



Mackenzie District Council

Waste Assessment

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The Waste Assessment (WA) is a technical document. The key purpose of the WA is to present as clear a picture as possible of what happens with waste in the TA area, what forces are driving current behaviours and outcomes, and from that, to highlight the key issues and the basic options for addressing those issues.

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1 Introduction

This Waste Assessment has been prepared by Mackenzie District Council (Council) in accordance with the requirements of the Waste Minimisation Act 2008 (WMA). This document provides background information and data to support the Council's waste management and minimisation planning process.

1.1 Structure of this Document

This document is arranged into a number of sections designed to help construct a picture of waste management in our district. The key sections are outlined below:

Introduction

The introduction covers a number of topics that set the scene for the assessment. This includes clarifying the purpose of this Waste Assessment, its scope, the legislative context, and key documents that have informed the assessment.

Canterbury Region

The second section presents a brief overview of key aspects of the region's geography, economy, and demographics that influence the quantities and types of waste generated and potential opportunities. It also provides an overview of regional waste facilities, and initiatives that may be of relevance to how we manage our waste.

Our District

The following section presents a brief overview of key aspects of Mackenzie District's geography, economy, and demographics that influence the quantities and types of waste generated and potential opportunities.

Waste Infrastructure, Services, Data and Performance Measurement

These sections examine how waste is currently managed, where waste comes from, how much there is, its composition, and where it goes. The focus of these sections is on the district picture.

Gap Analysis and Future Demand

This section provides an analysis of what is likely to influence demand for waste and recovery services in the district and identifies key gaps in current and future service provision and in the Council's ability to promote effective and efficient waste management and minimisation.

Statement of Options & Councils' Proposed Role

These sections develop options available for meeting the forecast future demand and identify the Council's proposed role in ensuring that future demand is met, and that the Council is able to meet its statutory obligations.

Statement of Proposals

The statement of proposals sets out the actions which are proposed to be taken forward. The proposals are identical to the actions that will be put forward in the upcoming Waste Management

and Minimisation Plan (WMMP) therefore, the Waste Assessment references the WMMP for this section.

Appendices

The appendices include the statement from the Medial Officer of Health, information on relevant legislation and policy and a glossary of terms.

1.2 Purpose of this Waste Assessment

This Waste Assessment is intended to provide an initial step towards the development of a WMMP and sets out the information necessary to identify the key issues and priority actions that will be included in the draft WMMP.

Section 51 of the WMA outlines the requirements of a waste assessment, which must include:

- a description of the collection, recycling, recovery, treatment, and disposal services provided within the territorial authority's district
- a forecast of future demands
- a statement of options
- a statement of the territorial authority's intended role in meeting demands
- a statement of the territorial authority's proposals for meeting the forecast demands
- a statement about the extent to which the proposals will protect public health, and promote effective and efficient waste management and minimisation.

1.3 Legislative Context

New Zealand's principal solid waste legislation is the Waste Minimisation Act 2008 (WMA). The stated purpose of the WMA is to:

"encourage waste minimisation and a decrease in waste disposal in order to

- (a) protect the environment from harm; and
- (b) provide environmental, social, economic, and cultural benefits.

To further its aims, the WMA requires territorial authorities (TA) to promote effective and efficient waste management and minimisation within their district. To achieve this, all TAs are required by the legislation to adopt a WMMP.

The WMA requires every TA to complete a formal review of its existing WMMP at least every six years. The review must be consistent with sections 50 and 51 of the WMA. Section 50 also requires that all TAs prepare a 'waste assessment' prior to reviewing its existing plan. This document has been prepared in fulfilment of this requirement.

Council's existing Waste Assessment was written in 2012 and the WMMP was subsequently adopted on 1 July 2012.

Further detail on key waste-related legislation is contained in Appendix A.3.0.

1.4 Scope

1.4.1 General

Further to fulfilling our statutory requirements, this Waste Assessment will build a foundation which will enable Council to update its WMMP in an informed and effective manner. In preparing this document, reference has been made to the Ministry for the Environment's (MFE) 'Waste Management and Minimisation Planning: Guidance for Territorial Authorities'¹.

A key issue for this Waste Assessment will be forming a clear picture of waste flows and management options in our townships and district. The WMA requires that a waste assessment must contain:

"A description of the collection, recycling, recovery, treatment, and disposal services provided within the territorial authority's district (whether by the territorial authority or otherwise)".

