciation).

The following list summarises the MDC Asset Management activities:

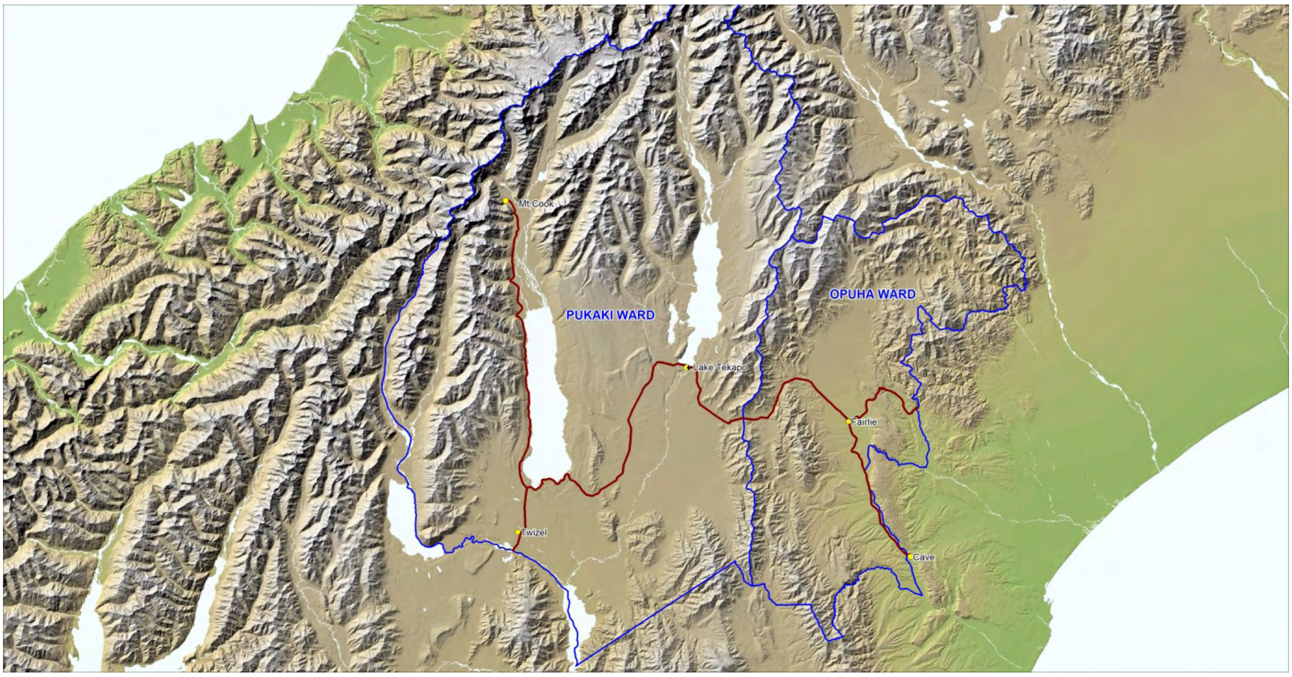
- Asset Management
- Safety Management
- Foul Sewer Maintenance
- Foul Sewer Data Management
- Project Management
- Environmental Management
- Network Inspections
- Legislative Compliance Management
- Network Management
- Customer Management

1.6 ASSET DESCRIPTION

1.6.1 LOCATION

Figure 1.1 shows the location of the district within the Canterbury Region

Figure 1.1 – Map of Mackenzie District



The Mackenzie District is bounded in the north and east by the Timaru and Waimate Districts, in the south by the Waitaki District and to the West by the Southern Alps/ Westland District boundary. There are two wards: **Pukaki** which in effect takes in the Mackenzie Basin and **Opuha** being the remaining area to the west of a line following the upper reaches of the Hakataramea River through Burkes Pass to Mt Musgrove in the Two Thumb Range.

The backbone of the roading network in the district is provided by the following State Highways which are the responsibility of the New Zealand Transport Agency (NZTA).

State Highway 8	Timaru - Fairlie - Lake Tekapo - Twizel - Omarama
State Highway 79	Fairlie - Geraldine
State Highway 80	Twizel - Mt Cook Village

The Mackenzie District Foul Sewers consists of a network of pipes conveying effluent to oxidation ponds in the towns of Fairlie, Tekapo, Twizel and Burkes Pass. In every case the effluent that exits the oxidation ponds after treatment discharges to ground.

1.6.2 THE ASSET

The Foul Sewer asset includes all Council owned pipelines, manholes and related infrastructure within the District as shown in Table 1.1.

Table 1.1 – Foul Sewer assets included in this plan

Asset Description	Sub-Asset Description	Quantity
Lines		78297m
Manholes		880
Treatment Facilities	Each of the four schemes are treated with oxidation pond wastewater treatment systems	4

1.7 KEY STAKEHOLDERS AND CUSTOMERS

Key Stakeholders
The Council as the ultimate owner of assets. Other key stakeholders of the Foul Sewer network include:

- Regional council
- Owners and operators of inter-connecting or separate Foul Sewer networks, specifically those owned and managed by Lake Tekapo Enterprises Ltd.

Funding Partners
Funding is provided by several parties and in particular the following are significant contributors:

- Ratepayers – Rates provide funding for maintenance and operation of the networks
- Developers – By constructing infrastructure and vesting it in the Council plus providing the required financial contributions

Customer Groups
MDC's customers fall into three different groups: associated service providers, users and the wider community. These are detailed in Table 1.2.

Table 1.2 – MDC Foul Sewer Customer Groups

Customer Group	Description	Customers
Associated Service Providers	These are other service providers who rely on the Foul Sewer network	• Contractors • Commercial operators
Users	Those who directly benefit from the service	• Ratepayers • Residents and holiday home owners • Commercial properties • Industrial users
The Wider Community	Non-users that are affected if the service is not provided	• Ratepayer and residents • Tourists • Local businesses

Other Parties

Other parties with an interest in MDC's AMP include Council employees, consultants and contractors who manage and work on the asset.

1.8 LEVEL OF SERVICE

Council's current and target levels of service as defined in the draft 2012-2022 LTP are summarised in Table 4.1 and are summarised below.

- The sewerage systems are managed without risk to public health
- Sewage is able to be disposed of without significant disruption.
- Safe discharge of wastewater

These show how levels of service contribute to the community outcomes and provide a technical measure that enables Council to monitor current levels of service against target levels of service.

The current LOS are documented as a combination of:

- LTP LOS documentation based on real or perceived customer feedback
- Contract processes which describe the contractors response to events such as system blockages or discharges.

The current LOS can be improved by:

- Augmentation of existing information e.g. clearer relationships between alternative service levels for pipeline replacement and their associated costs.
- Utilisation of a LOS model defining quality, quantity, location, and timeframe. This would accurately record over time events that cause disruption to the service impact on public health including the safe disposal of effluent and then look to solutions to minimise that disruption taking into account the risk of leaving the LOS as it is.

1.9 FUTURE DEMAND

The Mackenzie District Foul Sewer network caters for the three towns of Fairlie, Tekapo and Twizel. The districts population of approximately 4,000 is low and the growth at approximately 9.3% (since the 2006 census) this is a significant change from the 2001-2006 period where the population grew by a modest 2.3%.

Future demand on the network will be driven by residential subdivision and commercial development.

These areas sustained considerable growth during the period 2003-2009, but since then have slowed down significantly. That period of growth created a large number of sections in Twizel that will take some time to develop. As Twizel's infrastructure was designed for the total population when the town was at its height in the 1970's there is more than adequate capacity to cater for the growth expected.

In Tekapo planning during that period catered for large areas to be developed and infrastructure was designed and installed to cater for that. Resource consents were also obtained for that growth area. Therefore it is unlikely that there will be an increase in demand outside those already planned for.

1.10 RISK MANAGEMENT

Risk management is "the systematic application of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or plans, or from complying with its legal obligations".

There is currently no formal Risk Management process being implemented for the foul sewer activity within council. This in itself is a significant risk. A risk management strategy has been described in Section 8 of this AMP. The use of this strategy as outlined in the Improvement Plan should be completed with high priority. In particular issues surrounding emergency management and insurance require full review and inclusion in this plan.

1.11 LIFE CYCLE MANAGEMENT PLANS

Life cycle management plans outline what is work planned to keep the assets operating at the current levels of service defined in Section 4 while optimising lifecycle costs. The overall objective of the Life Cycle Management Plan is:

> ***To maintain performance measures to ensure that the current strategies do not consume the asset leading to an unexpected increase in maintenance/renewal expenditure in the future.***

In this AMP the lifecycle management plan has been separated into asset groups. Each Lifecycle Management plan covers the following:

- **Background Data** including current capacity and performance, current condition and historical data including costs.

- **Operations and Maintenance Plan** covering planning for on-going day to day operation and maintenance to keep assets serviceable and prevent premature deterioration or failure.

- **Renewal/Replacement Plan** covering Major work which restores an existing asset to its original capacity or its required condition (e.g. pipeline replacement, replanting treatment facilities).

- **Asset Development Plan** covering the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations.

- **Disposal Plan** covering activities associated with the disposal of a decommissioned asset.

1.11.1 ASSET CONDITION AND PERFORMANCE

The basis of the lifecycle management plans is the current condition and performance of the asset. This allows comparison with the prescribed level of service, and from this a gap analysis can be completed to determine future work requirements.

Currently MDC undertakes some condition and performance analysis of the network relying on internal CCTV inspections and the practical experience and knowledge of the engineering staff to provide a gauge of the networks overall performance. This knowledge is used extensively for planning purposes. Although adequate for the purpose, it would useful to extend the new Asset Register in ArcGIS and Asset Finda to record and analyse the condition and performance of the network to be more objective in its planning methodology.

Ongoing condition surveys of the asset components are undertaken and results recorded within the Asset Register. Council needs to keep up the internal CCTV inspection programme and the regular sampling of water mains, so that the sample results can be extrapolated out across the other similar pipe networks. Intermediate and long term planning of asset renewal is then be based on the results of these surveys, the performances obtained compared to that desired, the remaining expected life of the asset component and the decision making processes outlined (see appendix I) within this plan. Recently samples of Asbestos Cement pipe have also been analysed to confirm the level of deterioration and predicted replacement.

1.11.1.1 Asset Condition

Specific condition for each asset is not currently measured but internal inspections of representative sections of the network are carried out and the results extrapolated across the network. There is good condition information for Foul Sewer assets with the majority of assets graded at 2 or better (88%). Only 1% of the network is graded as having a rating of 4 and no asset is graded as requiring replacement.

Figure 1.2 – Condition Data for Foul Sewer Assets

Notes: 1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Significant maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

There are no pipelines that are graded as requiring renewal and 3% showing a grade of 4 that suggests a need to replace. This equates to 965m of pipework in Fairlie. It is not planned to programme the replacement of this pipework, but rather put it on a regular review and inspection regime to monitor the deterioration to replace at the optimum time.

1.11.2 ROUTINE MAINTENANCE PLAN

Current practice is to apply a combination of "reactive" condition driven and network lifecycle depreciation techniques to determine the work necessary to maintain the network within pre-determined financial constraints (see charts in Appendix I). The majority of maintenance is reactive so budgets have been based on historical expenditure. Increases to costs for some asset groups are projected in future due to vested assets from developers.

1.11.3 RENEWAL/REPLACEMENT PLAN

This plan is recommending the following renewal works to the existing Foul Sewer infrastructure.

- Twizel, land purchase around existing oxidation ponds, including legal costs
- Fairlie, pipeline replacement. The pipework in Fairlie is getting old and being impacted with tree root intrusion, so it is suggested that Council budgets for the replacement of one section of pipe as required.
- Tekapo, Upgrade existing pump station on Lakeside Drive to replace aging equipment and to cater for increased demand.
- Tekapo and Fairlie, Replace aerators at oxidation ponds.

1.11.4 ASSET DEVELOPMENT PLAN

This plan is recommending the following improvement works to the existing Foul Sewer infrastructure.

- Twizel, construct rapid infiltration basins and associated pipework to redirect the effluent disposal from the current disposal trench into the RIBs. The existing trench will be decommissioned at that time. The timeframe for this work is completion by early 2017.

- Twizel, construct a new rising main from Mackenzie Park pump station to the oxidation ponds. This work is programmed for later in the life of the plan when or if demand puts pressure on the current systems to the point it cannot cope.

- Tekapo, construct an extra disposal field for the effluent discharging from the oxidation ponds. There are periodically discharge issues caused by extra flow, particularly in the winter when the ground is frozen. A new disposal system will give Council an alternative disposal system for those periods.

1.11.5 ASSET DISPOSAL PLAN

In general Council has no specific plans for disposal of components of the Foul Sewer asset.

1.12 FINANCIAL FORECASTS

As at 1 July 2013 the total optimised replacement cost of the Foul Sewer Infrastructure was assessed to be $23,635,947. The total optimised depreciated replacement cost was assessed to be $14,985,817. The annual depreciation has been determined to be $322,585 per annum.

Mackenzie District Council
Funding Impact Statement for 10 Years to 30 June 2025 for Foul Sewer

	Annual Plan 2014/15 ($000)	LTP Year 1 2015/16 ($000)	LTP Year 2 2016/17 ($000)	LTP Year 3 2017/18 ($000)	LTP Year 4 2018/19 ($000)	LTP Year 5 2019/20 ($000)	LTP Year 6 2020/21 ($000)	LTP Year 7 2021/22 ($000)	LTP Year 8 2022/23 ($000)	LTP Year 9 2023/24 ($000)	LTP Year 10 2024/25 ($000)
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	461	441	576	555	541	530	494	493	552	490	497
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	37	49	31	46	72	93	98	130	136	159	173
Local authorities fuel tax, fines, infringement fees, and other receipts	-	6	6	6	7	7	7	7	8	8	8
Total operating funding (A)	**498**	**496**	**613**	**607**	**620**	**630**	**599**	**630**	**696**	**657**	**678**
Applications of operating funding											
Payments to staff and suppliers	179	157	237	250	256	227	225	233	243	253	264
Finance costs	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	13	-	-	-	-	-	-	-	-	-	-
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**192**	**157**	**237**	**250**	**256**	**227**	**225**	**233**	**243**	**253**	**264**
Surplus (deficit) of operating funding (A - B)	**306**	**339**	**376**	**357**	**364**	**403**	**374**	**397**	**453**	**404**	**414**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	133	-	-	262	-	-	657	-	-	208	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**133**	**0**	**0**	**262**	**0**	**0**	**657**	**0**	**0**	**208**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service	-	-	-	-	-	-	-	-	-	-	-
to replace existing assets	109	902	31	11	17	398	219	306	-	330	-
Increase (decrease) in reserves	330	-563	345	608	347	5	812	91	453	282	414
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**439**	**339**	**376**	**619**	**364**	**403**	**1031**	**397**	**453**	**612**	**414**
Surplus (deficit) of capital funding (C - D)	-306	-339	-376	-357	-364	-403	-374	-397	-453	-404	-414
Funding balance ((A - B) + (C - D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

The forecast total Mackenzie District and Community Board expenditure Foul Sewer for 2014/15 for operations, maintenance renewals and development totals $583,000 (inclusive of all administration costs and professional service fees). 27% ($158,000) of budgeted expenditure is to be spent on maintenance and operation with 19% to be spent on renewals. The remaining 51% is used to fund depreciation and administration costs. The full budget and forecast are shown in Appendix III.

A check of the annual renewal expenditure against the Annual Depreciation (AD) for each asset component gives an indication whether the renewal expenditure is appropriate for the age and condition of the network. For asset components nearing the end of their expected lives a figure greater than the depreciated costs would be expected to be spent. For situations where the asset component is new or only partially through the expected life the budgeted expenditure would be expected to be less than the AD with the balance banked so as funding will be available when required. Table 1.3 shows the 2011/12 forecast renewal expenditure compared to the AD.

Table 1.3 – Comparison between Forecast Expenditure and Annual Depreciation

Asset Type	2014/15 Renewals Forecast	Annual Depreciation Cost
New Treatment	$108,000	$296,000

1.13 ASSET MANAGEMENT PRACTICES

MDC employ an Asset Manager, a Utilities Engineer and an Engineering Technician who are responsible for the management of the Foul Sewer asset.

Management planning is actioned in-house generally based on the knowledge of the Asset Manager/Utilities Manager assisted by the council's contractors and by such planning tools as the ArcGIS Asset Register software and Asset Finda (asset management software)

Occasionally elements of the management of the network may be competitively tendered to consultancy services.

Routine maintenance is undertaken through a competitively tendered contract of normally 3 to 5 year duration.

MDC accounts for revenue and expenditure on an accrual basis. All works are identified through a job cost ledger with appropriate breakdown level to be able to monitor and report on revenues and expenditure. All external reports are prepared in compliance with Generally Accepted Accounting Principles.

1.13.1 ASSET MANAGEMENT PROCESSES

Council uses the LTP process to identify community concerns and issues which are incorporated into levels of service that are expressed by performance measures written into the professional services and physical works contracts. The satisfactory execution of these performance measures result in levels of service compliance that ensures the MDC's outcomes are achieved and the community vision of a district they wish to live in is accomplished.

Well documented standards and processes exist for an on-going inspection programme.

Maintenance and renewal costs are recorded in the general ledger.

There is no formal risk management process.

1.13.2 ASSET MANAGEMENT SYSTEMS

The ArcGis Geographic Information System database is used as the inventory management system and should be the depository for all the available asset data.

Council also uses Asset Finda (linked to ArcGis) which is a complete system for designing and managing solutions through the application of geographic knowledge. Data can be manipulated within Asset Finda, ArcGIS or exported to excel to assist in the decision making process for Stormwater network management.

Other systems operated by the Council are:

- NCS Corporate financial management system
- NCS electronic plan record system
- Hardcopy plan filing systems

The Council is moved its GIS platform from MapInfo to ArcGis from 24th October 2011. This continues to provide a good Asset Register.

1.14 PLAN IMPROVEMENT AND MONITORING

This AMP has previously been reviewed and updates incorporated including improvements to move towards "Core" level Asset Management. Council is committed to a continual improvement as outlined in Section 10. A key objective is to dovetail the asset management planning process with the other key planning processes particularly the Community Plan (LTP).

1.15 KEY ASSUMPTIONS AND CONFIDENCE LEVEL

There are a number of significant assumptions that have been made in the development of this AMP as outlined below.

1.15.1 ASSET DATA

In preparing the plan, data in the ArcGis database has been taken as the verified network asset. As a result of the recent revaluation and the move to ArcGis, significant validation checks were carried out on the data.

Table 9.1 gives the assessed data confidence quality of the MDC asset register as described in the 2013 Water, Wastewater, Stormwater and Solid Waste Assets "Mackenzie District Infrastructure Revaluation" report.

1.15.2 LEVELS OF SERVICE

These have been based on Levels of Service (LOS) outlined in the 2012-2022 LTP and updated in the 2014/15 Annual Plan. It is assumed that customer consultation completed as part of the LTP process has been taken into account in the development of these LOS.

Changes in government requirements in future may affect future LOS.

1.15.3 DEMAND

Although the population remains static within the district, other demand factors are based on limited information. No specific consultation or research has been completed to determine future demand on the network. There is a moderate level of confidence in future demand based on limited input information.

1.15.4 LIFE CYCLE MANAGEMENT

The knowledge of the practitioners directly providing this activity, both on a day-to-day basis and historically, has been relied upon. These practitioners include Council's engineering staff, Council's consultants and staff of the various physical works contractors.

1.15.5 FINANCIAL FORECASTS

Key assumptions made in the financial forecasts are as follows:
(Inflation figures have been provided by Business and Economic Research Limited.)

Table 3: Adjustors: % per annum change

	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private Sector Wages
Year Ending	% pa change								
Jun 12	5.2	3.3	6.0	15.4	2.3	1.4	4.7	3.1	2.1
Jun 13	1.1	1.7	-2.8	-1.8	2.1	2.9	2.1	-2.7	1.9
Jun 14	0.7	1.9	-2.1	1.3	1.9	1.8	2.8	-2.5	1.7
Jun 15	0.4	1.9	4.7	4.2	1.6	1.5	1.7	1.8	1.7
Jun 16	1.2	2.2	5.2	3.5	1.8	2.3	1.8	2.1	1.7
Jun 17	1.4	2.4	3.8	3.8	1.9	2.5	2.6	2.5	1.8
Jun 18	2.2	2.5	3.0	3.9	2.0	2.6	2.4	2.6	1.9
Jun 19	2.4	2.6	3.2	4.1	2.1	2.7	2.0	2.8	2.0
Jun 20	2.5	2.8	3.3	4.3	2.2	2.9	2.1	2.9	2.1
Jun 21	2.7	2.9	3.5	4.5	2.3	3.0	2.3	3.1	2.1
Jun 22	2.8	3.0	3.7	4.7	2.4	3.1	2.4	3.2	2.2
Jun 23	3.0	3.2	3.8	4.9	2.5	3.3	2.5	3.4	2.3
Jun 24	3.1	3.3	4.0	5.1	2.6	3.4	2.9	3.5	2.4
Jun 25	3.3	3.4	4.2	5.3	2.7	3.6	3.1	3.6	2.5
20-year avge %pa	3.2	2.9	3.5	4.7	2.4	3.0	3.0	3.0	2.2

- Council will continue to fund the level of service currently set out in this AMP
- The dollar values shown in this Plan are October 2014 dollars adjusted for inflation applicable to this Activity.
- Some renewal costs are rough order of cost estimates based on length and types of components using replacement costs form the recent revaluation exercise. These estimates will need to be further refined as projects develop.
- No account has been taken of the impacts related to the development, acceptance and implementation of the Risk Management Plan
- Assumptions made on Total Useful Life and Residual Useful Lives of the assets in relation to the asset valuation.
- The asset data is considered to be reliable and fit for the purpose for developing the long term financial forecasts.
- Any other specific assumptions

2. INTRODUCTION

2.1 PURPOSE OF THE PLAN

The objective of Asset Activity Management planning is:

"To provide the required level of service, in the most cost effective manner, through management of assets for existing and future customers."

Activity Management Planning is a management tool that provides the link between strategic planning and managerial areas of Council's business and community's desired outcomes.

The need for Activity Management Plans for Council's major infrastructure and other major assets is an implied requirement of the Local Government Act 2002 and the Long Term Plan (LTP). Such Activity Management Plans define agreed levels of service, and the expenditure required to maintain these agreed service levels for the period of the plan.

Levels of service are the definitions of service quality resulting from operation of the particular asset against which the assets service performance may be measured. Levels of Service are one of the key outputs from the strategic planning process and typically comprise the following elements.

- Quantity
- Quality
- Cost
- Timescales
- Performance Measures
- Sustainability

2.2 RELATIONSHIP WITH OTHER PLANNING DOCUMENTS

The Activity Management Planning process analyses the impact of the Levels of Service on the business and should be structured to be compatible with other key planning mechanisms and documents, including:

LTP: Council's LTP 2012 – 2022 sets out the broad strategic direction for the period of the plan, defining the District Vision, Outcomes, Strategic Objectives, Projects and Tasks and the Financial Framework. The outcomes are directly related to Governance, Community Well-Being, Environment Protection, Sustainability, Economic Development, and Organisation Performance. These will remain relevant in the upcoming LTP.

District Plan: The Mackenzie District Plan assists the Council in carrying out its functions under the Resource Management Act 1991 so that it may achieve the purpose of the Act which is to "promote the sustainable management of natural and physical resources." The Plan was developed in consultation with local communities and interest groups. The Plan controls such activities as:

- Erection, relocation, or demolition of structures, buildings, network utilities and signs.
- Commercial activities.
- Earthworks.
- Use of hazardous substances.
- Planting, trimming or removing vegetation.

- Subdivision of land.

Other Related Activity Management Plans: Council has other activities each managed through the production and use of Activity Management Plans. Of particular relevance to the Foul Sewer activity are the Roading, Water and Stormwater Activity Management Plans. Cooperation with these activity groups is required as their works in the road corridor will have impact on all assets.

Annual Plan and Budget: The works identified in this AMP will form the basis on which future annual plans are prepared.

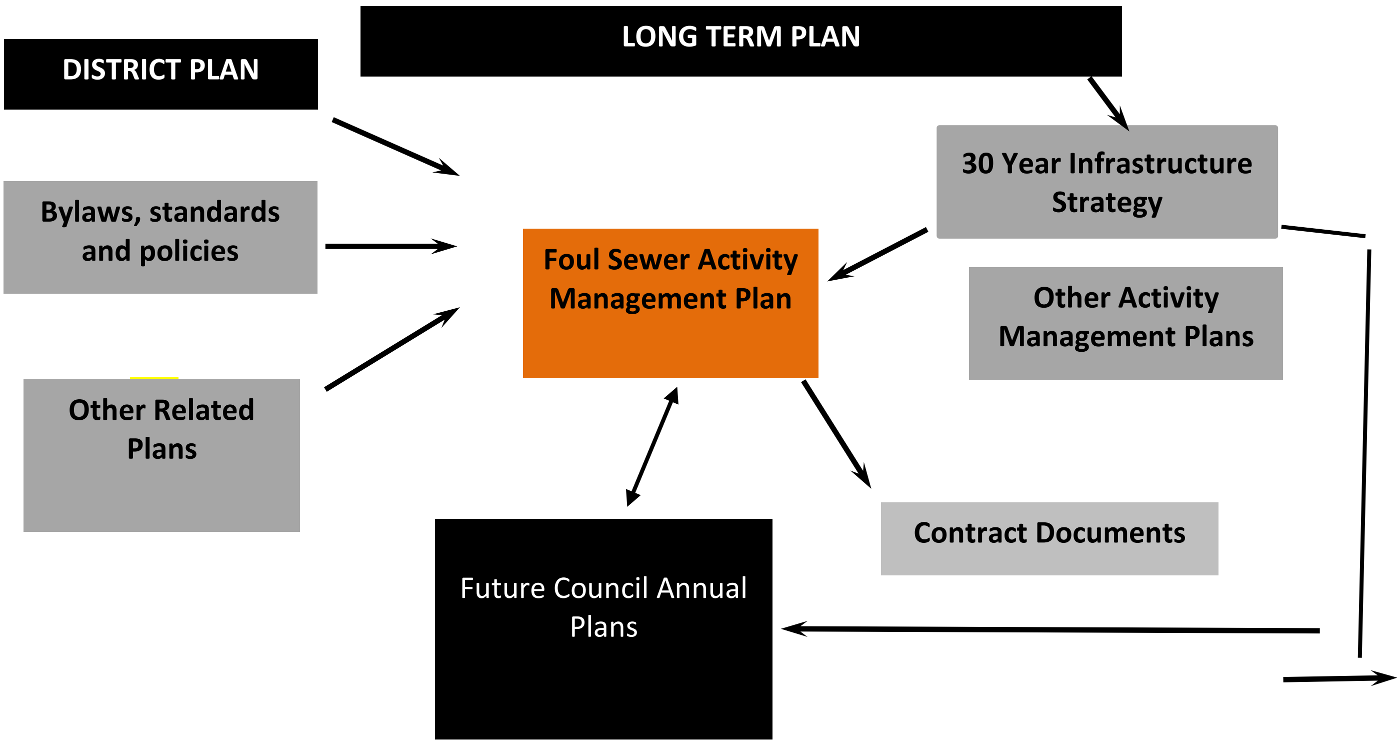
Contracts: The levels of service, strategies and information requirements contained in AMP's are translated into contract specifications and reporting requirements.

Bylaws, standards and policies: These tools for asset creation and subsequent management are needed to support AM tactics.

Other Foul Sewer Related Plans: These include:

- National Policy Statements
- Regional Policy Statements

Figure 2.1 – Relationship between the Foul Sewer Activity Management Plan and Other Plans



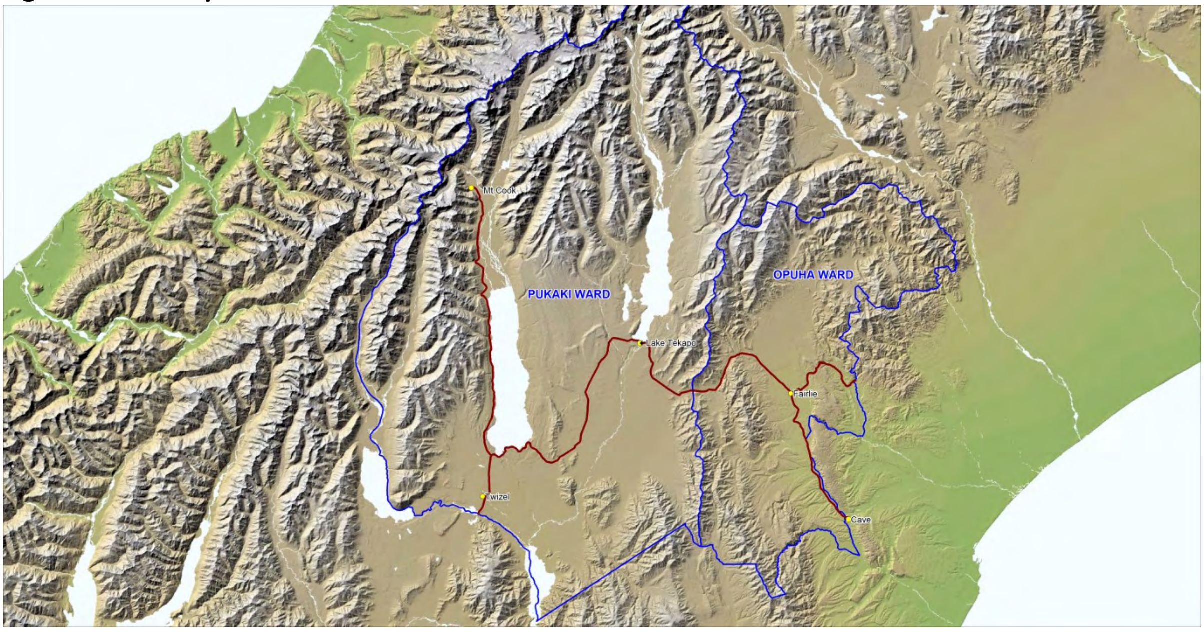
2.3 ASSETS INCLUDED IN THIS PLAN

2.3.1.1 Location

Figure 2.2 shows the location of the district within the Canterbury Region

The Mackenzie District is bounded in the north and east by the Timaru and Waimate Districts, in the south by the Waitaki District and to the West by the Southern Alps/ Westland District boundary. There are two wards: **Pukaki** which in effect takes in the Mackenzie Basin and **Opuha** being the remaining area to the west of a line following the upper reaches of the Hakataramea River through Burkes Pass to Mt Musgrove in the Two Thumb Range.

Figure 2.2 – Map of Mackenzie District



2.3.1.2 The Asset

The Foul Sewer asset includes all Council owned pipelines, manholes, treatment facilities and related infrastructure within the District as shown in Table 2.1.

Table 2.1 – Foul Sewer assets included in this plan

Asset Description	Sub-Asset Description	Quantity
Lines		74078m
Manholes		184
Treatment Facilities	Effluent from each of the four schemes is treated by oxidation pond systems	4

2.4 KEY STAKEHOLDERS AND CUSTOMERS

Key Stakeholders
The Council as the ultimate owner of assets.

- Regional council
- Owners and operators of inter-connecting or separate Foul Sewer networks.

Funding Partners
Funding is provided by several parties and in particular the following are significant contributors:

- Ratepayers – Rates provide funding for maintenance and operation of the networks
- Developers – By constructing infrastructure and vesting it in the Council plus providing the required financial contributions

Customer Groups
MDC's customers fall into three different groups: associated service providers, users and the wider community. These are shown in Figure 2.3 and further detailed in Table 2.2.

Figure 2.3 – Customer Groups (Ref IIMM Figure 2.1.5)

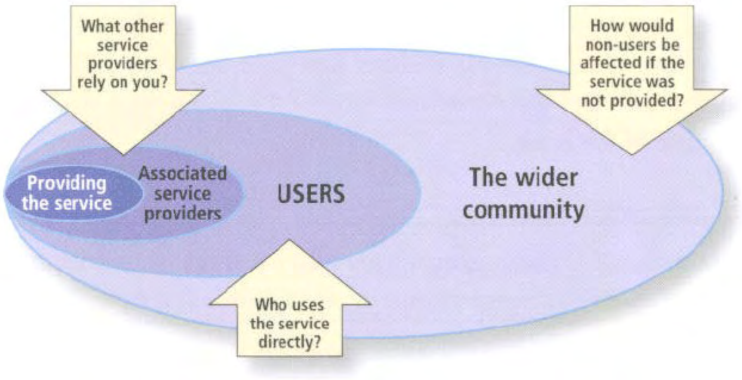


Table 2.2 – MDC Foul Sewer Customer Groups

Customer Group	Description	Customers
Associated Service Providers	These are other service providers who rely on the Foul Sewer network	• Contractors
Users	Those who directly use the service	• Rate Payers • Residents • Commercial business owners/operators • Industrial users
The Wider Community	Users that are affected if the service is not provided	• Citizens • Tourists • Visitors

Other Parties
Other parties with an interest in MDC's AMP include Council employees, consultants and contractors who manage and work on the asset.

2.5 ORGANISATION STRUCTURE

Mackenzie District Council's organisation structure is shown in Figure 2.4. This AMP covers activities included under Essential Services, led by the council Asset Manager and Utilities Manager.

Figure 2.4 – MDC Organisation Structure

CHIEF EXECUTIVE OFFICER
WAYNE BARNETT

ESSENTIAL SERVICES

Bernie Haar
Asset Manager

Geoff Horler
Utilities Manager

Suzy Ratahi
Roading Manager

Angie Taylor
Solid Waste Manager

Matthew Wade
Assets Technical Assistant

PLANNING & REGULATIONS

Nathan Hole
Manager Planning & Regulations

Steve McLellan
Building Control Manager

Christine Scannell
Building Control Officer

Denis Lenihan,
Building Control Officer

Judith Gray,
Building Administration Officer

Anastasia Blignaut
Planner

Ray Gardner
Civil Defence Officer

Vacant
Policy Planner, District Plan Review

PROJECTS & ADMINISTRATION

David Rae
Manager Projects and Administration

Arlene Goss
Committee Clerk

Christine O'Connell
Regulatory Assistant

Nic Guerin
Receptionist

Stephen Barlow
IT Manager

Terry Sharples
GIS Officer

Jana Kaeppler
GIS Officer Twizel

Julie Hadfield
Catherine Johnson
Executive Assistants

Toni Morrison
Senior Policy Planner

FINANCE

Paul Morris
Manager Finance and Administration

Tania Hoefsloot
Accountant

Pauline Jackson
Revenue Officer

Julie Hadfield
Payroll/Payments Officer

COMMUNITY FACILITIES

Garth Nixon
Community Facilities Manager

Barbara McGartland
Summer McDougall
Jane Nicholls
Heather McKendrick
Twizel Office Staff

Colleen Brien
Mackenzie Community Centre Cleaner

Kevin McDonald
Twizel Events Centre Caretaker

Seasonal Staff:

Strathconan Swimming Pool Supervisor and five attendants

Twizel Swimming Pool Supervisor and three attendants

2.6 GOALS AND OBJECTIVES OF ASSET OWNERSHIP

Purpose of Ownership
Council provides a safe, effective and sustainable Foul Sewer system:

- To ensure that adequate wastewater treatment and disposal systems are provided (by either private or public means) for all dwellings.
- To provide and maintain reliable and affordable wastewater systems which protect public health, property, safety and the environment and which recognise cultural values, both now and in the future.

The Council's overriding goal is:

"The outcome desired by the community is to have safe, effective and sustainable water, waste communication, energy and transport systems in place when required, through sound long term planning and funding"

Review of Activities and Funding
The LTP identifies planned activities, defines the rationale for justifying these activities, and identifies the appropriate funding source.

Legal Authority for Council Action
The ***Local Government Act 2002*** gives local authorities the full capacity, and full rights, powers and privileges, to carry on or undertake any activity or business, do any act, or enter into any transaction wholly or principally for the benefit of its district.

Along with these wide sweeping powers comes the requirement to identify all reasonably practicable options before making a decision, and to assess the benefits and costs of each option against the likely economic, environmental, social and cultural impacts.

Local authorities are also required to consult widely, effectively and appropriately with the community to determine the communities' wishes and to seek feedback on all potentially significant activities – not only when a particular course of action is proposed, but at the various stages of the decision-making process.

A significant aspect of this consultation process is the development of the LTP, which forms the long-term (not less than ten years) direction for all Council's activities.

2.7 LINKS TO ORGANISATION VISION, MISSION, GOALS AND OBJECTIVES

VISION
Mackenzie will be a district in which:

- We foster the unique attributes and strong sense of community that makes the Mackenzie District special.
- Our natural environment is protected and enhanced in balance with achieving social and commercial objectives.
- A dynamic economy provides employment and investment opportunities consistent with the quality of life aspirations of existing and future generations.
- Democracy is respected and equal opportunity and the rights of the individual are upheld.

- A variety of sporting, recreational, cultural, spiritual, welfare and educational resources are available to enrich the lives of our people.
- Safe, effective, sustainable water, waste, communication, energy and transport systems are in place.
- People are encouraged to use their skills and talents for the benefit of the community.

MDC's outcomes and objectives for the foul sewer network are stated in the LTP 2009 – 2019.

These outcomes and objectives have been translated into various targets for maintenance and renewals to be achieved in each financial year. The outcomes are reported in each Annual Report.

The principal goal is to provide an effective, efficient, accountable and sustainable range of services that meet the actual needs of the residents. The foul sewer network provides the means to collect and convey sewage away from properties and dispose of it in an environmental and sustainable way.

The over-riding management strategy is that the Foul Sewer infrastructure as it presently exists will be maintained in the same state in perpetuity.

Table 2.3 – Community outcomes

Community Outcome	Contributions of the Foul Sewer Activity towards the Outcomes
'Safe, effective and sustainable infrastructure'	By ensuring that adequate public disposal systems are provided and maintained and that private disposal systems are properly installed, Council provides an essential component of the District's infrastructure.
'A fit and healthy community."	Every household requires a good wastewater disposal system to avoid exposure to water-borne health risks.
'A thriving economy'	By ensuring that adequate public disposal systems are provided and maintained.

2.8 ASSET MANAGEMENT DRIVERS

The business drivers, which define the need, priority and scope for improved AM practices within Council may be summarised as follows:

Customer Service
Customers require that agreed levels of service be delivered reliably, efficiently and economically. The use of AM techniques provides the following benefits in satisfying these demands:

- focuses on identifying and satisfying customer requirements
- provides a basis for customer consultation when determining levels of service preferences by identifying the range and cost of service level and service delivery options
- enhances customer confidence that funding is being allocated in an equitable and cost effective manner; that assets are being well managed and improves understanding of service level options and requirements

Financial Responsibility
The Local Government Act requires Local Authorities to:

- prepare and adopt, every three years, a long term (10 years plus) financial strategy for all infrastructural assets which takes into account asset creation, realisation, and loss of asset service potential
- prepare and adopt, every three years, a 30 year infrastructural strategy
- determine their long term financial strategy, consider all relevant information and assess the cost/benefit of alternatives
- adopt a financial system consistent with generally accepted accounting practices
- manage assets prudently in the interests of the district and its inhabitants
- fund or otherwise provide for loss of service potential (deferred maintenance or depreciation) from July 1999

The implementation of the optimised work programmes and resulting long-term cash flow projections contained in AMP's will aid compliance with these requirements.
AMP's (supported by appropriate processes, systems and data) should provide clear justification for forward works programmes (and associated funding programmes) and provide the ability to even out peak funding demands and account for changes in asset service potential.

Environmental Responsibility
Asset Management (AM) Planning demonstrates how MDC is addressing sustainable management of its physical resources while enhancing the protection of the environment as required under the provisions of the Resource Management Act.

Safety
AM planning addresses MDC's safety obligations through:

- adoption of appropriate design standards for the creation of new assets
- development of risk management practices

Economic Efficiency
The techniques incorporated into this AMP support economic efficiency by:

- providing a basis for monitoring asset performance and utilisation
- enabling asset managers to anticipate, plan and prioritise asset maintenance and renewal expenditure
- identifying under-funding of asset maintenance and renewal
- quantifying risk, leading to minimisation of high impact (financial and service level) failures and environmental effects and resulting in savings where asset renovation is less than the cost of replacement
- extending the life of an asset by optimising maintenance programmes and demand management

Achieve Strategic Goals

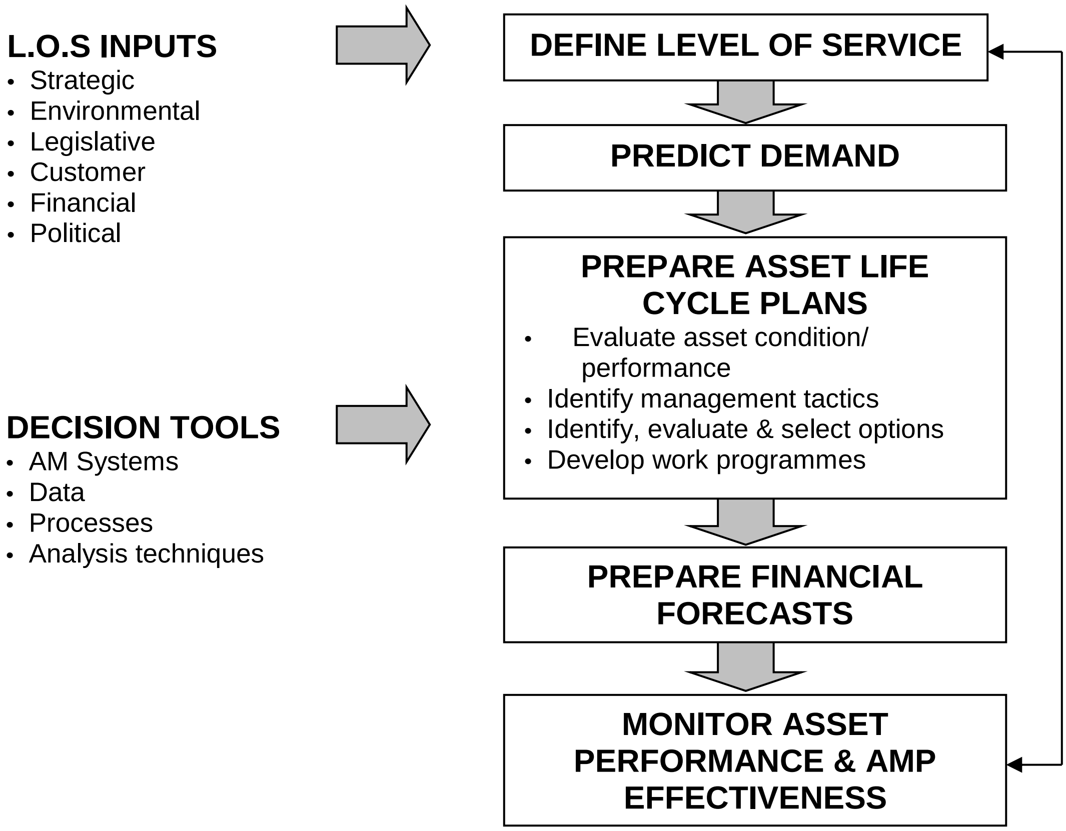
MDC has a strategic intent to “achieve sustainable development” and other goals relating to growth, building communities, protecting the environment, supporting the economy and providing quality customer service.

2.9 PLAN FRAMEWORK

This AMP is structured around the current asset inventories, the existing levels of service and consequential financial management plan for the next ten years. It includes Maintenance requirements, Renewals, and Capital improvements in terms of Council requirements.

This AMP generally follows the format recommended in the National Asset Management Steering Groups (NAMS) Infrastructure Asset Management Manual to a core level. Figure 2.5 shows the framework of this AMP.

Figure 2.5 – Foul Sewer AMP Framework



This AMP assumes that the current sewer network will be maintained in perpetuity.

2.10 APPROPRIATE LEVEL OF ASSET MANAGEMENT

The International Infrastructure Management Manual (IIMM) provides a summary of the different degree asset management complexity: Minimum, Core, Intermediate and Advanced. The degree of complexity differs according to an organisation's corporate needs. The level of complexity of Asset Management is dependent on the following:

- The costs and benefits to the organisation
- Legislative and other mandated requirements
- The size, condition and complexity of the assets
- The risks associated with failures
- The skills and resources available to the organisation
- Customer expectations

A core Activity Management Plan will meet minimum legislative and organisational requirements for financial planning and reporting. It provides basic technical management outputs such as statements of current levels of service, forward replacement programmes and associated financial projections.

MDC considers the required sophistication of their plan in the short to medium term need not progress beyond a **"Core"** planning level, as:

- the cost at this time to move to an advanced plan would provide little significant benefit to Council or its' customers
- the size, complexity and use of the assets is consistent with a rural sparsely populated district
- the risks associated with failure are low

The current Activity Management Plan generally meets "Core" requirements. By implementing improvement planning Council can assess the asset management performance and identify gaps to drive the improvement actions.

3. DESCRIPTION OF FOUL SEWER ASSET

3.1 DESCRIPTION OF ACTIVITY

Foul Sewer management is the median of the three water activities with an annual expenditure of $583,000 (2014/15)

There are un-sophisticated networks in Fairlie, Tekapo, Twizel and Burkes Pass only. In every case the effluent is treated by way of an oxidation pond system and then discharge to ground.

The Foul Sewer asset is made up of the following components, which are described in more detail in the sections below.

- Pipelines
- Manholes
- Pump chambers
- Overflow storage chambers
- Treatment facilities

3.2 FAIRLIE

3.2.1 GENERAL

a)	Total population (2013)	
	Permanent	693
	At Holiday times	900
b)	Number of properties in area of benefit	
	Connectable	527

3.2.2 OVERVIEW AND OVERALL ASSET CONDITION

The Fairlie waste water system was first constructed in 1938 using earthenware pipes with cement joints. The Initial Oxidation ponds were constructed in 1971 and then upgraded in 2002 with the dividing up of the secondary pond with solid bunds and filter paths at the ends. This was to control the flow paths through the ponds.