Therefore, this Waste Assessment must consider all waste and recycling services carried out by private waste operators as well as Council's own services. While Council has reliable data on the waste flows that it controls, data on those services provided by private industry is limited. Reliable, regular data on waste flows is important for Council to be able to include waste reduction targets in our WMMP. Without data, targets cannot be readily measured.

The New Zealand Waste Strategy 2010 also makes clear that TAs have a statutory obligation (under the WMA) to promote effective and efficient waste management and minimisation in their district. This applies to all waste and materials flows in the district, not solely those controlled by Council.

1.4.2 Period of Waste Assessment

WMMPs are required to be reviewed at least every six years, but it is considered prudent that they take a longer-term view. The horizon for the WMMP is not fixed but is assumed to be centred on a 10-year timeframe, in line with council's Long Term Plans (LTPs). For some assets and services, it is necessary to consider a longer timeframe and this has been taken into account where appropriate.

1.4.3 Consideration of Solid, Liquid and Gaseous Wastes

In line with the Council's previous WMMP, this Waste Assessment is focused on solid waste that is disposed of to land or diverted from land disposal.

The guidance provided by MFE on preparing WMMPs states that:

"Councils need to determine the scope of their WMMP in terms of which wastes and diverted materials are to be considered within the plan".

The guidance further suggests that liquid or gaseous wastes that are directly managed by a TA, or are disposed of to landfill, should be seriously considered for inclusion in a WMMP.

Other wastes that could potentially be within the scope of the WMMP include gas from landfills and the management of biosolids from wastewater treatment plant (WWTP) processes.

¹ Ministry for the Environment (2015), Waste Management and Minimisation Planning: Guidance for Territorial Authorities

As there are no active landfills within our district, gaseous wastes from landfill are considered to be outside the scope of the Waste Assessment for the Mackenzie and have not been considered further.

It is expected that, in future years' time, biosolids from the WTTP process will be disposed of at a Class 1 landfill, however this is not current practice. Details of this process are ongoing and it is considered appropriate that the management of this disposal only be addressed once further investigation by Council's Asset team has been completed. Therefore, this Waste Assessment and the subsequent WMMP will focus primarily on solid waste.

1.4.4 Public Health Issues

Protecting public health is one of the original reasons for TA involvement in waste management. The New Zealand Waste Strategy 2010 contains the twin high-level goals of "Reducing the harmful effects of waste", and "Improving the efficiency of resource use". In terms of addressing waste management in a strategic context, protection of public health can be considered one of the components entailed in "reducing harm".

Protection of public health is currently addressed in numerous legislation. Discussion of the implications of this legislation is contained in Appendix A.3.0.

1.4.5 Key Waste Management Public Health Issues

Key issues that may be of concern in terms of public health include the following:

- Population health profile and characteristics;
- Meeting the requirements of the Health Act 1956;
- Management of putrescible wastes;
- Management of nappy and sanitary wastes;
- Potential for dog/seagull/vermin strike;
- Timely collection of material;
- Locations of waste activities;
- Management of spillage;
- Litter and illegal dumping;
- Medical waste from households and healthcare operators;
- Storage of wastes;
- Management of biosolids/sludges from WWTP;
- Management of hazardous wastes (including asbestos, e-waste, etc.);
- Private on-site management of wastes (i.e. burning, burying);
- Closed landfill management including air and water discharges, odours and vermin; and
- Health and safety considerations relating to collection and handling.

1.4.6 Management of Public Health Issues

From a strategic perspective, the public health issues listed above are likely to apply to a greater or lesser extent to virtually all options under consideration. For example, illegal dumping tends to take place ubiquitously, irrespective of whatever waste collection and transfer station systems are in place. Some systems may exacerbate the problem (infrequent collection, user-charges, inconveniently located facilities etc.) but, by the same token, the issues can be managed through methods such as enforcement, education and by providing convenient facilities.

In most cases, public health issues will be able to be addressed through setting appropriate performance standards for waste service contracts. It is also important to ensure performance is monitored and reported on and that there are appropriate structures within contracts for addressing issues that may arise. There is expected to be added emphasis on workplace health and safety under the Health and Safety at Work Act 2015. This legislation could impact on the choice of collection methodologies and working practices and the design of waste facilities, for example.