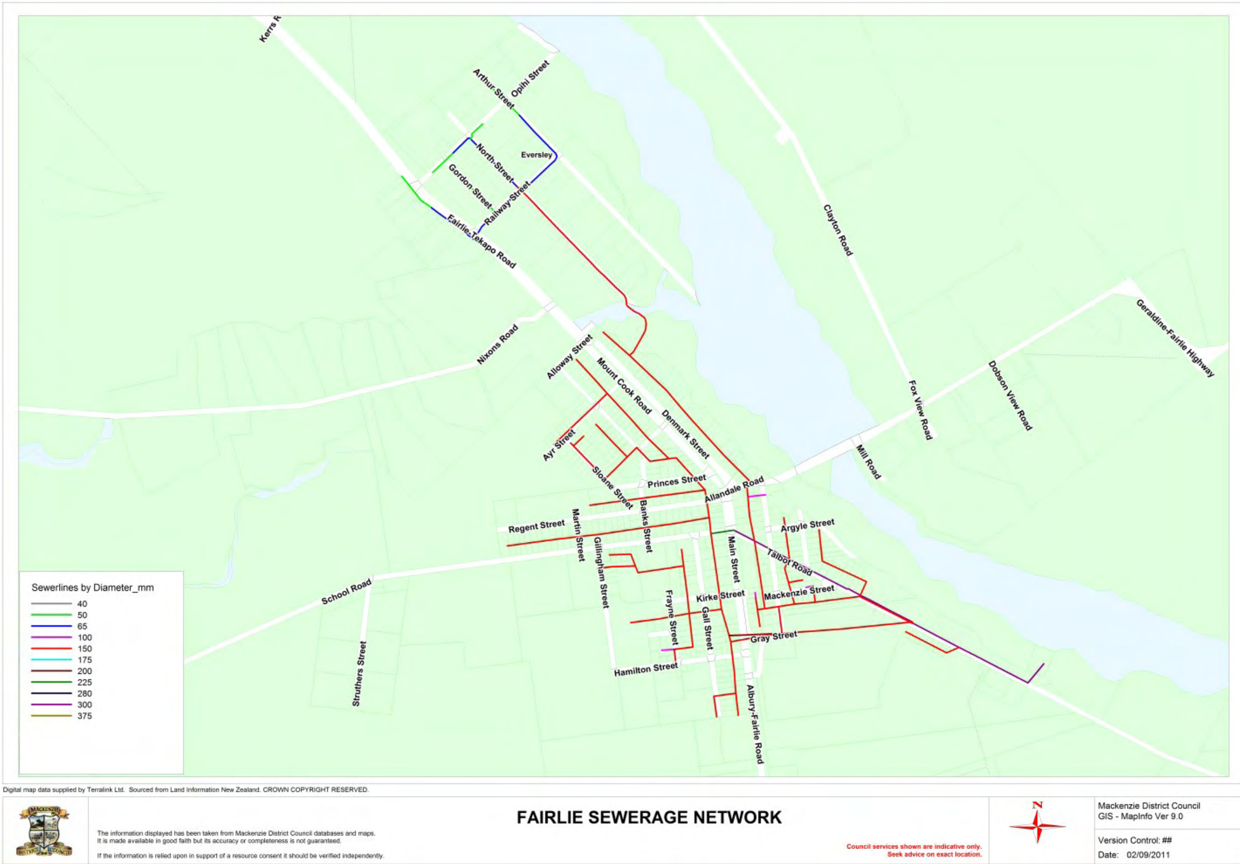
The five soakage basins were constructed in 2004 to remove the discharge from the Opihi River. Now all effluent either evaporates or discharges to ground.

Extensions of pipelines over the years have been mainly in asbestos cement and uPVC.

3.2.3 DISCHARGE LOCATIONS

Foul Sewer Oxidation pond and disposal system is located on Talbot Road.

FIGURE 3.1 – Current Foul Sewer Network



3.2.4 CONDITION AND PERFORMANCE OF ASSETS

♦ CONDITION

The condition profile in the graph is based on the results of surveys undertaken from 1993 to 2010. Closed circuit television was used to video the wastewater pipes, with faults recorded and grades assigned to each fault depending on the severity and type of fault.

Generally speaking, all of the systems in Fairlie are in a good state of repair and if they are maintained and renewed regularly, and at the appropriate times, they can be expected to last indefinitely, without any significantly abnormal costs having to be incurred.

3.2.5 PUMP STATIONS

There is only one pump station in Fairlie. This collects the effluent from the Camping Ground and pumps it via a rising main into the gravity system.

The original Camp Ground Pump Station was decommissioned and a new pack pump system was installed in 2014. The system installed was a Model 2014iP 1100 x 2000mm supplied by Ecoflow Ltd.

The pump station has two EOne 0.75 kW submersible grinder pumps and an alarm panel as part of the package. The Duplex station is rated for 4000litres per day. With both pumps running it pumps 1.2 l/s.

Pump Station Instalation

Emergency Holding Tank (2m^3) Installation

TREATMENT

Fairlie	
Oxidation Ponds	Pond 1 0.98ha Maturation Ponds (5) 0.60ha
Properties Connected	474

FAIRLIE OXIDATION PONDS

The Initial Oxidation ponds were constructed in 1971 and then upgraded in 2002 with the dividing up of the secondary pond with solid bunds and filter paths at the ends. This was to control the flow paths through the ponds. The soakage basins were constructed in 2004.

The effluent enters the ponds in the south west corner travelling a long flow path to exit the pond system at the north east corner.

The treated effluent then enters the soakage system to finally discharge to ground via the soakage basins. The five soakage basins are automatically rotated in the following sequence:- Basin 1 – 3 - 5 – 2 then 4.

3.2.6 FLOW AND LOADING ESTIMATIONS (ORIGINAL DESIGN)

Flow and loading monitoring is now in place for the discharge. However, the following assumptions were used during the investigation and design of the wastewater treatment and disposal investigation.

LOADINGS

Allowing a standard contribution of 75g BOD/person.day and a population of 1000 then an average loading of 75 kg/day is expected. This is a reasonable estimation because the town is largely residential with some commercial properties which are typically quite stable contributors. The 75g BOD/person.day is an upper value with a range of 60-75 being used in assessments elsewhere. The large number of school children arriving to town each day, relative to the base population supports the use of the upper value.

FLOWS

Significant infiltration is expected. A good approach for estimation of flows is given by the Christchurch Drainage Board Design Manual. This approach was used in the Status Report, assuming a population of 800. As a design population of 1000 has been chosen, the flows have been reworked with this increased population.

The Average Wastewater Flow (AWF) can be reliably approximated with an allowance of 270 l/day/person which gives a flow of 3.14 l/s. Determination of the Peak Wet Weather Flow (PWWF) and the Peak Dry Weather Flow (PDWF) can be achieved by the Christchurch Drainage Board method as follows:

Table 3.1.6a – Flow Estimation (l/s)

Zone	Area (ha)	AWF	P/A	PDWF	BI	SA	PWWF
A	27	1.21	5.7	6.9	1.9	5.4	14.2
B	20.3	0.91	6.9	6.3	1.4	4.1	11.7
C	8.5	0.38	12	4.6	0.6	1.7	6.9
D	14.5	0.65	8.4	5.4	1.0	2.9	9.4
Total	70.3	3.14		23.1	4.9	14.1	42.1

Notes:
The town is split into 4 zones: A, B, C, D with the AWF based on each area
AWF = Average Wastewater Flow
P/A = Peak to Average ratio which increases for smaller catchments
BI = Basic Infiltration which allows for sub-surface infiltration
SA = Storm Allowance which allows for surface infiltration (e.g. through manhole covers) and increased sub-surface infiltration
PDWF = Peak Dry Weather Flow
PWWF = Peak Wet Weather Flow

From the above table, wet weather and groundwater infiltration will have a significant effect on the flow rate. Fairlie has a remarkably consistent rainfall from month to month through the year with only April having a significantly higher precipitation than the other months. Hence the infiltration rate will be assumed as consistent when evaluating an Average Wastewater Flow (AWF). The AWF will be assumed to be the sum of the Average Sewage Flow and the Basic Infiltration or 8.04 l/s.

Average Flow = BI + AWF
= 8.04 l/s

An estimation of the sustained wet weather flow can be made by combining the AWF, BI and a percentage of the SA. Inclusion of a percentage of the SA is justified because it is defined as including not only the direct run-off entering the sewerage but also the delayed increase in sub-surface infiltration. Thirty percent of the SA will be included in the Sustained Wet Weather Flow to give a rate of 12.3 l/s over a week of wet weather.

Sustained Wet Weather Flow = AWF + BI + 0.3SA
=12.3 l/s

The above flow rates display a high variability which is typical of smaller and older sewerage reticulations. The peaking factors for the above flow rates are:

	Flow rate (l/s)	Peaking Factor
AWF	8.0	1
SWWF	12.3	1.5
PDWF	23.1	2.9
PWWF	42.1	5.3

The minimum flow rate can be assumed to be less than the AWF of 3.1 l/s. The new system is operating effectively and we are experiencing no issues with it.

3.2.7 TREATMENT FACILITY PERFORMANCE

- Fairlie – complies with the current Resource Consent for air and effluent discharge

3.2.8 RESOURCE CONSENTS HELD

Wastewater Treatment Plant	Consent No.	Type	Expiry Date	Comments
Fairlie	CRC992647	Air Discharge	17-Dec-2038	
	CRC992608	Discharge to land 400m3 daily	17-Dec-2038	

3.2.9 RETICULATION

Summary of Fairlie Urban Foul Sewer System

Asset Type	Fairlie
Pipelines	13354 m
Foul Sewer Manholes	98
Pump stations	1

Reticulation Description

The following tables have been compiled to show the extent and makeup of the systems.

Figure 3.2 – Pipe Size Distribution

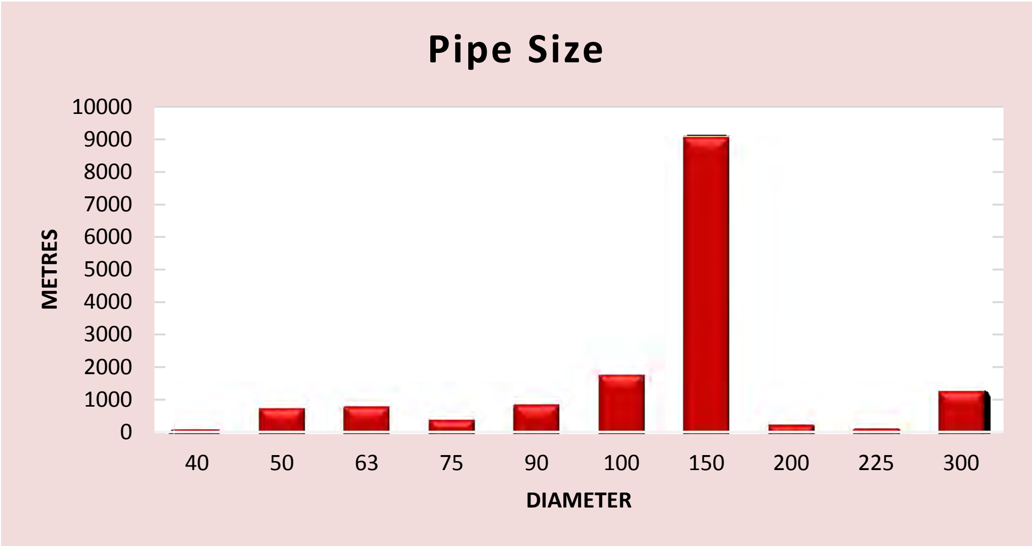


Figure 3.3 – Pipe Material Type Distribution

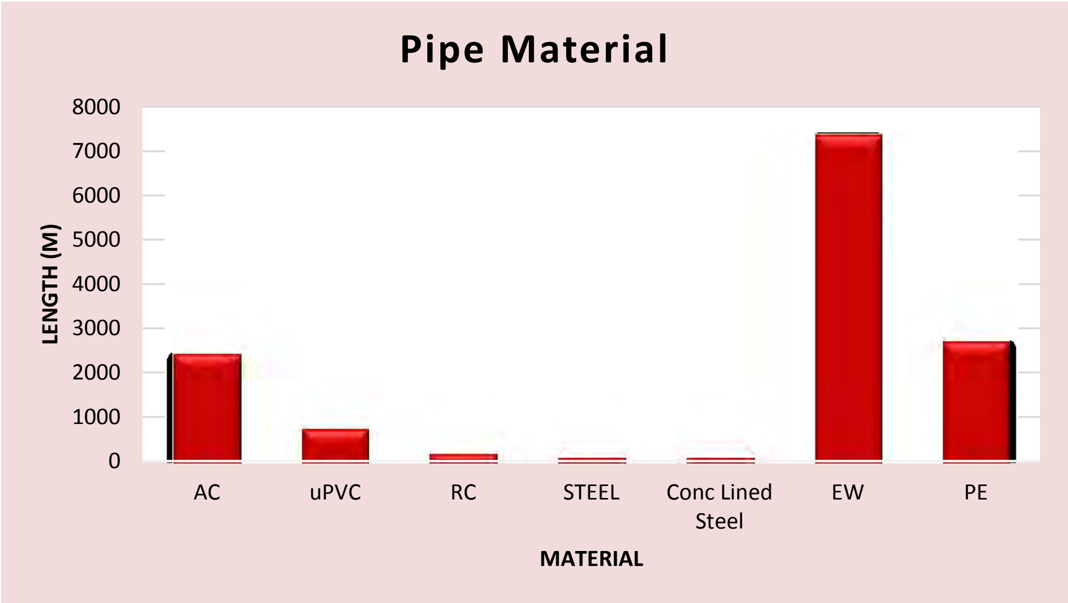


Figure 3.4 – Pipe Age Distribution

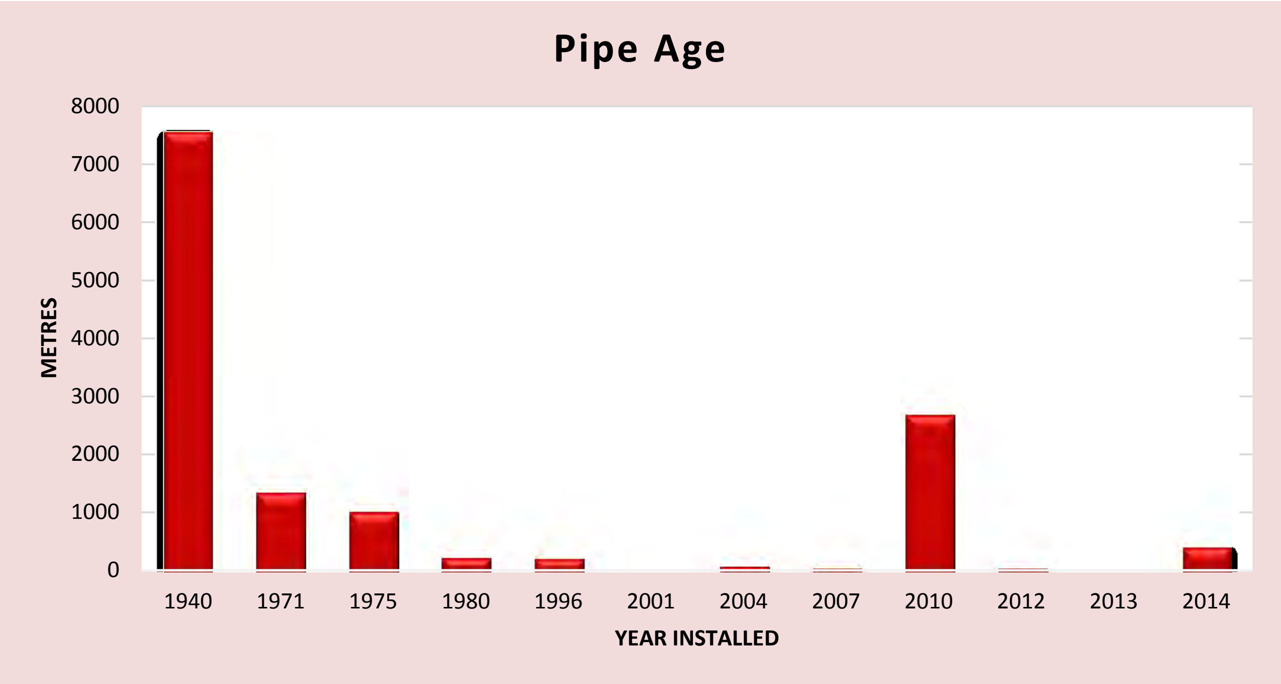
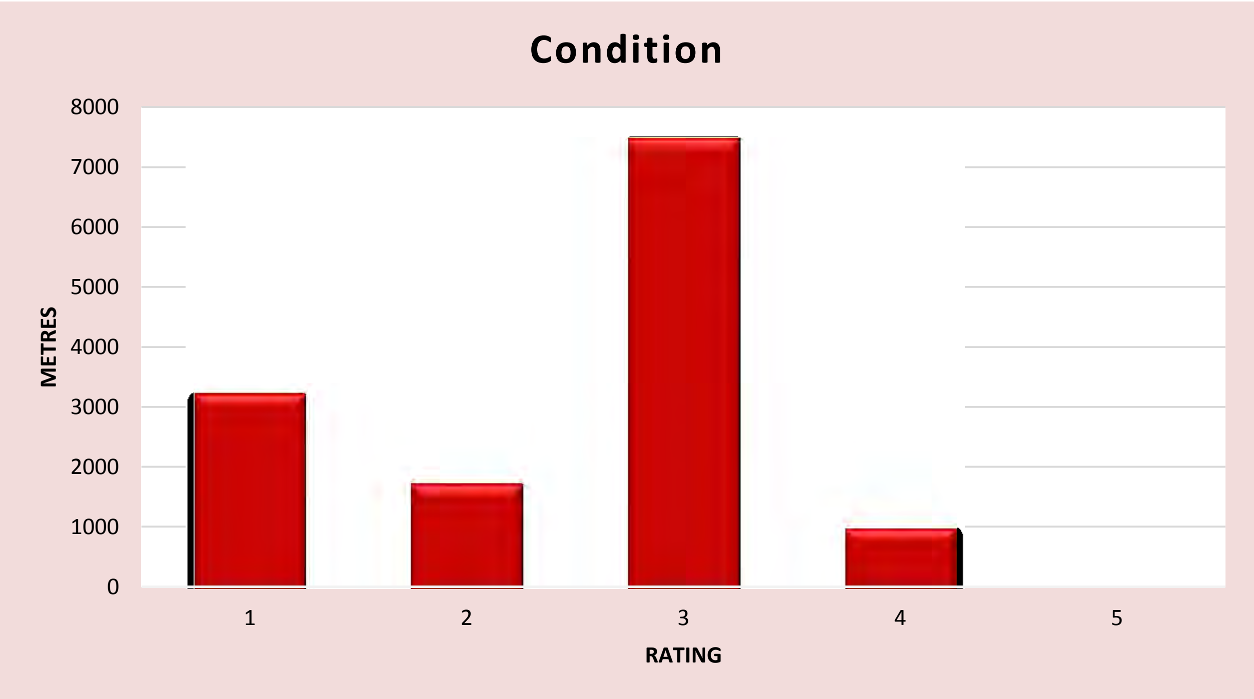


Figure 3.5 Current Condition Profile



Notes:

1 = **Very Good Condition** - Only normal maintenance required

2 = **Minor Defects Only** - Minor maintenance required (5%)

3 = **Maintenance Required to Return to Accepted Level of service** - Significant maintenance required (10-20%)

4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)

5 = **Asset Unserviceable** - Over 50% of asset requires replacement

A number of pipes are shown as three or four, these are regularly monitored including visual inspection and sampling. This gives us the information to decide on replacement timeframes. No pipelines are graded as unserviceable.

3.2.10 CAPACITY / FUTURE DEVELOPMENT REQUIREMENTS

Capacity Issues

Detailed work was completed as part of the upgrade of the treatment facility in 2002. Reports for the Fairlie Oxidation Ponds state:

Allowing a standard contribution of 75g BOD/person/day and a population of 1000 then an average loading of 75 kg/day is expected. This is a reasonable estimation because the town is largely residential with some commercial properties which are typically quite stable contributors. The 75g BOD/person/day is an upper value with a range of 60-75 being used in assessments elsewhere. The large number of school children arriving to town each day, relative to the base population supports the use of the upper value.

Significant infiltration is expected. A good approach for estimation of flows is given by the Christchurch Drainage Board Design Manual. This approach was used in the Status Report, assuming a population of 800. As a design population of 1000 has been chosen, the flows have been reworked with this increased population.

With a population of 717 (2006) at a peak holiday loading estimated at 900 then there is capacity in the treatment facility without further pre-treatment.

Over winter problems can occur with high water tables causing increased infiltration in a number of locations these are private drains but regular monitoring of the known sites and smoke detection surveys will need to be carried out to locate any large infiltration and remedy it. This used to create an issue of non-compliance with our resource consent but the conditions were varied in 2008 to allow for discharge of the increased flows. .

3.3 LAKE TEKAPO

3.3.1 INTRODUCTION

a)	Total population (2013)	
	Permanent	369
	At Holiday times	1050
b)	Number of properties in area of benefit	
	Connectable	687

3.3.2 OVERVIEW AND OVERALL ASSET CONDITION

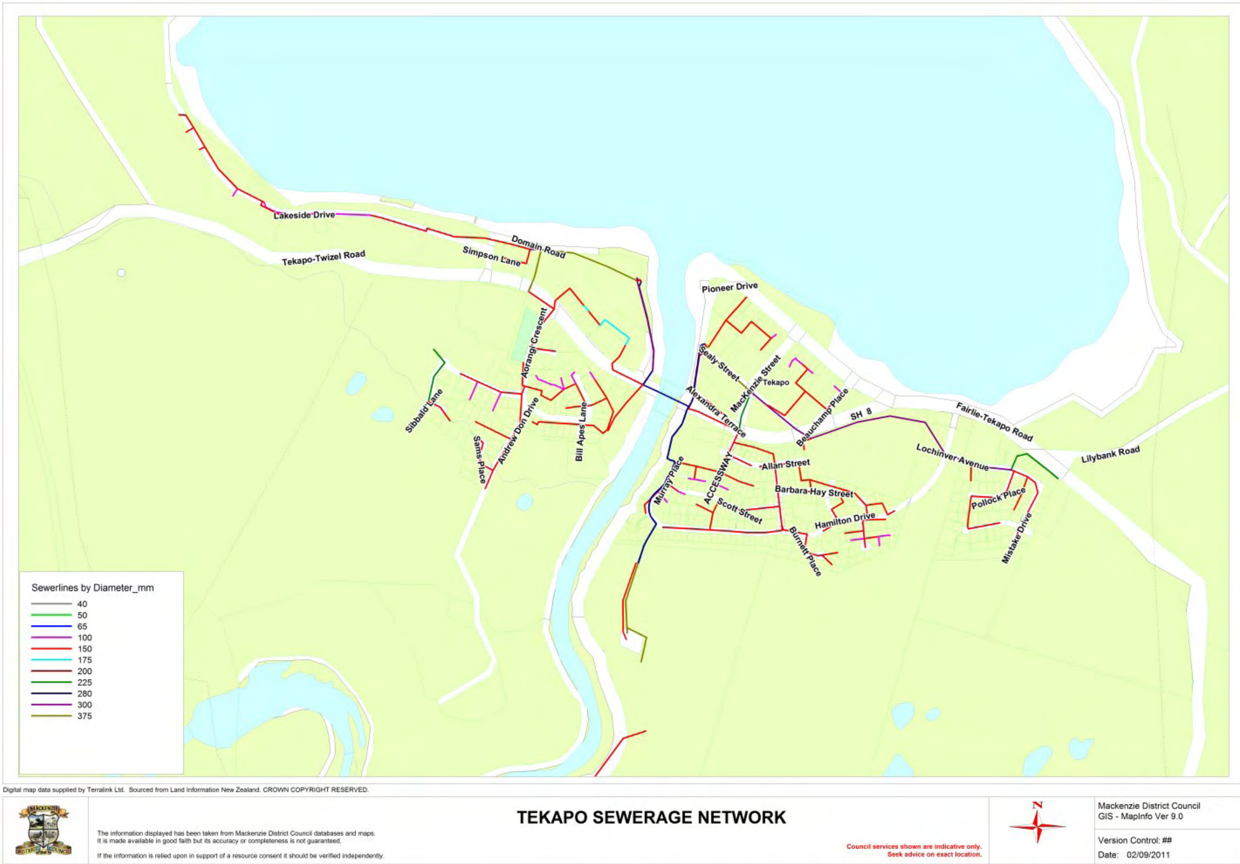
Lake Tekapo waste water system was first constructed in the 1950's when Lake Tekapo was predominantly a Ministry of Works and NZED Village. In 1972 the present oxidation pond was constructed and development of the Lake View subdivision has developed since that time. In the early 1980's the Pioneer Drive Area was connected to the waste water system. A variety of materials have been used for sewer lines.

Recently the Tekapo township has seen a growth in subdivision with significant developments on both sides of the river. This demand has slowed up in the last two years.

3.3.3 DISCHARGE LOCATIONS

Foul Sewer Oxidation pond and disposal system is located on Council land off Murray Place, with discharge by way of trickle irrigation to the south of the site.

FIGURE 3.1 – Current Foul Sewer Network



3.3.4 CONDITION AND PERFORMANCE OF ASSETS

♦ **CONDITION**

The condition profile in the graph is based on the results of surveys undertaken from 1993 to 2010. Closed circuit television was used to video the wastewater pipes, with faults recorded and grades assigned to each fault depending on the severity and type of fault.

Generally speaking, all of the systems in Tekapo are in a good state of repair and if they are maintained and renewed regularly, and at the appropriate times, they can be expected to last indefinitely, without any significantly abnormal costs having to be incurred.

3.3.5 PUMP STATIONS

There are three Foul sewerage pump stations in Tekapo. Two recently constructed (Sealy St and West Side) constructed in 2005 using modern engineering design. They are both connected to the

Fairlie office by telemetry, monitoring a range of functions. Both have eight hours over flow storage at peak flow.

The third one is beside the Camping ground and has no telemetry but is connected to our alarm system. This PS will have to be upgraded when the demand increases in the area. It also has at least eight hours overflow storage at peak flow.

Sealy Street Pump Station (installed 2005)

Duty Regime	Q max l/s	H Total m	H Static m
Initial Stage	77	31.4	24.6
Future Stage (3rd pump)	77	31.4	24.6

Pumps (two installed)	
Make	Flygt
Model	NP 3202.180 HT
Outlet Size	DN 150
Impeller diameter	344mm
Motor Out put rating	37 Kw
Motor rated current	63 A
Motor poles	4
Motor efficiency	91%
Motor Power factor	0.90
Base frequency	57Hz
Rated speed	1475 rpm

West Side Pump Station (installed 2005)

Duty Regime	Q max l/s	H Total m	H Static m
Initial Stage	77	31.4	24.6
Future Stage (3rd pump)	77	31.4	24.6

Pumps (two installed)	
Make	Flygt
Model	NP 3202.180 HT
Outlet Size	DN 150
Impeller diameter	344mm
Motor Output rating	37 kW
Motor rated current	63 A
Motor poles	4
Motor efficiency	91%
Motor Power factor	0.90
Base frequency	57Hz
Rated speed	1475 rpm

Camp Ground Pump Station (installed 1990)

Duty Regime	Q max l/s	H Total m	H Static m

Initial Stage	7	14	X

Pumps (two installed)

Make	Sarlin
Model	SV-044BH-1
Outlet Size	DN 100
Impeller diameter	X
Motor Output rating	X
Motor rated current	X
Motor poles	X
Motor efficiency	X
Motor Power factor	X
Base frequency	X
Rated speed	X

3.3.6 TREATMENT

Treatment Elements of Tekapo Waste Water Treatment Plant

WWTP Overview

Raw sewage from Tekapo Township gravitates to three pumping stations: one on the shore of Lake Tekapo to the west of the outlet, one at the camping grounds and the main one in Sealy Street on the eastern bank.

The Sealy Street and West Side Pump Stations are equipped with two large submersible pumps (with provision for a third) and they operate automatically. The Camping Ground pump station conveys the sewage over a small rise, then it gravitates for approximately 800 m back down to the West Side pump, which pumps the sewage 1000 m to the treatment plant in a 200 mm diameter PE pipeline. The Tekapo sewage reticulation system was upgraded is 2004/05 to cater for the projected demand for the next 50 years.

The plant was first commissioned in 1972 and consisted of a single oxidation pond, which was overloaded by 2000. It was upgraded in 2002 to two oxidation ponds and three maturation ponds, which discharge into two evaporation basins and now provides primary, secondary and tertiary treatment. Any overflow from the evaporation basins discharges via trickle irrigation on the forested slopes of the site.

The flow is split between two primary oxidation ponds, then recombines to flow through three maturation ponds in series. The increased area provided by the four additional ponds has increased the capacity of the treatment plant.

Tekapo	
Oxidation Ponds	Pond 0.42ha (2) Maturation Ponds (5) 0.3ha
Properties Connected	525

Fig 3.3.1 – Location of Oxidation Ponds

The original ponds were constructed in 1972and upgraded in 2002. The incoming effluent is split between the two primary ponds and then takes a long flow path through the five maturation ponds. The design in 2002 allowed for the disposal of the effluent to ground via the 4th and 5th pond. During operation it was found that there was insufficient permeability in the underlying soils and these ponds overflowed. In 2004 the outflow was modified to include a gravity trickle irrigation system, discharging to ground amongst a stand of wilding pines to the south of the site.

This area has scope for extension. The system has been working reasonably well since the extensions to the irrigation in 2010. The new arrangement allows for three different configurations of disposal to spell disposal areas or cope with increased demand.

3.3.7 FLOW AND LOADING ESTIMATIONS (ORIGINAL DESIGN)

The facultative ponds (primary oxidation ponds) were sized on surface BOD loading rate according to temperature. The photo above shows the upgraded treatment plant surface areas for the ponds at the Tekapo WWTP.

Table 3.3.6a

Pond Surface Areas

Pond Number	Area
Previous	0.42 ha
Pond 1	
Current	
Pond 1A (existing)	0.42 ha (0.59ha(1))
Pond 1B (new)	0.47 ha
Pond 2 (new)	0.30 ha
Pond 3 (new)	0.10 ha
Pond 4 (new)	0.05 ha

Pond 5 (new basins) 0.03 ha

1 Provision has been made for future extension of existing Pond 1A.

A freeboard of 0.6m has been provided for the Tekapo WWTP external bunds. Internal bunds at Tekapo have a freeboard of 0.2m. Overtopping of internal bunds at maximum storage levels will be infrequent and of minor consequence. Retention time in Pond 1A and 1B at ADF is approximately 35 days. Total retention time in all ponds is about 52 days.

Aeration improves oxygen transfer in primary ponds, allowing improved nutrient removal and micro-organism reduction (disinfection) by sunlight. Previously there was no aeration capability at the Tekapo WWTP.

Mechanical aeration has been adopted in the Tekapo primary ponds to increase the oxygen transfer during adverse weather (especially cold, still weather). Two floating, 2.2 kW brush aerators are now installed (one aerator shown in Photo 3.4 anchored to the northern bund), located so that flow circulation is encouraged away from the outlet.

The pump data showed that wastewater flows into the Tekapo ponds fluctuate seasonally. This resulted in seasonal overloading of the original pond. Aeration of the new primary ponds provides increased oxygen transfer, allowing effective treatment of the increased wastewater flow.

The pond capacity can meet the BOD demand for a population of approximately 1,000 people (without aerator assistance). If the size of pond 1A is increased from 0.42 ha to 0.59 ha (as allowed for in the layout), the ponds can meet the demand for a population of approximately 1,300 people (without aerator assistance). The present capacity of the Tekapo WWTP with the existing aerator assistance can meet a BOD demand for a population of approximately 1,800 people. Capacities are for monthly average populations because the load is buffered by the long retention time.

Should the population increase beyond 1,800, the capacity of the WWTP could be increased by installing additional brush aerators on the oxidation ponds and extending Pond 1A. A 1 kW brush aerator capacity can meet the BOD demand for 300 people (with algae oxygen supply). Allowing for two 2 kW aerators on each of Pond 1A and 1B and a total pond surface area of 1.06 ha, the pond capacity could meet a BOD demand of 2,100 people.

For any further growth above 2,100 people, the Tekapo WWTP will require the addition of a dedicated aeration basin at the inlet with all oxygen being supplied by aerators. Similar pre-treatment has been undertaken at the Oamaru and Blenheim WWTPs and can remove 40% of BOD. Therefore, these upgrades (extended Pond 1A, two 2 kW aerators and aeration basin with aerators) can increase plant capacity to about 3,500 people. If the population of Tekapo increases above 3,500, alternative means of treatment and disposal will have to be investigated and new resource consents applied for.

3.3.7 Pond Construction Details

(a) Rock Filters

In-bank rock filters have been constructed at the Tekapo WWTP, providing increased SS and nitrogen removal from the wastewater during summertime. The rock filters were designed on the basis of the horizontal velocity through the rock filter. The more conservative guideline value of 3m/hr was applied to achieve solids capture as per the Delft concept. Table 3.6 shows the rock filter sizing for various section of the WWTP.

Table 3.3.7a
Rock Filter Sizing

	Tekapo
Pond 1 – 2	None
Pond 2 – 3	3.00m
Pond 3 – 4	>10m (full bank width)

(b) Flow Splitting

The primary ponds at the Tekapo WWTP operate in parallel. Flow to these ponds is split, using manual valves located at the original manhole immediately prior to the original primary pond. These valves are manually trimmed until a suitable flow split is achieved.

The flow splitting structure divides the flow between the two primary ponds (Ponds 1A and 1B), as the ponds operate at two different levels, Pond 1A at 64.75m and Pond 1B at 63.50m.

The flow splitter is located at the original manhole located at the northwest corner of the original pond (RL65.50), which is manually adjusted to split the flow as follows:
– 49% to Primary Pond 1A
– 51% to Primary Pond 1B.

Adjustable weirs in the outlet manholes control flow out of both primary ponds.

(c) Inlet Scum Baffle

Previous to the WWTP upgrade, significant scum formations had been observed on the pond. Scum baffles have been constructed around the inlet structures to trap scum and floatable material discharging into the ponds, minimising the scum formation across the pond surface.

As the scum is trapped within the baffle structure, it builds up within the baffled area. If left for an extended period, this scum could become putrid, creating an odour nuisance. It is therefore necessary to manually remove any scum that has been trapped within the baffle structure at least weekly and possibly more often during periods of high flows or warm weather.

(d) Pond Liner

A pond liner minimises seepage from the new treatment ponds. This liner uses a silt-clay material, which was sourced from the bed of Lake Tekapo when levels were low. The liner has been placed 0.2m thick on the pond base and 0.3m thick on the external pond bunds.

Lining internal bunds was not considered necessary. In addition to the clay liner, a geotextile liner has been used beneath the clay liner on the pond base and the external pond bunds to reduce the chance of the fines being lost by seepage erosion.

(e) Embankment Structure

The pond banks were constructed using gravel/silt material available from the site. The gravel/silt material on site was suitable to construct the banks after screening to separate larger gravel (65-150mm) for use as rip rap and in the rock filters. Some parts of this site were used as rubbish pits and these areas were excavated to remove any rubbish material and backfilled with suitable fill material.

Rock rip rap protection against wave action has been adopted rather than the construction of a concrete wave band. Rip rap has lower construction cost and greater surface area available for biofilm growth, which aids the treatment processes. If minor settlement of the banks occurs the rock rip rap will be more forgiving and easily repairable if required.

3.3.8 Effluent Disposal

The Tekapo WWTP uses soakage to land for the final disposal of treated effluent. The disposal system is comprised of a two-cell evaporation basin system, located behind the Refuse Transfer Station (refer Fig 3.3.1). A single soakage basin was previously used for the disposal of the treated effluent and this formed the basis of the design of the upgraded system.

The original soakage basin overflowed from time to time, during extreme wet weather, and when the base became blinded by solids. The two new basins operate in parallel, with provision made to operate each individually (manual valves), so that the basins can be emptied and the accumulated solids dewatered, prior to disposal.

In periods of low evaporation and/or rainfall, the basins overflow to a slow rate irrigation land disposal system. The irrigation system is sited on the forested slopes south of the ponds and contours approximately 100 m across the slope. Discharge rates are dependent on water levels in the evaporation basins. Recently this system has not been as efficient, particularly in cold weather with concerns expressed by Ecan regarding the ponding. Investigations are underway to identify an alternative disposal system that will cope with the cold winter extremes and avoid the ponding issues we have had in the past.

Increased vegetation is noticeable near the discharge points along the irrigation line. Flow monitoring of the irrigation system has been undertaken since 22 December 2003. The results of this monitoring have shown a range of flow rates from 0 to 200 m3/d.

During the peak season (summer holidays) the irrigation averaged approximately 150 m3/day (2.0 L/s). During the rest of the year the flows fluctuate (depending on evaporation rates and sewage flows) around 45 m3/d (0.5 L/s).

A comparison of pump station flow rates and irrigation data for the monitoring period (December to April) show that a considerable percentage of flow is being evaporated prior discharge in the irrigation system.

3.3.8 TREATMENT FACILITY PERFORMANCE

Lake Tekapo - complies with Resource Consents for effluent discharge.

3.3.9 RESOURCE CONSENTS HELD

Wastewater Treatment Plant	Consent No.	Type	Expiry Date	Comments
Lake Tekapo	CRC042914	Discharge to land 1100m3 daily	18-Mar-2040	

3.3.10 RETICULATION

Summary of Tekapo Urban Foul Sewer System

Asset Type	Tekapo
Pipelines	15514 m
Foul Sewer Manholes	241
Pump stations	3

Reticulation Description

The following tables have been compiled to show the extent and make up of the systems.

Figure 3.3.2 – Pipe Size Distribution

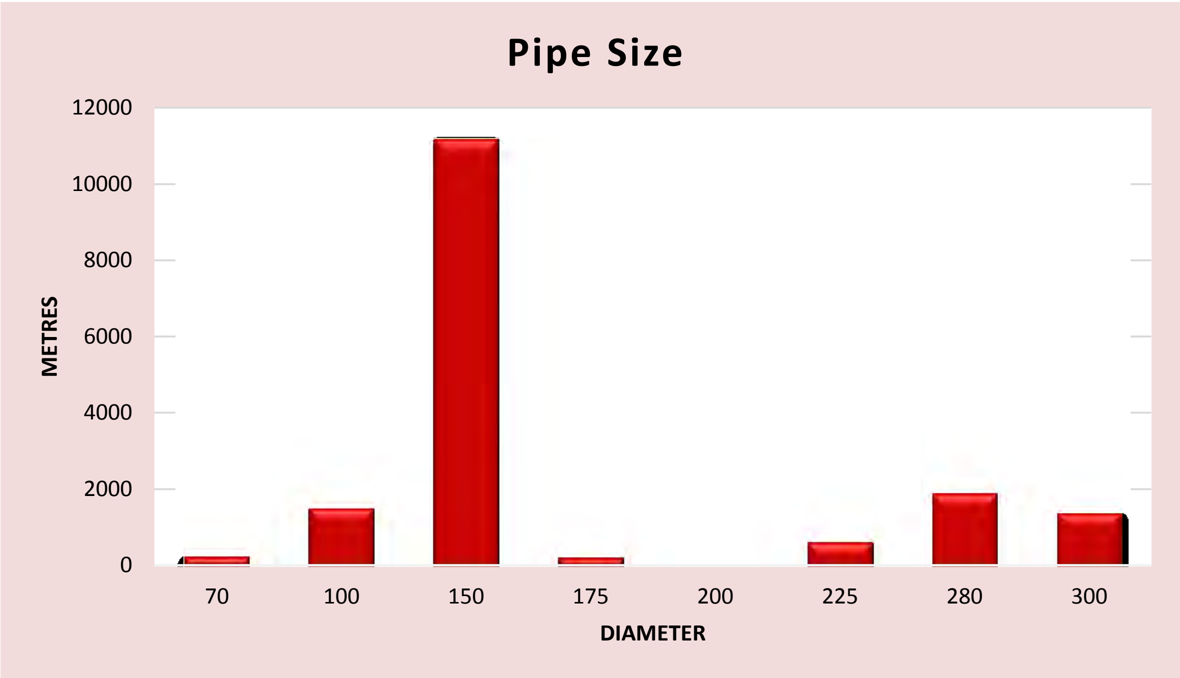


Figure 3.3.3 – Pipe Material Type Distribution

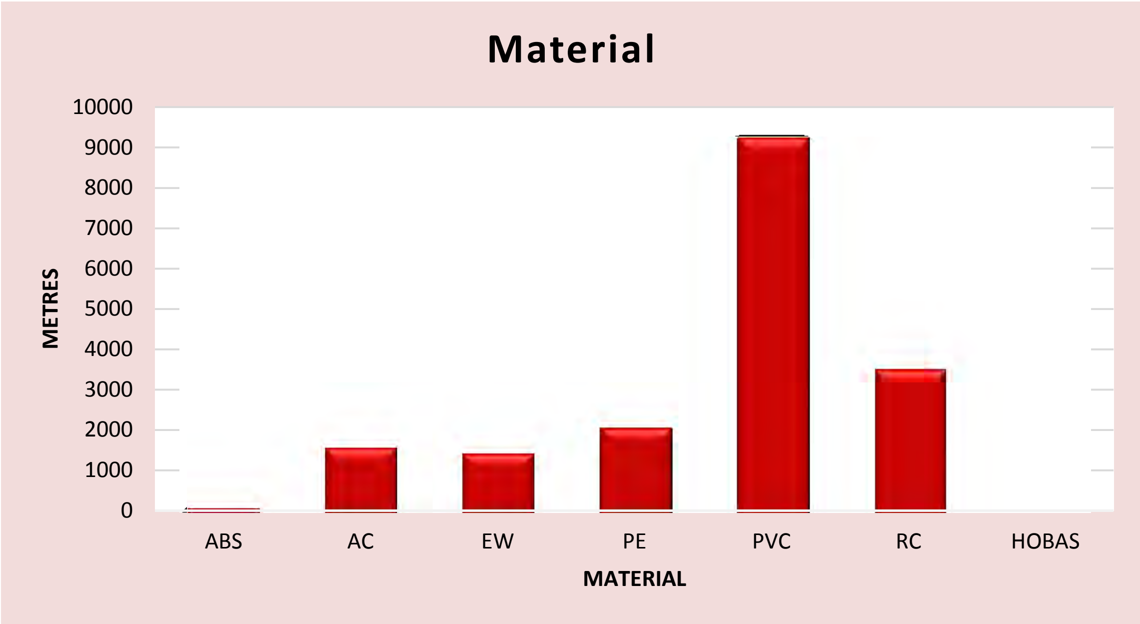


Figure 3.3.4 – Pipe Age Distribution

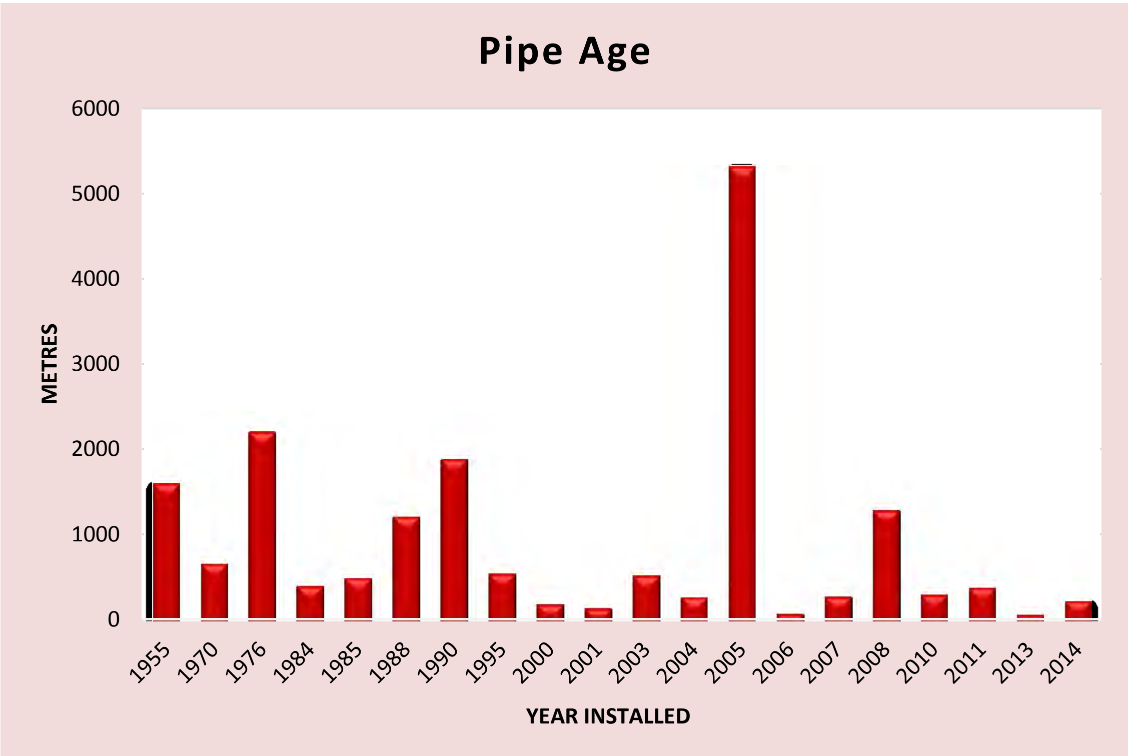
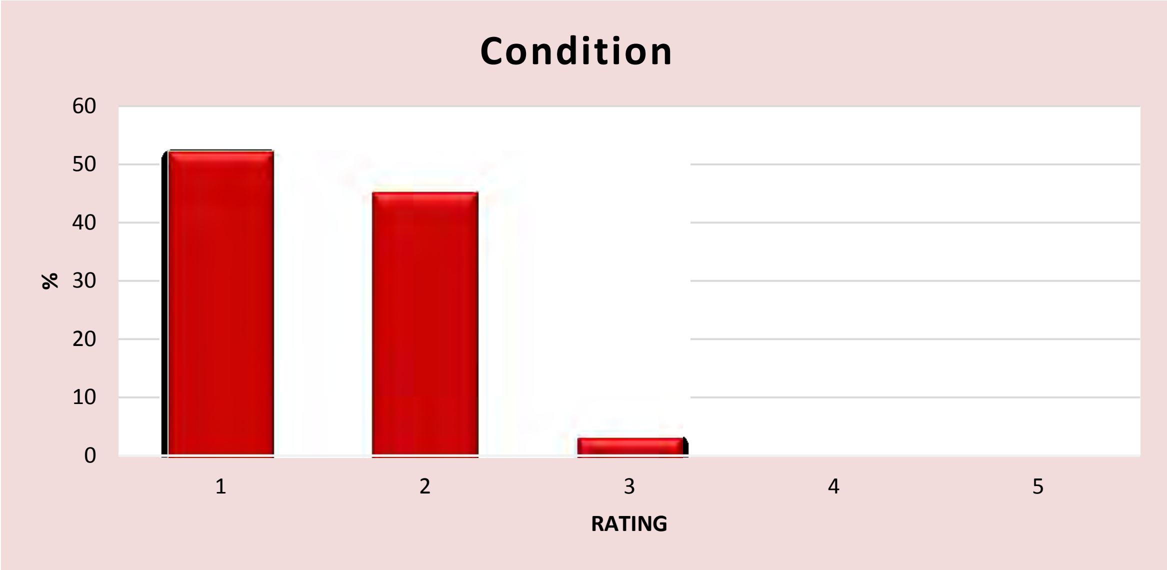


Figure 3.3.5 Current Condition Profile



Notes:
1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Significant maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

There are no pipelines that are graded as requiring renewal and only a small section, graded three, that requires monitoring as to the amount of deterioration.