In addition, public health impacts will be able to be managed through consideration of potential effects of planning decisions, especially for vulnerable groups. That is, potential issues will be identified prior to implementation to allow for mitigation.

1.5 Strategic Context

1.5.1 New Zealand Waste Strategy

The New Zealand Waste Strategy: Reducing Harm, Improving Efficiency (NZWS) is the Government's core policy document concerning waste management and minimisation in New Zealand. The two goals of the NZWS are:

- 1. Reducing the harmful effects of waste; and
- 2. Improving the efficiency of resource use.

The NZWS provides high-level, flexible direction to guide the use of the tools available to manage and minimise waste in New Zealand. These tools include:

- The Waste Minimisation Act 2008;
- Local Government Act 2002;
- Hazardous Substances and New Organisms Act 1996;
- Resource Management Act 1991;
- Climate Change Response Act 2002 and Climate Change (Emissions Trading) Amendment Act 2008;
- International conventions;
- Ministry for the Environment guidelines, codes of practice; and
- Voluntary initiatives.

The flexible nature of the NZWS means that councils are able to decide on waste management and minimisation solutions which are relevant and appropriate to local situations and desired community outcomes.

Section 44 of the WMA requires councils to have regard to the NZWS when preparing their WMMP.

For the purpose of this Waste Assessment, Council has given regard to the NZWS and our current WMMP (2012).

1.5.2 International Commitments

New Zealand is party to the following key international agreements:

1. Montreal Protocol – to protect the ozone layer by phasing out the production of numerous substances;

- 2. Basel Convention to reduce the movement of hazardous wastes between nations;
- 3. Stockholm Convention to eliminate or restrict the production and use of persistent organic pollutants; and
- 4. Waigani Convention bans export of hazardous or radioactive waste to Pacific Islands Forum countries.

1.5.3 National Projects

A number of national projects are underway, aimed at assisting TAs, businesses and the public to adopt waste management and minimisation principles in a consistent fashion.

1.5.4 National Waste Data Framework Project

The first stage of the National Waste Data Framework (NWDF) project, led by WasteMINZ, was funded by a grant from the Waste Minimisation Fund. The development of the NWDF took the following form:

- A staged development approach, focusing initially on the most important elements while also setting out a clear 'upgrade' path to include other elements.
- The first stage of the Framework (which has been completed) includes data on waste disposed of at levied disposal sites (Class 1 landfills) and information on waste services and infrastructure as well as other areas where practicable.
- Subsequent stages of the Framework will include more detailed data on diverted materials and waste disposed of at non-levied disposal sites.

The first stage of the Framework has been completed. WasteMINZ is now working on the implementation phase. The Framework will only be successful if it is widely adopted and correctly applied. The implementation report clearly sets out a range of options to progress the Framework.

Council intends to be a part of the implementation of the NWDF through employing the categories and terminology of the Framework in our Waste Assessment and the forthcoming WMMP. The specified categories have been included in our Resource Recovery Park systems to capture waste data in accordance with the framework.

1.5.5 National Standardisation of Colours for Bins

Until recently, councils and businesses in New Zealand had used a variety of colours to indicate what waste streams can be placed in what bins. This was thought to have the potential of reating confusion where colours were used inconsistently and may result in an increased likelihood of contamination.

In October 2015, WasteMINZ, the Glass Packaging Forum, and councils agreed on standardised colours for mobile recycling and rubbish bins, crates and internal office bins. Companies wishing to implement nationwide recycling schemes are strongly encouraged to use these colours for their bins and their signage. This ensures that the colours used are consistent with public place recycling and household recycling. The recommended colours are:

For bin bodies:

For 240 litre and 120 litre wheeled bins, black or dark green should be used. These colours maximise the amount of recycled content used in the production of the bins.

For bin lids, crates and internal office bins:

- Red used for rubbish;
- Yellow used for commingled recycling (glass, plastic, metal and paper combined);
- Lime green used for food waste and food waste/garden (referring to green) waste combined, noting that food waste-only collections are strongly encouraged to use a smaller bin size than combined food and garden collections;
- Dark Green used for garden waste;
- Light Blue used for commingled glass collections (white, brown, green glass combined); and
- Grey used for paper and cardboard recycling.

Council's kerbside bins are consistent with the recommended colours for rubbish and commingled recycling. Glass crates are blue, although they are a darker blue than detailed in the national standards. A change to shade of blue used will be considered at such time that a replacement of these crates is required. Signage on public place bins is in accordance with the recommended colours.