3.3.11 CAPACITY / FUTURE DEVELOPMENT REQUIREMENTS

Capacity Issues

Detailed capacity calculations were completed as part of a significant upgrade of the treatment facilities in 2002.

The pond capacity can meet the BOD demand for a population of approximately 1,000 people (without aerator assistance). If the size of pond 1A is increased from 0.42 ha to 0.59 ha (as allowed for in the layout), the ponds can meet the demand for a population of approximately 1,300 people (without aerator assistance). The present capacity of the Tekapo WWTP with the existing aerator assistance can meet a BOD demand for a population of approximately 1,800 people. Capacities are for monthly average populations because the load is buffered by the long retention time.

Should the population increase beyond 1,800, the capacity of the WWTP could be increased by installing additional brush aerators on the oxidation ponds and extending Pond 1A. A 1 kW brush aerator capacity can meet the BOD demand for 300 people (with algae oxygen supply). Allowing for two 2 kW aerators on each of Pond 1A and 1B and a total pond surface area of 1.06 ha, the pond capacity could meet a BOD demand of 2,100 people.

The upgraded pump stations and network, constructed in 2004 were sized to for an average size section of 400m2 that would see the network able to provide the current level of service beyond 2025.

There is a reasonable increase in flow to the oxidation ponds during wet weather. The Community Board have approved a programme of smoke detection to identify any illegal connections to the sewer network, as this is the most likely source. Once located the property owner will be required to resolve the situation.

3.4 TWIZEL

3.4.1 INTRODUCTION

a)	Total population (2013)	
	Permanent	1,137
	At Holiday times	3500
b)	Number of properties in area of benefit	
	Connectable	1769

3.4.2 OVERVIEW AND OVERALL ASSET CONDITION

Twizel was a purpose built town constructed in the late 1960's and early 1970's. The design parameters for the oxidation ponds were for a population in excess of 5,000 persons. The whole of the original system is gravity flow and asbestos cement pipe has been used extensively for the sewers. In 2006 a pump station was built to service the Mackenzie Park subdivision. This pump station discharges to the sewer in Ostler Road.

3.4.3 DISCHARGE LOCATIONS

The effluent from Twizel flows under gravity across State Highway 8 eastward onto land owned by the Council and discharges into oxidation ponds. After passing the oxidation ponds the effluent discharge to ground via a 1700 m long disposal trench.

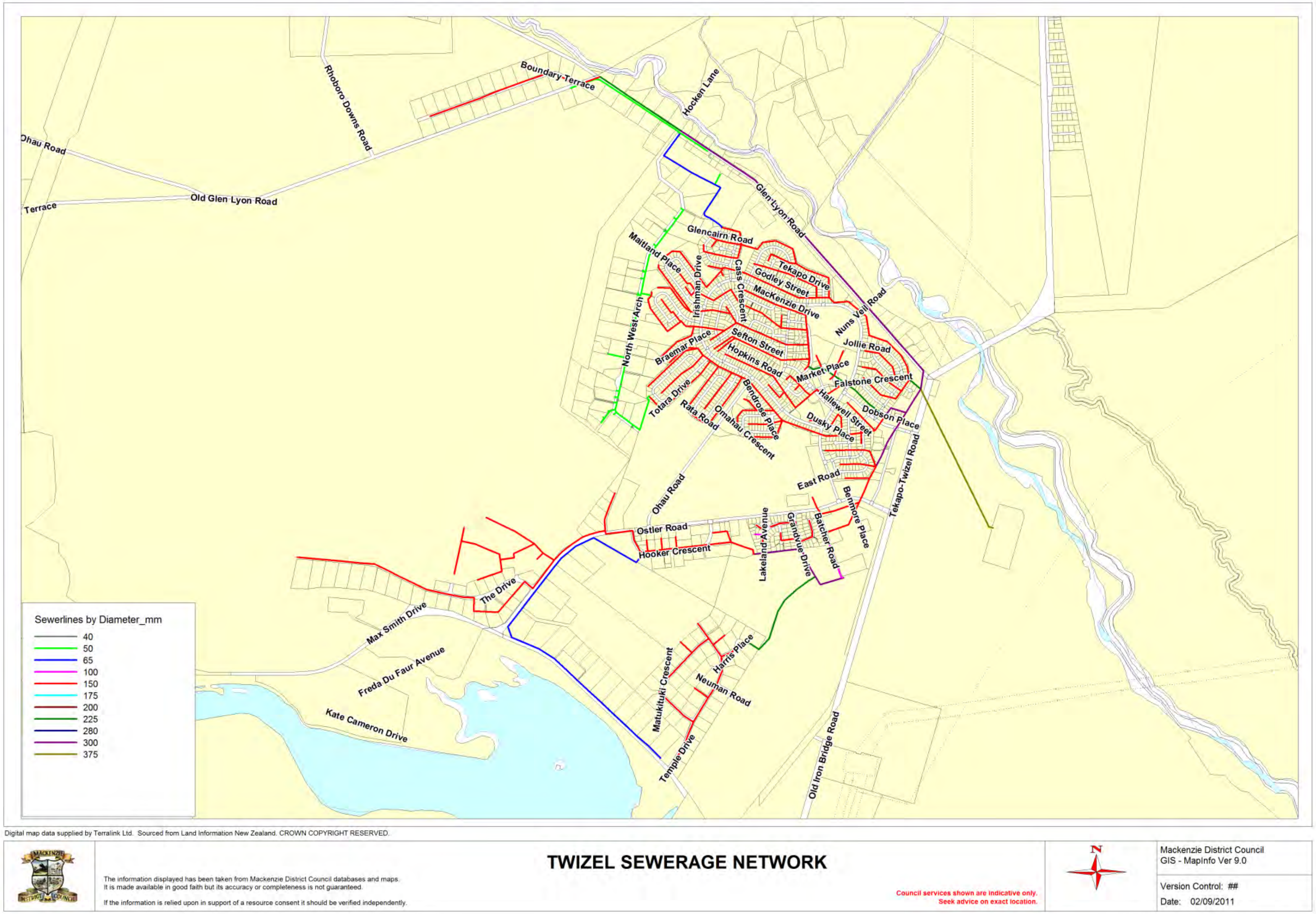
The original trench was 2600m long but as part of the renewal of the resource consent a condition was imposed to terminate the disposal system at an agreed point above the escarpment. This has not caused Council any operational issues.

Council has progressed the plan to acquire land adjacent to the oxidation ponds and construct rapid infiltration basins and consolidate the disposal on that site. The basins will be fenced for site security and the trench abandoned.

The soakage basins will be a series of below ground perforated distribution laterals that will discharge the effluent below the frost line to ensure they continue to operate even in winter extremes.

FIGURE 3.4.1 – Current Foul Sewer Network

DESCRIPTION OF FOUL SEWER ASSET



3.4.4 CONDITION AND PERFORMANCE OF ASSETS

♦ **CONDITION**

The condition profile in the graph is based on the results of surveys undertaken from 1993 to 2010. Closed circuit television was used to video the wastewater pipes, with faults recorded and grades assigned to each fault depending on the severity and type of fault.

Generally speaking, all of the systems in Twizel are in a good state of repair and if they are maintained and renewed regularly, and at the appropriate times, they can be expected to last indefinitely, without any significantly abnormal costs having to be incurred.

The Twizel sewer network was constructed in the 1970s using the Asbestos Cement (AC) pipe. A Pipe is composed of approximately 10-15% asbestos fibres in a matrix of ordinary Portland cement and finely ground silica. The process of making pipes was refined between 1906 and 1913 In Italy. In service these pipes have shown to deteriorate both from the inside, due to normal service, and the outside due to aggressive soil and ground water conditions.

In Twizel there are no aggressive soils or groundwater surrounding the AC pipes so the deterioration is only from the inside. Nationally studies have shown that the deterioration model is very irregular throughout the networks where AC pipe is used so it is necessary to have a programme of sampling to get a better understanding when these pipes will have to be replaced and by default adjust the depreciation charged accordingly.

There is 21354m of AC pipe in the Twizel sewer network and the current replacement cost (2010) of $4.2m. Due to known performance of the AC pipe the base life of the pipe has been set at 80 years leaving a remaining life of 40 years.

3.4.5 PUMP STATIONS

There are two pump stations in Twizel. One collects the effluent from the Mackenzie Park subdivisions and sections to the west of it and pumps it via a rising main into the gravity system in Ostler Rd and the second one pumps effluent from the Pukaki Airport into Twizel.

Mackenzie Park Pump Station (installed 2006)

Duty Regime	Q max l/s	H Total m	H Static m
Initial Stage	11.5	7.5	

Pumps (two installed)	
Make	Flygt
Model	NP3127.180MT
Outlet Size	DN 100
Impeller diameter	X
Motor Output rating	X
Motor rated current	X
Motor poles	X
Motor efficiency	X
Motor Power factor	X
Base frequency	X

Rated speed	X
Pump Controller	Flygt FMC200

Pukaki Airport Pump Station (installed 2009)

Duty Regime	Q max l/s	H Total m	H Static m
Initial Stage	2.1	28.1	

Pumps (two installed)	
Make	Flygt
Model	NP3068.170-210MT
Outlet Size	DN 75
Impeller diameter	X
Motor Output rating	X
Motor rated current	X
Motor poles	X
Motor efficiency	X
Motor Power factor	X
Base frequency	X
Rated speed	X
Pump Controller	Flygt FMC300

3.4.6 TREATMENT

Twizel	
Oxidation Ponds	Pond 1 2.5ha Pond 2 1.73ha

The two oxidation ponds were constructed in the 1970's with a discharge to the Twizel River. This discharge has been discontinued and now discharges to ground via 1.7km long soakage trench. Depending on demand the treated effluent does not always reach the end of the trench.

Disposal Trench (viewed from the south)

Disposal Trench (viewed from the north)

The original initial inlet that discharges into the centre of pond 1 has been reinstated and this has avoided having to relocate that inlet to the south west corner of pond 1 which will give the maximum flow path through the pond. A bund has been constructed (2010) in Pond 2, two thirds of the way across the pond to ensure the maximum retention time of the effluent within the ponds.

3.4.7 FLOW AND LOADING ESTIMATIONS (ORIGINAL DESIGN)

The Twizel WWTP was commissioned in 1969 and treats domestic sewage, as well as small quantities of trade wastes from Twizel Township. The WWTP provides primary treatment of the influent in oxidation ponds before discharging effluent into a 2km long soakage/evaporation trench that runs south from the plant.

The Twizel ponds were originally designed in 1969 for a population of 5,000 assuming an average daily flow (ADF) of 1,818 m3/day and a peak flow of 5,455 m3/day. An ADF of 650 m3/d was predicted by CH2MBeca in the "Application for Resource Consent and Assessment of Environmental Effects for the Twizel WWTP "(June 2004).

3.4.8 TREATMENT FACILITY PERFORMANCE

Twizel complies with the current Resource Consent for air and effluent discharge

3.4.9 RESOURCE CONSENTS HELD

Wastewater Treatment Plant	Consent No.	Type	Expiry Date	Comments
Twizel	CRC0442915	Discharge contaminants	08-Jul-2020	

		onto land		

3.4.10 RETICULATION

Summary of Twizel Urban Foul Sewer System

Asset Type	Twizel
Pipelines	43452 m
Foul Sewer Manholes	437
Pump stations	2

Reticulation Description

The following tables have been compiled to show the extent and makeup of the systems.

Figure 3.2 – Pipe Size Distribution

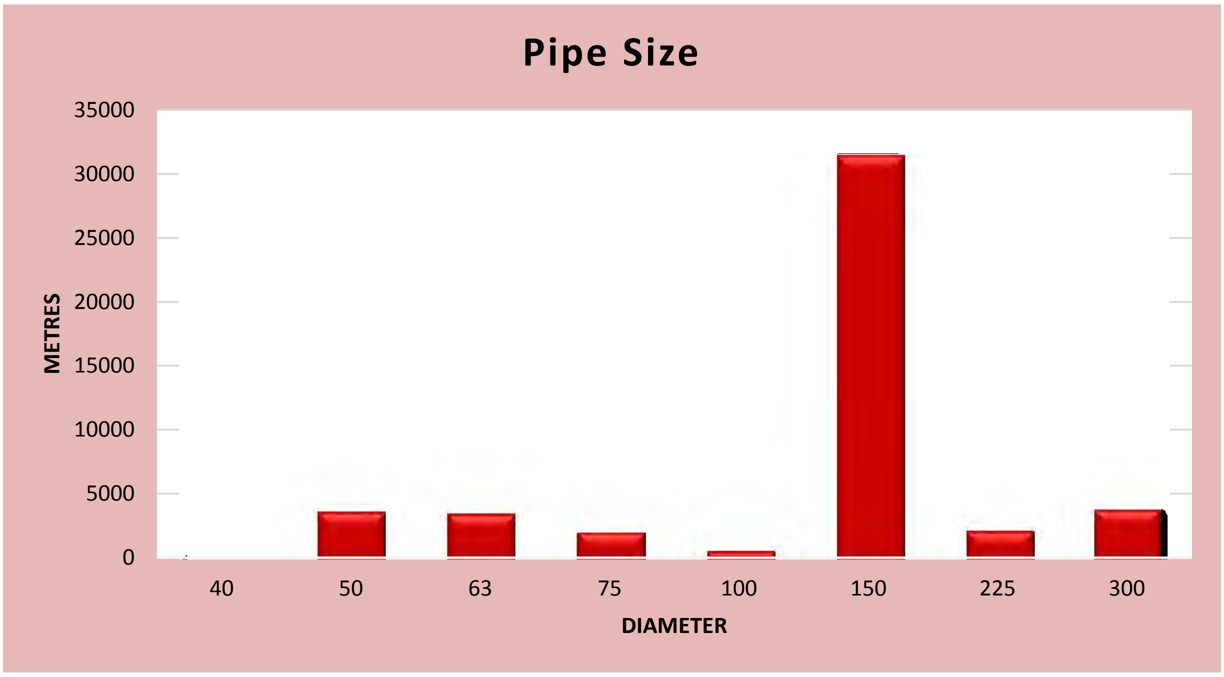


Figure 3.3 – Pipe Material Type Distribution

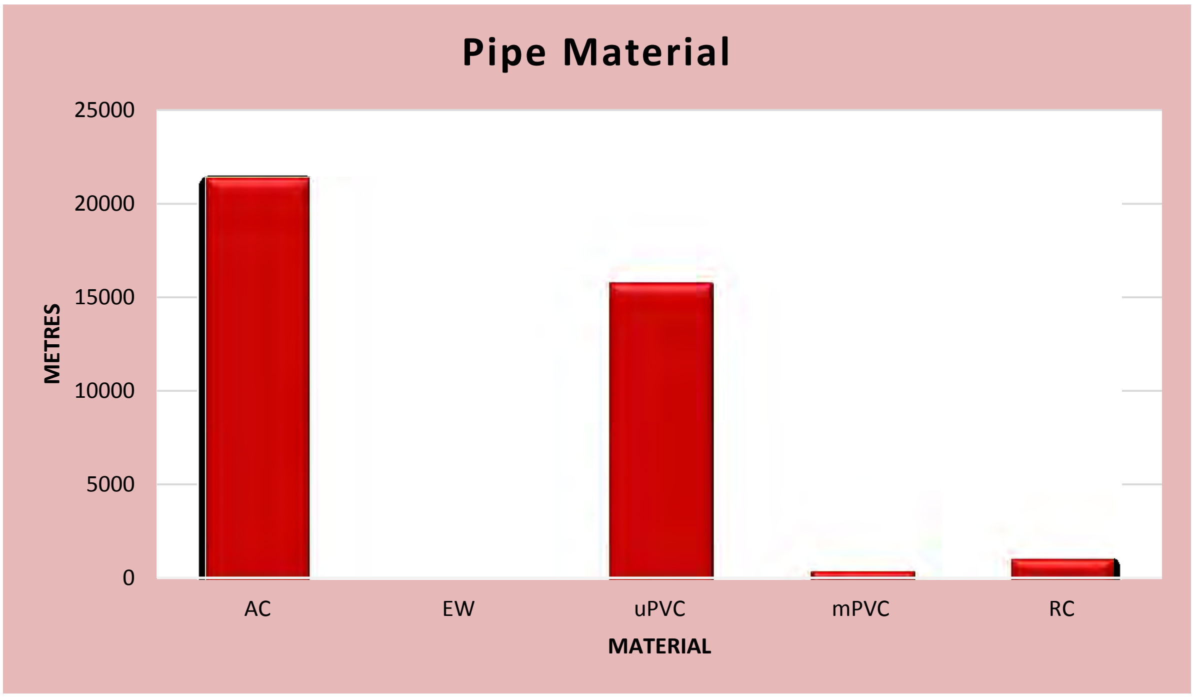


Figure 3.4 – Pipe Age Distribution

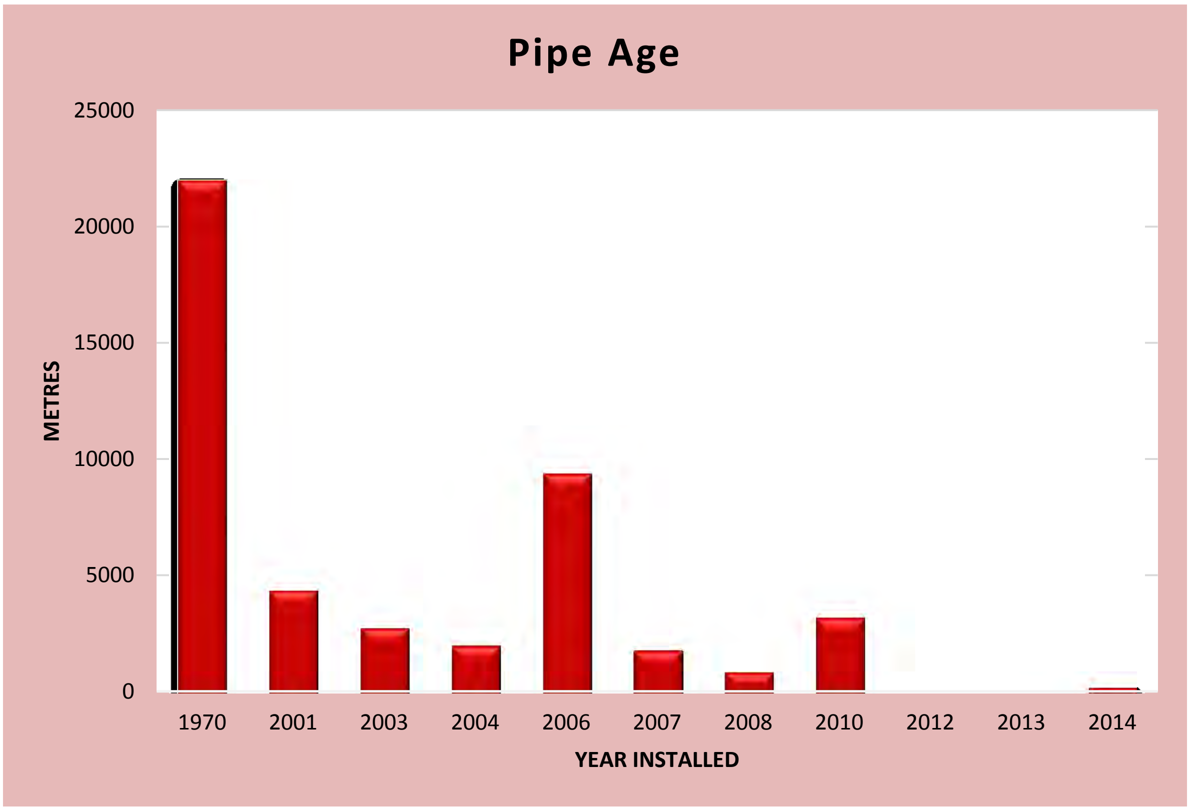
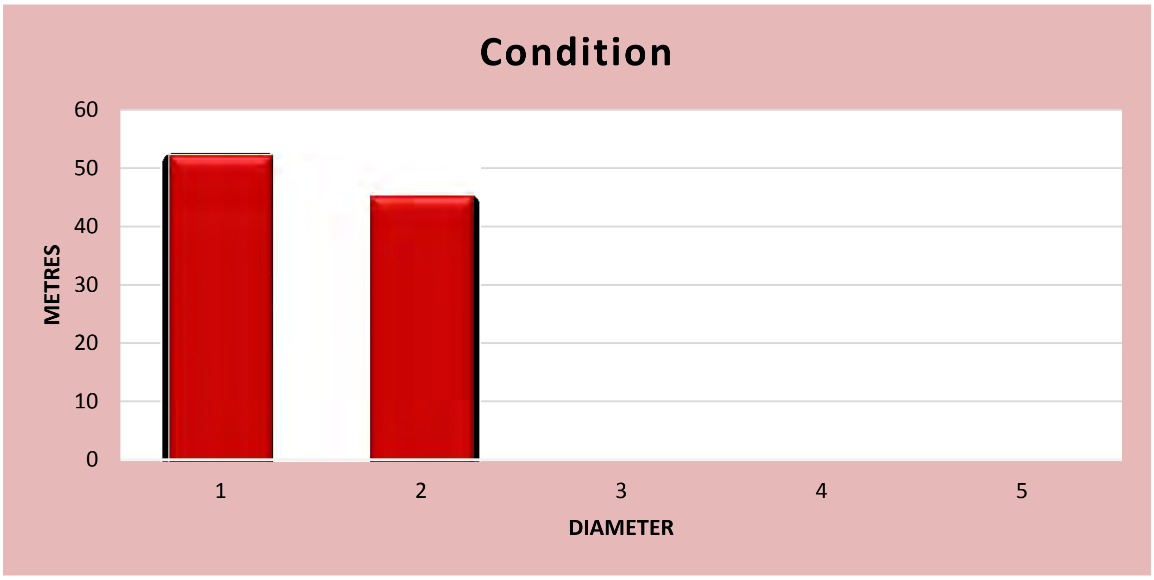


Figure 3.5 Current Condition Profile



There are no pipelines that are graded as requiring renewal.

3.4.11 CAPACITY / FUTURE DEVELOPMENT REQUIREMENTS

The Twizel ponds were originally designed in 1969 for a population of 5,000 assuming an average daily flow (ADF) of 1,818 m3/day and a peak flow of 5,455 m3/day. An ADF of 650 m3/d was predicted by CH2MBeca (June 2004) to be reached by 2025 with a population o 1860. This shows that there are no capacity issues with the oxidation ponds.

Council plans to acquire land adjacent to the oxidation ponds and construct rapid infiltration basins and consolidate the disposal in them. The basins will be fenced for site security and the existing disposal trench abandoned. This will retire the existing trench and consolidate the disposal on the 5.6ha site. The driver for this change is that in 2010, Council was granted a resource consent for the discharge to ground of the effluent that expires on the 8th July 2020. It is unlikely that Council will be able to renew this consent for the current disposal system.

Twizel continues to show steady growth in holiday homes and in order to understand the total demand Council will model the network so that it will be better able to predict when pipes need to be upsized or aeration installed at the oxidation ponds to improve treatment and when a new rising main will have to be constructed directly to the oxidation ponds from the pump station in Mackenzie Park. This work is programmed for 2018/19, but will only be constructed if demand puts pressure on the current systems to the point they cannot cope.

3.5 BURKES PASS

3.5.1 INTRODUCTION

a)	Total population (2006)	
	Permanent	30 approx
	At Holiday times	60 approx
b)	Number of properties in area of benefit	
	Connectable	18

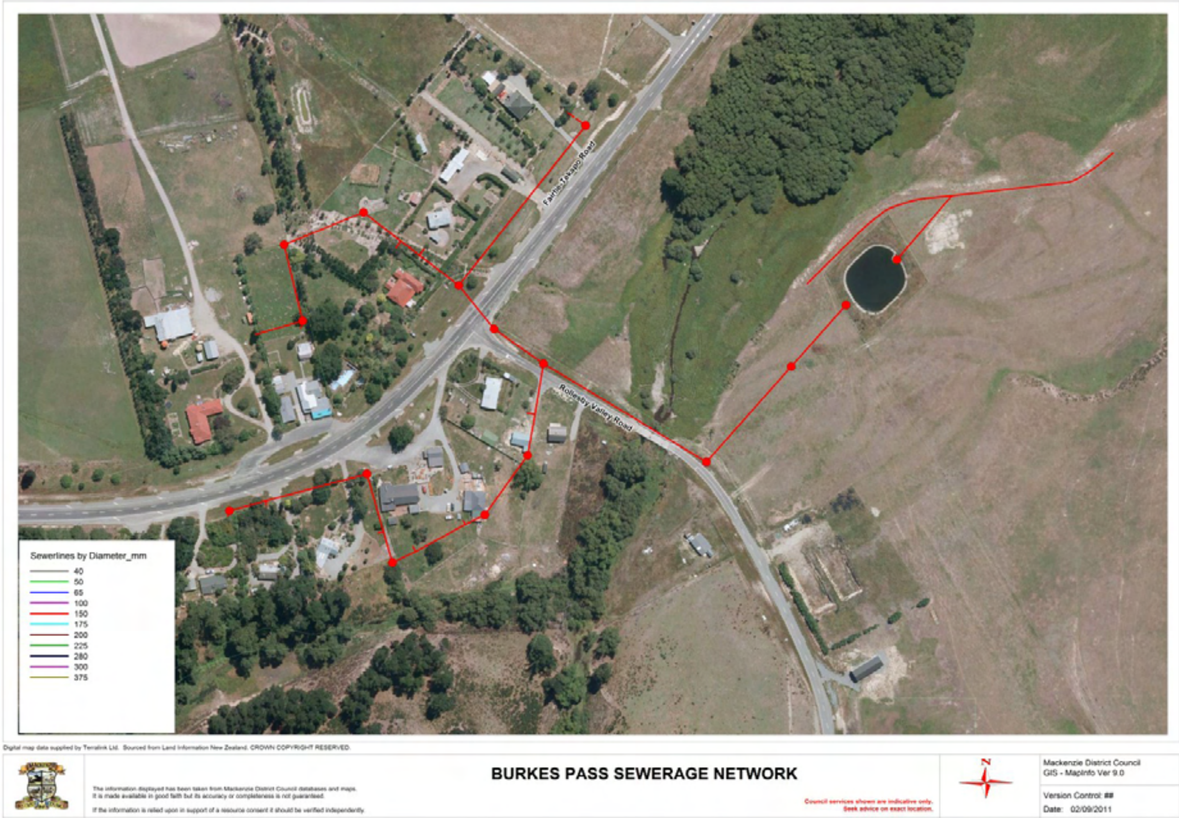
3.5.2 OVERVIEW AND OVERALL ASSET CONDITION

The Burkes Pass waste water system was built in 1990 to serve the existing town which is largely unchanged today.

3.5.3 DISCHARGE LOCATIONS

The effluent from Burkes Pass flows under gravity across State Highway 8 eastward onto land owned by the Council and discharges into oxidation ponds. After passing the oxidation ponds the effluent discharges to ground via two irrigation pipelines that are spelled individually on a six month cycle.

Figure 3.11 - Burkes Pass Foul Sewer Network



3.5.4 CONDITION AND PERFORMANCE OF ASSETS

- **Condition**

The condition profile in the graph is based on an assessment of the pipe network. With the pipe being uPVC and laid to the appropriate engineering standards fifteen years ago there is no reason to expect the pipe to be less than perfect.

However within ten years there should be a video inspection to confirm that there are no issues. This date will be bought forward if we start experiencing problems with the pipe system.

Currently the network performs as designed with no maintenance issues at all.

3.5.5 RESOURCE CONSENTS

Scheme	Consent Number	Expires
Burkes Pass Discharge	CRC0992607	07 Jun 2040

3.5.6 PUMP STATIONS

There are no sewerage pump stations in Burkes Pass.

3.5.7 TREATMENT

Burkes Pass	
Oxidation Ponds	One oxidation pond, of

	area 0.11ha
Properties Connected	18

3.5.8 FLOW AND LOADING ESTIMATIONS (ORIGINAL DESIGN)

LOADINGS

For oxidation ponds without mechanical aeration, the former MWD guideline value of 84 kg/BOD/ha/day is considered appropriate. This equates to 1,200 persons/ha for a mainly domestic catchment, which is the case for Burkes Pass.

1,200/ha x 0.11 =132 persons

Therefore the Burkes Pass pond appears to be adequate for servicing the estimated current population of 45 persons, including any short term peak loadings.

FLOWS

Estimated flow volume (domestic)	=	8,250 l/day
Estimated flow volume (commercial)	=	600 l/day
TOTAL FLOW	=	8,850 L/DAY

3.5.9 TREATMENT FACILITY PERFORMANCE

Burkes Pass – complies with the current Resource Consent for air and effluent discharge

DESCRIPTION OF FOUL SEWER ASSET

3.5.10 RESOURCE CONSENTS HELD

Wastewater Treatment Plant	Consent No.	Type	Expiry Date	Comments
Burkes Pass Discharge	CRC0992607	Discharge contaminants onto land	07 Jun 2040	

3.5.11 RETICULATION

Summary of Burkes Pass Urban Foul Sewer System

Asset Type	Burkes Pass
Pipelines	1137 m
Foul Sewer Manholes	16
Pump stations	0

Reticulation Description

The following tables have been compiled to show the extent and make up of the systems.

Figure 3.2 – Pipe Size Distribution

Figure 3.2 – Pipe Size Distribution

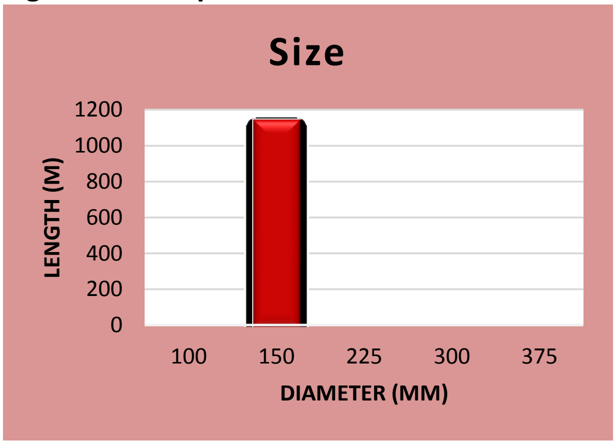


Figure 3.3 – Pipe Material Type Distribution

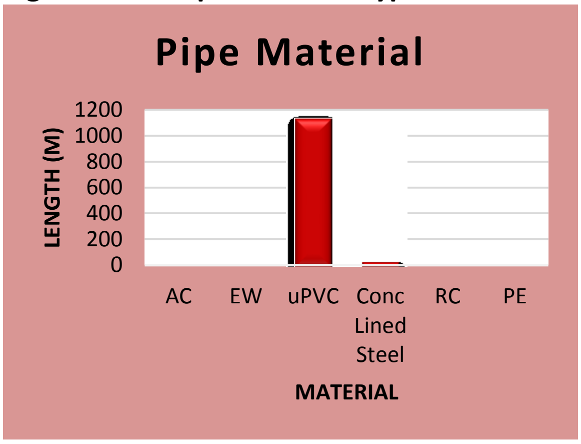
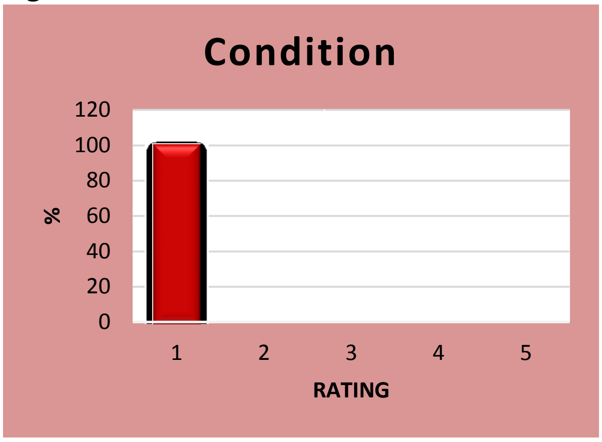


Figure 3.4 – Pipe Age Distribution

Figure 3.5 Current Condition Profile



Notes:

1 = **Very Good Condition** - Only normal maintenance required
2 = **Minor Defects Only** - Minor maintenance required (5%)
3 = **Maintenance Required to Return to Accepted Level of service** - Significant maintenance required (10-20%)
4 = **Requires Renewal** - Significant renewal/upgrade required (20-40%)
5 = **Asset Unserviceable** - Over 50% of asset requires replacement

All pipework is graded as being in very good condition and only requiring normal maintenance.

3.5.12 CAPACITY / FUTURE DEVELOPMENT REQUIREMENTS

Capacity Issues

Given the current population, no upgrading of the primary pond is necessary at this time. The pond is located on flat farmland, with strong prevailing winds (especially from the north-west in the summer time) so adequate wind mixing within the pond is expected.

As no data is available for the pond influent quality, an allowance of 70g BOD/person/day is assumed (former MWD guideline) for both the domestic and commercial wastewaters from Burke's pass. The total assumed BOD loading is, therefore, 3.2 kg/day for Burke's Pass.

The former MWD guideline of 84kg BOD/ha/day, when applied in this case, results in an allowable BOD loading of 9.24kg BOD/day for the single oxidation pond. The existing BOD loading on the pond is therefore well within the allowable BOD loading.

3.6 ENVIRONMENTAL EFFECTS

There are no negative environmental effects from any of the networks.

3.7 FUTURE IMPROVEMENTS

FAIRLIE

The oxidation pond was surveyed for sludge build up in September 2013. The average sludge depth was 0.50m and with a pond depth of 1.73m there is enough water depth to control odour. A liquid depth of 1m over the sludge is enough to control odour release.

The sludge depth will be checked periodically for accumulation, but this would only need removing if the sludge depth was to increase by another 300mm.

As the current population is within the design loading (and unlikely to increase substantially), the existing pond system appears to be more than adequate for continuation of wastewater treatment at Fairlie.

TEKAPO

The pond capacity can meet the BOD demand for a population of approximately 1,000 people (without aerator assistance). If the size of pond 1A is increased from 0.42 ha to 0.59 ha (as allowed for in the layout), the ponds can meet the demand for a population of approximately 1,300 people (without aerator assistance). The present capacity of the Tekapo WWTP with the existing aerator assistance can meet a BOD demand for a population of approximately 1,800 people. Capacities are for monthly average populations because the load is buffered by the long retention time.

Should the population increase beyond 1,800, the capacity of the WWTP could be increased by installing additional brush aerators on the oxidation ponds and extending Pond 1A. A 1 kW brush aerator capacity can meet the BOD demand for 300 people (with algae oxygen supply). Allowing for two 2 kW aerators on each of Pond 1A and 1B and a total pond surface area of 1.06 ha, the pond capacity could meet a BOD demand of 2,100 people.

For any further growth above 2,100 people, the Tekapo WWTP will require the addition of a dedicated aeration basin at the inlet with all oxygen being supplied by aerators. Similar pre-treatment has been undertaken at the Oamaru and Blenheim WWTPs and can remove 40% of BOD. Therefore, these upgrades (extended Pond 1A, two 2 kW aerators and aeration basin with aerators) can increase plant capacity to about 3,500 people. If the population of Tekapo increases above 3,500, alternative means of treatment and disposal will have to be investigated and new resource consents applied for.

The oxidation pond was surveyed for sludge build up in September 2013. The average sludge depth was 0.57m and with a pond depth of 1.67m there is enough water depth to control odour. A liquid depth of 1m over the sludge is enough to control odour release.

The sludge depth will be checked periodically for accumulation, but this would only need removing if the sludge depth was to increase by another 200mm.

The most pressing issue facing Tekapo is the disposal system. At the moment the disposal is generally adequate for the demand but during winter freezing periods we are having some problems. Environment Canterbury has indicated their dissatisfaction and has issued a notice of non-compliance with our discharge consent as a consequence. Also, as demand increases in

Tekapo the volume of effluent to be disposed of will also increase. We intend to review all of our disposal options in early 2015/16 with construction of a new system in later in that financial year.

TWIZEL

Council plans to acquire land adjacent to the oxidation ponds and construct rapid infiltration basins and consolidate the disposal in them. The basins will be fenced for site security and the existing disposal trench abandoned. This will retire the existing trench and consolidate the disposal on the 5.6ha site. The driver for this change is that in 2010, Council was granted a resource consent for the discharge to ground of the effluent that expires on the 8th July 2020. It is unlikely that Council will be able to renew this consent for the current disposal system.

Twizel continues to show steady growth in holiday homes and in order to understand the total demand Council will model the network so that it will be better able to predict when pipes need to be upsized or aeration installed at the oxidation ponds to improve treatment and when a new rising main will have to be constructed directly to the oxidation ponds from the pump station in Mackenzie Park. This work is provisionally programmed for 2018/19, but will only be constructed if demand puts pressure on the current systems to the point they cannot cope.

Twizel WWTP - Investigation of Disposal of Effluent by Soakage (letter from BECA to MDC, Nov 2005)

Introduction

Mackenzie District Council (MDC) has commissioned CH2M Beca Ltd to provide an assessment of the suitability of soils adjacent to the Twizel Wastewater Treatment Plant (WWTP) for disposal of effluent by soakage.

This letter presents the results of the geotechnical investigations undertaken, summarises the permeability characteristics of the soils and provides an estimate of the area of land required for sustainable soakage of effluent. The scope of work is outlined in our letter to Mackenzie District Council dated 15 September 2004.

Should you be in any doubt as to the applicability of this report and/or its recommendations for the proposed development as described herein, and/or encounter materials on site that differ from those described herein, it is essential that you discuss these issues with the authors before proceeding with any work based on this document.

Twizel WWTP and Proposed Development

The Twizel WWTP was commissioned in 1969 and treats domestic sewage, as well as small quantities of trade wastes from Twizel Township. The WWTP provides primary treatment of the influent in oxidation ponds before discharging effluent into a 2km long soakage/evaporation trench that runs south from the plant.

The Twizel ponds were originally designed in 1969 for a population of 5,000 assuming an average daily flow (ADF) of 1,818 m3/day and a peak flow of 5,455 m3/day. An ADF of 650 m3/d was predicted by CH2MBeca in the "Application for Resource Consent and Assessment of Environmental Effects for the Twizel WWTP "(June 2004).

A design effluent ADF of 1000 m3/d has been assumed in this report for the sizing of soakage ponds. This assumes a worst case scenario of peak summer or winter loadings, coupled with prolonged wet weather. It should be noted the oxidation ponds will buffer short term peak inflows and the effluent flow will be averaged over a period of a week or more. The design value of 1000 m3/d assumes no evaporation from the oxidation ponds and soakage basins. Normally evaporation will be significant in this locality.

Soakage Basin Site Requirements

Disposal by soakage involves the regular application of pre-treated effluent to shallow spreading basins in permeable soils with exposed soil surfaces. Additional treatment occurs within the soil as the effluent seeps through the base of the basins and travels with the groundwater to a discharge point.

In accordance with US EPA (1981), soakage systems require the following conditions for disposal of secondary treated effluent:

- Permeable soils, such as sands, gravels or sandy loams with hydraulic conductivities in the order of 1.4 x 10-4 to 1.4 x 10-6 m/s;
- Flat land is preferred, maximum slope is < 10%;
- Depth to groundwater greater than 1.5 m to 3 m;
- Soil depth of greater than 1.5 m;
- The hydraulic loading rate is dependent on the permeability of the soil and the depth to groundwater.

Properly designed and sited soakage systems can effectively remove organic and microbiological contaminants. However, limited nitrogen removal (specifically nitrate) means that down gradient contamination of groundwater resources needs to be assessed.

Preliminary assessments (AEE, CH2M Beca, 2004) suggest a soakage area in the order of 1ha, excluding margins, would be required for disposal of 650 m3/d. These assessments assumed an average hydraulic conductivity of 1.8 x 10-5 m/s to 3.6 x 10-5 m/s.

Site Description

The Twizel WWTP is located on a pastured, relatively flat, elevated alluvial terrace, approximately 200 m southwest of the Twizel River. The terrace lies at an elevation of approximately RL 450 m, some 5 m above the Twizel River bed.

Two oxidation ponds are sited on the terrace above the river. The ponds discharge via a weir into a soakage trench, which extends some 2 km south from the WWTP. The trench is about 3.5 m wide, 0.5 m deep, and vegetated with bulrushes. The oxidation ponds cover an area of 4.2 ha. Access to the site is via an access track which exits off SH8 nearly opposite the Twizel township entrance. The existing gravity sewer, which contains the raw sewage from Twizel, is buried adjacent to this track (see Figure 1 in Appendix A).

Geology

The geology of the study area has been assessed from site observations, the published geological map (Gair, 1975) and previous reports. The map describes the soils underlying the site as the Mt John Formation, which includes outwash gravels formed during the Otira Glaciation, some 18,000 yrs ago. Previous reports indicate that these gravels have an average permeability in the order of 10-4 to 10-5 m/s (Anderson, 1987; in URS, 2001). The higher permeabilities were considered to occur within layers comprising open gravel lenses.

Some 5 km west of the Twizel oxidation ponds lies the north - south trending active Ostler Fault Zone. The fault zone is up to 3 km wide, crossing the upstream end of the Ruataniwha Dam reservoir and passing through the Ohau A project. The recurrence interval for this fault has been calculated to be about 3,000 years (van Dissen et al. 1993 in Forsyth 2001), which means that the fault can be described as “active”.

Geotechnical Site Investigations
Test Pits

The geotechnical investigations were undertaken on 6 October 2004 and comprised four test pits up to 3 m deep in the area south of Pond A, and two soakage tests performed within the existing soakage trench (Figure 1, Appendix A). The pits were excavated by Whitestone Ltd and the soils logged by a Beca Geologist. Test pit logs are presented in Appendix B, photographs of pits are presented in Appendix C. Scala Penetrometer tests were undertaken from the ground surface adjacent to the test pits, to measure the density of an upper silt layer.

Soakage Tests

The soakage tests were undertaken within the soakage trench to estimate the hydraulic conductivity of the soils beneath the trench using effluent discharged from the oxidation ponds.

The existing vegetation in the trench was removed over a 6 m long section, and temporary bunds were created at each end of the section. The bunds were made from soils lying adjacent to the trench and previously excavated trench material that had been dumped nearby. The soakage pits were allowed to fill up prior to the upstream end being blocked off. Pit geometry was then measured and monitored throughout the day as the effluent infiltrated through the soil.

This procedure had the advantage of utilising the actual effluent and therefore provides a more realistic indication of the infiltration capacity of the subsoils.

Results of Investigations
Hydraulic Conductivities

The soakage test and graphical data are given in Appendix D. The assessed hydraulic conductivities, derived from the soakage tests, are summarised in Table 1.

Table 1

Assessed Hydraulic Conductivity Test Results

Soakage Trench	Hydraulic Conductivity, K (m/s)
S1	9.5 x 10-7
S2	9.4 x 10-7

The soakage trench is 0.5 m deep, therefore the assessed hydraulic conductivities are representative of layer 2 (silty gravels) as described in Table 2. It should be noted that the values in Table 1 do not include any allowance for evaporation of water from the trench during the test period.

Soil Profile

The soil profile assessed from the test pit excavations is summarised in Table 2 below.

Typical Soil Profile

Layer	Soil Description	Top of Bed (m)	Thickness (m)	Scala Penetrometer blows/150 mm	K (m/s)
1	Stiff dark brown ORGANIC SILT, some sand, minor gravel	0	0.2 - 0.25	2 - 4 typically 3	
2	Dense to very dense orange brown SILTY GRAVEL, minor sand	0.2-0.25	0.6	6 - 20+ typically 20+	**9.5 x 10-7
3	Tightly packed yellow-grey GRAVEL	0.8	0.6 - 0.7	Not tested	*1 x 10-4 to 1 x 10-5
4	Tightly packed yellow grey GRAVELLY BOULDERS trace silt-clay	1.35-1.5	1m+	Not tested	
* From URS (2001) ** Measured in soakage trench refer discussion in section 8					

Groundwater

A groundwater table was not encountered within the test pit excavations.

From URS (2001), the following information on groundwater is provided:

- General groundwater flow is towards the southeast;
- There is 1 m seasonal difference between winter and summer groundwater levels;
- Depth to nearest aquifer is 15 m in central Twizel and considered to be at a similar level below the WWTP.

Discussion
Overview

The site is relatively flat and comprises a river terrace that is considered to be an 18,000 yr old surface. The groundwater table was not encountered within the upper 3 m of the excavations, however, as the riverbed is some 5 m below the site, a depth of 4 m to groundwater is considered appropriate for analyses.

Soakage testing indicates layer 2 comprises soils of a moderately low hydraulic conductivity (9.5 x10-7 m/s). Previous reports indicate layers 3 and 4 comprise soils of moderately high hydraulic conductivity (1x10-4 to 1x10-5 m/s).

However, it is noted that the soakage testing undertaken within layer 2 provides an indication of the permeability after some 30 years of exposure to effluent. Pores between the soil particles beneath the trench are likely to have become clogged with sludge that has been accumulating since 1969, even though the surface of the trench was cleared for sludge testing. There are no permeability results for layer 2 using fresh water.

The hydraulic conductivity of layer 2 is lower than the recommended range of hydraulic conductivity given in USEPA (1981) (1.4x10-4 to 1.4x10-6 m/s). However, the deeper layers (3 & 4) are particularly suitable for land application of effluent, as the main purpose of the basins is seepage and the upgraded oxidation pond effluent will be of sufficiently high quality to avoid any adverse effects on the receiving groundwater environment.

Design Loading Rate

The design hydraulic loading rate is based on the soil infiltration rate. Allowable hydraulic loading rates are estimated to be in the order of 15 m/yr if applied to layer 2, or 250 m/yr if applied directly to layer 3 (US EPA, 1984). The 15m/yr loading rate would require an excessive land area and a more practicable loading rate will be 120m/yr applied to layer 3.

Assuming an 8 day cycle of wetting and drying (1 day loading and 7 days drying) applied to a series of 8 beds and a design effluent volume of 1000m3/day, 0.3ha will be required for each basin giving a total area of 2.4ha.

This area relates to the basin floor and does not include basin berms, roads, or buffer area. The US EPA (1981) recommends an allowance of 15 to 20 % of the field area for these items, giving a total required area at Twizel of 2.9 ha.

Because the peak effluent discharge rate of 1000m3/d is a long term prediction, it is recommended that half the basins be constructed initially with space left for doubling the area, if and when required by future growth and operating experience. A four day cycle would allow draining and reaeration of the soil or alternatively, effluent could be fed to one basin for 2 days, retaining an 8 day cycle.

The higher permeability layer 3 is about 0.8m below the surface. To remove all material down to layer 3 would require excavation of about 20, 000m3, which would cost an estimated $100,000 to $300,000, depending on whether the material was stockpiled on site or carted offsite. The soakage basin material could possibly be used as a source of fill for other developments in the area.

Alternatively, if all of layer 2 is not excavated, periodic deep ripping down to layer 3 could maintain sufficient soakage in the immediate future. If the need for ripping became too frequent, the basin area could be increased or layer 2 removed.

Groundwater Mounding

The higher permeability soils (layer 3) underlying layer 2 reduces the effect of groundwater mounding at this site. The US EPA (1984) states that groundwater mounds (localised rise in the groundwater table directly beneath a basin as a result of wastewater application) should not be closer than 0.6 m from the bottom of the basin. Assuming the basin areas identified in 8.2, a groundwater table at 4m below the ground surface, and application of the effluent to layer 2 (as a worst case), a groundwater mound of up to 0.2 m could be expected beneath the basins, reducing to about 0.1 m at the edge. As the water table occurs at a depth of more than 3 m, groundwater mounding could raise this to about 2 m below the existing ground surface, or 1.5 m below basins constructed in layer 2, which exceeds the 0.6 m minimum requirement.

Area Required and Possible Location

It is recommended that soakage basins be located adjacent to, and immediately down gradient of Pond A.

It is also recommended that MDC provide for the designation of an area, 150m around the upgraded WWTP and infiltration basins, as an odour buffer. This is considered normal practice for pond systems to minimise the potential for encroachment of sensitive development-and therefore future issues of reverse sensitivity.

Conclusions

Infiltration testing in the area south of Pond A, indicates that soils would be suitable for discharge of effluent by soakage.

As the basins are primarily required for soakage, rather than treatment, then effluent could be applied to soil layer 3 at about 0.8m below the existing ground surface.

Assuming a future, wet weather, sustained effluent flow rate of 1000 m3/day, the total area required for rapid infiltration is in the order of 2.9 ha. Initially, MDC could construct 4 basins with the balance provided based on actual operating experience and rate of growth.

Further Developments (Feb 2015)

MDC is in the process of acquiring a 150m odour buffer around the overall WWTP and disposal site as well as the land it requires for the consolidated disposal area.

The plan is to consolidate the disposal to ground by a series of sparge pipes just to the south of the ponds. As part of the agreement with the land owner to acquire necessary land. This project has been accelerated and is planned for completion by early 2017.

This will also require a land subdivision, land purchase, new resource consent and construction of the physical works along with the de-commissioning of the existing disposal trench.

BURKES PASS

The pond should be checked for sludge accumulation periodically, but this would only need removing if the sludge depth was much greater than 150mm.

As the current population is small (and unlikely to increase substantially), the existing pond appears to be more than adequate for continuation of wastewater treatment at Burke's Pass.

4. ASSET MANAGEMENT PRACTICES

4.1 INTRODUCTION

MDC has an Asset Manager, Utilities Manager and a Technician responsible for the maintenance management of the Utilities network. Occasionally some elements of the work are tendered to consultancy services to manage (e.g. Pipeline replacements etc). The Utilities Manager and the Maintenance Contractors regularly inspect and monitor the network. Any work identified is directly tasked to the incumbent maintenance contractor or, if it is beyond the scope of the maintenance contract, tendered using Competitive Pricing Procedure guidelines. This may or may not need the involvement of consultants depending on the nature or extent of the work.

MDC accounts for revenue and expenditure on an accrual basis. All work under the Works Programme is identified through a job cost ledger with a significant level of breakdown using analysis codes. The costs are summarised into the general ledger where operational/maintenance costs are identified separately to capital/renewal items.

The majority of the work (physical works and professional services) carried out as part of the total management of all Utilities Asset functions is actioned under either physical works or consultancy contracts.

All contract works are claimed monthly against each of the contract item numbers by the physical works and professional services contractors. MDC and/or consultants confirm the payment value for all physical works and the MDC confirms the payment of any professional services. The accounts job number and account codes are included on the payment certificate. These certificates are forwarded to MDC for payment. The types of work that this system relates to are maintenance, renewals and capital expenditure.

There are a range of reports prepared in order to comply with the requirements of Council, and the Auditors. All external reports are prepared in compliance with Generally Accepted Accounting Principles (GAAP)

4.2 ASSET MANAGEMENT PROCESSES AND SYSTEMS

4.2.1 PROCESSES

4.2.1.1 Levels of Service

The LTP process is used to determine the level of customer satisfaction and identify community concerns and issues. Council has incorporated the mandatory performance measures imposed by the Department of Internal Affairs as the measures for this activity.

The performance measures are:

Performance measure 1 (system adequacy)

The number of dry weather sewerage overflows from the territorial authority's sewerage system, *expressed per 1000 sewerage connections to that sewerage system.*

Performance measure 2 (discharge compliance)

Compliance with the territorial authority's resource consents for discharge from its sewerage 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.

Performance measure 3 (fault response times)

Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured:

(a) attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, and

(b) resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.

Performance measure 4 (customer satisfaction)

The total number of complaints received by the territorial authority about any of the following:

(a) sewage odour

(b) sewerage system faults

(c) sewerage system blockages, and

(d) the territorial authority's response to issues with its sewerage system, expressed per 1000 connections to the territorial authority's sewerage system.

4.2.1.2 Knowledge of Assets

The process of capturing as-built records for the on-going enhancement of asset registers is included as a requirement of the maintenance contracts. The information is supplied to Council staff for them to upgrade the relevant registers. Projects undertaken outside the maintenance contracts have a requirement within their contract for the relevant information to be collected and forwarded to Council for them to upgrade the registers. There are some observed gaps in the securing of data for new infrastructural assets (e.g. subdivisions).

4.2.1.3 Accounting/Economics

Maintenance and renewal costs are recorded against broad activities in the general ledger. Valuations are currently based on straight line depreciation and assumed effective lives.

4.2.1.4 Condition and Performance Monitoring

Well documented standards and processes exist for an on-going inspection programme of all foul sewer assets. Other assets are inspected irregularly.

Processes for regularly monitoring the performance of the Fouls Sewer network, (e.g. pipeline inspection, debris over inlets, debris in grass swales) and the information is also used for identifying and prioritising upgrading and development of projects. The monitoring of other assets is informal and mostly reactive.

4.2.1.5 Risk Management

Although processes are in place for the monitoring of some critical assets (e.g. pump stations), risk management is generally practised informally based on the knowledge of experienced staff as the foul sewer networks are relatively unsophisticated.

4.2.1.6 Operations

Operational processes are documented in service delivery contracts and are subjected to regular review.

4.2.1.7 Maintenance

Competitively tendered contracts are entered into annually for major budget items.

4.2.1.8 Optimised Life Cycle Strategy

Work optimisation for other assets is based on the judgement of experienced staff, internal inspection of pipelines and renewal projections are based on assumed economic lives.

4.2.1.9 Design, Project Management

There are no documented project management procedures for MDC, however there is confidence that suitable procedures are used during the project evaluation and design phase. Sound contract management procedures are in place. The supervision of assets constructed within sub-divisional development and subsequently taken over by MDC is considered to be adequate.

4.2.1.10 Quality Assurance/ Continuous Improvement

Audit NZ annually audits performance measures reported in the annual plan. All recommendations for improvement are adopted and implemented as resources permit.

4.2.2 SYSTEMS

Council uses Asset Finda which is a complete system for designing and managing solutions through the application of geographic knowledge. Data can be manipulated within AssetFinda, ArcGIS or exported to excel to assist in the decision making process for Foul Sewer network management.

4.2.2.1 Asset Finda

Asset Finda is an advanced Assets Management System designed to assist Councils in whole of life management of their assets. AssetFinda is designed to meet Council's long term and statutory asset management requirements.
It is has three main components:

Asset Register: An accurate asset register is critical to any asset management system. It controls a database that utilizes GIS, Web and iPad to view, edit, analyse and add data – faster, easier and more accurately than ever before.

Asset Maintenance: Maximizes the useful lifespan of assets by managing past, present and future maintenance requirements of your assets.

Asset Reporting: There is wide variety of reports, including Asset Revaluations, Monthly & Annual Depreciation Calculations, and Predictive Modelling.
AssetFinda utilizes a Web front end, GIS interfaces and iPad apps, thus creates a flexible and user friendly interface that even the newest of users can navigate quickly. The iPad App is designed to give real-time access to data in the field. View, analyse, edit & add data, capture images, run inspections, complete works requests from anywhere in the field with in either Online or Offline mode.

Council uses AssetFinda to manage the following:

- Water
- Drainage
- Wastewater
- Parks (to be added)
- Buildings (to be added)

The Asset Register contained within AssetFinda/ArcGIS (previously MapInfo) is contained within separate databases. Each database records the attribute of each asset to component level including age, condition, performance etc. An example of the information is shown in Fig 1 below.

Depending on what type of asset is identified there are varying amounts of information recorded for that asset. There are gaps in the information for each asset, but we are continually gathering information on these to complete the Asset Register.

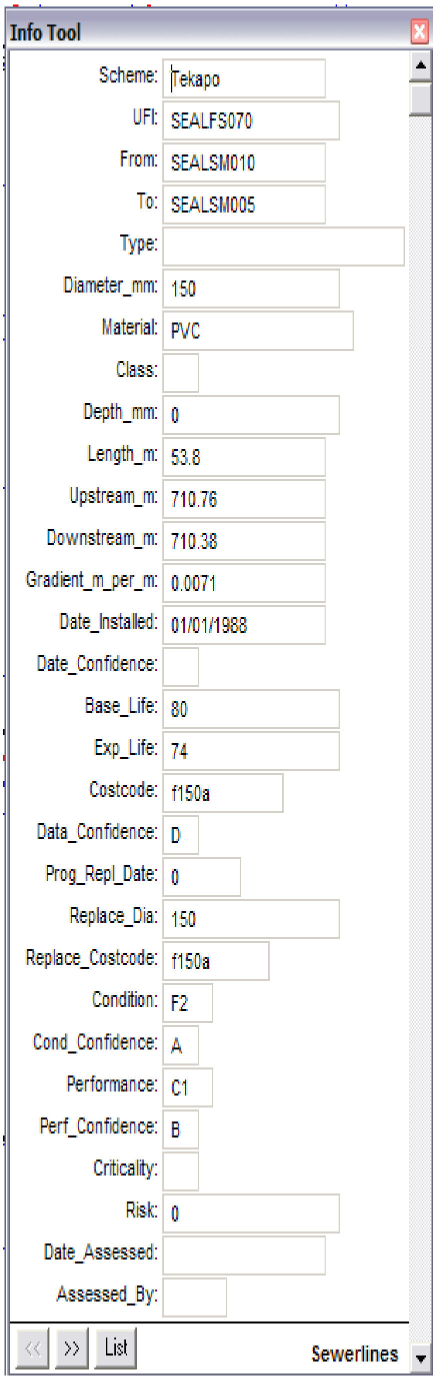
4.2.3 SCADA

SCADA (supervisory control and data acquisition) is a system operating with coded signals over communication channels so as to provide control of remote equipment. The control system may be combined with a data acquisition system.

The term SCADA (Supervisory Control and Data Acquisition) usually refers to centralized systems which monitor and control entire sites, or complexes of systems spread out over large areas. Most control actions are performed automatically by RTUs or by PLCs. Host control functions are usually restricted to basic overriding or supervisory level intervention.

Council is rolling out SCADA to all its remote sites across the district. This will not only control the operation of the site but actively monitor and send the operational data back to the Fairlie in real time via telemetry.

Figure 1



Info Tool
Scheme : Defines the scheme the infrastructure is part of
UFI : Unique identifier
From : Defines from where the pipe came from
To : Defines to where the pipe exits
Type :
Diameter_mm ; Diameter expressed in millimeters
Material: Material from which the pipe is made
Class : Class of pipe used
Depth_mm : Depth of pipe in millimeters
Length_m ; Length of pipe
Upstream _m : Upstream invert level
Dowstream_M : Downstream invert level
Gradient_m_per_m: Gradient of pipe
Date_Installed : Date pipe installed
Date_Confidence : How sure of date when installed
Base_Life : Initial life of the pipe
Expected_Life: Life expectancy of pipe
Costcode : This is a code assigned to replace the current pipe
Data_Confidence :
Prop_Repl_Date: Date proposed for replacement
Replace_Dia: Optimised replacement diameter
Replace_Costcode : Optimised replacement cost code
Condition: Condition rating of the pipe
Cond_Confidence : Degree of certainty of the condition
Performance : Performance rating of the pipe in the network
Perf_Confidence : Degree of certainty of the performance of the network
Criticality
Risk
Date_Assessed: : Date of latest assessment
Assessed_By : Name of person completing the

assessment of the pipe

This is an example of the information we hold on any section of sewer main, for other assets a different set of information is available.

Table 9.1 gives the assessed data confidence quality of the MDC Asset Register tables as described in the MDC 2010 Water, Wastewater, Stormwater and Solid Waste Assets Infrastructure Revaluation" report.

Table 9.1 – Data Confidence Levels

Valuation Element	Pipelines	Manholes	Plant
Asset Registers or Databases	H	H	H
Attribute Details	H	H	H
Age	VH	VH	VH
Optimisation Information	A	A	A
Useful Lives Information	G	G	G
Condition	H	H	G

The table Data Confidence Levels are:

VH	very high confidence	H	high confidence	G	good confidence
A	average confidence	P	poor confidence		

4.2.3.1 CCTVs role in Asset Management

The aim of asset management is to manage assets, such as sewer systems, in a way that provides the required level of service in the most cost-effective manner through the creation, operation, maintenance, renewal and disposal of assets to provide for existing and future customers.
CCTV inspections can help organisations gain an understanding of the existing condition of their piped assets. This understanding can help organisations make decisions such as which pipelines are:

- Undersized and need to be upsized to meet future flows.
- In risk of collapse.
- In need of maintenance works such, as root cutting.

Council is then able to prioritise works and prepare a timetable and budget for any required rehabilitation works.

4.2.3.2 Pipeline - Condition Assessments

Pipelines are regularly internally inspected by CCTV.

The process involves a camera that travels through the pipeline and transfers images to a screen on the surface, where they can be viewed by an operator. The images can then be recorded on video, DVD or direct to hard drive. At the same time the operator can also record observations of the pipe and faults, capture still images and/or produce sketches showing, for example, the position of manholes.

Some of the reasons that CCTV inspections are undertaken include:
• General condition surveys to determine the areas in pipe networks that require attention and to develop long-term programmes for replacement and maintenance of the network.
• Responsive maintenance, e.g. to identify and repair faults in pipes that have caused overflows or flooding.
• Determination of rehabilitation requirements, e.g. to determine which pipes need to be lined to prevent too much water entering into the system. This can result in the pipes not having enough capacity to cope with the flow, thus causing overflows.
• Quality checks on new works or after the rehabilitation of pipes.
• Build over approvals, e.g. inspections of pipes to determine whether buildings can be constructed above them.

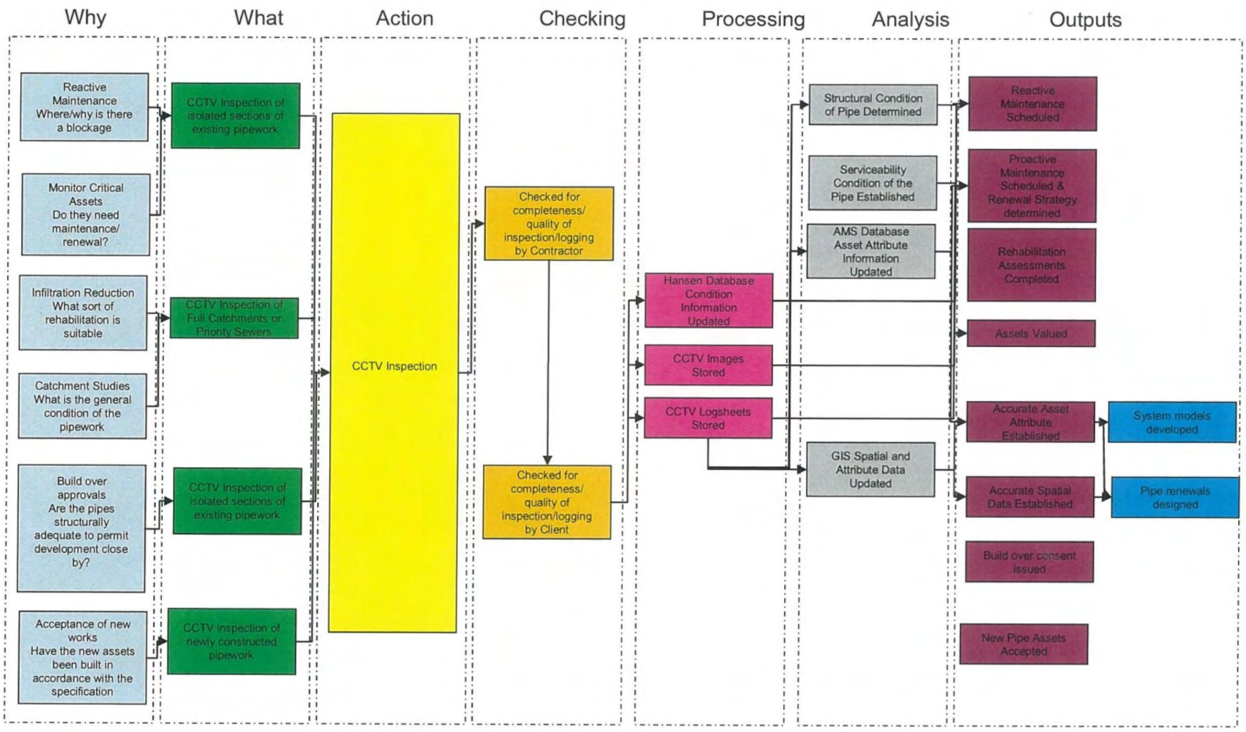
If CCTV inspections are carried out correctly then a CCTV inspection completed for one purpose, e.g. a build over approval, should be able to be used for any other purpose.

A CCTV inspection provides information for asset management, maintenance and rehabilitation purposes. CCTV inspections view the condition of assets, and provide information on attributes. Condition data can be used to:

• Determine the structural condition of pipes to enable rehabilitation works to be prioritised.
• Maintain a check on the structural condition and rate of deterioration of pipes to enable forward budgeting for maintenance and rehabilitation.
• Provide an overall inventory of the asset and a global picture of system problems.
• Check service conditions to enable regular maintenance planning.
• Provide miscellaneous information for additional uses, such as locating unused lateral connections for new housing developments.
• Provide a status of sewer and stormwater systems for industry benchmarking.

CCTV inspections also provide valuable information on the position and type/size of the pipes being inspected, such as:
• Connectivity, i.e. which manholes are connected by the pipe.
• The location of pipes and manholes can be determined by the length of the pipe surveyed and the position of the manholes noted when the CCTV camera was put into or retrieved from the pipe.
• The diameter of the pipe being inspected.
• The material of the pipe being inspected.

The CCTV Process



By taking this information on selected pipelines the data can be used to infer the condition of similar aged and type pipes to give a complete picture of the network.

4.3 INFORMATION FLOW REQUIREMENTS AND PROCESSES

General maintenance work is continuous throughout the year and responds to the needs of the network. The data from the repairs carried out is reported to Council and recorded in MDCs systems on a regular basis.

New subdivisions in the District result in additions to the pipeline infrastructure. In the past there have been difficulties in capturing the resulting updated and additional asset information. Processes need to be established to ensure that this data is provided electronically so that it can easily recorded in the Asset Register and available for ongoing effective Asset management.

4.3.1 PROGRAMMING OF WORKS AND FUNDING

Planning for the physical works programme involves the preparation of a 10 year programme and collating information required for the funding application to Council (The Annual Plan Process).

All the information obtained from network inspections, maintenance inputs and Asset Register analysis are used to develop the 10 year capital works programmes.

The Each year the following year's physical works programme is assessed by the Utilities Engineer and the Contractors representative, with sites inspected and confirmed as requiring work or deferred one or more years.

The total funds required are based on the current requirements identified and the previous year's expenditure. During the year there is very little ability to reallocate funds due to the silo-ed effect of each Community Board funding their respective maintenance and renewals and also the very small budget in each community.

4.3.2 STANDARDS AND GUIDELINES

The management of the pipeline assets are constrained by the funding available to maintain the network as a viable entity.

Another key manual is the International Infrastructure Management Manual which provides guidelines on the structure and format for Asset Management Plans and practice.

4.3.2.1 Levels of Service

The LTP process is used to determine the level of customer satisfaction and identify community concerns and issues. A good range of performance measures in keeping with NAMS guidelines are in use.

4.3.2.2 Knowledge of Assets

The process of capturing as-built records for the on-going enhancement of asset registers is included as a requirement of the maintenance contracts. The information is supplied to Council staff for them to upgrade the relevant registers. Projects undertaken outside the maintenance contracts have a requirement within their contract for the relevant information to be collected and forwarded to Council for them to upgrade the registers. There are some observed gaps in the securing of data for new infrastructural assets (e.g. subdivisions). The Contractors staff use IPads in the field to check and capture data for updating the asset registers. This information is confirmed by Council staff prior acceptance into the asset register.

4.3.2.3 Accounting/Economics

Maintenance and renewal costs are recorded against broad activities in the general ledger. Valuations are currently based on straight line depreciation and assumed effective lives.

4.3.2.4 Condition and Performance Monitoring

All pipelines, pump stations and oxidation ponds are monitored by the maintenance contractors to determine maintenance needs. This ensures MDC staff also monitors the network condition as an audit of the Contractors performance.

Well documented standards and processes exist for condition rating pipework as part of CCTV inspection.

4.3.2.5 Risk Management

Although processes are in place for the monitoring of some critical assets (e.g. pump stations), risk management is generally practised informally based on the knowledge of experienced staff.

4.3.2.6 Operations

Operational processes are documented in service delivery contracts and are subjected to regular review.

4.3.2.7 Maintenance

Competitively tendered contract is entered into approximately every five years to deliver the maintenance of this activity. Major new pipeline construction or replacement is tendered individually for larger budget items.

4.3.2.8 Optimised Life Cycle Strategy

Work optimisation for other assets is based on the judgement of experienced staff, internal inspection of pipelines and renewal projections are based on assumed economic lives.

4.3.2.9 Quality Assurance/ Continuous Improvement

Audit NZ annually audits performance measures reported in the annual plan. All recommendations for improvement are adopted and implemented as resources permit.

5. LEVELS OF SERVICE

5.1 DEFINING THE LEVEL OF SERVICE

Asset management planning requires a clear understanding of customer needs and preferences and the minimum obligations that must be met. A key objective of this activity plan is to match the level of service provided by the asset with the expectations of the customers given legislative, financial, technical and safety constraints. Service standards, set to meet this objective, provide the basis for the life cycle management strategies and work programmes identified in Section 7.

The service standards defined in this section will be used:

- to ensure legal and legislative requirements are met
- to inform customers of the type and level of service offered
- as a focus for the asset management strategies developed to deliver the required level of service
- as a measure of the effectiveness of this Plan
- to identify costs and benefits of the services offered
- to enable customers to assess the suitability, affordability and equity of the services offered

The MDC levels of service for Foul Sewer reflect current industry standards and are based on:

- **Customer Research and Expectations:** Information gained from the community on their expectations of quality and price of services
- **Strategic and Corporate Goals:** Provide guidelines for the scope of current and future services offered, the manner of service delivery and define specific levels of service which the MDC wishes to achieve
- **Legislative Requirements:** Environmental standards, regulations and acts that impact on the way assets are managed (i.e. resource consents, building regulations, health and safety legislation, Local Government Act)
- **Demands on the Network:** Service demands that are placed on the network.

5.2 CUSTOMER RESEARCH AND EXPECTATIONS

The Council utilises the following methods to determine and measure customer expectations:

- Public meetings
- Consultation via the Annual Plan and LTP process
- Feedback from customers and elected representatives
- Publicity

Ratepayers want full time availability of the sewerage network, free from blockages. They expect to flush and forget.

LEVELS OF SERVICE

Customer expectations are one of the key considerations used to determine the acceptable target levels of service prescribed for the MDC Foul Sewer Network.

The community's expectations can be summarised as being:

- Foul Sewer networks are provided to remove sewerage effluent from properties and dispose of it in an environmentally appropriate way meeting the disposal requirements of the relevant resource consent.
- Foul Sewer networks are replaced to ensure that they continue to operate efficiently and maximise the life of the asset.

In order to achieve the above community expectations there are two specific strategies that the MDC will implement:

- The maintenance of Foul Sewer networks to provide appropriate means to collect and dispose of Foul Sewer in a safe and environmentally acceptable way.
- The Council will employ preventative maintenance and monitoring systems to protect the network and ensure compliance with resource consent conditions.

5.3 STRATEGIC AND CORPORATE GOALS

The Foul Sewer network must be operated to meet Council policy, objectives and various Environment Canterbury requirements. Council's goals and the community's expectations are stated in the LTP which provides the framework for the operation and development of the Foul Sewer infrastructural assets.

Organisation Mission, Goals and Objectives

The Council's mission statement is: ***"FOSTERING OUR COMMUNITY"***. The particular aspects of the overall mission that relate to the sewer activity are:

> **SERVICE**
> **We are a service organisation. Providing efficient and cost-effective services is our prime responsibility.**
>
> **SUSTAINABILITY**
> **We are committed to the sustainable management of all the resources of the district.**

Foul Sewer Activity Goal and Principal Objectives

As outlined in Council's Long Term Plan (LTP) Council, the sewerage asset contribution to achieving Council's governance goal and the community outcomes identified in Section 2 is through the **Foul Sewer Activity Goal**:

> ***To ensure all Foul Sewer assets are managed to measures minimise damage and inconvenience to property and there are no environmental ill effects arising from Foul Sewer protection work***

The specific **Objectives** of the Foul Sewer activity are as follows:

- To develop an activity management plan for effluent disposal
- To contract cost-effective service delivery
- To identify and prioritise key areas for network improvements and progressively correct these.
- To ensure all resource consent conditions are met.
- To ensure the maintenance of the public infrastructural assets in perpetuity, so that there is no diminution in value, and to forecast the estimated future cost of so doing.

5.4 LEGISLATIVE REQUIREMENTS

Legislative requirements set the framework for the minimum standards of service that Council has to meet. The key legislation relating to the Council's responsibility to manage the Foul Sewer asset is:

- The Local Government Act 2002.
  Especially
  - Part 7.
  - Schedule 10.
  - The requirement to consider all options and to assess the benefits and costs of each option.
  - The consultation requirements.
- The Local Government Act 1974.
- The Climate Change Response Act.
- The Civil Defence Emergency Management Act 2002 (Lifelines).
- The Health Act 1956.
- The Resource Management Act 1991.
- The Local Government (Rating) Act 2002.
- The Health and Safety in Employment Act 1999.
- The Building Act 2004.
- The Local Authority's District Plan.
- The Council's Engineering Design Standards for Subdivisions and Development. SNZ 4404:2010
- Any existing established policies of the Council (outside those contained in this Activity Management Plan itself) regarding this activity.
- New Zealand Standard SNZHB 4360:2000 'Risk Management for Local Government'.
- Natural Resources Plan – Environment Canterbury
- Land and Water Plan – Environment Canterbury

The ***Local Government Act 2002*** gives local authorities the full capacity, and full rights, powers and privileges, to carry on or undertake any activity or business, do any act, or enter into any transaction wholly or principally for the benefit of its district.

Along with these wide sweeping powers comes the requirement to identify practicable options before making a decision, and to assess the benefits and costs of each option against the likely economic, environmental, social and cultural impacts.

Local authorities are also required to consult widely, effectively and appropriately with the community to determine the communities' wishes and to seek feedback on all potentially significant activities – not only when a particular course of action is proposed, but at the various stages of the decision-making process.

The MDC has determined that it will consult its communities where practical, reasonable and within the resources available to it. A significant aspect of this consultation process is the development of the LTP, which forms the long-term (not less than ten years) direction for all Council's activities.

The ***Local Government Act 1974*** gives local authorities the full capacity, and full rights, powers and privileges, to constitute "Drainage Areas" and construct drains.

The ***Resource Management Act 1991*** requires Council to:

- sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of current and future generations
- comply with the District and Regional Plans
- avoid, remedy or mitigate any adverse effect on the environment and structures (e.g. adverse effect of surface run-off)
- control the use of land for the purpose of the maintenance and enhancement of the quality of water in water bodies and coastal water;
- manage discharges of contaminants into water and discharges of water into water
- control the taking, use, damming and diversion of water, including:
    - the setting of any maximum or minimum levels or flows of water;
    - the control of the range, or rate of change, of levels or flows of water; and
- control the discharges or contaminants into water and discharges of water into water.

The ***Building Act 2004*** requires Council to:

- Ensure all buildings and facilities constructed comply with the Act
- Produce Project Information Memoranda (PIM's) which supply all available information relating to an individual property. For the foulsewer network the relevant information may include details of the location of the services to the property and any known issues with a history of blockage, type of disposal system, etc

The ***Health and Safety in Employment Act 1992*** requires Council to:

- Ensure that its employees, contractors are protected from injury as a result of its activities
- Notify the Occupational Safety and Health Department of serious harm or fatal accidents as a result of its activities within 7 days

The ***Civil Defence Emergency Management Act 2002*** requires Council to:

- Establish and be a member of a Civil Defence Emergency Management Group

- Co-ordinate, through regional groups, planning, programmes and activities related to civil defence emergency management across the areas of reduction, readiness, response and recovery, and encourage co-operation and joint action within those regional groups
- Improve and promote the sustainable management of hazards in a way that contributes to the well-being and safety of the public and also to the protection of property

Environment Canterbury's Land and Water Regional Plan

Environment Canterbury's Land & Water Regional Plan provides the regulatory framework to implement the community's aspirations for water management under the Canterbury Water Management Strategy. It addresses competing demands for land and water resources in both rural and urban Canterbury in a sustainable manner.
It also provides the regulatory framework around a number of other environmental and development matters required to be managed by Council.

- The objectives of the plan identify the outcomes that are to be met with regards to management of these resources. These outcomes will be achieved over varying timeframes.
- The policies (which direct how activities are to be managed to achieve these outcomes) give effect to the objectives.
- The rules are the tools used to implement these policies.

Natural Resources Regional Plan – Environment Canterbury
Chapter 7: Water Quality
7.1 Introduction
Canterbury's water resources - rivers, lakes and groundwater- are a significant regional and national resource (Figure WQL1, WQL2). The water resources are important for aquatic ecosystems, their aesthetic, cultural and recreation values, tourism, and as a source of water for drinking, industry and agriculture. Much of the region's surface water and groundwater resources are of high quality, and many water bodies are still largely in their natural state. Human activities, however, have greatly increased the concentrations and types of contaminants entering the region's water bodies. The impact of these activities on water quality varies throughout Canterbury. In most places, they are relatively minor (compared to other parts of New Zealand and the rest of the world), but in some areas the impacts are significant, restricting the use of water for drinking, recreational and other uses.
The objectives and policies in the Canterbury's Regional Policy Statement provide the broad planning framework for managing water quality in the region. Chapter 9, Objective 3 of the Canterbury Regional Policy Statement recognises the need that present and future generations of Canterbury's communities can to provide for their social and economic well-being from the use of water as a receiving environment while ensuring that certain values are safeguarded.

Ngai Tahu values
Ngai Tahu perceive water as the source of life and sustenance. It is held that water contains a mauri (life essence) that joins physical and spiritual elements and links water to every other part of the natural world. Water is viewed as a taonga (treasure) because it carries the lifeblood of the land; the well-being of all living things depends on it. Maintaining water quality in the best

possible condition so that a water body and its ecosystems are in a healthy state is an issue of major concern for Ngai Tahu. The use of water bodies for certain types of activities can impact on their spiritual and cultural values. For example, the discharge of effluent to water, especially human waste, is considered an offensive activity, that defiles the spiritual and cultural values of the water.

Ngai Tahu have sought the following outcomes:

- maintenance of the mauri of natural and physical resources, and to restore mauri where it has been degraded by the actions of humans.
- recognition of tangata tiaki as kaitiaki of water;
- protection of wahi tapu sites from inappropriate activities.
- the integrity and cultural uses of water bodies are protected by prohibiting "unnatural" mixing of waters from different water bodies.
- maintain or enhance water quality by controlling the discharge of point and non-point sources of contaminants to water, and prohibiting the direct discharge of human effluent to water.
- the discharge of water containing industrial and agricultural effluent be required to pass through land before it enters a water body.
- the restoration of wetlands and riparian margins is encouraged because of their pollution abatement function.

Wider community

Awareness throughout the community of the effects of human activities on water quality has increased in recent times. People now have a better understanding of the linkage between human activities and their impacts on water quality. Communities are less tolerant of polluters than a decade ago. This is part of a world wide recognition of the importance of protecting water quality which has led to improved methods for detecting contaminants, tracing their sources, managing and treating wastes.

Over the last 20 years, control of point source discharges has led to a significant improvement in the water quality of degraded water bodies. Businesses are increasingly conscious of the need to maintain a positive public image in relation to impacts on the environment and to adopt environmentally acceptable policies and practices. The greatest pressures on water quality are now from non-point source discharges. These are the most difficult to manage because reducing the impacts of non-point source discharges involves changes to land management practices and consumption patterns. Education will play a key role in increasing awareness of the issues and bringing about a change in practices and patterns of resource use.

Land Drainage Act 1908

This Act is subject to the provisions of the Resource Management Act 1991.

The Governor General may constitute a drainage district which in turn will cause a Board to be created.

Local Authorities may assume the powers of a Drainage Board for areas outside of drainage districts.

Soil Conservation and Rivers Control Act 1941

This Act is subject to the provisions of sections 176 to 182 of the Harbours Act 1950 and the Resource Management Act 1991.

This Act generally covers rivers and drainage that was previously under the control of Catchment Boards but now administered by Regional Councils.

There are implications for Local Authorities mainly to do with the overall drainage of a district.
Section 143 States –

> (2) Every Catchment Board shall exercise a general supervision with respect to the exercise and performance within the catchment district by local authorities of any powers, functions, and duties as to watercourses and as to drainage conferred and imposed on local authorities by the Land Drainage Act 1908, the River Boards Act 1908, the Local Government Act 1974, or any other Act, and may give such general or special directions as it considers reasonable for the guidance of local authorities with respect to the exercise and performance of those powers, functions, and duties.
> (3) Without prejudice to the generality of the foregoing provisions of this section, no Drainage Board, River Board, or local authority shall, in exercise or performance of any of the powers, functions, or duties referred to in the foregoing provisions of this section, construct or alter any watercourse or any other works in a catchment district otherwise than with the consent (not to be unreasonably withheld) of the Catchment Board of the district.

Public Works Act 1981

This Act would be used if necessary to procure land for Foul Sewer activities but has no specific reference to Foul Sewer.

Local Government (Rating) Act 2002 No 6

The purpose of this Act is to promote the purpose of local government set out in the Local Government Act 2002 by—

- (a) providing local authorities with flexible powers to set, assess, and collect rates to fund local government activities:
- (b) ensuring that rates are set in accordance with decisions that are made in a transparent and consultative manner:
- (c) providing for processes and information to enable ratepayers to identify and understand their liability for rates.

Bylaws

These are permitted under the Local Government Act for a range of purposes including preserving public health, well being, and safety. However amendments in 1991 restrict its use to ensure the Building Act over rules a bylaw in that area of activity.

District Plan

The District Plan requires all new subdivision areas make provision for Foul Sewer control infrastructure, encourages the retention of natural open water ways for Foul Sewer disposal and requires Foul Sewer disposal to be carried out in a manner that avoids inundation of land within or adjoining the subdivision. The District Plan provides means of compliance for Foul Sewer control works, which includes reference to Mackenzie District Council Code of Practice. This Code is based on the Code of Practice for Urban Land Subdivision (NZS 4404:2004).

Other Legislation and Regulations

The following additional legislation or regulations affect the operation of the Urban Foul Sewer Systems:

- Water Supplies Protection Regulations 1961
- Dangerous Goods Act 1974

In addition to the above legislation the following is applicable to the Fairlie and Burke Pass Foul Sewer discharge.

- Environment Canterbury, Opihi River Regional Plan

Legislation (e.g. Resource Management Act) requires Council to consult with the Tangata Whenua and take into account the principles of the ***Treaty of Waitangi*** in the management of infrastructural assets.

5.5 CURRENT AND TARGET LEVELS OF SERVICE

Council’s current and target levels of service as defined in the 2012-2022 LTP are summarised in Table 5.1. These show how levels of service contribute to the community outcomes and provides a technical measure that enables Council to monitor current levels of service against target levels of service.

These Levels of Service will be no longer used from 1 July 2015 onwards, instead they will be replaced by the mandatory performance measures as required by Audit NZ.

Table 5.1 – Current and Target Levels of Service

Levels of Service	Measure of Service	Baseline Information	Target
Sewage is managed without risk to public health.	Number of sewage overflows from pump stations. Number of annual blockages per 10km of sewer. % of ratepayers satisfied with the sewage treatment and disposal service.	Last measured YE June 2011, there were nil overflows. Last measured YE June 2011, there were 1.1 blockages per 10kms. CINTA survey October 2011, showed 91% were satisfied.	Nil Less than six 85%
Sewage is able to be disposed of without significant disruption.	% of temporary or permanent repairs completed within 6 hours (during working hours) or 12 hours (outside working hours). Normal disruption should not exceed 8 hours. Apart from earthquake or flood, no single disruption should exceed 24 hours.	Last measured YE June 2011, where these targets were met. Not measured in YE June 2011.	100% 100%
Safe discharge of wastewater	% of notices of non-compliance, issued by Environment Canterbury, for Council's discharge consents actioned within 20 working days.	New measure and we have no prior year data.	100%

Further to the levels of Service in Table 5.1 there are requirements that form part of the maintenance contract specifications. These are detailed in the following sections.

5.5.1 SECONDARY LEVELS OF SERVICE

These are technical measures included in the Infrastructural Services Contract

Table 5.2

MDC Event	Service Standard
Response	Provide a 24 hour, 365 day per year call out service
	Complete administration functions in a timely manner
Response Times	Faults with potential to cause disruption of service – two working days
	Blockage in Public Sewer and Other Emergency Repairs: During working hours - The service to be reinstated by temporary or permanent repairs within six hours of call out Outside working hours - The service to be reinstated by temporary or permanent repairs within nine hours of call out

Availability / ***Disruption to Service***	Maximum duration of one disruption - 24 hours
	Normal duration of one disruption - eight hours *(It should be noted the above duration would not apply for an extraordinary event such as a major earthquake or flood)*

5.5.2 ASSET PRESERVATION MEASURES

MDC is committed to maintaining and improving the network where current levels of service may not be met. Analysis of the network condition over time provides an indication of asset behaviour and performance achievement. Table 5.3 outlines the measures that will be used to determine the network condition and performance.

Table 5.3 - Asset Preservation Measures

Measure	Explanation	Method of Measurement	Target Values	Response Times
All sewerage facilities functioning satisfactorily	Sewerage facilities, such as: - Pipelines - Manholes - Manholes - Pump Stations -Treatment Facilities - Disposal systems	Visual inspection DO monitoring	Oxidation Ponds – Clean out inlets. Measure and record DO Check aerators and disposal fields for effective operation. Pump Stations – Check and record water levels and pump hours. Wash down wells and test alarms Service all pumps Clear blocked sewer mains	Weekly Inspected at least monthly Six monthly 6 hours in normal work hours and 12 hrs to clear blockages at any other time.

5.6 GAP ANALYSIS

5.6.1 LEVELS OF SERVICE DEVELOPMENT WITH USERS AND STAKEHOLDERS

The current LOS being provided has been established through Council’s LTP process. This would suggest there is approval with the current regime, although this could also be interpreted as an over provision of service in the context of Council’s broader service profile.

Options to further examine this issue in the future could include:

(a) Monitor and interpret customer feedback through customer feedback and complaints. This information can be analysed for any trends or common factors related to current service levels (e.g. number of complaints received)

(b) Engage customers in a formal process. There are a number of mechanisms to achieve this from public meetings to surveys to focus groups. This may include the use of documented feedback processes. In all methods the clear description of different LOS options, fully costed, is a prerequisite to meaningful feedback

(c) Engagement with key stakeholders. These include the Regional Council, and others. Again good input information to these engagements will produce valuable feedback.

5.6.2 LEVELS OF SERVICE DEFINITION

The current LOS are documented as a combination of:

- LTP LOS documentation based on real or perceived customer feedback
- Contract processes which describe some elements of the quality of service provided, mainly travelling surfaces and intervention levels

This can be improved by:

(a) Augmentation of existing information e.g. clearer relationships between alternative service levels for blockages, surcharge etc and their associated costs.

(b) Utilisation of a LOS model defining quality, quantity, location, and timeframe. This would be based on the IIMM and define the wastewater service in terms of Accessibility, Health and Safety, Quality, Reliability and Responsiveness, Sustainability, Functionality.

These would form the basis for a consultative process as outlined above.

5.6.3 PERFORMANCE MEASURES

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2015-25 Long Term Plan and no other measures will be used.

Performance measure 1 (system adequacy)

The number of dry weather sewerage overflows from the territorial authority's sewerage system, *expressed per 1000 sewerage connections to that sewerage system.*

Performance measure 2 (discharge compliance)

Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of:

e) abatement notices
f) infringement notices
g) enforcement orders, and
h) convictions,

received by the territorial authority in relation those resource consents.

Performance measure 3 (fault response times)

Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured:

(c) *attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, and*

(d) *resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.*

Performance measure 4 (customer satisfaction)

The total number of complaints received by the territorial authority about any of the following:

(e) *sewage odour*

(f) *sewerage system faults*

(g) *sewerage system blockages, and*

(h) *the territorial authority's response to issues with its sewerage system, expressed per 1000 connections to the territorial authority's sewerage system.*

5.6.4 AFFORDABILITY AND WILLINGNESS TO PAY

Hand in hand with the current LOS vs. Desired LOS is the issue of cost. This needs to be addressed at two levels:

(a) Cost for different Levels of Service options within the Foul Sewer Activity

(b) Cost of the Foul Sewer activity within the total Council programme.

The first level can be addressed using the options outlined above where fully described and costed service level options are consulted with the community.

The second level needs to be addressed as an assessment of the relative contribution the Foul Sewer Activity makes towards the achievements of Community Outcomes at the current level vs. greater or lesser levels of service.

6. FUTURE DEMAND

6.1 DEMAND DRIVERS

The significant future demands affecting foul sewer infrastructural services in Mackenzie District to be considered are:

➔ **Growth Trends –** Trends in population growth or decline give a good indication of future growth and in turn demand on the network.

➔ **Economic Changes** – Changes in land use, industry, economic climate and tourism can all affect the demand on the Foul Sewer asset.