1.5.6 Rural Waste Minimisation Project

Environment Canterbury is leading the New Zealand Rural Waste Minimisation Project to better understand the nature of waste on farms and to begin to identify alternatives to burning, burial and bulk storage of waste. The project has the following objectives:

- 1. To determine the impacts on and risks to New Zealand's natural resources (land, water and air), economy, and social and cultural wellbeing from current rural waste burning, burying and stockpiling practices;
- 2. To identify new waste minimisation options for rural waste management and assess the technical and economic feasibility of these; and
- 3. To develop implementation plans with service providers for feasible waste minimisation options.

Practical outcomes from this project could facilitate the development of rural waste solutions in our district.

1.6 Local and Regional Planning Context

This Waste Assessment and the resulting WMMP are prepared within a local and regional planning context whereby the actions and objectives identified in the Waste Assessment and WMMP reflect, intersect with, and are expressed through other planning documents. Key planning documents and waste-related goals and objectives are noted in this section.

1.6.1 Long Term Plan

A key part of the Long Term Plan (LTP) is the vision that has been set by Council. Our vision is that the Mackenzie District 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 for our people;
- Safe, effective, sustainable water, waste, communication, energy and transport systems are in place; and
- People are encouraged to use their skills and talents for the benefits of the community.

The LTP does not propose any key projects within the ten years of 2018-2028 which will substantially affect waste management within our district. Council's solid waste activity will operate as business as usual, ensuring maintenance of current levels of service.

1.6.2 Regional Council Plans

The Canterbury Regional Policy Statement (CRPS), which became operative on 15 January 2013, provides an overview of the resource management issues in the Canterbury region, and the objectives, policies and methods to achieve integrated management of natural and physical resources, including directions for provisions in district and regional plans. Regional and District Plans cannot be inconsistent with the CRPS.

Chapter 19, Waste Minimisation and Management, contains objectives and policies for waste management in the region and methods to achieve them.

Objective 19.2.1 – Minimise the generation of waste

Adverse effects on the environment are avoided by minimising the generation of waste.

Objective 19.2.2 – Minimise adverse effects of waste

Adverse effects on the environment caused by residual waste and its management are avoided, remedied or mitigated.

Policy 19.3.1 – Waste management hierarchy

To apply the principles of the 5Rs (Reduce, Reuse, Recycle, Recover, Residual waste management) hierarchy to the management of all waste streams. This policy implements the following objectives: Objective 19.2.1, Objective 19.2.2.

Methods:

The Canterbury Regional Council:

Will: (1) Set out objectives and policies, and may include methods in regional plans to manage the disposal of residual waste through the control of disposal processes and practices. (2) Set out objectives and policies, and may include methods in regional plans that will require consideration of the adverse waste effects with regard to discharges to land, air and water and in any land-use over which a regional plan has control. Should: (3) Advocate the implementation of the 5Rs principles throughout the Canterbury region. (4) Support product stewardship programmes aimed at the reduction of waste. (5) Advocate for and encourage the reuse of materials, particularly in industry.

Territorial Authorities:

Should: (6) Set out objectives and policies, and may include methods in district plans specifically seeking to reduce the potential waste generated as a result of the use of land. (7) Take into account the 5Rs hierarchy when considering waste management options and plans (including, but not limited to district plans) for their districts.

Local Authorities:

Will: (8) Engage with Ngāi Tahu as tāngata whenua and use iwi management plans to assist in informing them of Ngāi Tahu values associated with the management of waste, and of methods to avoid conflict with particular values in the application of the 5Rs principles.

Policy 19.3.2 – Reduce waste at the source

Promote a change in behaviour that will result in the reduction of waste at the source. This policy implements the following objectives: Objective 19.2.1, Objective 19.2.2

Methods:

The Canterbury Regional Council:

Should: (1) Develop public education initiatives throughout Canterbury that endorse the 5Rs, with particular focus on reduction of waste through consumer choice. (2) Advocate for stronger national guidance and incentive for reducing waste, particularly at the manufacture/ production/import stage.

Policy 19.3.3 – Integrated management of waste

Promote an integrated approach to waste management in the region. This policy implements the following objective: Objective 19.2.2

Methods:

The Canterbury Regional Council:

Should: (1) Support territorial authorities to maintain an integrated approach to management of waste in the region. (2) Advocate, to