➔ **Improvements to Levels of Service** - Continual demand for improvements in the levels of service. This can result from:
- Advances in available technology
- A greater understanding of customers' perceptions and expectations
- A higher level of public conscientiousness
- Changing legislative requirements
- Government organisations setting higher standards

6.2 DEMAND FORECASTS

6.2.1 GROWTH TRENDS

6.2.1.1 Population Projections

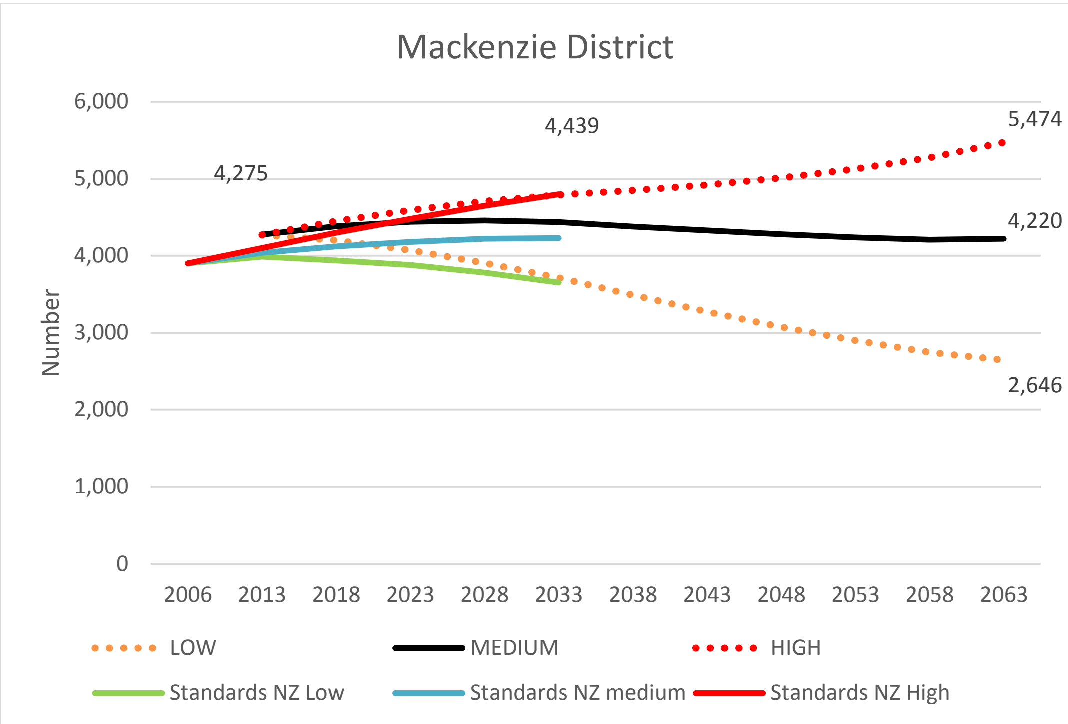
The Mackenzie District has seen an increase in population of 9.3% since 2006, this is a significant change from the 2001-2006 period where the population grew by a modest 2.3%

As we cannot predict the future population level and when it will occur, it will be inappropriate to extrapolate this trend to a 20 – 25 year horizon.

The projected population trends (2013) from a collaborative study completed for the three South Canterbury Councils is demonstrated in Figure 6.1. This shows that a medium population projection indicates that the population will remain stable. As, we have identified, the Mackenzie District has had a 9.3% increase in normal resident population, therefore are tracking slightly above the medium growth projection, however, the results are slightly skewed due to the longer period between census surveys.

Consequently the following graph predicts a relatively static population growth over the period of this asset management plan. As a result there will not be any significant increase or decrease in demand for Council services based on change in population.

Figure 5.1 Estimated and projected population (Statistics NZ)



6.2.1.2 Development

Analysis of the future urban and rural residential subdivision over the next 4 years shows an average of 10 sections per year, along with associated infrastructure, to be vested in Tekapo and an average of 46 per year in Twizel.

During the 2015/17, 2355m of Foul Sewer network, including sumps and manholes, will be vested in Council. Whilst developers have to construct this to Councils standard before vesting the ongoing maintenance and depreciation costs have to be allowed for.

It is assumed that this level of development will slow down to about a third of this but continue at that rate for the duration of this strategy.

6.2.2 ECONOMIC CHANGES

The economy of the District is built on tourism, farming and hydroelectric development.

The District is fortunate in having Lake Tekapo and Aoraki Mount Cook, the international tourist icons, within its boundaries. They provide an excellent platform from which to develop the tourism potential of the District.

Land use intensification, due in part to increased irrigation, such as dairying, cropping, horticulture and forestry are becoming increasingly common and offer considerable scope to grow the local economy.

Change in land use is ongoing and something that is hard to predict. The following factors influence those land use changes.

- Tourism
  - Mt John Tourism along with the Night Sky Reserve are putting increasing pressure on Godley Peaks Rd as people want to travel to the top of Mt John.
  - Lake Alexandrina. Having been to the top of Mt John and observed the lake the tourist wants to visit these scenic attractions. Challenge here is keeping them on the “right” side of the road, along with the associated wear of the sealed and un-sealed pavements.
  - Haldon Camp. This is on the shore of Lake Benmore and puts high summer traffic on Haldon Road.
  - Ski Fields. As these open the traffic on the feeder roads can increase by 1200%
  - Alp2O cycle trail. This new attraction is starting to put increased demands on Mt Cook Station Road and Hayman Road creates conflict with other road users especially the logging operations.
- Tenure Review
  - There are a number of High Country Stations still to go through tenure review. Historically this has involved part of the station passing into the public estate and being opened up for access. There is a higher expectation from the Department of Conservation and other road users for better access to be made available with no extra funding from either NZTA or DoC. Staff are working with DoC to try to minimise this effect so significant allowance has been made for this.
- Land Use Intensification
  - Godley Peaks Station – New water take consent obtained and it is projected to significantly add to the 30,000 lambs that come off the property and the 1500 tonnes super applied to the property last year. 250 HCV movements on and off the property, all towed through the Cass River by a dozer.
  - Dairy Conversions
  - Mt Cook Station 50yr forestry programme
  - Primary Produce increase as the result of increased irrigation

Due the difficulty in predicting where this demand might be over the next 30 years, it is important to recognise that it will happen and plan for it as early as the knowledge and effects become better understood.

6.2.2.1 Tourism

Local Government and the Tourism Strategy

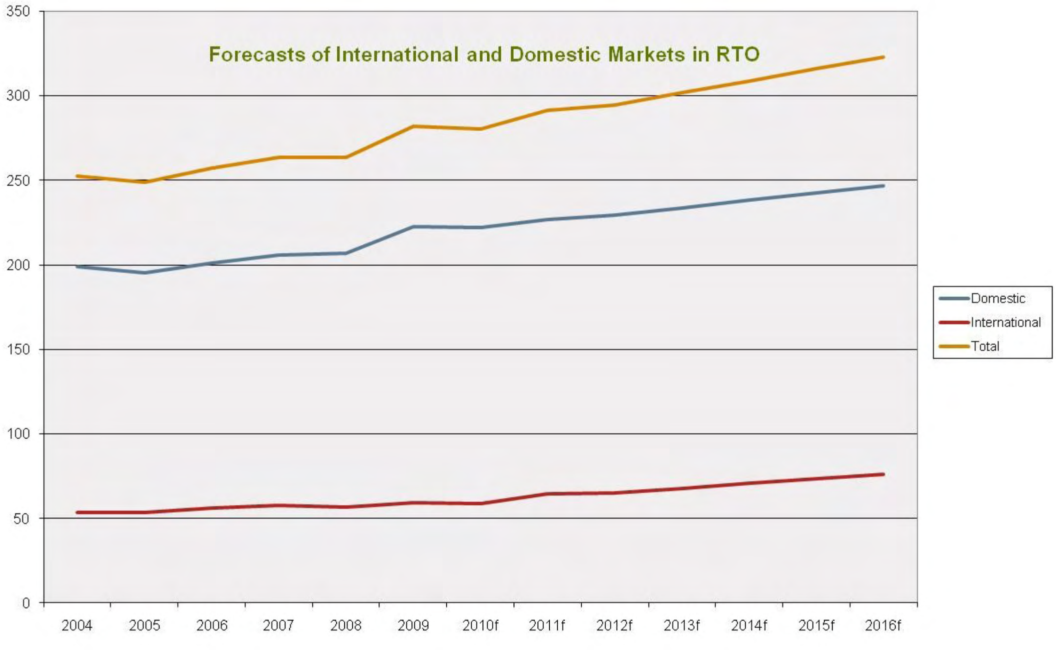
Outcome Four of the New Zealand Tourism Strategy 2015 New Zealand Tourism Strategy 2015 is, "The Tourism Sector and Communities to Work Together for Mutual Benefit". The Strategy states that the role of local government is to provide:

- Infrastructure and facilities, such as roads, water, waste management, lighting, and, in some areas, public transport. Many local authorities also operate attractions such as museums, art galleries, gardens, sports venues, and events for the enjoyment of both locals and visitors
- Visitor information and marketing services through the i-SITE network, signs and the Regional Tourism Organisations
- Planning support for the tourism sector, including regional tourism strategies, destination-management plans, Long Term Plans and District Plans.

Tourism makes up a large component of transportation demand within the district. The Ministry of Tourism states that total visits by travellers to Mackenzie RTO (Mackenzie District) are forecast to rise from 960,377 in 2009 to 1,075,079 in 2016 - an increase of 11.9% or 1.6% per annum. Growth is shown in Figure 6.2.

The influx of domestic holiday-makers into the district, particularly the Mackenzie Basin, has little impact on the Foul Sewer network. As development occurs, the developers are required to develop their own Foul Sewer system to connect into the Council system. They are also required to confirm that the existing network can cope with the increased effluent from the proposed subdivision.

Figure 6.2 – Forecast Tourism for Mackenzie District (Ministry of Tourism)



6.2.2.2 Changes in Land Use, Practices and Resource Use

Rural change can take several different dimensions, which might include:

- Land cover (e.g. grass, indigenous vegetation)
- Land use (e.g. development)

The change in land use will not adversely affect the districts Foul Sewerage systems

In Twizel, change in land use around the oxidation pond could affect their continued use. There is a no build zone of 150m for rural residential building around the oxidation ponds and 50m adjacent to the disposal trench. The proposed consolidation of the discharge from the oxidation pond will see the trench de-commissioned, a 150m buffer around the ponds purchased by Council and a further 150m no build zone established.

6.2.3 IMPROVEMENTS TO LEVELS OF SERVICE

6.2.3.1 Changes in Customer Expectations

In recent years there has been an increasing awareness on the part of owners with respect to Foul Sewer issues. It is anticipated that the following issues will become an increasing priority for Council in determining design and operational standards.

- Extended areas being desiring to be connected to reticulated sewerage systems
- Improved response times

6.2.3.2 Changing Level of Service Demands

The intended Levels of Service defined in Section 3 are considered to be representative of the service demands of the current and the future community. With rate of growth in the rating base reducing, the following factors may need to be considered:

- reduction in maintenance of some facilities that have little impact on the overall service delivery (if possible)

6.2.3.3 Policy or Management Changes

Changes to Foul Sewer policies may be driven from a number of directions. They could be internally driven (e.g. Development Impact Levy policies) or externally driven (e.g. changes driven by regional or national organisations like Environment Canterbury). Monitoring and being aware of possible implications of these changes enables the impacts of such changes to be anticipated and predicted. While there is no certainty, it is important to consider them when developing asset management risk forecasts and strategies.

National Infrastructure Plan 2011

The second National Infrastructure Plan was released on Monday 4 July 2011. The Plan outlines the government's 20 year vision for New Zealand's infrastructure:
By 2030, New Zealand's infrastructure is resilient, coordinated and contributes to economic growth and increased quality of life.
It also outlines a 3 year programme of work to progress this vision.
The overall purpose of this Plan is to improve investment certainty for businesses by increasing confidence in current and future infrastructure provision.

Three-Year Action Plan

Government is committing to the following actions to give effect to the vision and principles and to move towards the next edition of the Plan in 2014.

Transport

Ensuring a stable regulatory environment. Supporting growth in Auckland. Improving the overall effectiveness and efficiency of the network.

Telecommunications

Public and private sector take up UFB infrastructure. Greater efficiency in telecommunications networks.

Energy

Further develop and improve the electricity regulatory regime. Improve the information base available to support further investments in petroleum and minerals sectors.

Water

Better demand management practices and consistent performance criteria for water infrastructure. Promote partnerships and activities within the sector. Ensure that management of water assets contributes to improved social, economic, environmental and cultural wellbeing of communities.

Social

Alternative approaches to the funding delivery and management of assets and associated services. Improved spatial consideration of social infrastructure to support growing communities. Greater use of shared services by local government.

Strategic Opportunities

The following is a snapshot of the strategic opportunities that will help achieve vision and goals that have been identified in each sector.

1. Central government will commit to developing and publishing a ten year Capital Intentions Plan for infrastructure development to match the planning timeframe required of local government.
2. Increase understanding of and encourage debate on the use of demand management and pricing in infrastructure sectors.
3. Improve access to information on current infrastructure performance to create certainty about when, where and how infrastructure development is occurring, including consideration of whole of life costs.

4. Develop performance indicators for each sector on the stock, state and performance of central and local government infrastructure assets as well as those managed by the private sector.
5. Work with regions to develop more strategic infrastructure planning at a macro-regional level. Consider where adoption of spatial planning would produce optimum outcomes, particularly in metropolitan areas.
6. Improve scenario modelling to more accurately project likely infrastructure investment requirements from the short to very long term.
7. Use lessons from Christchurch to significantly enhance the resilience of our infrastructure network. This may include developing improved seismic design standards, reviewing organisation culture to improve performance in emergencies and identifying ways to quickly return services to full operational capacity.
8. Explore alternative sources of funding, and implement funding tools that can be used to manage the current portfolio more effectively.

Financial Contributions

Financial Contributions are another means of funding network infrastructure, reserves or community infrastructure. Mackenzie District Council has prepared a 'Financial Contribution Policy'. The contribution policy includes a methodology for calculating the equity in the existing specific infrastructure network including Foul Sewer. This ensures that the Developer pays their fair share of that network, installed previously, that allows the development to connect to that service and proceed to completion.

The policy uses the following formula to calculate the level of contribution:

ASSET VALUATION – DEBT LOADING / THE NUMBER OF CONNECTABLE PROPERTIES TO THE SCHEME.

For 2015/16, the financial contribution payable on each lot created at the time of subdivision is calculated at $3706. This amount is GST exclusive.

The financial contribution figures are reviewed annually.

Environment Canterbury's Land and Water Regional Plan

Environment Canterbury's Land & Water Regional Plan provides the regulatory framework to implement the community's aspirations for water management under the Canterbury Water Management Strategy. It addresses competing demands for land and water resources in both rural and urban Canterbury in a sustainable manner.

It also provides the regulatory framework around a number of other environmental and development matters required to be managed by Council.

- The objectives of the plan identify the outcomes that are to be met with regards to management of these resources. These outcomes will be achieved over varying timeframes.

- The policies (which direct how activities are to be managed to achieve these outcomes) give effect to the objectives.
- The rules are the tools used to implement these policies.

6.3 DEMAND IMPACTS ON ASSETS

Overall implications for the network of continual demand for improvement in levels of service tied to an effectively static population are:

- An increasing level of treatment and disposal caused by outside agencies requirements.
- An increasing focus environmental controls/requirements
- An increased level of expenditure to attain those desired controls/requirements
- A static ratepayer base to fund Mackenzie District Council's contribution to the separate community based foul sewer budget

6.4 DEMAND MANAGEMENT PLAN

There are two recognised components to a demand management strategy:

6.4.1 ASSET BASED DEMAND MANAGEMENT

Asset Based demand management on the system really can only be focused on removing stormwater or ground water infiltration.

In Fairlie there are private drains that require repair to correct the infiltration of groundwater when the water table is high. These will be identified as part of an ongoing monitoring programme and owners will be asked to repair the offending drains.

In Tekapo we are aware of stormwater infiltration into the pipe network caused most likely by roof water being plumbed into the on property sewer pipework. Council has begun a programme (2012) to identify those offending properties and have their stormwater redirected to the appropriate location.

There are minimal asset based demand options that do not have a significant cost attached.

6.4.2 NON-ASSET BASED DEMAND MANAGEMENT

There are few options to affect reduced demand on the sewerage network that are not asset based. Loading on oxidation ponds can be reduced by requiring more on property treatment, in particular for high BoD loading industries.

6.5 UPCOMING ISSUES IN THE NEXT TEN YEARS

Fairlie

It is intended to install Scada telemetry in 2018-19 at a cost of $15,000. Also the resource consent for the discharge from the oxidation ponds expires in 2038. $50,000 has been allowed for consent renewal in 2036/37.

The Fairlie oxidation ponds require regular monitoring of sludge level build up and eventually will require sludge removal. $2,000 has been allowed in 2020 to repeat the sludge depth survey and $150,000 for de-sludging the Primary pond in 2025 if required.

There are 7,100 metres of earthenware pipe in Fairlie. These were originally condition rated in 2000 as 4 and 5.

It is intended to re-evaluate these sewer mains over the next three years and then develop a replacement programme from that re-inspection. $99,000 has been allowed over the period 2015-18 for the re-inspection. If the CCTV inspection confirms the results of earlier inspections with further deterioration, then the whole 7,100m will have to be replaced. In anticipation of that result, we have allowed for a replacement programme starting in 2017/18 with completion by 2027. Approximately 1200m to be replaced or rehabilitated every second year at a rate of $255,000 starting in 2017/18. Deterioration can take the form of cracked pipes leading to effluent leakage into the surrounding ground or ground water intrusion which puts excessive pressure on the disposal system and less effective treatment.

Replacement options include dig and relay with new pipe or in-situ refurbishment using relining techniques or pipe bursting.

Tekapo

There are 1,600 metres of earthenware pipe in Tekapo. These were originally condition rated in 2000 as 3.
It is intended to re-evaluate these sewer mains over the next two years and then develop a replacement programme from that re-inspection. $23,000 has been allowed over the period 2015-17 for that re-inspection. If the CCTV inspection confirms the results of earlier inspections with further deterioration, then the 1,600m of sewer main will be programmed for replacement or refurbishment.

If there is significant deterioration then replacement will need to be scheduled for 2031-35 and $408,000 has been allowed in that period. Deterioration can take the form of cracked pipes leading to effluent leakage into the surrounding ground or ground water intrusion which puts excessive pressure on the disposal system and less effective treatment.

Replacement options include dig and relay with new pipe or in-situ refurbishment using relining techniques or pipe bursting.

The most pressing issue facing Tekapo is the disposal system. At the moment the disposal is generally adequate for the demand but during winter freezing periods we are having some problems. Environment Canterbury has indicated their dissatisfaction and has issued a notice of non-compliance with our discharge consent as a consequence. Also, as demand increases in Tekapo the volume of effluent to be disposed of will also increase. We intend to review all of our disposal options in early 2015/16 with construction of a new system in later in that financial year.

There are alternative sites on Council owned land in the area where we can dispose of the effluent, but these have not been used in the past as they require pumping to a higher elevation and discharging on a face above the Oxidation Ponds. A total cost of $100,000 has been allowed for the investigation, design and installation of an alternative disposal system.

The existing aerators are programmed for replacement in 2020/21 at an estimated price of $124,000.

Twizel

Network Modelling: Twizel continues to show steady growth in holiday homes and in order to understand the total demand staff suggest that the network should be modelled to be able to predict when pipes needed to be upsized or aeration installed at the oxidation ponds to improve treatment. It can also be used to predict when the rising main (mentioned later) has to be replaced.

Asbestos Cement (AC) pipe: The Twizel sewer network was constructed in the 1970s using the Asbestos Cement (AC) pipe. A Pipe is composed of approximately 10-15% asbestos fibres in a matrix of ordinary Portland cement and finely ground silica. The process of making pipes was refined between 1906 and 1913 In Italy. In service these pipes have shown to deteriorate both from the inside, due to normal service, and the outside due to aggressive soil and ground water conditions.

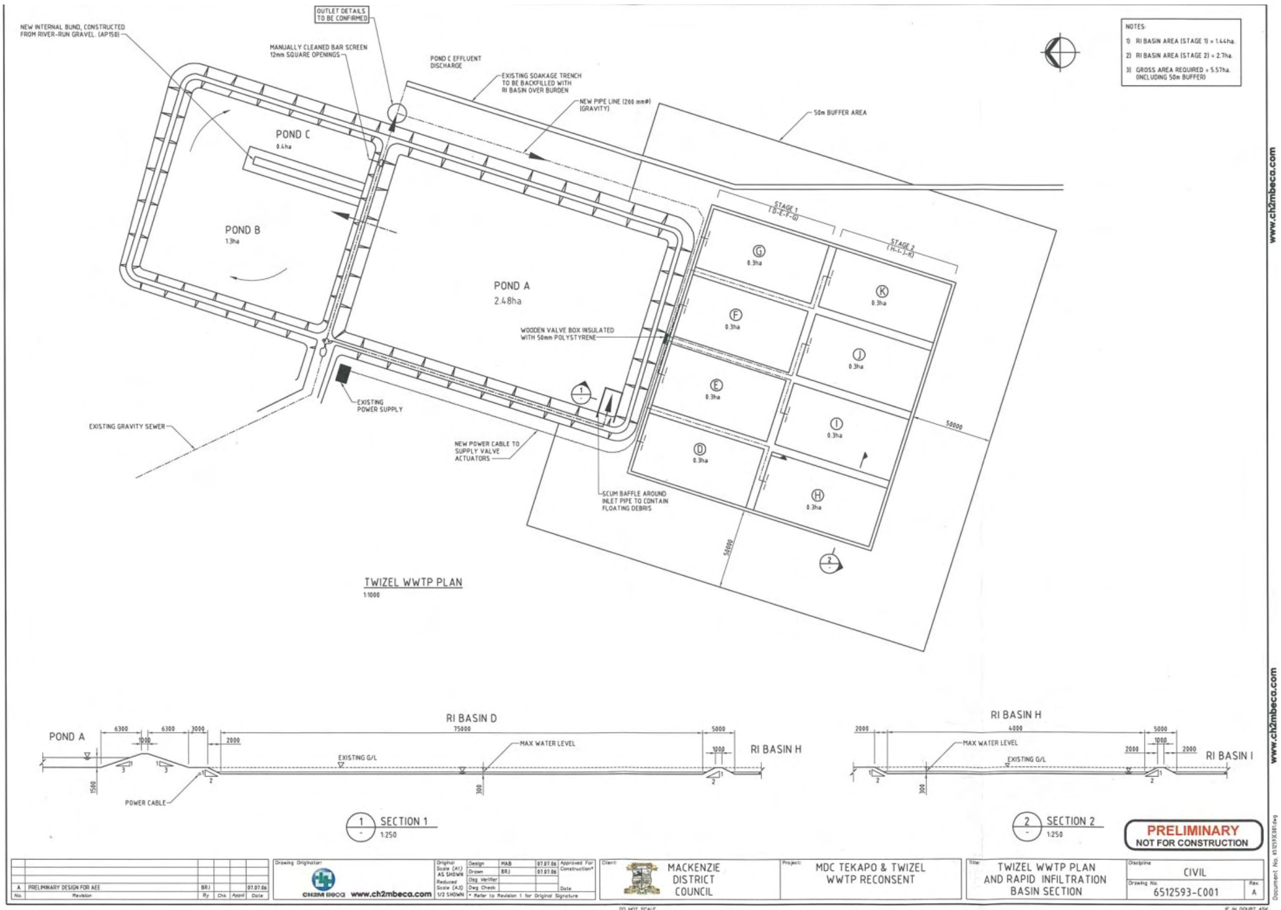
In Twizel there are no aggressive soils or groundwater surrounding the AC pipes so the deterioration is only from the inside. Nationally studies have shown that the deterioration model is very irregular throughout the networks where AC pipe is used so it is necessary to have a programme of sampling to get a better understanding when these pipes will have to be replaced and by default adjust the depreciation charged accordingly.

There is 21354m of AC pipe in the Twizel sewer network and the current replacement cost (2010) of $4.2m. Due to known performance of the AC pipe the base life of the pipe has been set at 80 years leaving a remaining life of 40 years. This figure is based on knowledge to date but further work should be done on a specific deterioration model for the gravity sewers in Twizel to more accurately predict the replacement date.

Disposal Consolidation and Retirement of Disposal Trench: Effluent from the Oxidation Ponds in Twizel currently discharges to ground via a 1700m long disposal trench that meanders across private property. The trench has been in existence for many years and performed well during that time.

The plan is to consolidate the disposal to ground by a series of sparge pipes just to the south of the ponds. As part of the agreement with the land owner to acquire necessary land. This project has been accelerated and is planned for completion by 2017.

This will require a land subdivision, land purchase, new resource consent and construction of the physical works along with the de-commissioning of the existing disposal trench. The budget for this work is $750,000.



Key to protecting the Twizel Oxidation Ponds for the future is acquiring the land required and also the access easements for power and the proposed rising main.

Rising Main: The sewerage network from the new subdivisions to the south of Twizel were not able to be gravity fed to the existing network and as such discharge to a new pump station on Batcher Road. Due to the low initial flows from this pump station, a rising main was constructed from it to the existing network on Ostler Road where the pumped effluent discharges. At some stage in the future, growth in the area will overload the 100mm rising main and a new main will have to be constructed directly to the oxidation ponds. Budget has been provisionally allowed for this work in the year 2018/19. The timing of construction of this new main is dependent on actual building constructed and occupied in the area served. It may be accelerated from the 2018/19 year but could equally be delayed.

Burkes Pass

There are no issues facing Burkes Pass sewerage network in the next ten years other than the installation of SCADA telemetry monitoring.

6.6 FUTURE IMPROVEMENTS

In order to have a more accurate idea of the impacts of demand on the network and managing any growth, Council should consider the following:

Foul Sewer Network Modelling
Modelling the existing Foul Sewer network would provide definitive information on the ability of the existing network to cope with increased development at the top end of the pipe networks. There are no immediate plans to complete this but Twizel is the highest priority.

Asbestos Cement Deterioration Modelling
Modelling the Asbestos Cement pipework deterioration for Foul Sewer network would provide definitive information on the replacement timeframes and therefore the amount of depreciation to be funded on these schemes.

Customer Demand Changes
Complete a Customer Survey, including local industry, to establish any changes in customer expectations as they relate to demand on the network.

7. RISK MANAGEMENT

7.1 INTRODUCTION

The following outlines a suggested risk management procedure for the MDC infrastructure networks. The procedure establishes the basic parameters within which risks must be managed and sets the scope for the risk management process.

The risk management process proposed is based on the Guidelines in AS/NZS 4360:2004, "Risk Management" and SNZ HB 4360:2000 New Zealand Handbook "Risk Management for Local Government" that defines the risk management process as:

> ***"The systematic application of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or Plans or from complying with its legal obligations".***

These plans may include the Long Term Plan, Activity Management Plan, Annual Plan, Financial Strategies, corporate plans and policy documents.

It is important for Council and it's stakeholders to understand and appreciate that the risk management structure for the any asset management system will inevitably be different from that which is appropriate for capital works projects, and will be greatly influenced by the structure of existing asset management systems. With capital projects, risk management systems are very much focussed on the early identification of live or emerging risks and then developing treatments or strategies to minimize or mitigate their negative effects.

Because the capital project has a beginning and an end, the identification of these risks is a dynamic process that must focus on actively managing known risks, and also expending resources on identifying those risks that were unanticipated. In the capital project, one would expect a significant number of unanticipated events that may affect the completion date or the financial performance of the project, but the majority of these risks then decline to zero as the project nears completion.

In contrast, asset management and network operations are ongoing activities that have been functionally providing expected results to Council for many years. Within this environment, the risk management practitioner is likely to find fewer emerging risks, particularly because existing systems have been established to minimize their occurrence.

Managing infrastructural assets and network operations as a management activity has evolved as it has matured as an industry and the modus operandi has been structured over time to minimize the risk of unexpected events. In many cases these existing controls were likely implemented with risk being one of several motivators for the control. In most cases, these controls will materialise as a set of policies, procedures, and detailed systems that manage some of the network risks in more detail. One tenet within "Risk Management" is "once the risk actually occurs, it ceases to be risk management, and becomes incident management". While incidents continue to occur, in the asset management case, many of these incidents will have occurred early in the industry's history. Policy, procedure and micromanagement have therefore already been developed to minimize their frequency and consequences.

From the asset manager's perspective, the existing system for managing risk to a standard level will be reliant on a defined level of funding, and further investment and effort will be required to allow for an increase in the level of control of existing risk exposure.

The risk management system requires a reporting function that informs management personnel, who are likely to be outside the day-to-day activities of asset management, of the impact their existing decisions have on their risk exposure, along with the effective communication of emerging risks that may be exceptional. This reporting function should be composed of both a standardised format at a defined frequency in addition to an exceptional reporting mechanism that will occur at a higher frequency as the need arises. It is through this reporting mechanism that Council can be:

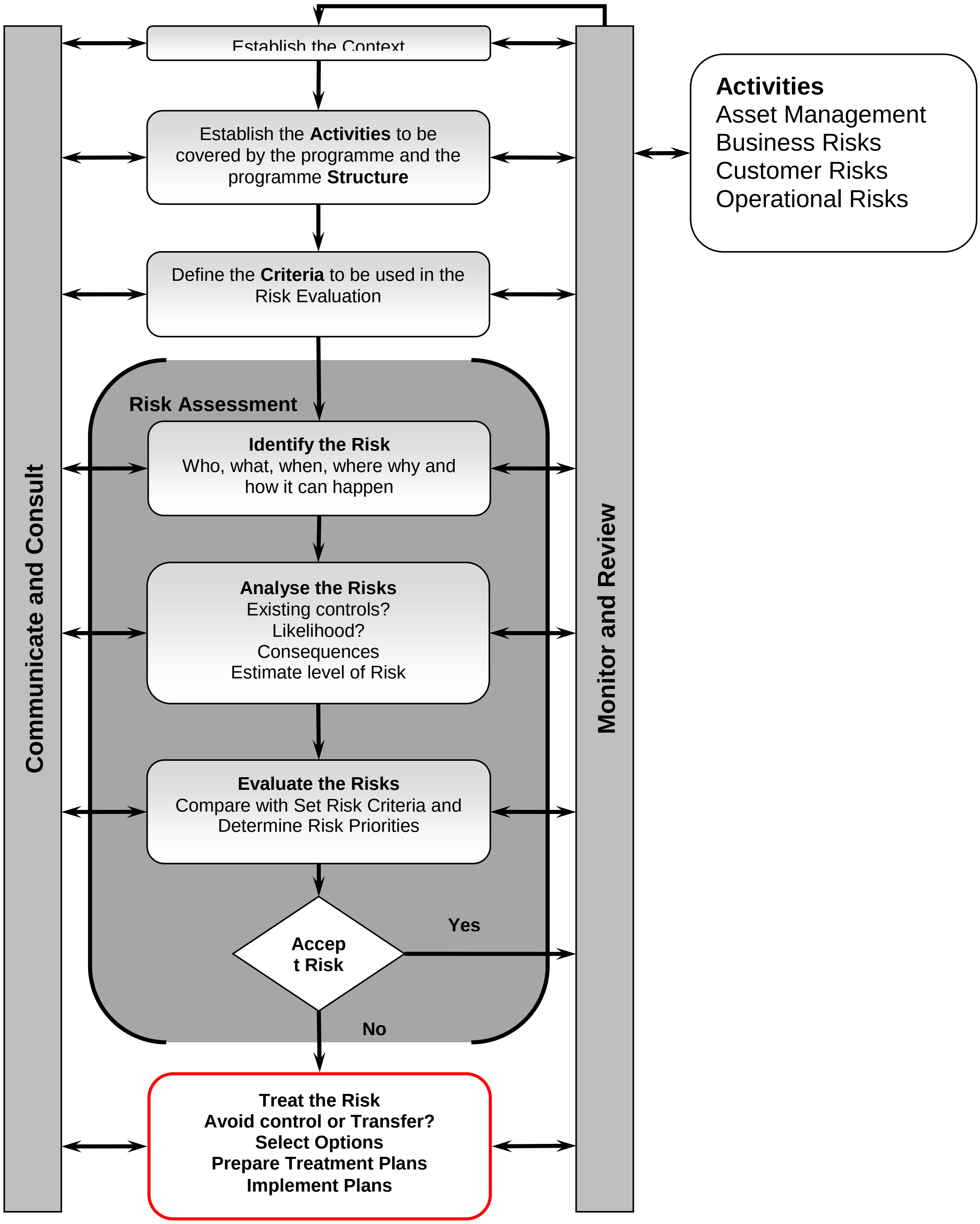
- Informed of current risk levels given the existing funding regime
- Appraised of emerging risks that may require immediate or exceptional attention and resources

This information will assist Council personnel to assess where risk reduction efforts should be focussed based on their corporate accepted risk level. The reporting mechanism will also allow the asset management teams the opportunity to provide alternatives to decrease the current risk levels based on Council's priorities and assist with the development of preferred strategies which can be effectively implemented at the functional level.

Assessment of risks is initially based on a qualitative analysis. More sophisticated analysis or quantitative risk analysis may be carried out as part of the risk treatment plan for specific high risk events.

The overall risk management process is illustrated in Figure 7.1.

Figure 7.1 – Risk Management Process



7.2 THE RISK MANAGEMENT PROCESS

7.2.1 UNDERSTANDING THE CONTEXT

As for the levels of service, the context for the application and development of risk must be set to ensure that risk development is not completed in isolation, as the identification analysis and treatment of risk will impact at all levels in the management of the asset; from community outcomes through to service level delivery, strategic goals and operational delivery.

Context refers to strategic context, organisational context and risk management context.

7.2.1.1 Strategic Context

This AMP for Sewerage sets out the strategic context as it relates to risk management. It outlines the relationship to identified community outcomes, activity goals, strategic result and strategic action. Further the plan sets out the relationship to other plans, legal requirements, financial strategies, regulatory and policy obligations of this infrastructural activity.

7.2.1.2 Organisational Context

The organisational context is approached through the identified activities of managing the asset, as the activity identifies the risk associated with staffing, the elected representatives and work areas, location and IT systems.

7.2.1.3 Risk Management Context

The risk management context refers to the risk-related activities undertaken within the activity. The remainder of this section sets out the risk management context in terms of risk management activities, likelihood scale, and consequence scale. A risk assessment matrix and risk register are introduced, as are the required analysis and format for a risk treatment plan.

7.2.2 ESTABLISHING THE ACTIVITIES

Table 6.1 sets the areas of activity associated with the MDC foul sewer activity. Under each heading is a process that might occur within these activities (not an exhaustive list). These processes have associated with them a number of risks. By setting the activity and their associated processes the development of the risk register and all associated risks can be considered and analysed and related to the AMP for Foul Sewer.

Table 6.1 – Risk Management Activities

Foul Sewer Risk Management Activities				
	Asset Management	**Business**	**Customer Services**	**Operational**
Processes	Forward Planning	Funding Provision	Public Request Management	Routine Maintenance
Processes	Council Maintenance Programme	Governance	Managing Response Times	Planned Maintenance
Processes	Information Management	Legislation Compliance	Customer Expectation - Raise/Reduce	Routine Network Maintenance

Foul Sewer Risk Management Activities				
	Asset Management	Business	Customer Services	Operational
	Standards and Guidelines	Policy Development	Level of Service change	Planned Maintenance - Unsealed
	Demand Change	Service Provision Purchasing	Customer not understanding service levels	Routine Corridor and Safety Maintenance
	Data Storage	Employment	Customer Consultation	Capital/Renewal Physical Works (QA, Management, Timeliness)
	Information Systems	Financial Reporting /Management		Routine Inspections - (Contractor/Consulta nt/ Asset Owner)
	Consultant	Political – Elected Representative		Contract Administration
	Contractor	Council Staff		Drainage Maintenance

7.2.2.1 Relationship of Risk

The relation of risk in the AMP is achieved through the risk management activities. The activities relate to the plan in the following way:

Table 6.2 – Relating Risk to Foul Sewer Activity Plan Sections

Risk Management Activity	Plan Section
Activity Management	Life Cycle Management, Future Demand, Level of Services, Asset Management Practice
Business	Financial Summary, Level of Service, Asset Management Practice, Plan Improvement and Monitoring
Customer Services	Levels of Service, Life Cycle Management, Plan Improvement and Monitoring
Operational	Life Cycle Management, Asset Management Practice

Risks apply across all processes in the management of the asset. The risk register holds the identified risk and which activity the risk impacts on.

The outcome of the process, illustrated in Figure 6.1, will be development and on-going maintenance of a Foul Sewer Risk Register. This register will contain a prioritised list of all of the identified risk within each of the above four Risk Management Activity areas.

7.2.3 RISK CRITERIA

Criteria are used to evaluate the level of risk. They may be measured by key performance indicators. Risk is a function of consequence and probability/likelihood of an adverse event. Risk management procedures set out in AS/NZS 4360:2004 provide a general frame work for different organisations and activities. The following tables suggest criteria for the MDC sewer network.

7.2.3.1 Likelihood (L) Scale

Likelihood Scale applicable for foul sewer activities are based on frequency or return period, rather than an absolute probability. These are set out in Table 6.3 below.

Frequency and probability of occurrence in 10 years are indicative only. Values are rounded off where appropriate to avoid giving a greater impression of accuracy than is justified by the qualitative analysis that is undertaken. The prime objective of this process is to determine a set of applicable likelihood criteria which are also reasonable within the context of managing the foul sewer network.

Table 6.3 – Likelihood Scale

Likelihood Scale (L)				
Level	**Descriptor**	**Description**	**Indicative Frequency**	**Probability of at least one occurrence in 10 years**
A	Probable	The threat is expected to occur frequently	> 1 year	>99.9%
B	Common	The threat will occur commonly	1 to 5 years	90% to 99.9%
C	Possible	The threat occurs occasionally	5 to 10 years	65% to 90%
D	Unlikely	The threat could occur infrequently	10 to 50 years	20% to 65%
E	Rare	The threat may occur in exceptional circumstances	>50 years	<20%

7.2.3.2 Consequence (C) Scale

The scale of consequence is focused around a quantitative approach and includes categories of health and safety, image/reputation, annual costs, obligations, network condition and serviceability.

The following provides explanatory notes for each consequence type:

- **Health and Safety**: Self explanatory
- **Image Reputation**: Self explanatory
- **Environment**: The possible impact on the environment from an event taking place
- **Annual cost**: The risk assessment for annual cost is the whole cost of negative events, without considering the potential subsidies from Central Government for reducing the risk or dealing with the potential consequences. This is something that maybe taken into account at 'Treatment Plan' stage.

- **Obligation**: Relates to those issues of sound governance and includes the ability of the Council to meet identified Community Outcomes as stated in the LTP in relation to the LGA2002's four well beings
- **Network Condition**: Is the net reduction of the asset value in the case of an event occurring. This is a subjective measure and is used to indicate the unexpected loss of service potential in the asset.
- **Serviceability**: Relates to accessibility and the impact on accessibility from an event.

Where an event may impact upon more than one outcome area, then the one scored as having the highest level should be used for the risk rating calculation.

Table 6.4 – Consequence Scale

Level	Descriptor	Consequence Scale (C)						
		Health and Safety	Image / Reputation	Environment	Annual Cost	Obligations	Network Condition	Serviceability
I	**Severe**	Multiple fatalities	International media cover	Permanent widespread ecological damage	>$10M	Central government takeover	Net reduction to asset value > $10 million	Prolonged (> 1 Month) disruption to major facility or large area
II	**Major**	At least one fatality	Sustained national media cover	Heavy ecological damage	$1M to $10M	Government or independent commission of Inquiry	Net reduction to asset value $2 to $10 million	Temporary (5 Days – 1 Month) disruption to large area or prolonged disruption to smaller area
III	**Moderate**	Serious injury	Regional media cover or short term national cover	Significant, but recoverable, ecological damage	$100k to $1M	Abatement Notice, RMA prosecution, Audit tags	Net reduction to asset value $0.5 to $2 million	Temporary disruption to small area and significant reduction in Levels of Service. Detour > 10 km
IV	**Minor**	Minor Injury	Local media cover	Limited, medium term, ecological damage	$10k to $100k	Minor claims, excessive rate payer complaints.	Net reduction to asset value $100 to $500 thousand	Moderate reduction in Levels of Service. Significant traffic delay or short detour in place for < 1 day.
V	**Negligible**	Slight Injury	Brief local media cover	Short term damage	< $10k	Occasional rate payer complaints	Net reduction to asset value < $100,000	Minor traffic delay (< 2 hours)

7.2.3.3 Risk Rating

The risk ratings have been assigned 4 categories, based upon the actions required to mitigate the risk set out in Table 6.5. These actions are:

- For risks in the **Very High** category are considered intolerable and immediate action is required to reduce the likelihood or consequence to reduce the risk to a lower category. Risk treatment options may be required that are not justifiable on strictly economic grounds. Safety, legal and social responsibility requirements may override financial considerations. As a minimum there must be a specific risk treatment plan for each entry in the “very high risk” category.
- **High Risks** are undesirable, but may be accepted if they cannot be reduced or avoided. All reasonable measures should be undertaken to reduce these risks to as low a level as possible, regardless of cost, inconvenience or other factors. As a minimum there must be a specific risk treatment plan for each entry in the “high risk” category.
- Items in the **Medium Risk** category should be evaluated on a case by case basis. Action to reduce these risks will be undertaken only when the potential benefits of the risk treatment outweigh the expected costs. Normal project evaluation criteria can be used to asses potential risk treatment measures for medium risks.
- No action required for **Low Risks**, other that monitoring to ensure they do not progress into higher risks.

Table 6.5 – Risk Rating Categories

Rating	Description
Very High	**Intolerable. Urgent action required. Mitigation plan required for each risk**
High	**Take actions to reduce risk to as low as reasonable possible. Mitigation plan required for each risk.**
Medium	**Tolerable. Consider mitigation measures on case by case basis. Measures to reduce risk if justified.**
Low	Business as usual.

Table 6.6 summarises the outcome of the various likelihood x consequence (LxC) combinations producing a risk rating matrix. When the analysis of the risk is undertaken any item on the register that receives a rating of high or very high will require further work according to the rating outcome.

Table 6.6 – Risk Rating Matrix

Likelihood (L)		Consequence (C)				
		I	II	III	IV	V
		Severe	Major	Moderate	Minor	Negligible
A	Probable	Very High	Very High	High	High	Medium
B	Common	Very High	High	High	Medium	Medium
C	Possible	High	High	Medium	Medium	Low
D	Unlikely	High	Medium	Medium	Low	Low
E	Rare	Medium	Medium	Low	Low	Low

7.2.4 RISK ANALYSIS

The next steps in the risk management process are to develop a comprehensive list of risks (Identify the Risks), analyse the risks and to evaluate each one against the criteria defined above. The risks will be entered in a risk register, Appendix V, in the form shown on example table 6.7. Ideally, a risk should be identified in the following terms:

Table 6.7 – Example Risk Register

Ref	Name	Description	Existing controls	Likelihood (L)	Consequence (C)	Risk Rating (LxC)	Treatment option	Treatment cost

(Something happens) leading to a (negative outcome). The description should include additional information, such as:

- the source of the risk
- what are the existing controls or influences on the risk
- what (specifically) are the consequences
- is it dependent on other risks or conditions

The risk may trigger several categories of consequence, or if it has a range of probability/likelihood and consequence, it should be rated according to the combination that gives the highest risk rating.

Risks fall under the general headings of the Activities as outlined in table 5.1 “Risk Management Activities”:

- Asset Management (Ref A for example placed under “Management Activity” in the Risk register)
- Operational (Ref; O)
- Customer Services (Ref; C)
- Business (Ref; B)

The reference is then used to relate the identified risk to the Asset Management Plan for Foul Sewer.

An event leading to a negative outcome to Council's objectives is regarded as a **Threat.** However the process of risk analysis can also occasionally identify positive outcomes or **Opportunities**, and it is quite appropriate to use this register as a means of recording these in addition to the more common approach of only just considering the Threats.

The description should include additional information, such as: the source of the risk, what are the existing controls or influences on the risk, what **(specifically)** are the consequences, is it dependent on other risks or conditions.

Residual Risk

The Consequence and Likelihood values applied to derive Risk Rating on the register need to reflect the level of residual risk remaining after the Risk Treatment Plans have been developed and implemented and their effectiveness in mitigating or eliminating the initial level of risk has been assessed.

7.2.5 TREAT RISKS

A risk treatment plan should be created for all risks rated high or very high in the form shown in Figure 6.2, to document how the risk treatment options will be implemented.

Risk treatment options generally fall into the following categories:

- Avoid the risk by deciding not to start or continue with the activity that gives rise to the risk. This includes considering the possible risks within a project when a project is being considered
- Reduce the likelihood of the negative outcomes
- Reduce the consequences
- Sharing or transferring the risk with other organisations
- Retaining the risk, after all reasonable treatment measures have been considered.

Some risks may be rated high initially due to uncertainty in the likelihood or effects and the risk treatment plan may consist of further investigations or assessments to better define the level of risk. Other risk treatment options may consist of financial controls (e.g. insurance), operational improvements, contingency planning or physical works to reduce risks.

Figure 6.2 – Risk Treatment Plan

<table>
<tr><th colspan="4">Risk Treatment Plan</th></tr>
<tr><td colspan="3">Risk:</td><td>Ref:</td></tr>
<tr><td colspan="4">Summary</td></tr>
<tr><td colspan="4">Proposed actions</td></tr>
<tr><td colspan="4">Resource Requirements</td></tr>
<tr><td colspan="4">Responsibility</td></tr>
<tr><td colspan="4">Timing</td></tr>
<tr><td colspan="4">Reporting and Monitoring</td></tr>
<tr><td>Compiled By:</td><td>Date:</td><td>Reviewed By:</td><td>Date:</td></tr>
</table>

7.2.6 RISK TRANSFER

A fundamental concept in Risk Management is that the Risk Treatment activities should be the responsibility of, and carried out by, the party who is in the best position to manage them; which may be Council staff, Consultant(s), the Maintenance Contractor(s) or other third parties. To assist with this understanding, Council is encouraged to seek and evaluate as much information as possible on the spectrum of risk associated with all practical alternatives along with their associated costs.

Through this process of risk/cost trade off they will be able to then determine an appropriate balance of accepted risk and associated cost. In some situations the Council may feel that it is appropriate for them to carry a higher level of risk rather than bare a much higher level of expenditure that would otherwise be necessary to see the risk transferred to another party.

7.3 IDENTIFIED RISKS

7.3.1 CRITICAL RISKS

The most critical risks are:

- Identifying and agreeing the risk management context, i.e. consequence/likelihood frame work. Without this agreement the risk rating process may lead to an extensive number of high to very high risks requiring funding to mitigate or fix
- The changing legislative environment requirements
- Incomplete management and supervision of this activity due to limited staff resources

7.3.2 CONSIDERED RISKS

MDC Contract Procedures Manual

- The various contracts for the operation and maintenance of this activity require the contractors to provide Quality Plans for the execution of the contract requirements. The Quality Plans include procedures for work to be carried out. The risk is that the MDC and contractors procedures are not followed.

Health and Safety

- Council has a comprehensive Health and Safety Programme for its operations. Internally there is no risk in the implementation of this Programme.
- The various contractors involved in this activity have Health and Safety Programmes in operation. Reports are received from the contractors about any incidents relating to health and safety. Council's risk is that no inspection of work sites is undertaken by Council staff or their consultant to ensure that the requirements of the Council's and the contractors' Health and Safety Programmes are being carried out on site.

General Management Issues

- **Contract Observation** - The various contractors are not being observed sufficiently to ensure that all aspects of the contracts are being carried out or met.

- **Legislative Compliance -** Council staff practitioners supported by their experience and training, believe that all legislative requirements that impact on this activity are being complied with.

- **Resources -** The financial provisions shown in this Plan should be sufficient to provide the service required for this activity.

- **Service Agreements -** There are no specific service agreements in place between each department to ensure everyone is aware of their roles in this activity. However being a small Council with a small staffing level, interdepartmental discussion in relation to any facet of this activity is normal practice.

- **Council Policies Clear** - Council's policies are held in the Policy Manual. The activities for asset management policies were reviewed and approved by Council in December 2011.

Financial

- **Cost 'Overruns' -** Council staff manage expenditure by:
  - ordering work only if finance is available and approved
  - reviewing expenditure monthly
  - reporting exceptions

- **True Costs – Costs Not 'Manipulated' -** The financial forecasts that have been made in this Plan portray the true cost of this activity, given the assumptions made in making those forecasts.

7.4 INSURANCE

All above ground infrastructural assets are currently insured by Council. The below ground assets are not insured and Council is relying on its strong balance sheet to borrow sufficient funds to replace those assets in the unlikely event that there is widespread damage to those assets.

Council is not a member of LAPP, but have considered becoming a financial member but due to the Christchurch earthquake there is a significant buy in cost. Council is also concerned that another event like the Christchurch earthquake in another main centre would fully deplete the fund to the point there would not be enough funds available to repair our assets if they were damaged at the same time.

7.5 EMERGENCY MANAGEMENT

Operational Risks are those associated with the day to day operation of the District. The most prevalent of these are snow events followed by flooding and serious wind events. Initial response to all these events is managed through the Utilities Services Maintenance Contract, and is covered in our specifications. These specifications covers response times, liaison, notifications, plant and personnel requirements.

Council has held discussions on the "Life Lines" philosophy with the various groups that provide services within the district and is reviewing its "Disaster Resilience Summary". Council has participated in an Engineering Lifelines project, Earthquake Hazard Assessment, and the summary of the assessment is tabled below.

7.6 EARTHQUAKE DAMAGE ASSESMENT

Reference Report

The attached chart has been compiled for use with the Waimate, MacKenzie and North Waitaki

Districts Engineering Lifelines Project, Earthquake Hazard Assessment, Report to Environment Canterbury, May 2008, (Ecan Report no. U/08/18) prepared by Geotech Consulting Ltd. It should be read in conjunction with Sections 6, 7 and 8 of that report. Section 9 outlines three earthquake scenarios, and it is recommended that these also be read to provide a perspective on the chart contents.

Chart Zones

The chart has been set out for each of the three Ground Shaking Zones as shown in Figure 6.13 of the above report. Because of the large area of the Districts, and the range of expected earthquake shaking intensities for any single earthquake event, or on a probabilistic basis, indicative damage is shown for a range of shaking intensities for each zone. The damage is indicative only and a wide variation can be expected within each zone due to variations in subsurface conditions, geology, terrain and orientation of the site with respect to the earthquake source.

Chart Limitation

The Damage Assessment Chart is an indicative guide only. This table is derived from a similar chart originally prepared for the Christchurch Engineering Lifelines Study (Risks and Realities, 1997). It is based on damage reports from historical earthquakes in New Zealand and overseas. There is little information on damage ratios for structures or infrastructure other than buildings, (this particularly applies to in ground pipework) and the relative damage is necessarily somewhat subjective. The damage to structures should be read in conjunction with the description of damage in the Modified Mercalli Intensity Scale, Appendix C of the Report. It may be used for coarse screening of effects, but must not be used as the basis for any design. Any decision involving expenditure or engineering design requires a more detailed evaluation of the conditions pertaining at that particular site.

Liquefaction

The Damage Assessment Chart does not include reference to liquefaction. Areas of significant liquefaction hazard in the Districts are limited. The majority of the areas are underlain with alluvium are older Pleistocene surfaces. Both the relatively old age and the predominantly coarse grading of this gravel make widespread liquefaction very unlikely. Liquefaction is more likely to occur within the ground shaking Zone 3 areas. If liquefaction occurs, the damage outlined in the chart could be significantly greater. For an indication of the effect of liquefaction, refer to Table 2.2, page 28 of Risks and Realities, report of the Christchurch Engineering Lifelines Group, CAE, 1997.

RISK MANAGEMENT

A - Structures

IMPORTANT: Refer notes page 1

Zone	Shaking Intensity	Structures	Fixings designed for seismic loads	Equipment not fixed or fittings not designed for seismic loads
1	MM VI	Slight damage to Type I buildings	Little to no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable. Some settlement damage possible	Considerable damage, 30 - 40% failure	80% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse. Settlement damage probable.	Widespread damage 50 - 60% failure	90 - 100% failure
2	MM VI	Slight damage to Type I buildings	Little to no damage	Movement probable, 10% failure
	MM VII	Minor damage except for poorly constructed weak material Type I buildings	Minor damage	Movement expected, 30% failure
	MM VIII	Well designed structures serviceable, but with at least minor damage. Many non seismically designed structures damaged and unserviceable.	Considerable damage, 25% failure	70% failure
	MM IX	Damage and distortion to even modern, well designed structures, some may be unserviceable. Non seismically designed structures likely to be seriously damaged and poorly constructed weak material structures collapse.	Widespread damage 40% failure	90% failure
3	MM VI	As for Zone 2, with some small reduction in severity possible		
	MM VII			
	MM VIII			
	MM IX			

B - In Ground Pipework

IMPORTANT: Refer notes a e 1

Zone	Shaking Intensity	Welded Steel polyethylene	Moderately ductile pipes Concrete with rubber joints Steel and cast iron with rubber joints	Low strength/ low ductiliity pipes Earthenware with rubber joints Asbestos cement Cast iron with lead joints	Non-ductile pipes Ceramic with cement joints Brick
1	MM VI	Should be OK	Should be OK	Occasional mains damage and entry and junction failure	Minor mains damage 10% entries and junctions fail
	MM VII	Should be OK	some mains damage, 10% entries and junctions fail	Some mains damage, 25% of entries and junctions fail	Mains damage possible 40% entries and junctions fail
	MM VIII	Should be OK, minor damage and permanent distortion	mains damage, 30% entries and junctions fail	Mains damage probable 60% entries and junctions fail	Mains damage widespread
	MM IX	Distortion to mains, Damage possible at entry to structures and at junctions	Mains damage likely, 50% entries and junctions fail	Mains damage 80% entries and junctions fail	Major mains damage
2	MM VI	Should be OK	Should be OK	Occasional mains damage and entry and junction failure	Minor mains damage 5% entries and junctions fail
	MM VII	Should be OK	little mains damage, 5% entries and junctions fail	Little mains damage, 10% of entries and junctions fail	Mains damage possible 20% entries and junctions fail
	MM VIII	Should be OK, minor damage	Some mains damage, 15% entries and junctions fail	Mains damage likely 40% entries and junctions fail	Mains damage widespread
	MM IX	Damage possible at entry to structures and at junctions	Mains damage likely, 40% entries and junctions fail	Mains damage probable 60% entries and junctions fail	Mains damage
3	MM VI	As for Zone 2 but with 30% reduction in severity			
	MM VII				
	MM VIII				
	MM IX				

C - Transport

IMPORTANT: Refer notes øaae 1

Zone	Shaking Intensity	Roading	Railway	Bridge Structure	Bridge Abutments
1	MM VI	Little to no damage	Little to no damage	Refer section A - Structures	Little to no damage
	MM VII	Minor damage to kerbs and cracking of seal	Minor damage to alignment		Minor slumping
	MM VIII	Some damage to kerbs. Some distortion and cracking of seal.	Distortion of rail lines, some fissuring and spreading of embankments		Some slumping of abutment fill common
	MM IX	Widespread damage to kerbs, Distortion and cracking of seal, some ground fissuring. Permanent ground distortion and settlement.	Marked distortion of rail lines, both horizontal and vertical, significant embankment damage		Slumping of abutment fill at nearly all bridges, many of significant magnitude. Translational or rotational movement at some abutments.
2	MM VI	Little to no damage	Little to no damage		Little to no damage
	MM VII	Minor damage to kerbs and cracking of seal. Small slips on steep batters.	Minor damage to alignment		Minor slumping
	MM VIII	Some damage to kerbs. Some distortion and cracking of seal. Slips in batters	Distortion of rail lines, some spreading of embankments		Some slumping of abutment fill common
	MM IX	Damage to kerbs, distortion and cracking of seal, Landsliding in steep slopes and batters, cracking of ground	Distortion of rail lines, both horizontal and vertical, significant embankment damage		Slumping of abutment fill at most bridges, many of significant magnitude. Translational or rotational movement at some abutments.
3	MM VI	Little to no damage	Little to no damage		Little to no damage
	MM VII	Rockfall and small slips on steep batters.	Minor damage to alignment		Minor slumping
	MM VIII	Rockfall and slips in steep batters	Distortion of rail lines, some spreading of embankments		Some slumping of abutment fill common
	MM IX	Landsliding in steep slopes and batters, cracking of ground, large volume rockfall possible	Distortion of rail lines, both horizontal and vertical, significant embankment damage		Significant slumping of abutment fill at most bridges. Translational or rotational movement at some abutments.

7.7 FUTURE IMPROVEMENTS

Development of Risk Management
It is important to have input from a broad range of people and organisations so that the risk register is as comprehensive as possible. Often the greatest risks arise from events that were not anticipated or considered beforehand. Initially the risk register and assessment should be created in a workshop environment from a number of stake holders including Council staff and input from other stakeholders (e.g. contractors). Once the risks have been identified these should then be analysed in the consequence / likelihood frame work to assess the validity of the scales. If the risk outcome for all identified areas of risk is too great then the consequence and likelihood scales may need to be adjusted. At this stage a second review of the scales and reassessment of the identified risk can be completed.

After rating the risks and creating the risk register, Council will need to determine which parties are in the best position to carry out risk treatment planning for each of the high and very high risks, so that the appropriate actions may be taken.

Cross-Asset Risk Management Process
Risk Management procedures set out in AS/NZS 4360:2004 and SNZ HB 4360:2000 are generic for a wide range of activities and organisations. The Risk Management system proposed in this Activity Management Plan is based on the assessment of Council values and goals for its Foul Sewer network. Council will need to review the risk management process and provide feedback on the proposed risk rating criteria.

To ensure a robust and fair approach is taken with all of these assets, it is recommended that Council consider the development of a Cross-Asset Risk Management process in the future. This would then provide a greater level of assurance to Council that the prioritisation of the risks associated with its entire asset base, along the allocation of Council funds required to manage them, has been based upon an approach that is both rational and equitable.

On-Going Review
To ensure that emerging risks are identified and captured and that the Risk Treatment Plans are monitored for effectiveness over time, both the register and treatment plans must be reviewed on a regular basis by Council and other stake holders. The frequency for these reviews should be agreed and included in the Councils Operating Procedures.

Any significant additions or changes to the risk register will be noted as they occur through regular reporting procedures. It is recommended that the risk register should have a comprehensive update at each AMP review.

RISK MANAGEMENT

8. LIFECYCLE MANAGEMENT PLANS

8.1 LIFECYCLE MANAGEMENT – AN OVERVIEW

This section of the AMP outlines what is work planned to keep the assets operating at the current levels of service defined in Section 4 while optimising lifecycle costs. The overall objective of the Life Cycle Management Plan is:

> ***To maintain performance measures to ensure that the current strategies do not consume the asset leading to an unexpected increase in maintenance/renewal expenditure in the future.***

This lifecycle management plan covers the following:

➔ **Background Data** identifying where possible:

- Physical parameters of the assets as outlined in the description of the Foul Sewer asset included in Section 3
- Current capacity and performance of the asset relative to the levels of service defined in Section 5 and demand projections of Section 6
- Current condition of assets
- Asset valuations
- Historical data

➔ **Operations and Maintenance Plan**: This covers planning for on-going day to day operation and maintenance to keep assets serviceable and prevent premature deterioration or failure. This plan includes:

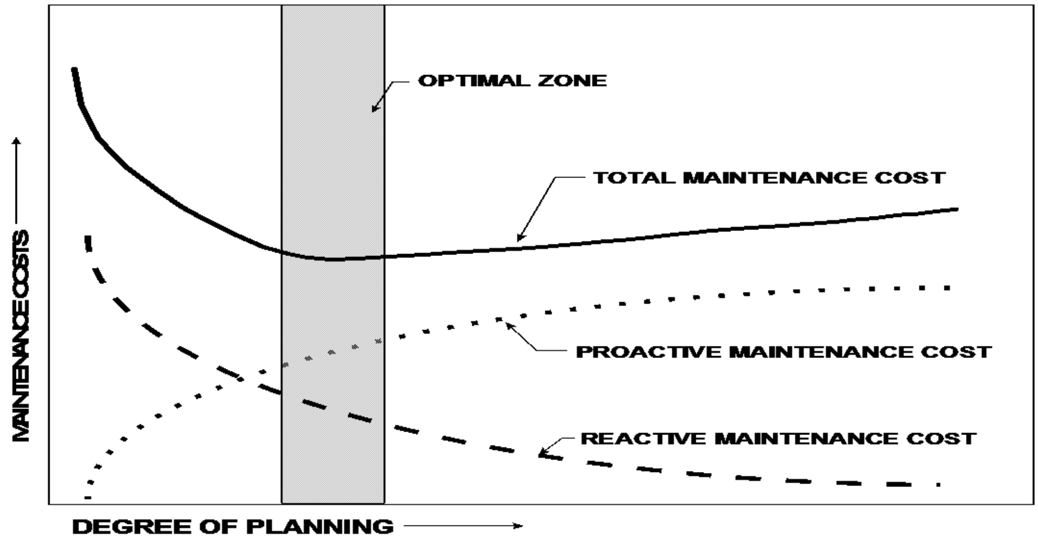
- Current trends and issues
- Maintenance decision making process
- Strategies required to meet levels of service
- How tasks are prioritised
- Summary of future costs
- Any deferred work and associated risks

Two categories of maintenance are carried out:

- Unplanned Maintenance: Reactive work carried out in response to reported problems or defects (e.g. clear blocked drains, respond to pump station alarms)
- Planned Maintenance: Proactive work carried out to a predetermined schedule (e.g. pipeline flushing, manhole inspections, pump station inspections and cleaning etc).

A key element of asset management planning is determining the most cost effective blend of planned and unplanned maintenance as illustrated in Figure 8.1.

Figure 8.1 – Balancing Proactive and Reactive Maintenance



➔ **Renewal/Replacement Plan**: This covers Major work which restores an existing asset to its original capacity or its required condition (e.g. pipeline replacement, pump replacement or reconditioning). This plan includes:
- End of life projections
- Renewal decision making process
- Renewals strategies and methods to meet required LOS
- How renewals are identified, prioritised and to what standard they are replaced
- Summary of future costs

➔ **Asset Development Plan**: This section of the plan covers the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations (e.g. development demand). This plan includes:

➔ **Disposal Plan**: This covers activities associated with the disposal of a decommissioned asset. Assets may become surplus to requirements for any of the following reasons:
- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Uneconomic to upgrade or operate
- Policy change
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social, vandalism).

8.2 MANAGEMENT PROGRAMME

8.2.1 METHOD OF SERVICE DELIVERY

Council staff manages the Foul Sewer network with some assistance from consultants. The maintenance on the network is maintained through a competitively tendered multi-year contract. The current contracts let are included in Table 7.2.

The Utilities Services contracts (3 year + 1 yr + 1 yr) place considerable onus on the contractors to self-manage all utilities maintenance activities; this involves regular inspection of the various components of the networks, locating maintenance requirements and carrying them out.

Table 8.2 – 2011 Physical Works Contracts

Contract No.	Contract Name	Length (Years)	Responsibilities	Contractor
1213	Utilities Services Contract 2013-2016	3+1+1	**Water Supplies** The contract includes the complete operation and maintenance of the following water supplies ▪ Fairlie ▪ Lake Tekapo ▪ Twizel ▪ Burkes Pass ▪ Allandale **Waste Water Systems** The contract includes the complete operation and maintenance of the following waste water systems ▪ Fairlie ▪ Lake Tekapo ▪ Twizel ▪ Burkes Pass ▪ Mt Cook Lookout **Foul Sewer System** The contract includes the complete operation and maintenance of the following Foul Sewer system ▪ Fairlie ▪ Lake Tekapo ▪ Twizel	Whitestone

8.2.2 FORWARD WORKS PROGRAMME

There is currently a detailed 10-year forward works programme for renewals.
This programme has been used as a basis for works included in this AMP. When the AMP is next reviewed the newly developed full FWP will be incorporated.

8.2.3 ASSET VALUATION

A valuation is undertaken every three years in order to assess the value of the network, the depreciated value and the annual depreciation. Details on Asset Valuation and Depreciation are held in Section 8 Financial Summary.

8.2.4 HISTORICAL DATA

Historical data is used to make an assessment of past performance and to see if future trends can be applied. At a network level, these trends can indicate if the condition of the network is deteriorating or improving. The different forms of historical data and their location are outlined in Table 7.3.

Table 8.3 – Historical Data

Type	Location	Comment
CCTV	Asset Register	Pipelines are internally inspected and rated for condition
Past Maintenance Costs	Contractor's Database	Provides summary of maintenance costs and works completed.
Past History	MDC	

8.3 FOUL SEWER CONTROL

8.3.1 DRAINAGE CONTROL BACKGROUND DATA

8.3.1.1 Foul Sewer Control Scope and Nature of Asset

Foul Sewer assets are main pipeline, manholes, pump stations, oxidation ponds and the attached disposal fields. The "point of discharge" for the individual customer is where the property connection connects to the trunk main, not the property boundary.

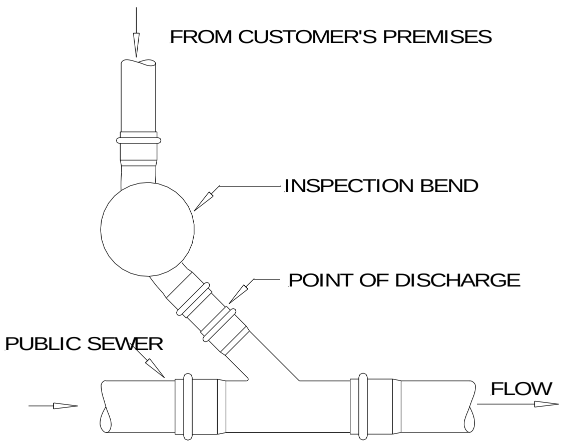


Figure 7.3Typical Layout at point of discharge

The key issues relating to sewer control are:

- blockages
- regular cleaning programmes
- monitoring
- aerator maintenance
- disposal field management

8.3.1.2 Drainage Control Current Condition

Council rates the condition of the Foul Sewer pipelines and manholes. There is an ongoing inspection and maintenance regime under the routine maintenance contract. Council has a programme of internal inspection of the pipeline by CCTV to also monitor and record condition and performance. This information is used to estimate the condition of similar types of pipe in similar ground conditions.

8.3.1.3 Drainage Control Current Performance and Capacity

The four sewer networks are performing well with limited blockages. These are generally tied to tree root intrusion. Specific condition for each asset is not currently measured but internal inspections of representative sections of the network are carried out and the results extrapolated across the network. There is good condition information for Foul Sewer assets with the majority of assets graded at 2 or better (88%). Only 1% of the network is graded as having a rating of 4 and no asset is graded as 5 (unserviceable).

8.3.1.4 Historic Maintenance Costs

The average expenditure over the three years 2008/09 to 2010/11 has totalled $81,995 per year for maintenance.

8.3.2 FOUL SEWER OPERATIONS AND MAINTENANCE PLAN

Foul Sewer drainage maintenance work is included under the main utilities services maintenance contract and covers:

- minimum maintenance standards
- frequency of routine inspections
- response times to correct defects

Drainage maintenance is achieved by undertaking the following activities annually:

- Pipelines
    - Inspection of all manholes as required
    - Repairs to damaged sewer pipes and manholes
    - Clearing of blocked pipes
    - Flushing of sewerlines as required, to maintain service levels.

- Facilities
    - Oxidation pond maintenance
    - Pumps operation and maintenance
    - Aerator Maintenance
    - Disposal field and drip irrigation maintenance
    - Calibration and operation of monitoring equipment
    - Alarms monitoring and testing
    - Dissolved oxygen monitoring at oxidation ponds
    - Compliance with resource consent conditions
    - Recording and reporting
    - Programming of maintenance not included in LS/mth Item
    - Attend callouts

Maintenance Strategy

Condition inspections: The maintenance contractors are required to report any defects observed during day to day maintenance activity.

Unplanned condition assessment of critical drainage assets are required after each blockage or surcharge situation to assess if there is cause for greater concern or action than just dealing with the immediate effect of that blockage.

The Contractors are required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken within the specified response timeframes.

Planned maintenance: Damaged and malfunctioning sewerage assets identified by public complaint or contractor reports are programmed for repair according to the following priority:

- Loss of Service
- Environmental impact
- public safety
- accelerated deterioration

Maintenance Standards
The maintenance standards to be achieved are set out in MDC specifications contained in the utility services maintenance contract.

All critical sewerage assets are required to be inspected and cleaned regularly.

Maintenance Programme
The majority of the sewer maintenance is reactive so budgets have been based on historical expenditure.

The financial forecasts are presented in Appendix III.

8.3.3 DRAINAGE CONTROL RENEWAL/REPLACEMENT PLAN

The renewal programme is prioritised on the basis of overall condition.

Preventive Maintenance
Preventative maintenance includes non routine work required to protect the serviceability of the network and minimise the threat of sewer surcharge.

Standards
The MDC standards for replacement infrastructure are based on NZS 4404:2010

8.3.4 DRAINAGE CONTROL ASSET DEVELOPMENT PLAN

Most new assets are created as part of subdivisions and subsequently taken over by the Council.

The criterion used for justifying new construction undertaken by Council includes evidence of regular blockage and surcharge or evidence of broken sections of pipe. There are no instances of internal pipeline erosion.

Development Standards
MDC uses the Land Subdivision Standard NZS4404: 2010

Development Programme
The cost of pipeline renewal and development works is included in the Council Renewal Programme.

8.4 DISPOSAL PLAN FOR ALL ASSETS

In general Council has no specific plans for disposal of components of the Foul Sewer asset. Details for specific assets are included in Table 7.6.

Table 8.6 – Disposal of Assets Summary

Asset Description	Disposal Plan	Comments
Pipelines	**None**	Generally left in the ground for possible future use as duct pipe for telecommunications or are removed in pieces as part of the excavation to lay the replacement pipe.
Manholes	**None**	Generally left in the ground
Pump Stations	**None**	Generally removed and the hole filled in. If any components can be reused then they are, otherwise they are disposed to waste.

9. FINANCIAL FORECASTS

9.1 INTRODUCTION

The forecast total Mackenzie District and Community Board expenditure on Foul Sewer for 2015/16 for operations, maintenance renewals and development totals $1,056,000 (inclusive of all administration costs and professional service fees). 11% ($154,000) of budgeted expenditure is to be spent on maintenance and operation with 66% to be spent on renewals. The remaining 23% is used to fund depreciation and administration costs.

The current financial forecast will need to be updated on a regular basis as the foul sewer network needs change. This section sets out the funding forecast required for the Mackenzie District Council over the next 10 years Cash flow forecasts by year.

9.1.1 30-YEAR FUNDING FORECAST

Table 8.1 sets out the 30 year funding forecast for the Foul Sewer activity.

9.1.2 CAPITAL WORKS

Fairlie

* CCTV earthenware pipelines (7,100m) in 2016-19 - $100,000. Information used to plan their eventual replacement
* Replace aerator at Oxidation ponds $62,000 in 2020/21
* De-sludge primary pond in 2025 - $150,000 (Re-survey 2019/20)
* Replace all the pumps in the Eversley Reserve in 2031-35

Tekapo

* Design and construct new sewerage disposal irrigation system in 2015-16
* Investigate condition of sewers laid in 1955 during 2015-17 (by CCTV), if deterioration is as expected, replacement is programmed for 2031-35
* Replace aerators at Oxidation ponds $124,000 in 2020/21
* Replace Camp Ground Pump Station in 2020 - $100,000
* Replace pumps at the two main pump stations – 2026

Twizel

* Consolidate disposal system at the Oxidation ponds in 2018 at a cost of $700,000
* De-sludge primary pond in 2025 - $200,000 (Re-survey 2019/20)
* Investigate condition of 21.3km of AC sewers laid in 1970 (by CCTV). Information used to confirm the remaining life of the asset, set depreciation levels and plan for their eventual replacement
* Replace the two pumps in Mackenzie Park Pump Station

FINANCIAL FORECASTS

Table 8.1

	Forecast 2015/16 ($000)	Forecast 2016/17 ($000)	Forecast 2017/18 ($000)	Forecast 2018/19 ($000)	Forecast 2019/20 ($000	Forecast 2020/21 ($000)	Forecast 2021/22 ($000)	Forecast 2022/23 ($000)	Forecast 2023/24 ($000)	Forecast 2024/25 ($000)
OPERATING FUNDING										
Administration	11	11	11	11	11	11	11	11	11	11
Consultancy Expenses	5	8	5	15	0	0	8	0	0	7
Operational & Maintenance	182	183	184	141	144	144	144	144	144	144
Total operating funding	198	202	200	167	155	155	163	155	155	162
CAPITAL FUNDING										
Capital Expenses	902	30	35	15	349	186	250	0	250	150
Total Capital Funding	902	30	35	15	349	186	250	0	250	150

FINANCIAL FORECASTS

Table 8.2 - Capital Projects

Requirement for Work		Budget 2015/16 $0	Forecast 2016/17 $0	Forecast 2017/18 $0	Forecast 2018/19 $0	Forecast 2019/20 $0	Forecast 2020/21 $0	Forecast 2021/22 $0	Forecast 2022/23 $0	Forecast 2023/24 $0	Forecast 2024/25 $0
	Fairlie										
I	Ponds SCADA	10									
I	Ponds Magflo		20	-	-	-	-	-	-	-	-
R	Sewermain Replacement					250					
R	Sewermain Replacement							250			
R	Sewermain Replacement									250	
R	Aerator						62				
		10	**20**	**0**	**0**	**250**	**62**	**250**	**0**	**250**	**0**
	Tekapo										
I	Alternative Disposal	100									
R	Upgrade Campground Pump Station, SCADA	-				99					
R	Replace Aerators						124				
		100	**0**	**0**	**0**	**99**	**124**	**0**	**0**	**0**	**0**
	Twizel										
I	Design and pond construction – new disposal area, SCADA	762									
I	Mackenzie PS SCADA		10	-	-		-	-	-	-	-
		762	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL	**872**	**30**	**0**	**0**	**349**	**186**	**250**	**0**	**250**	**0**

9.2 FUNDING STRATEGY

The first priority is to maintain and operate the existing network in its current condition then allow for renewal expenditure that revitalises a component of the network that has worn out. In the 2014/15 year 27% ($158,000) of budgeted expenditure is to be spent on maintenance and operation with 19% ($108,000) to be spent on renewals. The remaining 54% is used to fund depreciation and administration costs.

Up until 2014/15, funding for the management and maintenance of the foul sewer network was provided from the respective Community Board. Capital projects are funded through the Council's Policy for Funding Capital Expenditure, which was adopted as part of the 2004-2014 Long Term Council Community Plan.

The policy is summarised as follows:

Capital Reserves

- A Capital Reserve has been established for each activity that the Council undertakes.
- All depreciation that has been funded from that activity will be lodged into the Capital Reserve on a quarterly basis when each instalment of rates is due.
- Funds from other reserves or financial contributions can also be deposited into the Capital Reserve.
- All capital expenditure will be paid from the Capital Reserve at the time of payment.
- Capital Reserves may go into overdraft at any stage with prior approval of Council.

Capital Expenditure

- All Capital Expenditure must be approved by Council through the budget process or by an explicit resolution.

Interest Component For Debt Incurred Prior to 30 June 2012:

- If the balance of the Capital Reserve is overdrawn, the community of interest for the relevant activity will be charged an interest rate set at 100 basis points greater than the Official Cash Rate determined by the Reserve Bank. Such interest will be charged as a cost to the activity operating expenses and be rated for.
- If the balance of the Capital Reserve is in funds, then the Council will pay the community of interest in the relevant activity an interest payment set at 25 basis points less than the Official Cash Rate determined by the Reserve Bank. Such interest will accrue to the activity's Capital Reserve.

Interest Component For Debt Incurred After 30 June 2012:

- For the component of the debt incurred after 30 June 2012 the interest rate will be set at a level equal to the Council's average bond portfolio rate applying at the previous 1 January. Such interest will be charged as a cost to the activity operating expenses and rated for.

In determining the projects to be undertaken the benefit/cost ratio is the governing criteria used with preference being given to projects which can be shown to be economically justified, attract subsidy and have the necessary Council funding available.

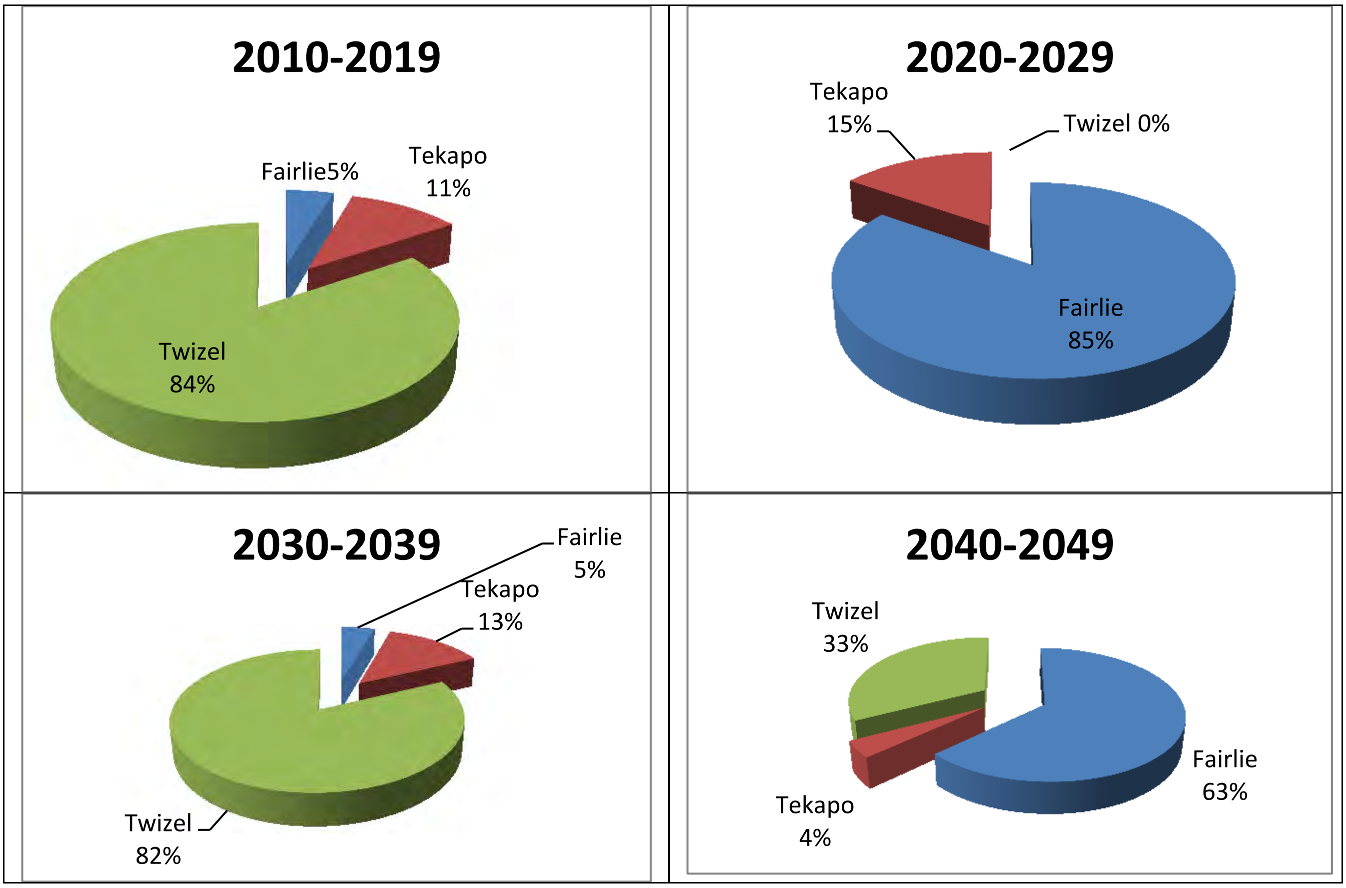
9.3 SUSTAINABILITY - LOOKING OUT SIXTY YEARS

With these types of assets in is important to take a longer term view, perhaps forty to sixty years, especially considering the uniqueness of Twizel and to a lesser extent Tekapo. As Twizel was built in the seventies all assets are generally of the same level of deterioration and potential loss of service. Analysis of the initial construction date shows the following percentage of the overall network that will have to be replaced in a narrow timeframe:

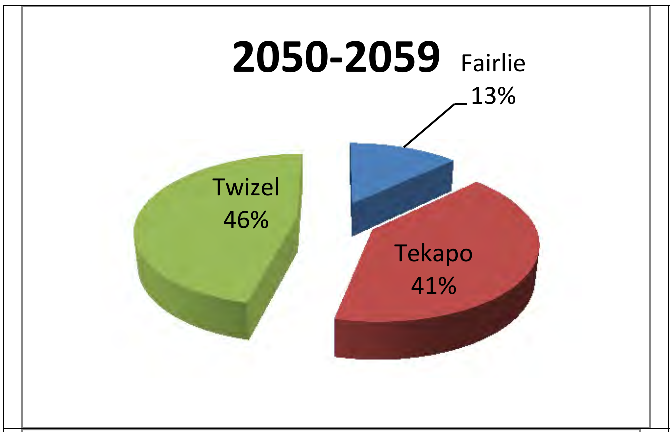
Water supply 63%
Sewer network 51%
Stormwater network 0%
This is likely to be a major hurdle that Twizel cannot afford long term. Tekapo has a similar issue with the early town reticulation completed in three specific years, namely 1955, 1970 and 1976. These original networks are likely to fail at the same time.

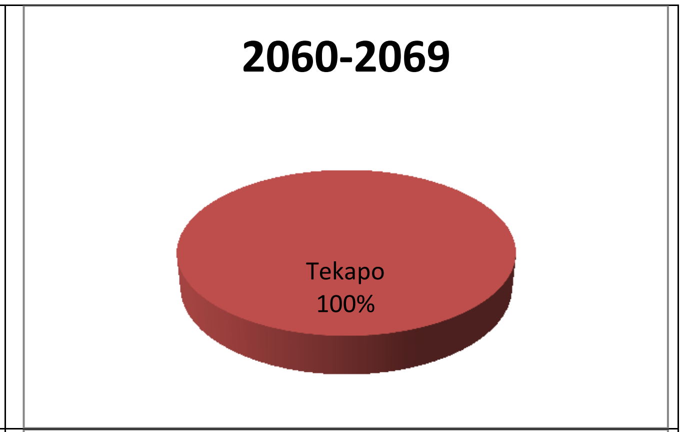
A major piece of work was completed for the current AMP, using 2009 pipe construction costs and industry standard base lives, to look out eighty years. As part of this LTP the Council has also prepared a 30-year Infrastructure Strategy, which identifies significant infrastructure issues facing the District over the next 30 years, and outlines how the Council intends to manage its infrastructure assets.

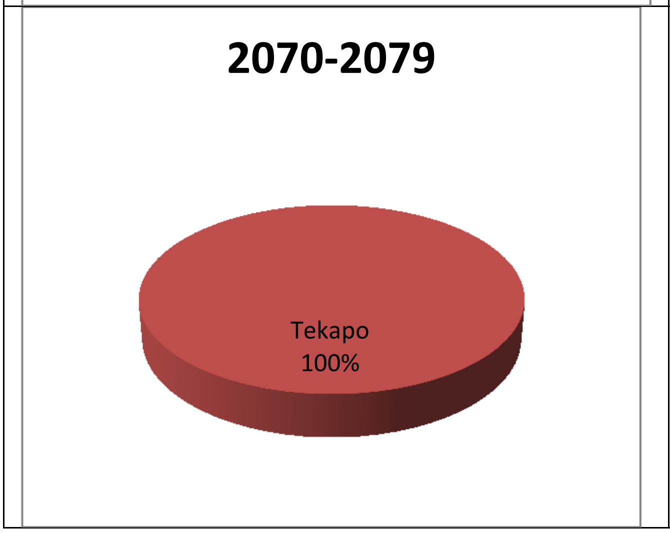
The graphs below show that results of that work clearly on a decade by decade basis.

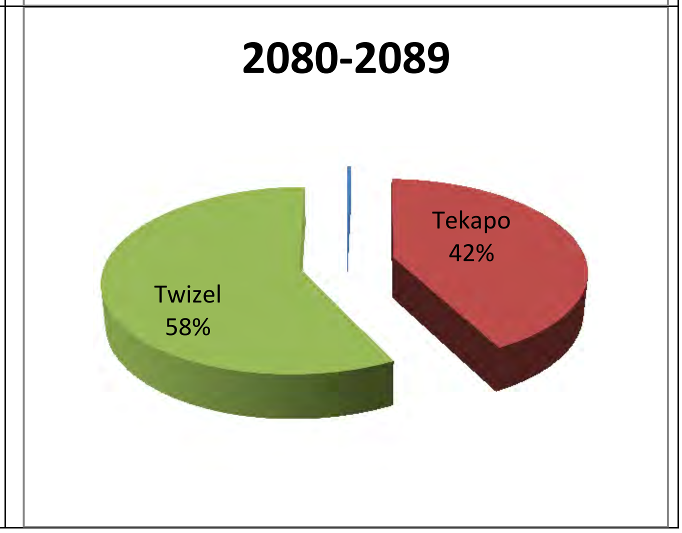


FINANCIAL FORECASTS









Summary (in 2009 dollars)

Decade	Fairlie	Tekapo	Twizel	Total
2010-2019	70,000	164,000	1,271,000	1,505,000
2020-2029	1,870,000	335,000	0	2,205,000
2030-2039	235,000	696,000	4,258,000	5,189,000
2040-2049	178,000	12,000	92,000	282,000
2050-2059	282,000	883,000	1,004,000	2,169,000
2060-2069	0	28,000	0	28,000
2070-2079	0	49,000	0	49,000
2080-2089	16,000	1,684,000	2,300,000	4,000,000
Totals	**2,650,000**	**3,850,000**	**8,926,000**	**15,426,000**

The table and graphs confirm what we intuitively know, that for the foul sewer networks in the three communities, Fairlie will be generally have its network renewed in the second decade, Tekapo will be spread over the fifth, sixth and seventh decade with Twizel have a big spike in the first and third decade and again in the fifth decade.

This work has allowed the Council to ascertain where the peaks in replacement expenditure of these assets are, by community. Council has modelled this expenditure and has come to the conclusion that some towns cannot afford this level of expenditure alone. If the District as a whole is to be sustainable, the individual communities cannot be left to fund these large replacement costs.

Council has decided its preferred option is that each of the four urban water supplies, sewerage schemes and stormwater networks are amalgamated into single urban schemes for water, stormwater and sewerage, all paying the same rate for the provision of those services. Council is proposing that the cost of providing water services across the townships is funded universally across the users of those services. This is to ensure that water supply networks remain affordable to all ratepayers that benefit from the service, regardless of where they reside in the district.

With the combining of the water supplies, stormwater and the sewerage schemes, the Council will be able to set priorities on the key capital expenditure for the networks as a whole, and bring more resources to problems and remedy them more efficiently. This is also expected to provide lower operating costs and as a result, the Council will be able to control the overall rates increases rather than certain factors that will cause significant increases being recommended and endorsed by local boards.

This proposal is being consulted on during the 2015/2025 LTP process.

9.3.1 REVIEW AND FURTHER CONSULTATION

As part of the preparation of the “30 Year Infrastructure Plan” extensive modelling and testing was carried out on the Twizel infrastructure and this confirmed that there was an issue with the Asbestos Cement pipework and that replacement would have to begin in 2015/16.

Council is revisiting the proposal to amalgamate the four urban Sewerage schemes into one urban scheme all paying the same rate for the provision of that service as part of the 2015/25 Long Term Plan as it still the most sustainably way to fund and manage the Sewerage network across the district.

9.4 FOUL SEWER VALUATION

The last valuation of the Foul Sewer infrastructural network and associated assets was undertaken as at 1 July 2013 and is summarised in the Table 8.2. The valuation is updated 3 yearly to take into account capital works and additions to the foul sewer network.

The valuation consists of an assessment of the replacement cost, depreciated replacement cost and the annual depreciation or decline in service potential of the network. The annual depreciation or decline in service potential is the amount the asset declines in value over a year as a result of the remaining life of the asset reducing. Provision is required to be made to fund this depreciation so as to make suitable allowance for the future replacement or renewal of the asset.

Depreciation is provided on a straight-line basis on all physical assets at rates which write off the cost of the asset to the estimated residual value at the end of its assumed effective life.

FINANCIAL FORECASTS

Expenditure on renewing or improving the capacity of the asset is capitalised annually as are assets which are vested in Council by developers. Capital work in progress is not depreciated. The total cost of this work is capitalised at the end of the financial year in which it is completed and depreciated from then onwards.

Table 9.2 – Foul Sewer Infrastructure Valuation

Summary	ORC 1 July 2013 ($)	ODRC 1 July 2013 ($)	Annual Depreciation ($)
Pipelines	17,287,748	10,772,876	233,340
Manholes	2930,675	1,689,384	36,633
Plant	3,417,524	2,523,557	52,611
TOTAL	**$23,635,947**	**$14,985,817**	**$322,585**

The total optimised replacement cost of the Foul Sewer Infrastructure was assessed to be $23,635,947 as at 1 July 2013. The total optimised depreciated replacement cost was assessed to be $14,985,817

The annual depreciation or decline in service potential has been determined to be $322,585 per annum.

9.4.1 VALUATION METHODOLOGY

All assets have been valued using depreciated replacement cost (DRC). A DRC valuation requires:

- Determination of quantities of assets optimised to relate to those required for current service delivery and foreseeable demand
- Unit rates for replacement with modern engineering equivalent assets
- Effective lives that take account of local influences
- Depreciation that defines current value given a definable remaining life.

The NZ Infrastructure Asset Valuation and Depreciation Guidelines 2006 give direction as to the overall methodology applicable to a DRC valuation for all infrastructural assets. This has been applied in this case to achieve a suitable valuation for MDC Improvements and Infrastructure Asset Valuation.

Borrowing costs were excluded from the valuation.

The primary data source for this revaluation was MDC's Asset Register.

9.5 KEY ASSUMPTIONS

Key assumptions made in the financial forecasts are as follows:

(Inflation figures have been provided by Business and Economic Research Limited.)

Table 9.5: Adjustors: % per annum change

	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private

FINANCIAL FORECASTS

									Sector Wages
Year Ending	% pa change								
Jun 12	5.2	3.3	6.0	15.4	2.3	1.4	4.7	3.1	2.1
Jun 13	1.1	1.7	-2.8	-1.8	2.1	2.9	2.1	-2.7	1.9
Jun 14	0.7	1.9	-2.1	1.3	1.9	1.8	2.8	-2.5	1.7
Jun 15	0.4	1.9	4.7	4.2	1.6	1.5	1.7	1.8	1.7
Jun 16	1.2	2.2	5.2	3.5	1.8	2.3	1.8	2.1	1.7
Jun 17	1.4	2.4	3.8	3.8	1.9	2.5	2.6	2.5	1.8
Jun 18	2.2	2.5	3.0	3.9	2.0	2.6	2.4	2.6	1.9
Jun 19	2.4	2.6	3.2	4.1	2.1	2.7	2.0	2.8	2.0
Jun 20	2.5	2.8	3.3	4.3	2.2	2.9	2.1	2.9	2.1
Jun 21	2.7	2.9	3.5	4.5	2.3	3.0	2.3	3.1	2.1
Jun 22	2.8	3.0	3.7	4.7	2.4	3.1	2.4	3.2	2.2
Jun 23	3.0	3.2	3.8	4.9	2.5	3.3	2.5	3.4	2.3
Jun 24	3.1	3.3	4.0	5.1	2.6	3.4	2.9	3.5	2.4
Jun 25	3.3	3.4	4.2	5.3	2.7	3.6	3.1	3.6	2.5
20-year avge %pa	3.2	2.9	3.5	4.7	2.4	3.0	3.0	3.0	2.2

- Council will continue to fund the level of service currently set out in this AMP
- The dollar values shown in this Plan are November 2012 dollars adjusted for inflation applicable to this Activity.
- Some renewal costs are rough order of cost estimates based on length and types of components using replacement costs form the recent revaluation exercise. These estimates will need to be further refined as projects develop.
- No account has been taken of the impacts related to the development, acceptance and implementation of the Risk Management Plan
- Assumptions made on Total Useful Life and Residual Useful Lives of the assets in relation to the asset valuation.
- The asset data is considered to be reliable and fit for the purpose for developing the long term financial forecasts.
- Any other specific assumptions

10. IMPROVEMENT PLAN

10.1 STATUS OF AM PRACTICES

This section provides details of how Council plans to improve this version of the Foul Sewer AMP.

This AMP has previously been reviewed and updates incorporated including improvements to move towards "Core" level Asset Management. Council is committed to a continual improvement as outlined in this section of the AMP. A key objective is to dovetail the asset management planning process with the other key planning processes particularly the Long Term Plan (LTP).

10.2 IMPROVEMENT PROGRAMME

The review and improvement of this AMP requires resource and budget in order to complete the selected improvement tasks. Table 10.1 outlines the items for improvement, relative urgency, resource, priority, budget and the authority sought to give approval to complete each item.

FOUL SEWER ACTIVITY MANAGEMENT IMPROVEMENT PLAN

Table 10.1 – Improvement Programme

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
3.0	**Description of Asset**								
3.1	Current age and remaining life of all assets needs to be reviewed and determined.		✓		Council	Medium	**To be Confirmed**	Council	Within 12 months
4.0	**Levels of Service**								
4.1	Augment existing LoS information		✓		External Consultant	Medium	**To be Confirmed**	Council	Within 12 months
4.2	Undertake customer surveys with defined performance targets.			✓	Council or Consultant	Low	**To be Confirmed**	Council	Prior to next AMP revision
5.0	**Future Demand**								
5.1	Develop a model of the Twizel Sewer Network to determine what impact development will have on specific areas.		✓		Council	**Medium**	**To be Confirmed**	Council	Within 24 months
5.2	Conduct a research study, to determine the impact of the Land and Water Plan as produced by Environment Canterbury as it applies to MDC.			✓	Council	**Low**	**To be Confirmed**	Council	Within 12 months

Item	Task Name	Relative Urgency 1	2	3	Resource	Priority	Budget	Approval Sought	Timeframe
5.3	Complete a Customer Survey, including local industry, to establish any changes in customer expectations as they relate to demand on the network.			✓	Council	Low	To be Confirmed	Council	Prior to next AMP revision
6.0	**Risk Management**								
6.2	All assets need to be assessed for criticality	✓			External Consultant	High	To be Confirmed	Council	Within 12 months
6.3	Risk management register needs to be developed. Assessed risks can then be linked to maintenance and renewals programmes.		✓		Workshop utilising External Consultant	Medium	To be Confirmed	Council	Within 12 months
6.4	Significant negative effects need to be identified and provide an input into the LTP. Also identify procedures for mitigating significant negative effects.		✓		External Consultant	Medium	To be Confirmed	Council	Within 12 months
6.5	Emergency management (including lifelines) requires full review and inclusion. Require procedures in place for rapid response to emergency failures.	✓			Council External Consultant	High	To be Confirmed	Council	Within 6 months

IMPROVEMENT PLAN

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
6.6	Corporate insurance policy/requirements and updating of asset insurance costs needs to be considered and incorporated.	✓			Council	**High**	**To be Confirmed**	Council	Within 6 months
7.0	**Life Cycle Management**								
7.1	Review and update the Asset Register database. Ensure all inventory data is captured.		✓		External Consultant	**Medium**	**Within Current PS Engineering Services Budget**	Utilities Manager	Within 12 months
7.2	Complete a full review of the network assets (using both ESRI and field inspections) and confirm a detailed 10 year Forward Work Programme for all asset groups.	✓			Council	High		Asset Manager	Prior to next AMP review in 2013
8.0	**Financial Forecasts**								
8.1	Confirm Annual Plan Forecasts, adjust 10 year plan and add Year 10 to total programme		✓			Medium		Utilities Manager	
8.2	The assessment of annualised depreciation needs to be reviewed to ensure that the depreciation collected is realistic and comparable to the lifecycle renewal cost.			✓	Council	Low		Asset Manager Utilities Manager	Prior to next Valuation in 2013

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
8.3	**Valuation**								
8.3.1	Review and update the Asset Register database. Ensure all inventory data is captured and up todate			✓	Council	Low		Asset Manager Utilities Manager	Prior to next Valuation in 2013
8.3.2	The default construction date and the expected life of all assets need to be reviewed			✓	Council	Low		Utilities Manager	Prior to next Valuation in 2013
9.0	**Other Improvements**								
10.1	Sustainability Include further summary of sustainability measures that are in place, including details of Council Sustainability policy, strategies and operations enabling greater sustainability etc			✓	Council	Low	**To be Confirmed**	Council	Prior to next AMP revision

10.3 MONITORING AND REVIEW PROCEDURES

9.4.1 3 YEAR REVIEW

This AMP is to be reviewed on a 3-yearly basis, with the next full review taking place in 2016. During the three year period leading up to this review, the items in the Improvement Programme should be addressed within the timeframes provided. These improvements can then be incorporated into the next review of the AMP.

It is suggested that there may be value AMP is also audited externally with the review including process, data integrity and Levels of Service.

9.4.2 ANNUAL REVIEW

At the completion of each annual budgeting period the financial forecasts are to be updated to include the new Yr 10 figures and any changes made to the intervening budgets by the Council.

11. APPENDICES

11.1 METHOD OF FORECASTING LONG TERM CAPITAL EXPENDITURE

Asset Records

Asset records are held in Council's GIS system which forms the Asset Register. Thus assets can be located and information obtained and displayed easily, either spacially or by text fields. The following is a list of fields in the spatial attribute table in the GIS system for the waterlines layer.

Scheme
UFI
From
To
Type
DN_mm_ID
Dia _actual_mm
Material
PN
Depth_mm
Length_m
Date_installed
Date confidence
Base life
Exp life
Cost code
Data confidence
Prog replacement date
Replace dia
Replace cost code
Condition
Condition confidence
Performance
Performance confidence
Critically
Risk
Date assessed
Assessed by
Grading confidence
Note 1
Note 2
Note 3
Alterations
Row number
Theo replace

Calculations and Predictions

APPENDIX I

Calculations using data in the attribute table and from other sources are carried out more conveniently in Excel, rather than directly in the attribute table.

The attribute tables from the GIS system are downloaded to Excel where information contained within the tables along with information from the latest valuation of the assets are used to determine expected life, theoretical replacement date and programmed replacement date. These attributes are imported back into the spatial attribute tables.

Estimates of capital expenditure for renewals and new work are also calculated in excel.

Expected Life

The calculation of the theoretical remaining lives of each asset feature is a modification of the method explained in Section 4 “The Toolbox” of the 1998 New Zealand Infrustructural Asset Management Manual. It goes through processes which predict the theoretical remaining life by applying factors to a standard base life for each class of asset.

a) Age Factor (F1)
   Actuarial evidence shows that as assets age , their total life expectancy increases. This is best explained by drawing an anology with human beings – whilst at birth our life expectancy is 74 years, at age 70 our life expectancy is nearer 80 years if we are still enjoying good health. The age factor increases with age of the asset.

   Economic life from age alone = Base life x F1

b) Service Utilisation Factor (F2)

   The economic life of certain assets, eg pumps, is dependant on use (as measured on hours run) and not just age. The life of these assets is extended if they are used at less than their design capacity.

   Economic life from utilisation alone = Base life x F2

c) Combined effct of Age and Utilisation
   The starting life expectancy is calculated from the age and utilisation predictions before analyising the effect of condition and performance of those assets.

   Starting economic life = Base life x F1 x F2

d) Condition Grading Factor (F3)
   Each feature is graded according to its condition between C1 and C5. C1 being excellent condition and C5 requiring urgent replacement or rehabilitation. The F3 factor for condition grade C1 is 1 and for C5 is 0, with the factors varying uniformly in-between.

   The remaining economic life from condition = (starting economic life – age) x F3

e) Performance grading Factor (F4)
Each feature is graded according to its performance between P1 and P5. P1 being no performance problems, and P5 complete inadequate performance. The F4 factor for performance grade P1 is 1, and for P5 is 0, with the factors varying uniformly in-between.

The remaining economic life form performance = (starting economic life – age) x F4

f) Combined effect of Condition and Performance.
The remaining economic life is calculated by taking the lesser of the predictions for asset condition and performance. The economic life was extended by the age factor and reduced back by the condition or performance factors where the grade for condition or performance are less than “1”.

g) Expected Life

Expected life = age + the lesser of the predictions of remaining economic life for condition and performance. The calculated expected lives are imported into the spatial attribute tables.

Capital Works Programme

a) Theoretical Replacement Date

Theoretical Replacement Date = Date installed + expected life. The theoretical replacement dates are imported into the spatial attributes table.

b) Programmed replacement Date.

All features that have a theoretical replacement date within the following 20 years are identified and assessed in more detail, with consideration given to factors which impact on the programmed replacement date, such as:

- Maintenance history
- Decay prediction
- Ability to rehabilitate
- Criticality
- Risk
- Demand
- Level of Service
- Maintenance Costs
- Operation Costs
- Management Costs
- Other Work Programmed such as road sealing

Programmed replacement dates are entered into the attribute tables for features where replacement is programmed within the following 10 years.

c) New Works

Proposed new works, where no asset currently exists are included in a separate Excel table and are not centre in the spatial attribute tables.

Financial Projections

a) Cost Codes

Cost codes are allocated for all asset classes. Pipes for example are allocated codes depending on size and ground conditions. Separate codes are allocated for pipes in sealed roads, in road berms, or in open country etc. On rural schemes the codes also distinguish between pressure classes. Unit values are attached to the cost codes at each three yearly valuation based on the optimised replacement costs.

The cost-codes for each asset feature are entered in the spatial attribute table.

b) Forecasting Future Demand

The likely future demand is considered for each asset feature.

The replacement asset and associated cost-code are entered in the spatial attribute table. Greater consideration is given to forecasting future demand for assets where the programmed replacement date is within the following 10 years period.

c) Calculations in Excel

As stated earlier the spatial attribute tables are downloaded to Excel. The “look-up” function in Excel attaches the most recent unit value (optimised replacement cost) to each asset feature and each replacement feature.

Renewal/new work expenditure is calculated on the optimised replacement costs of the existing asset and the proposed replacement asset. The forecast expenditure is separated into “Expenditure Renewal” which is the cost of replacing like with like, and “Expenditure New” which is the difference in cost between the existing asset and the proposed replacement asset.

Proposed new works, where no asset currently exists, are included in a separate table.

A long term capital expenditure programme is developed from the above information. The “Programmed Replacement Date”, when one has been allocated is used in preference to the “Theoretical Replacement Date”.

A pivot table is created for the 10 year programmed work which summarises the programmed works into years of expenditure.

The proposed expenditure amounts are not imported into the spatial attribute tables.

11.2 FUNDING IMPACT STATEMENT

Mackenzie District Council Funding Impact Statement for 10 Years to 30 June 2025 for Foul Sewer	Annual Plan 2014/15 ($000)	LTP Year 1 2015/16 ($000)	LTP Year 2 2016/17 ($000)	LTP Year 3 2017/18 ($000)	LTP Year 4 2018/19 ($000)	LTP Year 5 2019/20 ($000)	LTP Year 6 2020/21 ($000)	LTP Year 7 2021/22 ($000)	LTP Year 8 2022/23 ($000)	LTP Year 9 2023/24 ($000)	LTP Year 10 2024/25 ($000)
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	461	441	576	555	541	530	494	493	552	490	497
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	37	49	31	46	72	93	98	130	136	159	173
Local authorities fuel tax, fines, infringement fees, and other receipts	-	6	6	6	7	7	7	7	8	8	8
Total operating funding (A)	**498**	**496**	**613**	**607**	**620**	**630**	**599**	**630**	**696**	**657**	**678**
Applications of operating funding											
Payments to staff and suppliers	179	157	237	250	256	227	225	233	243	253	264
Finance costs	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	13	-	-	-	-	-	-	-	-	-	-
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**192**	**157**	**237**	**250**	**256**	**227**	**225**	**233**	**243**	**253**	**264**
Surplus (deficit) of operating funding (A - B)	**306**	**339**	**376**	**357**	**364**	**403**	**374**	**397**	**453**	**404**	**414**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	133	-	-	262	-	-	657	-	-	208	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**133**	**0**	**0**	**262**	**0**	**0**	**657**	**0**	**0**	**208**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service	-	-	-	-	-	-	-	-	-	-	-
to replace existing assets	109	902	31	11	17	398	219	306	-	330	-
Increase (decrease) in reserves	330	-563	345	608	347	5	812	91	453	282	414
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**439**	**339**	**376**	**619**	**364**	**403**	**1031**	**397**	**453**	**612**	**414**
Surplus (deficit) of capital funding (C - D)	-306	-339	-376	-357	-364	-403	-374	-397	-453	-404	-414
Funding balance ((A - B) + (C - D))	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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11.3 RISK REGISTER

Management Activity	*Name*	*Description*	*Existing Controls*	*Assessment*				
				Consequence	**Likelihood**	**Risk**	**Treatment Option**	Treatment Cost

APPENDIX VI

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: SIGNIFICANT FORECASTING ASSUMPTIONS

DATE: May 7 2015

FROM: Toni Morrison, Senior Policy Planner
Paul Morris, Finance Manager

REASON FOR REPORT

To provide and adopt updated Significant Forecasting Assumptions for the Council's Long Term Plan 2015/2025 and Consultation Document.

RECOMMENDATIONS:

1. That the report be received.

2. That the Significant Forecasting Assumptions be adopted by Council.

WAYNE BARNETT

CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

Attachment 1: Significant Forecasting Assumptions

BACKGROUND:

The Council is currently finalising all of the supporting information that will form the basis of the 2015-25 Long Term Plan (LTP). The Local Government Act 2002 requires the LTP to clearly identify significant forecasting assumptions and risks in relation to financial information in the LTP.

The Council approved a set of forecasting assumptions at its meeting of March 10 2015. These should now be updated to reflect subsequent budget and policy decisions.

In summary, the proposed changes are:

- Inserting the financial contributions proposed for infrastructure;
- Updating the New Zealand Transport Agency (NZTA) subsidy assumptions to reflect the indications regarding co-funding levels recently received from NZTA;
- Clarifying the matter of valuations in respect of forestry assets;
- Updating the forecast dividend flows from Alpine Energy.

POLICY STATUS:

N/a.

SIGNIFICANCE OF DECISION:

In accordance with Council's Significance and Engagement Policy, these matters have been assessed as significant because the decisions relate to supporting information for the Consultation Document and the Long Term Plan 2015-25.

ISSUES & OPTIONS:

This process is currently progressing under tight timeframes. Council is required to adopt all supporting information for the Consultation Document prior to adopting the Consultation Document itself. The CD will be presented to Council on 7 May for public consultation.

This timeframe is necessary to ensure that the LTP is adopted by June 30. The consequences of not adopting the LTP by June 30 include a delay in striking the rates for the new financial year, resulting in a loss of income to Council.

The options available to Council are to either:

1. Approve the significant forecasting assumptions as contained in this report OR
2. Amend as appropriate and approve the significant forecasting assumptions.

CONSIDERATIONS:

Legal

This process is guided by the Local Government Act 2002.

Financial
As stated above there is a financial risk to Council if the Long Term Plan process does not meet its tight deadlines and adoption is delayed until after June 30, 2015.

CONCLUSION:

The Council is required to have adopted all supporting information for the Consultation Document prior to adopting the Consultation Document itself. This paper seeks the adoption of updated forecasting assumptions as part of that supporting information.

Significant Forecasting Assumptions

ASSESSMENT OF ASSUMPTIONS

The assumptions listed in this section have been prepared based on current information available to Council.

It has been assessed by Council that all of the assumptions have between a low to medium level of uncertainty.

Council has assumed modest growth over the period of the plan. We have assessed various factors such as historical information and projected future subdivision work.

We see the following trend occurring in the 4 years leading up to the commencement of the Long Term Plan (LTP).

Year Prior to	Increase in Rates Assessments	Increase in Capital Value
1 July 2012	43	$27.1m
2012/13	30	$24.1m
2013/14	39	$148.7m
2014/15	31	$33.9m
	=====	======
TOTAL	143	$233.8m

We have assessed the likely future growth in each of our main urban areas covered by this plan based on the number of subdivision consents currently on Council's books.

	Years 1-3	Years 4-6	Years 7-10
Fairlie	13	2	-
Tekapo	12	51	-
Twizel	0	50	-
	====	====	====
	25	103	-

We have used the average of the 4 years leading up to the LTP and will increase the number of rates assessments by 36 from years 4 to 10. We will also increase the capital value by $58.2m. Both metrics will be apportioned on the basis of actual subdivisions for years 1 to 3.

FINANCIAL CONTRIBUTIONS

These are charged to developers to connect new sections to the infrastructure of the relevant urban area. As at 1 July 2015 these contributions excluding GST are estimated to be:

	2015 /16	2016 /17	2017 /18	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25
Water	4288	6312	6269	5232	6714	6520	5984	6506	6298	5940
Sewer	3706	3427	3758	3430	3398	3051	2718	3030	2947	2572
Stormwater	1039	1101	1050	764	1179	1137	732	1383	1314	1187

LAND SUBDIVISION RESERVE CONTRIBUTIONS

Again Council wishes to make a conservative approach in assessing these contributions.

Developers make a contribution towards development and maintenance of reserves of 5% of the value of the land value of the sections created. In rural residential developments the value is based on an area of 1,500m^2 not the whole block. Payment is made just before the developer decides to seek title for the sections created. The plan allows for the creation of one hundred and twenty eight sections.

The average value of sections created is estimated to be $66,660. This translates into $3,333 of reserves contributions per section created.

Risks and Uncertainties:
There is considerable uncertainty in predicting the level of development likely to occur in the District over the period of this plan, particularly after the first three years.

Council has experienced considerable growth in recent times and it is likely this will continue over the first three years of this plan.

Its predictions while conservative incorporate this growth.

The impact upon individual ratepayers is not thought to be significant.

Council's infrastructure and planned capital works will be adequate to cope with this level of subdivision.

INFLATION

In preparing the long-term plan, the Council is required to use *best estimates* in determining the level of costs to be budgeted in the future. As a result, Council is required to account for the effect of price changes or inflation that is expected to occur over the ten year period.

To develop a consistent approach for local government to account for inflation, the Society of Local Government Managers (SOLGM) contracted Business and Economic Research Limited (BERL) to construct forecasts for inflation.

Council has endorsed the rates produced by BERL and has used these rates as the assumption for accounting for inflation for the preparation of the LTP.

	Jun 16	**Jun 17**	**Jun 18**	**Jun 19**	**Jun 20**	**Jun 21**	**Jun 22**	**Jun 23**	**Jun 24**	**Jun 25**
Road	1000	1014	1036	1061	1088	1117	1148	1185	1217	1260
Property	1000	1024	1050	1077	1107	1139	1175	1211	1251	1260
Water	1000	1038	1019	1103	1140	1180	1223	1270	1321	1376
Energy	1000	1038	1078	1123	1171	1224	1281	1344	1413	1487
Staff	1000	1019	1039	1061	1085	1109	1136	1165	1195	1227
Other	1000	1025	1052	1080	1111	1145	1180	1219	1261	1306
Earthmoving	1000	1026	1051	1072	1094	1119	1146	1175	1209	1246
Pipelines	1000	1025	1052	1081	1112	1147	1184	1224	1267	1312

The table above represents the inflation rate increase relative to the base year of June 2015.

Risk and Uncertainties:
Inflationary costs in some areas may increase at a rate different to that forecast. Some types of costs (eg roading and transport costs) have been subject to fluctuations in recent years, so it is inherently difficult to predict trends with accuracy. However, these costs will be mitigated through the annual plan process where the annual adjustment can be made.

NEW ZEALAND TRANSPORT AGENCY SUBSIDIES

To fund roading operational and capital expenditure, the Council receives a percentage of the cost as a subsidy from New Zealand Transport Agency (NZTA). The co-investment rate is based on recent review of the New Zealand Transport Agency Funding Assistance Rates.

The Council has been informed by NZTA that the new Co-investment Rate will be as follows

	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	Jun 23	Jun 24	Jun 25
Maintenance, Operational and Renewal Expenditure	54%	53%	52%	51%	51%	51%	51%	51%	51%	51%
Minor Improvement	54%	53%	52%	51%	51%	51%	51%	51%	51%	51%

The roading programme could be reduced from what is shown, due to limitations on the amount of work NZTA is prepared to financially support. The Council has received notification indicating that the NZTA will increase its total subsidiseable programme by 10% on 2012-2015 figures. Council has assumed that this level of increase will continue over the life of its LTP. Therefore the LTP contains increases in the total subsidiseable programme by 10% for each of the subsequent three year periods 2019 - 2021 and 2022 – 2025. Final confirmation of the full programme for the first three years of this Plan will not be available from NZTA until June 2015.

Risk and Uncertainties
Council's risk is the roading programme may reduce due to a number of factors. These are:
- a further change in subsidy rates and/or size of the programme in years 4-10. This plan assumes Council will maintain or expand its spend through additional unsubsidised work.
- the full NZTA programme is not finalised until August 2015, which means that the level of rates may not be sufficient to meet any short fall in NZTA co-funding.
- the NZTA subsidiseable programme may differ from what has been assumed, which may impact the Council's spend in future years.
- The funding impact of the One Network Road Classification (ONRC) is as yet unknown.

INTEREST RATES

The movement in interest rates has a wide ranging effect on the Council. The Council's cash investments have derived interest at the market rates and the Council's internal financing policy bases the interest paid to or charged to individual communities on the Official Cash Rate.

The level of works and services rates levied is dependent in part on the interest rate used in Council's internal funding policy.

Council assumptions on interest rates are based on the Official Cash Rate (OCR). That rate will be used for calculating interest rates in the table below and will be adjusted annually.

%	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	Jun 23	Jun 24	Jun 25
OCR Pre 30 June 2012 internal	4.75	5.0	5.25	5.5	5.75	6.0	6.0	6.0	6.0	6.0
Capital reserves in funds	3.5	3.75	4.0	4.25	4.5	4.75	4.75	4.75	4.75	4.75
Post 30 June 2012 Capital Reserves deficits	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Risks and Uncertainties:
Council is setting its internal funding interest rate six months in advance and holding it stable for the next twelve months. There is a risk its estimates may not correlate with external interest movements which may mean Council is not optimising its returns. However, Council believes that is outweighed by the certainty of internal return it can give to the capital reserves over the financial year.

REVALUATION OF RATING VALUES OF THE MACKENZIE DISTRICT

The Rating Valuations Regulations require the Council to undertake a full revaluation of the rating values of District every three years. Council contracts QV Rating to perform this task for it. The last full valuation was effective from July 2014 and the rates for the 2014/2015 year will be levied on these 2014 values, with the appropriate adjustments for new sections and capital improvement work.

Over the ten year period of the LTP, there will be further revaluations in July 2017, July 2020 and July 2023.

The uncertainties in trying to predict such changes are simply too great. In addition, revaluations do not fundamentally impact upon the overall costs incurred by the Council, although they may impact on the relative rating load carried by individuals.

Risks and Uncertainties:
Under the Rating Valuation Regulations, each district requires a full revaluation for rating purposes every three years. The result of the revaluation may increase or decrease the value of the District at a rate different to assumptions. Unanticipated surges in development may increase the rating base to a material extent. This will not impact the total rates required but may impact the levels of rates paid by individual ratepayers.

REVALUATION OF THE COUNCIL'S NON-CURRENT ASSETS

The Council has a policy of revaluing its buildings, land and infrastructural assets on a three yearly basis. The revaluation process is important as it regularly updates the replacement cost of these assets and accordingly, revises the appropriate level of depreciation that should be charged on these assets.

The depreciation charge is generally rated for and funds are deposited into individual capital reserves, which are used to fund any capital expenditure, so the revaluation process ensures that the depreciation charge keeps pace with inflation.

The last revaluation of the Council's buildings and infrastructural assets was effective from 1 July 2013; therefore the next revaluation will take effect from 1 July 2016, with the resulting depreciation charges accounted for in the 2016/2017 expenditure. Further revaluations take effect from 1 July 2019 and 1 July 2022.

The Council has made the assumption that the book values of the relevant assets as at the revaluation dates will be increased by the inflation rates as per the BERL inflation forecasts as described in the assumption for inflation. The revaluation in 2017 will use the inflationary increase from the 2013/14 as the base year and the subsequent revaluations will be increased by the cumulative inflationary factors for the three year period. Due to the difficulty in calculating a meaningful remaining useful life, it is assumed this will remain constant and depreciation calculated will be inflated by the same BERL rates as the fixed assets.

These increases, along with any increases on capital purchases made in the intervening years have been applied to the existing values to arrive at the revalued amount for each asset.

Risks and Uncertainties:
Inflationary costs in some areas may increase at a rate different to that forecast. Some types of costs (e.g. roading and transport costs) have been subject to fluctuations in recent years, so it is inherently difficult to predict trends with accuracy. In addition, the condition of the assets revalued may be different to that assumed and the value of the asset may differ accordingly.

FORESTRY ASSETS

The Council revalues its forestry assets so that the carrying value is maintained at fair value. It is assumed that the value of the investment will be maintained at its current value and therefore the Council will not recognise any movements in valuation.

Risks and Uncertainties:
There is a risk that the value of the forestry asset may change. This would change the Council's financial performance in the year it occurs. It will not have a direct impact on the level of rates or expenditure.

EFFECT OF ASSETS VESTED TO COUNCIL

When a developer carries out a subdivision, they are required to vest various assets to Council. These assets include any new roads, water mains, sewer mains, stormwater systems, footpaths, street lighting and landscaped areas. The Council is then responsible for the maintenance and future replacement of those assets.

It is Council policy to accept the vesting of the assets in the year that the Council is able to rate the individual sections created.

To determine the value of the assets to be vested, the Council made assumptions based on an analysis of the costs of recent subdivisions in the District. The average costs were assumed as follows:

Roading (incl Footpaths)	$5,406 per section
Sewer	$8,300 per section
Stormwater	$3,120 per section
Water	$5,500 per section

These amounts will be applicable to all three townships and the amounts will be multiplied by the numbers of urban sections created in each year to arrive at the total assets to be added to the Council's asset register. This will also be inflation-adjusted each year according to the BERL inflation forecasts as described in the assumption for inflation. Each addition to the asset register will be depreciated by any appropriate depreciation charge. No vested assets will be applied to rural sections.

To balance the books, the introduction of the asset value needs to be reflected in income, therefore, there will be a corresponding income line called "Vested Assets Income". This income will be treated the same as financial contributions as it is deemed to be capital income rather than operational income. The amount of this income plus the amount of the vested asset will be accounted for in the capital reserve of each asset.

Risks and Uncertainties:
The assumption has based the level of assets vested to Council on an analysis of recent major subdivisions carried out in the District. Some subdivisions may not result in any further assets to be vested in the Council as there has already been adequate capacity provided for the new sections and some subdivisions may have a greater amount of assets vested into Council as there may be a greater per property costs associated with the subdivision.

DIVIDENDS RECEIVED

Alpine Energy Limited:
It has been forecast that the dividend flow from Alpine Energy will be set at $396,000 for the first year of the LTP, rising to $437,000 by year 10 of the plan. This has been based on the historical performance of the company, and indications from the company as to levels of dividends it is likely to pay.

Risks and Uncertainties:
The actual dividend flow from any of the Council's equity investments is subject to a number of external factors, which the Council may or may not have the ability to influence. As a result, the dividends received may be different to those assumed in the forecast financial statements and will impact the level of rates required as dividends from Alpine Energy Ltd are used to offset the General Rate.

INVESTMENTS

Funding Of Asset Replacement
All future capital expenditure is to be funded by way of the Council's internal financing policy or external borrowing. The policy provides for the use of capital reserves as the basis for funding capital expenditure. Income from funded depreciation and financial contributions are deposited into the capital reserves.

The components of interest will either receive or be charged interest based on the assumption in the 'Interest' section.

Risk and Uncertainties:
As the interest component of the policy is based on the Official Cash Rate, and estimates of future bond and term deposit rates, there is inherent uncertainty with regards the movements in the rate and external debt.

Property Sales and Land Development
This plan assumes that land held by Council considered to be surplus to requirements will be disposed of. Council assumes that any costs of development that may arise will be funded from those sales. The sales income where appropriate has been based on independent valuation.

Risk and Uncertainties:
Council may not attract interested parties willing to purchase or lease land it has for sale.

There is also a risk that the value may vary from that assumed for this plan. Since we have relied on external valuations to quantify the values included, we consider this to be low. However, should the land values fall, Council will postpone sales meaning costs of development and sales will be moved into future years.

FUNDING OF CAPITAL PROGRAMME

The capital base over the next ten years is expanding; this is due to assets vested in Council by developers, and capital projects. The capital projects will be funded by existing or future cash reserves, funded depreciation accumulated over a ten year period and external borrowings. Subsidies will be available for most roading projects.

Risks and Uncertainties
Council is required to produce a 30 year Infrastructure Strategy for its capital expenditure. The first ten years has been incorporated into the LTP. Years 1 and 2 of the plan have a reasonable degree of certainty as to the level of expenditure required. Beyond this period since detailed costing or design have not occurred there is potential for these estimates to be inaccurate.

USEFUL LIVES OF ASSETS

The useful lives of assets have been assumed as follows, which matches the depreciation policy under the Statement of Accounting Policies:

Land
Land has an enduring life.

Motor Vehicles
Motor vehicles are deemed to have a five year life.

Infrastructural Assets and Buildings
The estimated useful lives of the assets are as follows:

Roading/Bridge Network

- Land under roads — Enduring Life
- Formation — Enduring Life

▪ Sub base	Enduring Life
▪ Base Course	75 - 100 years
▪ Surfacing	0 - 18 years
▪ Kerb & Channelling	10 - 100 years
▪ Street Signs	13 years
▪ Street Lighting	20 - 40 years
▪ Bridges	80 years
▪ Box Culverts	100 years

Water Network

▪ Mains	20 - 80 years
▪ Pumps	25 years
▪ Service lines	80 - 100 years
▪ Hydrants	80 years
▪ Valves and Air Valves	80 years
▪ Meters	25 years
▪ Reservoirs	80 years
▪ Electrical Controls	20 years

Sewerage Network

▪ Mains	60 - 80 years
▪ Pumps	15 years
▪ Oxidation Ponds	100 years
▪ Manholes	80 years
▪ Electrical Controls	20 years

Stormwater Network

▪ Lines	150 years
▪ Manholes	150 years
▪ Open Drains	Enduring Life

Buildings

▪ Structure	80 years
▪ Services	45 years
▪ Internal Fitout	25 years

Other Assets

The expected useful lives of major classes of assets are as follows:

▪ Light Plant & Machinery	5-10 years
▪ Office Equipment	2-10 years
▪ Furniture & Fittings	5-10 years
▪ Computer Equipment	3-5 years
▪ Computer Network Cabling	10 years
▪ Heritage Assets	60-150 years
▪ Village Projects	5-80 years
▪ Landfills	33-50 years
▪ Resource Recovery Parks:	
- Formation/Site Development	35 years
- Surfacing/Metalling	15 years
- Signage, Plant & Equipment	5-10 years

Risks and Uncertainties:
The useful lives are based on historical information. Some assets may last longer than the lives stated above because of differing factors and conversely, some assets may deteriorate at a faster rate that the lives stated above.

RESOURCE CONSENTS

It is assumed that the condition of resource consents held by the Council will not be changed significantly and that the Council will be able to renew and obtain the necessary resource consents for planned projects.

Risks and Uncertainties:
There is a risk that the consent conditions will change or that consents will not be obtained for Council projects. If these situations occur, then expenditure may increase to comply with the conditions and this may have an impact on rate levels. If consents cannot be obtained for planned projects, the project may be delayed or may not go ahead.

CLIMATE CHANGE

It is assumed that climate change is happening but that there will be no significant impact on the Council's activities within the period covered by the long term plan. However, the Council will take into account the impacts of climate change as it plans, builds and renews its infrastructure.

As has been seen in the first two years of the previous LTP (2012-22) changing weather patterns are having a negative effect on our Roading network. There has been approximately $1.8m spent on emergency works recovery on the roading network. The increased rainfall events of a medium to high intensity have caused many wash outs, slips and scouring throughout areas not usually subjected to such issues. Works have been completed in an attempt to ensure network resilience on key access roads, yet on other roads, where there is suitable alternative access, the level of service has dropped to heavy four-wheel drive access only. Future restrictions on available emergency works funding from NZTA will mean larger Roading Reserves will be required to ensure adequate funding is available to reinstate roads following an emergency flooding or snow fall event.

LEGISLATION AND LOCAL GOVERNMENT REFORM

The Mackenzie District long-term plan assumes that existing legislation will remain in place and that the structure and responsibilities of the Council will remain the same over the period covered by the plan. It also assumes it will remain an independent unit of local government during the next 10 years. The Council sees merit in pursuing the sharing of services with its neighbours to allow more efficient use of skills and resources.

Risks and Uncertainties:
There is a likelihood that legislative change may affect responsibilities of Council. This may impact upon the delivery of building control functions, roading and water supply. Until Government policy intentions are clearer, accurate predictions of these changes upon Council during the period of the Plan cannot be made.

COMMITMENTS AND CONTINGENCIES

It has been assumed that the level and nature of commitments and contingencies as stated in the Council annual report for the year ended 30 June 2014 will remain unchanged over the period covered by the LTP.

Commitments
The commitments include contracts entered into but obligations or considerations yet to be delivered. The principal contracts in this category are the contributions that the Council makes to the Mackenzie Community Library and the Twizel Community Library.

As at 30 June 2014, there was also a list of non-cancellable contracts that had a number of years to completion. While some of these contracts will be renewed or re-let over the period of the long-term plan, the level and nature of commitments are not expected to significantly change.

Contingencies
It has been assumed that there will be no contingencies to be reported over the period of the long-term plan.

Risks and Uncertainties
It should be noted that circumstances can change throughout the ten year period and that the level and nature of commitments and contingencies is subject to change.

NATURAL DISASTERS

Council has assumed no natural disasters will occur during the period of this plan. Council has, in this plan, accepted that it will keep appropriate levels of cash reserves ($3.0m) and sufficient head room in its borrowings to enable it to undertake any repairs on its underground asset. In event of a major disaster, Council has assumed additional central government support will be forthcoming plus it will need to borrow additional funds to make repairs and meet the costs of restoration. More work needs to be done in terms of mitigating the risks Council faces from natural disasters.

Risk and Uncertainties
It is difficult to assess the level of impact natural disasters may have on the District. Council will use the strength of its balance sheet to fund its share of repair/reinstatement costs.

PROPERTY SALES

The development at Lake Tekapo has commenced year 2014/15. Council's forecast levels of surpluses are dependent on remaining sales occurring. There is a risk that the sales will not occur in the years portrayed in the LTP. Council will not undertake any development without securing sales beforehand. Council may also sell other land as surplus to its requirements. These have been included in future years of the LTP and again may not occur in the years portrayed in the Plan.

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: FINANCIAL STRATEGY

DATE: May 7 2015

FROM: Toni Morrison, Senior Policy Planner
Paul Morris, Finance Manager

REASON FOR REPORT

To provide and adopt the updated Financial Strategy for the Council's Long Term Plan 2015/2025 and Consultation Document.

RECOMMENDATIONS:

1. That the report be received.

2. That the Financial Strategy 2015-2025 be adopted by Council.

WAYNE BARNETT

CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

Attachment 1: Financial Strategy 2015-2025

BACKGROUND:

The Council is currently finalising all of the supporting information that will form the basis of the 2015-25 Long Term Plan (LTP). The Local Government Act 2002 requires the LTP to include the Council's Financial Strategy, and a summary of the strategy must be included in the Consultation Document.

The Council approved the Financial Strategy at its meeting of March 31 2015. However some amendments have been required to reflect subsequent budget and policy decisions.

In summary, the proposed updates are:

- Widening the section on drinking water infrastructure to describe the affordability of all key infrastructure as a significant factor;
- Including a chart on current land use based on capital value in the district;
- Inserting a table and information on the quantified limits on rates increases and predicted rates increases;
- Inserting a table showing the maximum levels of debt and financing costs.

POLICY STATUS:

N/a.

SIGNIFICANCE OF DECISION:

In accordance with Council's Significance and Engagement Policy, these matters have been assessed as significant because the decisions relate to supporting information for the Consultation Document and the Long Term Plan 2015-25.

ISSUES & OPTIONS:

This process is currently progressing under tight timeframes. Council is required to adopt all supporting information for the Consultation Document prior to adopting the Consultation Document itself. The CD will be presented to Council on 7 May for public consultation.

This timeframe is necessary to ensure that the LTP is adopted by June 30. The consequences of not adopting the LTP by June 30 include a delay in striking the rates for the new financial year, resulting in a loss of income to Council.

The options available to Council are to either:

1. Approve the final Financial Strategy as contained in this report OR
2. Amend as appropriate and approve the Financial Strategy.

CONSIDERATIONS:

Legal
This process is guided by the Local Government Act 2002.

Financial
As stated above there is a financial risk to Council if the Long Term Plan process does not meet its tight deadlines and adoption is delayed until after June 30, 2015.

CONCLUSION:

The Council is required to have adopted all supporting information for the Consultation Document prior to adopting the Consultation Document itself. This paper seeks the adoption of the updated Financial Strategy as part of that supporting information.

Financial Strategy 2015-2025

The Council is required to have a financial strategy as part of its Long Term Plan (LTP). The purpose of the Financial Strategy is to facilitate prudent financial management by providing a guide to consider proposals for funding and expenditure against, and to show the overall effects of funding and expenditure proposals on the Council's services, rates, debt and investments.

In the strategy, the Council is required to specify the factors expected to have a significant impact on Council for the period covered by the LTP.

We have outlined below the factors we consider to be significant:

a) Affordability of key infrastructure, including implementation of the Drinking Water Standards.
b) Levels of internal debt currently held by Council and plans to repay that debt over a 25 year period.
c) Reduction in Central Government roading subsidy contribution.

We are also required to cover the following:

a) Expected changes in population and changes in the use of land within the District and the impact on operating and capital costs of providing those changes;
b) The expected capital expenditure on network infrastructure required to maintain existing levels of service currently provided by Council; and
c) Other significant factors affecting our ability to maintain existing levels of service and to meet additional demands for service.

We must as part of this strategy:

a) Place a quantified limit on rates, rate increases and borrowing
b) Assess our ability to provide and maintain existing levels of service and to meet additional demands for service within those limits
c) Detail our policy on the giving of securities and
d) Specify our objectives for holding and managing financial investments and equity securities.

Each of these are discussed in more detail below.

FACTORS EXPECTED TO HAVE A SIGNIFICANT IMPACT

Affordability of Key Infrastructure

The Health (Drinking Water) Amendment Act 2007 requires water suppliers to take all practical steps to comply with the (previously voluntary) NZ Drinking Water Standards. To comply with the Act, Council must have in place a public health risk management plan which is approved by the Ministry of Health for each water supply. Dates for compliance with the Act are staggered depending on the size of the community.

For Fairlie, Tekapo and Twizel the compliance date was 1 July 2014. For Burkes Pass, Allandale and Albury, the compliance date is 1 July 2016. (The Albury Water Supply is managed by the Albury Rural Water Supply Society Inc. under an agreement with Council, and expenditure on this scheme is not included in Council's budgeting process). Council currently does not comply with the drinking water standards.

The expected capital outlay to enable Council to comply is expected to be approximately $2.459 million for the Fairlie town supply.

Upgrades to sewerage and stormwater systems are also required in the Long Term Plan (LTP) period. While no significant change to the operation of most of the Council's stormwater assets is proposed, the Council is required to develop 'stormwater management plans' under the Land and Water Regional Plan, and stormwater discharges will be required to be progressively upgraded to improve discharge quality.

Changes to environmental standards, climatic conditions and growth will also require upgrades to some of the district's sewerage systems. Replacement of deteriorating infrastructure is also required over the term of the LTP.

Level of Internal Debt Currently Held By Council
Council has two types of internal debt; being operational and capital.

Capital debt has been incurred where capital expenditure has occurred in advance of capital receipts. This tends to occur where larger infrastructure costs are incurred ahead of rate funded depreciation. It is a buy now/pay later mentality that effectively spreads the cost of the asset over its useful life. The issue is interest is being charged over a longer period than is prudent and there is no likelihood of the debt being repaid as the capital debt is constantly renewed over time through additional capital expenditure.

Operational debt tends to occur when an activity is not appropriately funded so that it creates an operational deficit. This means current ratepayers have received a benefit (a lower cost service) at the expense of future generations. Current policy does not require a monetary cost (interest) on this type of debt.

Council's proposal is to commence a programme of repayment of these debts. It is proposed capital debt will be repaid over a period of 25 years, which may increase the levels of rates paid to ensure the repayment timetables are being met. Operational debt will be repaid over a period of 10 years, which will increase the level of rates paid to ensure repayment schedules are met.

Intergenerational Equity
Council has to balance the equitable sharing of debt load over the life of its assets compared with the interest burden of that is associated with long term debt. Repaying debt over 25 years on assets that have a longer life than that was considered by Council to be a reasonable compromise.

Reduction of Central Government Roading Subsidy
We currently undertake our roading programme based on a contribution from our ratepayers augmented by a larger contribution from central government through the New Zealand Transport Agency (NZTA).

Prior to 30 June 2014 Council received a funding assistance rate (FAR) of 53% for maintenance works and 63% for capital improvements. However NZTA has advised the Council that from 30 June 201 the FAR rate for Council will be 51%, for maintenance works and capital improvements.

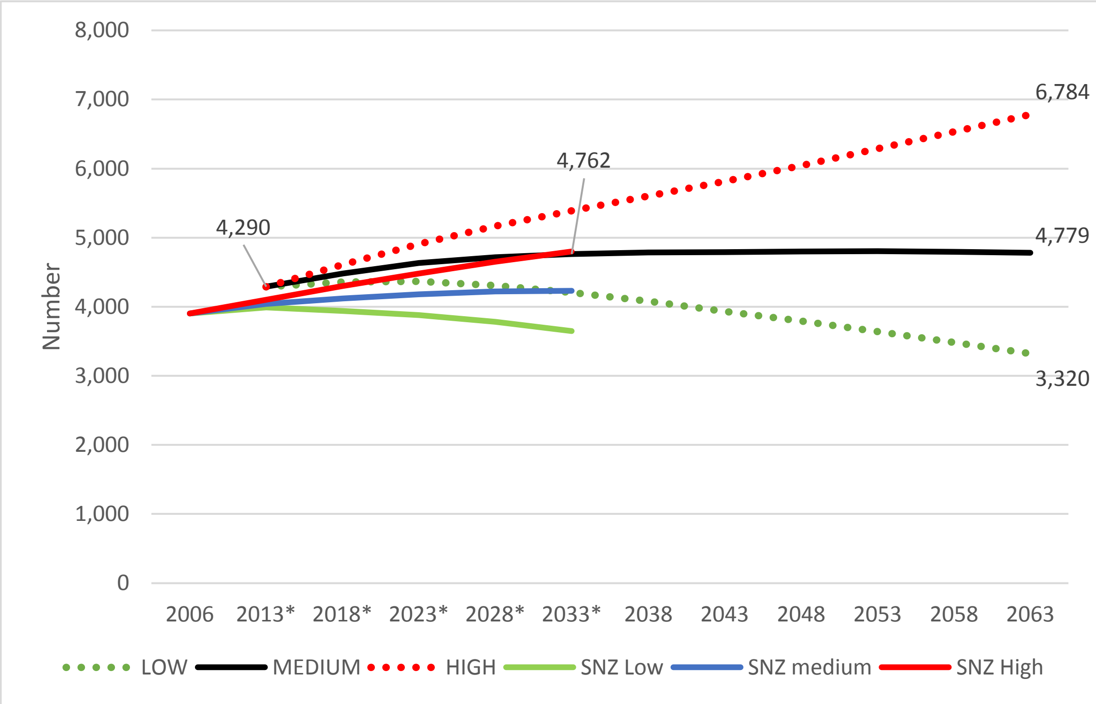
There will be a transition period where Council's FAR will be set at 54% as at June 2016, reducing by 1% per annum until the rate of 51% is reached. This will then remain the rate for years 4 – 10 of our LTP. This reduction will place a greater burden on our ratepayers to be able to fund current levels of service.

Property Sales
There are risks and additional effects associated with adopting such a financial strategy, particularly that, in addition to balancing affordability, community needs and aspirations, with the proposed capital expenditure outlays, the success of the strategy hinges on the sale of subdivided land and a build up of significant cash reserves by 2025.

Population Changes
The LTP has been prepared on the basis that population will continue to grow. We have used the population projections from the 2013 census as a base for the period of the LTP. The following

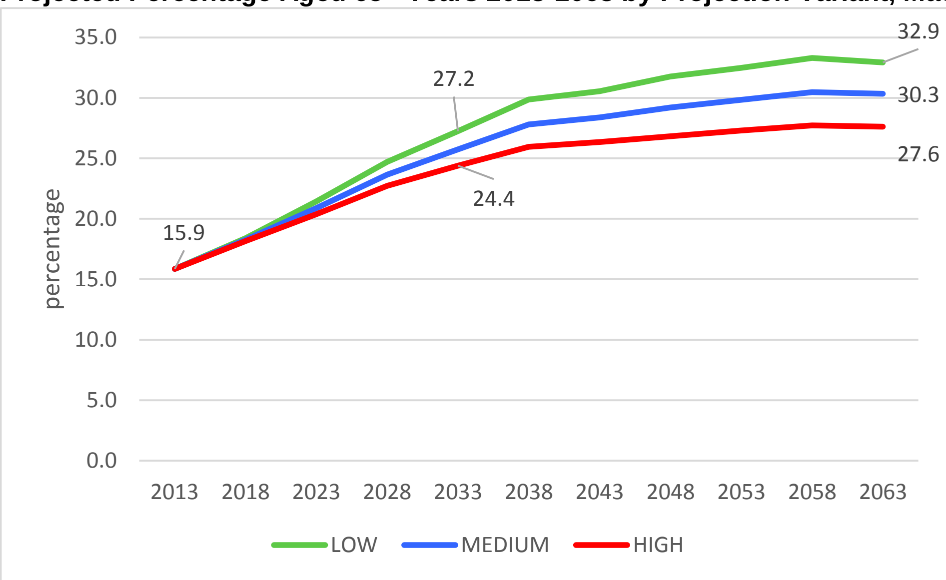
graph shows the population projection for the Mackenzie District between now and 2063. It comes from a population study conducted by Natalie Jackson at the University of Waikato.

Projected Population of the Mackenzie District 2013-2063 and Comparison with Statistics New Zealand Projections (2006-2031), by Projection Variant



It is acknowledged that the population of the Mackenzie is older than the national average and that the percentage of people aged over 65 is growing. This presents issues around ensuring there are appropriate facilities and services for older people. We are committed to providing buildings for medical centres to ensure that health services are adequately provided to the community. The following graph shows the growth in the older population.

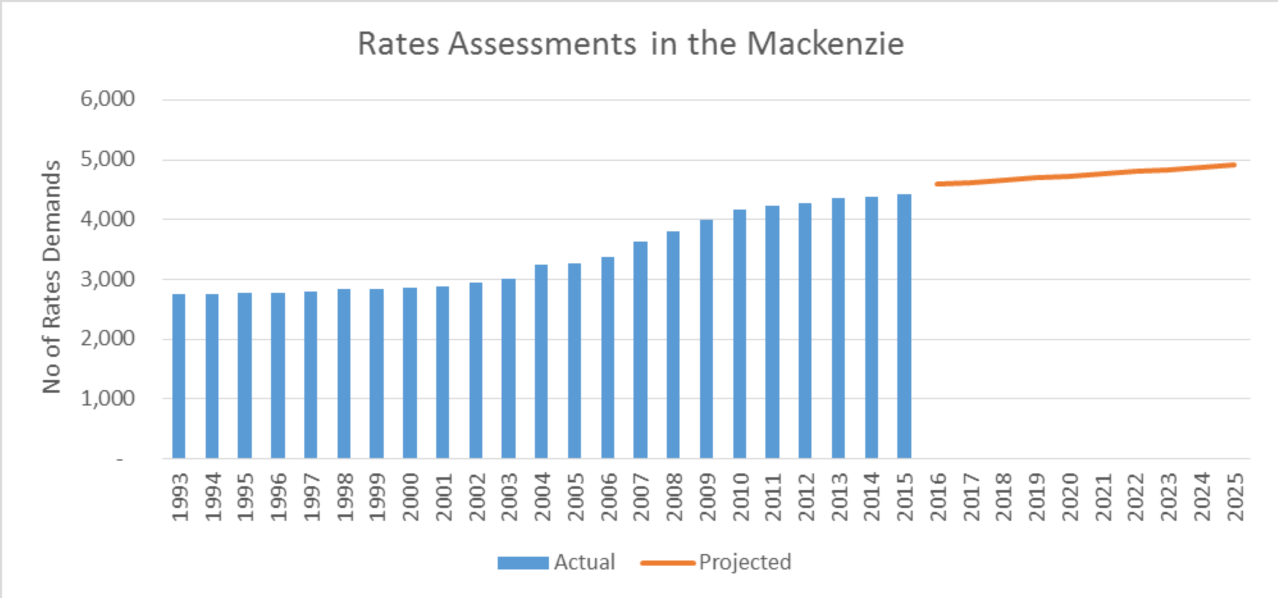
Projected Percentage Aged 65+ Years 2013-2063 by Projection Variant, Mackenzie District



The problem with using the census figures is that Mackenzie has a high proportion of absentee ratepayers. It is difficult to plan using the census figures as they do not account for this.

A more appropriate measure is to use rate demands issued as this accounts for absentee ratepayers.

The table below highlights the growth in rate demands experienced by Mackenzie since 1993 (blue) which has equated to a 56% increase over that period or 76 additional rate demands per year. We expect this level of growth to reduce and have estimated the levels of growth (based on the last 4 years of data) to be 36 rate demands per annum.



We consider our infrastructure networks to have sufficient capacity so as not to require any capital or operational expenditure to increase that capacity over the next ten years.

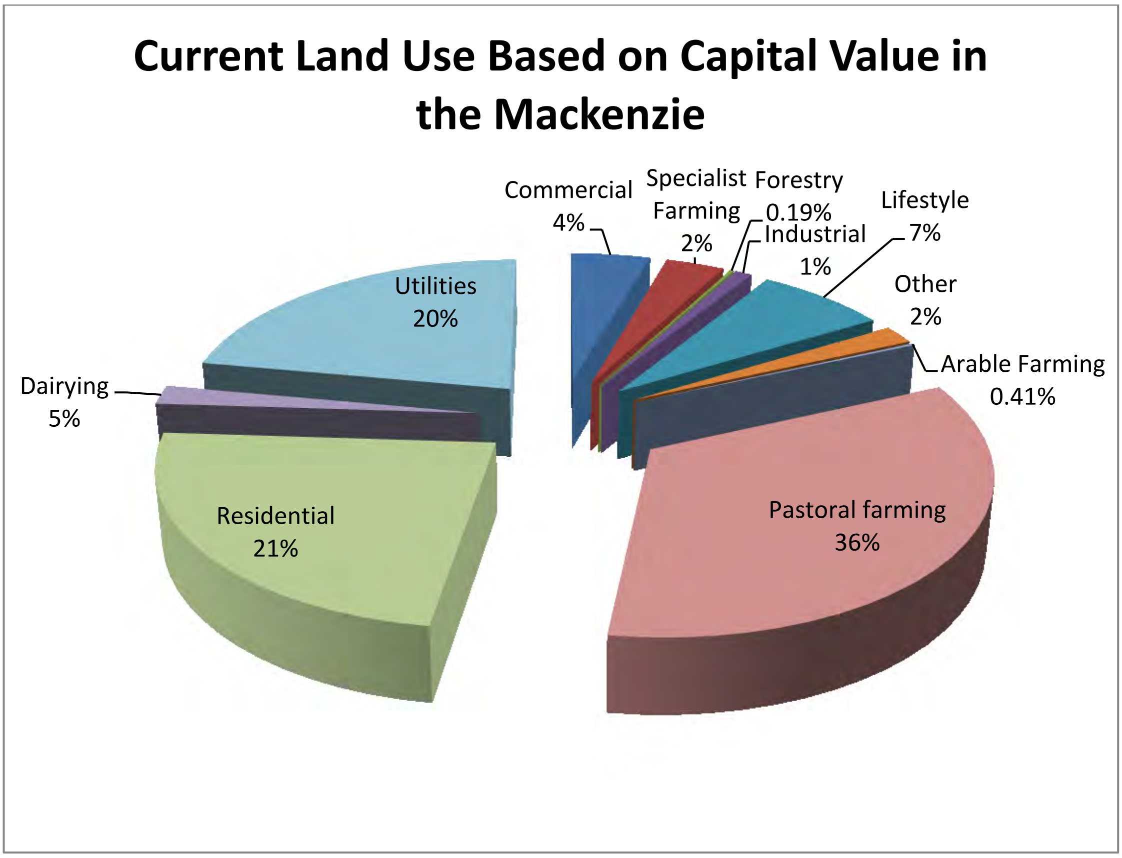
Land Use Changes

The Mackenzie District has historically been an agriculture based district; primarily beef and sheep. Over the past ten years, there have been marked changes to the use of land throughout the District.

The growth in tourism has resulted in increased number of accommodation providers and other businesses associated with tourism, as well as more holiday homes.

The Fairlie Basin has seen an increase in the number of dairy farms and that trend is likely to increase if access to further irrigation can be secured.

The following pie chart shows the current land use of properties in the Mackenzie District as at July 2014 (the date of the last district revaluation).



There is considerable uncertainty associated with future changes in land use within the district. Additionally, any land use change will most likely be between similar categories that have limited impact on infrastructural services (eg converting from pastoral farming to dairy). We therefore have made no allowance for this in this Financial Strategy.

LEVELS OF SERVICE

Capital Expenditure Programme

Capital expenditure requirements for our infrastructural assets and roads are dictated by the levels outlined in our asset management plans (AMPs) for each activity. The AMPs are updated on a regular basis to ensure that various changes to the plan in the interim period are accounted for.

The table below details our capital expenditure programme for major infrastructure required to maintain our existing levels of service.

Network Activity	30 Jun 16 ($000)	30 Jun 17 ($000)	30 Jun 18 ($000)	30 Jun 19 ($000)	30 Jun 20 ($000)	30 Jun 21 ($000)	30 Jun 22 ($000)	30 Jun 23 ($000)	30 Jun 24 ($000)	30 Jun 25 ($000)
Water	751	421	3,394	550	585	1,944	1,930	321	830	361
Sewer	902	31	343	17	398	1,189	306	0	626	0
Stormwater	0	0	666	17	0	150	0	57	222	0
Roading	2,108	2,138	2,642	2,228	2,294	2,739	1,903	1,952	2,293	2,583
Other	653	169	845	648	726	158	157	231	125	90
	====	====	====	====	====	====	====	====	====	====
	4,414	2,759	7,890	3,460	4,003	6,180	4,296	2,561	4,096	3,034

We have prepared this strategy expecting there will be no impediments to providing services in maintaining our existing levels of service for our infrastructural assets. However the Long Term Plan Consultation Document will be asking questions about levels of service in these areas and may prompt changes.

Rates

In general terms, we try to minimize the overall rate increase each year. We do not use the Consumers Price Index (CPI) as our absolute target but more as a guide. This is because the inputs used by Council tend to increase by more than the CPI. The actual increases in rates from an organisational point of view do change from year to year depending on the funding options chosen and also the fact that there are operational costs that are not carried out every year, but need to be funded in the year they are incurred. As a result, as the overall rates increase is an amalgam of many individual rate increases, we intend to set the rates at the level that is required, rather than to ensure the overall rate increase matches inflation.

The Mackenzie District has a small population (one of the smallest in New Zealand), and because of this, relatively minor factors can have a marked effect on the rate increases in any one year as there are fewer people to share the cost. As a result, there is an allowance for any rate increases being higher than the level of inflation due to extraordinary items. These items include, but are not limited to, the following:

- Capital expenditure requirements, which increase the level of debt, both internal and external.
- Increased expenditure due to compliance with new legislation.
- Increases in input costs (as measured by the Local Government Construction Index).

When determining the overall rate increase, an allowance has been made for a $58 million increase in capital value of the district over ten years. This may be reviewed if there are significant areas of growth experienced in excess of this. The increase is applied to all capital values.

Because of the structure of our rating system, the overall increase in rates will not be consistent for each property throughout the District. It will depend on the targeted rates that are charged to that particular property and also the capital value of the property. We monitor the relative rate impacts on 32 sample properties from throughout the District. For each town we measure an average section value, the lower and upper quartile and the mid-point property. For rural areas we measure mainly in increments of $1.0 million as there is no difference in rating factors in the rural area.

Rate Increases

All Councils are required to set a limit on rates increases over the 10 year period of the LTP. There are no rules around how we are to determine what limits are appropriate.

Options

There are a number of options available to us, for instance:

- Linking rate increases to an inflation rate
- Setting a percentage increase
- Setting an increase based on known factors and assumptions

We feel that setting rate increase limits based on an arbitrary rate of inflation was not consistent to the assessment of the proposed costs outlined in the LTP. This is because it did not take into account items such as new capital expenditure, which could result in a necessary increase in rates to fund the work, which could exceed the overall increase in rates.

Setting a percentage increase per annum again did not reflect the assessment of the proposed costs in the long term. Furthermore, as the rates for individual communities can increase at varying amounts due to various factors, it was difficult to set a percentage increase that reflected these factors adequately.

As a result, we have decided to set any increases based on known factors and assumptions.

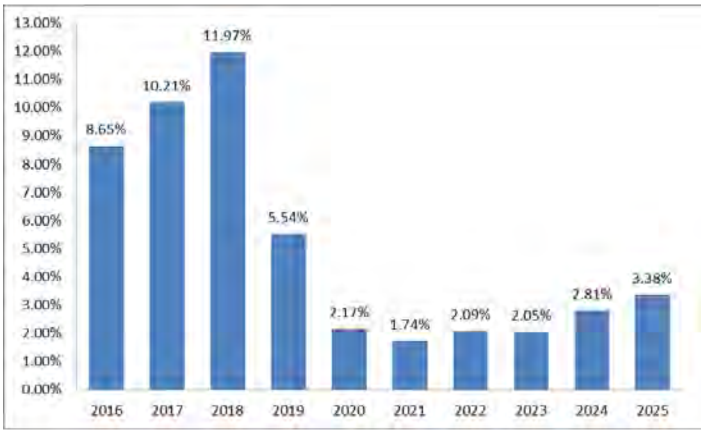
Quantified Limits on Rate Increases

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
$7.82 million	$8.61 million	$9.64 million	$10.18 million	$10.40 million	$10.58 million	$10.80 million	$11.02 million	$11.33 million	$11.72 million

Council's LTP shows rates increases from $7.82 million in the 2015/16 year to $11.72 million over the 10 year period. This equates to an average rate increase of 5.0%. Therefore we have set our annual rate increase to be no more than an average of 5% per year over the 10 years with the exception of the first four years of the plan when Council will set the rate increases at 8.65% in 2015/16, 10.21% in 2016/17, 11.97% in 2017/18 and 5.54% in 2018/19. These higher levels are due to the changes in NZTA funding and infrastructure upgrades.

There may be times where strict adherence to the average increase is not possible. This may occur due to bringing expenditure forward or deferring some expenditure. We have allowed a contingency of +2.5% in any one year as long as the total for 10 years is not exceeded.

Predicted Rates Increases in the Mackenzie District over the next 10 years



Borrowing

We do not anticipate taking on any external debt in the next 10 years. If we do, the following ratios will be used to limit the level of debt we can incur.

a) Debt will not be more than two times our rate income
b) Debt will not be more than 100% of total operating revenue (excluding property sales, capital type contributions or vested assets).
c) Financing costs will not be more than 10% of total rate income.

The following table details Council's maximum levels of debt and financing costs compared to levels proposed in the plan.

	2015/16 ($000)	2016/17 ($000)	2017/18 ($000)	2018/19 ($000)	2019/20 ($000)	2020/21 ($000)	2021/22 ($000)	2022/23 ($000)	2023/24 ($000)	2024/25 ($000)
Maximum debt level (2x rates level or 100% of operating revenue	13,417	14,788	16,558	17,476	17,855	17,166	18,546	18,927	19,458	20,115
*Debt levels predicted in this plan	105	116	152	24	68	293	237	127	22	73
Maximum level financing costs	671	739	828	874	893	908	927	946	973	1066
**Financing costs predicted in this plan	3	11	19	25	28	36	46	49	49	49

*These debt levels relate to our share of the Downlands Water Joint Venture.
**In the case of Downlands Joint Venture interest is cumulative while borrowing is net.

We consider these to be appropriate affordability measures.

Security
Council has the ability to offer as security a charge against rates. This allows us to offer strong security and should help secure lower interest rates.

Depending on the type of debt we take on we may need to prepare a debenture trust deed. The policy details are provided in our external liability management policy.

TARGETS FOR INVESTMENTS

Cash Investments
During the period of the last LTP, we have managed to build up our cash reserves to a significant level. The Council will be undertaking significant capital projects during the period. These cash reserves will be used to fund those programmes, in the form of an internal loan to that activity or project. The loans will be repaid over a 25 year period. The cash investment income along with the interest earned on internal loans are used to offset the district-wide general rate.

Equity Investments
Currently, we hold one equity investment being 4.96% share in Alpine Energy Ltd. This asset is not readily tradeable on the open market, but our objective is to retain ownership of this investment.

Forestry Investments
We hold approximately 1,040 hectares of trees. Some of the key plantations are due for milling during the life of this plan. Forestry assets are held as long term investments on the basis of net positive discounted cash flows, factoring in projected market prices and annual maintenance and cutting costs. All income from forestry is included in the statement of comprehensive income, and this is used to fund replanting of the land. Where there is an excess of funds, we may distribute this in a manner we see fit.

During this Long Term Plan period Council is proposing to sell two blocks of forestry land in the Opuha Ward and maintain the balance of its forestry operation.

IMPLICATIONS OF MACKENZIE'S FINANCIAL STRATEGY

Assessment of our ability to provide and maintain existing levels of service and to meet additional demands for service within those rate increase limits:

We face potential issues in the future in regards to the level of funding that is expected to be provided for roading from NZTA as discussed previously in this financial strategy. This shortfall will be required to be funded in the longer term by rates or levels of service may be cut back. However Council recognises it is a significant step to make up the shortfall in NZTA funding in one year so it is proposed to fund a portion of its roading capital expenditure from land sales. We may also face potential issues relating to future borrowing requirements for renewal of infrastructural assets (water, stormwater and sewer). Rates affordability in individual communities of interest may have an implication on that community's ability to fund large infrastructure projects.

Assessment of our ability to provide and maintain existing levels of service and to meet additional demands for service within those debt limits:

We are not contemplating taking on any debt. However, if required the maximum amount of interest expected to be charged on the external debt is budgeted at less than $0.329m. Therefore, our assessment is that we do have the ability to maintain the existing levels of service and to meet additional demands for service within those debt limits.

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: LONG TERM PLAN SUPPORTING INFORMATION

DATE: May 7 2015

FROM: Toni Morrison, Senior Policy Planner
Paul Morris, Finance Manager

REASON FOR REPORT

To provide a number of updated supporting reports for the Council's Long Term Plan 2015/2025 and Consultation Document for adoption.

RECOMMENDATIONS:

1. That the report be received.

2. That the updates to the Infrastructure Strategy be adopted by Council.

3. That the updates to the Transportation Activity Management Plan be adopted by Council.

4. That the updates to the Stormwater Activity Management Plan be adopted by Council.

WAYNE BARNETT

CHIEF EXECUTIVE OFFICER

ATTACHMENTS:

Attachment 1: Updates for Infrastructure Strategy
Attachment 2: Updates for Transportation Activity Management Plan
Attachment 3: Updates for Stormwater Activity Management Plan

BACKGROUND:

The Council is currently finalising all of the supporting information that will form the basis of the 2015-25 Long Term Plan (LTP).

Infrastructure Strategy

The Local Government Act 2002 requires the LTP to include the Council's Infrastructure Strategy, and a summary of the strategy must be included in the Consultation Document.

The Council approved the Infrastructure Strategy at its meeting of March 10 2015. However discussions at subsequent Council workshops and recent indications as to co-funding from NZTA have resulted in a need to review and amend the strategy. Attached are the relevant sections with the updated wording (highlighted in yellow), for the Council's consideration and adoption. Once adopted this will form part of the supporting information for the Consultation Document and LTP.

Transportation and Stormwater Activity Management Plans

As with the Infrastructure Strategy, these AMPs have been adopted by Council at previous meetings, but require consequent updating following recent decisions. Attached are the relevant sections with the updated wording (highlighted in yellow), for the Council's consideration and adoption.

POLICY STATUS:

N/a

SIGNIFICANCE OF DECISION:

In accordance with Council's Significance and Engagement Policy, these matters have been assessed as significant because the decisions relate to supporting information for the Consultation Document and the Long Term Plan 2015-25.

ISSUES & OPTIONS:

This process is currently progressing under tight timeframes. Council is required to adopt all supporting information for the Consultation Document prior to adopting the Consultation Document itself. The CD will be presented to Council on 7 May for public consultation.

This timeframe is necessary to ensure that the LTP is adopted by June 30. The consequences of not adopting the LTP by June 30 include a delay in striking the rates for the new financial year, resulting in a loss of income to Council.

The options available to Council are to either:

1. Approve the amendments as contained in this report OR
2. Amend as appropriate and approve the amendments.

CONSIDERATIONS:

Legal
This process is guided by the Local Government Act 2002.

Financial
As stated above there is a financial risk to Council if the Long Term Plan process does not meet its tight deadlines and adoption is delayed until after June 30, 2015.

CONCLUSION:

The Council is required to have adopted all supporting information for the Consultation Document prior to adopting the Consultation Document itself. This paper seeks the adoption of updates to various supporting documents, to enable the adoption of the Consultation Document.

Attachment 1 – Updates for Infrastructure Strategy

software where the Financial Strategy is developed and inflation allowed for using figures supplied by BERL on behalf of local government.

3.7.1 3 Waters

In the process of producing this Infrastructure Strategy, and the underlying supporting plans, Council has considered the following:

- Alignment with the Community Outcomes in the LTP
- Council priorities in terms of the overarching aim for delivering core services
- The need to manage the assets at a Core (3 Waters) level in accordance with appropriate asset management best practice
- Delivering cost effective services that are efficient, effective and appropriate
- Providing an appropriate level of resilience
-

This Infrastructure Strategy is supported by a previous study by Council on water supply and sewerage assets, which used 2009 pipe construction costs and industry standard base lives, to look out eighty years.

This work has allowed the Council to ascertain where the peaks in replacement expenditure of the these assets are, by community. Council has modelled this expenditure and has come to the conclusion that some towns cannot afford this level of expenditure alone.

Council has decided its preferred option is that each of the four urban water supplies, sewerage schemes and stormwater networks are amalgamated into single urban schemes for water, stormwater and sewerage. This means that the cost of providing the 3 waters infrastructure across the townships is funded universally across the users of those services, who pay the same amount for receiving the service. This is to ensure that infrastructure networks remain affordable to all ratepayers that benefit from the services, regardless of where they reside in the district.

With the combining of the water supplies, stormwater and the sewerage schemes, the Council will be able to set priorities on the key capital expenditure for the networks as a whole, and bring more resources to problems and remedy them more efficiently. This is also expected to provide lower operating costs.

This proposal is being consulted on during the 2015/2025 LTP process.

3.7.2 Land Transport

To fund roading operational and capital expenditure, the Council receives a percentage of the cost as a subsidy from New Zealand Transport Agency (NZTA). The co-investment rate is based on recent review of the New Zealand Transport Agency Funding Assistance Rates.

The Council has been informed by NZTA that the new Co-investment Rate will be as follows:

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Maintenance, Operational and Renewal Expenditure	54%	53%	52%	51%	51%	51%	51%	51%	51%	51%
Minor Improvement	54%	53%	52%	51%	51%	51%	51%	51%	51%	51%

The roading programme is funded from Council's own resources and a co-investment from NZTA. NZTA's contribution is limited to the approved land transport programme. is prepared to financially support. Council may compensate for any reduction by increasing the amount of unsubsidised work it undertakes.

3.7.3 Risk and Uncertainties

3.7.3.1 Transportation

Council's risk is the roading programme may contract further due to the reduction in subsidy rates and/or under co-investment by NZTA that will inevitably reduce the programme. This plan assumes Council will maintain or expand its spend through additional unsubsidised work.

Due to the uncertainty around NZTA's "One Network Classification" system and its impacts, no account of this has been considered in the strategy.

3.7.3.2 Three Waters

The document identifies a significant amount of renewals and new works over the life of the strategy. It assumes that the capital works programmes will be funded by existing cash reserves, funded depreciation accumulated over time and external borrowing.

These are critical assets that will have a significant impact on service delivery, including fire suppression, if not replaced before they completely fail.

3.7.3.3 Insurance and Risk

There are numerous significant active fault zones within Mackenzie District and surrounding areas. Of these, some of the most significant in terms of potential lifeline impacts, include the Ostler and the Irishman Creek Fault Zones in the Mackenzie Basin. Both fault zones have the ability to generate significant earthquakes. Not to be ignored is the Alpine Fault on the Districts northern boundary that has the ability to generate the largest earthquakes and the greatest spread of damage which could severely impact Council's lifelines.

The Council holds $3,000,000 in cash reserves to insure against natural disasters that affect its infrastructure. It is essential that Council continues to maintain the cash reserve or put in place an insurance regime to replace/complement it, if it changes its current policy.

Figure 6.1 – 20+ Year Resurfacing Forward Works Programme

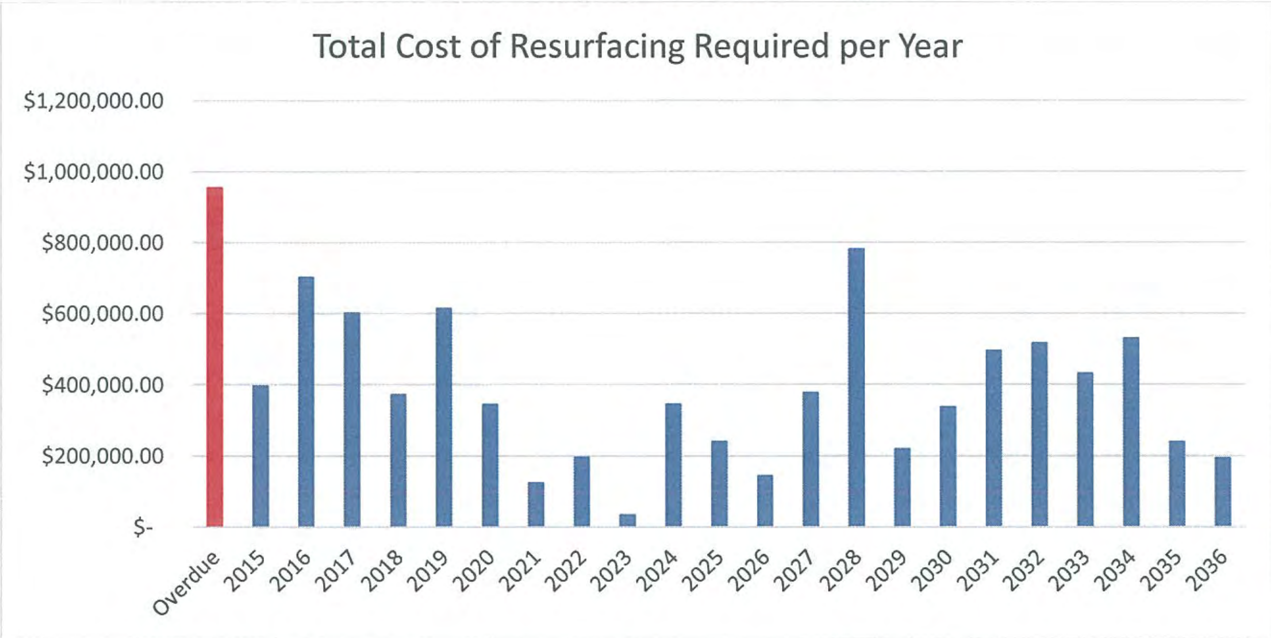
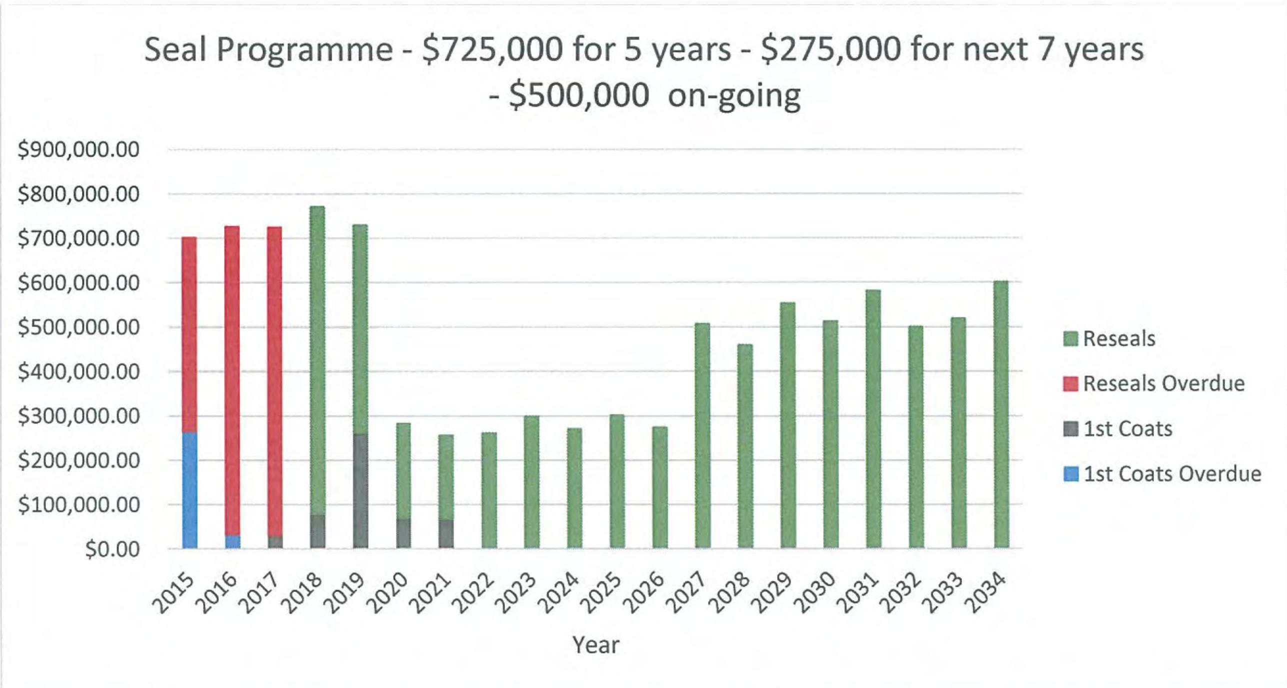


Figure 6.2 – Smoothed Resurfacing Forward Works Programme



It should be noted that this is an ideal situation that does not allow for early failure of any seal or inflation. It is also modelled on the re-sealing rates for 2013/14.

NZTA have indicated that they will not fund MDC at the above levels. MDC proposes to fund the shortfall in coinvestment through rates, use of reserves and the sale of assets. If the proposal is not adopted then Council may recommend a reduced level of service on some roads by allowing them to revert to gravel.

Activity District Wide Roading

Note Year 1 through 30 to be in todays $

Account Type	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11-15 2026/30	Year 16-20 2031/35	Year 21-25 2036/40	Year 26-30 2041/45
Grand Total														
Income														
Rates														
NZTA														
Expenses (Operational)														
Sealed Pavement Mtce	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	1,000,000	1,000,000	1,000,000	1,000,000
Unsealed Pavement Mtce	370,000	370,000	370,000	370,000	370,000	370,000	370,000	370,000	370,000	370,000	1,850,000	1,850,000	1,850,000	1,850,000
Routine Drainage Mtce	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	600,000	600,000	600,000	600,000
Drainage Mtce - St Cleaning	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	150,000	150,000	150,000	150,000
Structures Maintenance Bridges	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	650,000	650,000	650,000	650,000
Structures Maintenance Cattlestops	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	75,000	75,000	75,000	75,000
Environmental Mtce	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	700,000	700,000	700,000	700,000
Traffic Services Mtce	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	225,000	225,000	225,000	225,000
Minor Events	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	250,000	250,000	250,000	250,000
Street Lighting – Maintenance	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	300,000	300,000	300,000	300,000

Street Lighting – Electricity	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	350,000	350,000	350,000	350,000
Emergency Reinstatement	0	0	0	0	0	0	0	0	0	0	0			
Street Lights - Mtce – NZTA	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	30,000	30,000	30,000	30,000
Street Lights-Elect – NZTA	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	60,000	60,000	60,000	60,000
Drainage Mtce - St Cleaning NZTA	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	125,000	125,000	125,000	125,000
Footpaths	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	175,000	175,000	175,000	175,000
New Year Road Sweep	0	0	0	0	0	0	0	0	0	0				
Assets (Capex)														
Unsealed Road Metalling	650,000	650,000	650,000	650,000	650,000	650,000	650,000	650,000	650,000	650,000	3,250,000	3,250,000	3,250,000	3,250,000
Sealed Road Resurfacing	725,000	725,000	725,000	725,000	725,000	275,000	275,000	275,000	275,000	275,000	1,600,000	2,500,000	2,500,000	2,500,000
Drainage Renewal	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	300,000	300,000	300,000	300,000
Sealed Road Pavement Rehabilitation	0	200,000	400,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	1,000,000	1,000,000	1,000,000	1,000,000
Structures Component replacements-Bridges	20,000	20,000	120,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	100,000	100,000	100,000	100,000
Structures Component replacements-Cattlestops	8,000	8,000	8,000	0	8,000	0	8,000	0	8,000	0	0			
Traffic Services Renewals	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	400,000	400,000	400,000	400,000
Associated Improvements	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Footpaths - Surfacing	20,000	120,000	160,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	500,000	500,000	500,000	500,000
Minor Improvements	50,000	250,000	450,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	1,250,000	1,250,000	1,250,000	1,250,000
Sealing Past Houses	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	50,000	50,000	50,000	50,000

Attachment 2 – Updates for Transportation AMP

Changes that may affect future LOS include:

- Changes in government requirements
- Continual drops in Funding Assistance Rate (FAR) to a base level of 51%
- Funding shortfalls caused by natural disasters, such as Canterbury Earthquakes
- One Network Road Classification.
- Change in land use and intensification associated with the roading network.
- Increased pressure from Central Government to allow heavier vehicles on the network.

1.9 NEW ZEALAND LAND TRANSPORT – ONE NETWORK ROAD CLASSIFICATION - LEVEL OF SERVICE

This AMP was written on the basis of agreed levels of service, consulted on through the LTP process since 2009, with our customers. NZTA's One Network Road Classification recently confirmed (late January 2015) indicates a different level of service from that previously confirmed by Council. The lateness of delivery of this new confirmed classification system has not allowed staff sufficient time to complete the necessary gap analysis to ascertain whether there is a gap between ONRC levels of service and Council's levels of service. A Transitional Plan has been completed and is awaiting NZTA approval.

1.10 FUTURE DEMAND

The Mackenzie District Roading network predominantly carries low volume rural traffic on unsealed roads. Only 52.55km of the total 722km in the network is urban. The districts population of approximately 4,000 is low and the growth at approximately 9.3% (since the 2006 census) this is a significant change from the 2001-2006 period where the population grew by a modest 2.3%. Predominantly the growth we are experiencing in traffic numbers is due to increasing Tourist numbers and economic development due to irrigation and changes in far practices.

Future demand on the network will continue to be driven by tourism and land use changes and intensification brought about through changes to irrigation within the district.

1.10.1 POPULATION

The following graph predicts a relatively static population growth over the period of this strategy. As a result there will not be any significant increase or decrease in demand for Council services based on change in population.

Other systems operated by the Council are:

- ArcGIS Geographic Information System
- NCS Corporate financial management system
- Hardcopy plan filing systems

1.14 PLAN IMPROVEMENT AND MONITORING

This AMP has previously been reviewed and updates incorporated including improvements to move towards "Core+" level Asset Management. Council is committed to a continual improvement as outlined in Section 10. A key objective is to dovetail the asset management planning process with the other key planning processes particularly the 30 year infrastructure plan and the Community Long Term Plan (LTP).

The review and improvement of this AMP requires resource and budget in order to complete the selected improvement tasks. Table 10.1 outlines the items for improvement, relative urgency, resource, priority, budget and the authority sought to give approval to complete each item.

1.15 KEY ASSUMPTIONS AND CONFIDENCE LEVEL

There are a number of significant assumptions that have been made in the development of this AMP as outlined below.

1.15.1 ASSET DATA

The level of confidence in our data has significantly increased since the last iteration of this AMP completed in 2013. Council has carried out a significant auditing and validation programme on its RAMM data, completed by OPUS Consultants Ltd. All previous assets excel spreadsheets and modelling practises have been integrated with this validated data.

Table 9.1 gives the assessed data confidence quality of the MDC RAMM and spread sheet data tables as described in the 2010 Roading Asset "Mackenzie District Infrastructure Revaluation" report.

1.15.2 FINANCIAL FORECASTS

NZTA's 10 year National Land Transport Programme (NLTP) for Mackenzie District is based on targeted maintenance of the existing and increased roading infrastructure paired with an escalation in renewal programmes. Over the 10 year period there has been no allowance for cost increases due to inflation.

The forecast total Mackenzie District Transport Programme for 2015/18 for operations, maintenance and renewals totals $10,380,949 (inclusive of all administration costs and professional service fees). 47% ($4.85M) of this is to be spent on maintenance and operation with 53% ($5.53M) to be spent on renewals. Whilst Council realise this is an increase of nearly 36% over the approved allocation for the 2012/15 NLTP, the real cost is under $1M per annum and addresses the network needs, which deals with deferred maintenance, due to restricted funding for a number of years. This is not an increased level of service. The $250,000 approved in the 2012/15 NLTP, for WC 341, has been requested to continue to allow for minor improvements to address structures replacements and safety issues. NZTA have indicated approval of approximately $8.8 million of total transport programme.

9. FINANCIAL SUMMARY

9.1 INTRODUCTION

The total Mackenzie District National Land Transport Programme for 2014/15 for operations, maintenance, and renewals is $2.46M. The overall roading budget is $3.36M. The difference is for other "direct expenses" such as Administration, Employment, Consultancy and Non Funded Depreciation.

The following table summarise the budgets presented within the lifecycle management section. In addition budgets for "Other Direct Expenses" are developed and are included within the totals. In accordance with good practise, and the procedures used so far within this AMP, the budgets are shown in today's dollars unless noted otherwise.

9.1.1 10-YEAR FUNDING FORECAST

Table 8.1 sets out the Council's 10 year expenditure forecast for the Land Transport activity. This programme reflects the application for funding initially requested from NZTA for the 2015/18 NLTP period. This will be finalised once the NLTP programme is approved by NZTA. NZTA has notified Council that it is increasing the roading programme that is co-funded, by 10% on the 2012-2015 level. Council has decided to proceed with its proposed programme as planned.

9.1.2 CAPITAL WORKS

The only capital works allowed for over the 10 years 2015-2025 is covered under minor improvements (WC 341). Work to be completed using this funding primarily consists of bridge renewals/replacements, other minor improvements and minor safety works. The amount forecast for Capital works is $250,000 per year over the 10 year period. Audit requires these capital works projects to be split to identify whether new capital is growth or LOS related. Generally capital projects identified are related to meeting LOS requirements.

Item	Task Name	Relative Urgency			Resource	Priority	Budget	Approval Sought	Timeframe
		1	2	3					
6.4	Emergency management (including lifelines) requires review. Require procedures in place for rapid response to emergency failures.		✓		Workshop utilising External Consultant	Medium	To be Confirmed	Council	Within 24 months
7.0	**Life Cycle Management**								
7.1	Review and update the RAMM database. Ensure all inventory data is captured.			✓	Council External Consultant	Low	To be Confirmed	Roading Manager	Ongoing
7.2	Complete a full review of the network assets (using both RAMM and field inspections) and develop a detailed 10 year Forward Work Programme for all asset groups.			✓	Council External Consultant	Low	To be Confirmed	Roading Manager	Ongoing
8.0	**Financial Forecasts**								
8.1	Review funding on confirmation of 2015/18 NLTP	✓			Council	High		Financial Manager Asset Manager	June 2015

Attachment 3 – Updates for Stormwater AMP

Water supply	63%
Sewer network	51%
Stormwater network	0%

While stormwater network issues are not significant in the period of this LTP for Twizel, water supply and sewer networks are likely to present major hurdles that Twizel cannot afford long term. Tekapo has a similar issue with the early town reticulation completed in three specific years, namely 1955, 1970 and 1976. These original networks are likely to fail at the same time.

A major piece of work was completed for the current LTP on Water supply and Sewerage assets, using 2009 pipe construction costs and industry standard base lives, to look out eighty years. As part of this LTP the Council has also prepared a 30-year Infrastructure Strategy, which identifies significant infrastructure issues facing the District over the next 30 years, and outlines how the Council intends to manage its infrastructure assets.

This work has allowed the Council to ascertain where the peaks in replacement expenditure of these assets are, by community. Council has modelled this expenditure and has come to the conclusion that some towns cannot afford this level of expenditure alone. If the District as a whole is to be sustainable, the individual communities cannot be left to fund these large replacement costs.

Council has decided its preferred option is that each of the four urban water supplies, sewerage schemes and stormwater networks are amalgamated into single urban schemes for water, stormwater and sewerage, all paying the same rate for the provision of those services. Council is proposing that the cost of providing stormwater networks across the townships is funded universally across the users of those services. This is to ensure that stormwater networks remain affordable to all ratepayers that benefit from the service, regardless of where they reside in the district.

With the combining of the water supplies, stormwater and the sewerage schemes, the Council will be able to set priorities on the key capital expenditure for the networks as a whole, and bring more resources to problems and remedy them more efficiently. This is also expected to provide lower operating costs and as a result, the Council will be able to control the overall rates increases rather than certain factors that will cause significant increases being recommended and endorsed by local boards.

This proposal is being consulted on during the 2015/2025 LTP process.

9.4 STORMWATER VALUATION

The last valuation of the stormwater infrastructural network and associated assets was undertaken as at 1 July 2013 and is summarised in the Table 8.2. The valuation is updated 3 yearly to take into account capital works and additions to the stormwater network.

The valuation consists of an assessment of the replacement cost, depreciated replacement cost and the annual depreciation or decline in service potential of the network. The annual depreciation or decline in service potential is the amount the asset declines in value over a year as organisation culture to improve performance in emergencies and identifying ways to quickly return services to full operational capacity.

8. Explore alternative sources of funding, and implement funding tools that can be used to manage the current portfolio more effectively.

Financial Contributions

Financial Contributions are another means of funding network infrastructure, reserves or community infrastructure. Mackenzie District Council has prepared a 'Financial Contribution Policy'. The contribution policy includes a methodology for calculating the cost of the impact a development will have on existing community infrastructure including Stormwater. This ensures that the negative impact of development is in part funded by the developer rather than the ratepayer.

The policy uses the following formula to calculate the level of contribution:

ASSET VALUATION – DEBT LOADING / THE NUMBER OF CONNECTABLE PROPERTIES TO THE SCHEME.

For 2015/16, the financial contribution payable on each lot created at the time of subdivision is calculated at $1039. This amount is GST exclusive.

The financial contribution figures are reviewed annually.

Environment Canterbury's Land and Water Regional Plan

Environment Canterbury's Land & Water Regional Plan provides the regulatory framework to implement the community's aspirations for water management under the Canterbury Water Management Strategy. It addresses competing demands for land and water resources in both rural and urban Canterbury in a sustainable manner.

It also provides the regulatory framework around a number of other environmental and development matters required to be managed by Council.

- The objectives of the plan identify the outcomes that are to be met with regards to management of these resources. These outcomes will be achieved over varying timeframes.
- The policies (which direct how activities are to be managed to achieve these outcomes) give effect to the objectives.
- The rules are the tools used to implement these policies.

Clause 5.93

The discharge of stormwater from a community or network utility operator Reticulated stormwater system onto or into land or into or onto land in circumstances where a contaminant may enter water, or into groundwater or a surface water body is a restricted discretionary activity provided the following conditions are met:

11.2 FUNDING IMPACT STATEMENT

Mackenzie District Council Funding Impact Statement for 10 Years to 30 June 2025 for Stormwater	Annual Plan 2014/15 ($000)	LTP Year 1 2015/16 ($000)	LTP Year 2 2016/17 ($000)	LTP Year 3 2017/18 ($000)	LTP Year 4 2018/19 ($000)	LTP Year 5 2019/20 ($000)	LTP Year 6 2020/21 ($000)	LTP Year 7 2021/22 ($000)	LTP Year 8 2022/23 ($000)	LTP Year 9 2023/24 ($000)	LTP Year 10 2024/25 ($000)
Sources of operating funding											
General rates, uniform annual general charges, rates penalties	-	-	-	-	-	-	-	-	-	-	-
Targeted rates (other than a targeted rate for water supply)	82	78	91	163	98	116	92	97	110	98	111
Subsidies and grants for operating purposes	-	-	-	-	-	-	-	-	-	-	-
Fees, charges, and targeted rates for water supply	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads recovered	14	10	13	17	19	21	25	28	31	33	35
Local authorities fuel tax, fines, infringement fees, and other receipts	-	-	-	-	-	-	-	-	-	-	-
Total operating funding (A)	**96**	**88**	**104**	**180**	**117**	**137**	**117**	**125**	**141**	**131**	**146**
Applications of operating funding											
Payments to staff and suppliers	33	26	38	118	35	50	38	37	43	42	55
Finance costs	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	-	1	-	-	14	13	12	11	9	10	8
Other operating funding applications	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding (B)	**33**	**27**	**38**	**118**	**49**	**63**	**50**	**48**	**52**	**52**	**63**
Surplus (deficit) of operating funding (A - B)	**63**	**61**	**66**	**62**	**68**	**74**	**67**	**77**	**89**	**79**	**83**
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	21	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	-	-	-	-	-	-	-	-	-	-	-
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding (C)	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Applications of capital funding											
Capital expenditure											
to meet additional demand	-	-	-	-	-	-	-	-	-	-	-
to improve the level of service	172	-	-	321	17	-	-	-	57	20	-
to replace existing assets	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in reserves	-88	61	66	-259	51	74	67	77	32	59	83
Increase (decrease) in investments	-	-	-	-	-	-	-	-	-	-	-
Total applications of capital funding (D)	**84**	**61**	**66**	**62**	**68**	**74**	**67**	**77**	**89**	**79**	**83**
Surplus (deficit) of capital funding (C - D)	-63	-61	-66	-62	-68	-74	-67	-77	-89	-79	-83
Funding balance ((A - B) + (C - D))	0	0	0	0	0	0	0	0	0	0	0

MACKENZIE DISTRICT COUNCIL

REPORT TO: MACKENZIE DISTRICT COUNCIL

SUBJECT: LTP 2015-25 CONSULTATION DOCUMENT

DATE: MAY 7, 2015

FROM: Paul Morris, Manager Finance and Administration
Arlene Goss, Long Term Plan Project

REASON FOR REPORT

To adopt the Consultation Document and begin the public consultation process for the 2015-25 Long Term Plan.

RECOMMENDATIONS:

1. That the report be received.

2. That Council adopts the 2015-2025 Long Term Plan Consultation Document for public consultation.

A copy of the Consultation Document will be circulated to councillors before the meeting, subject to audit timelines.

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER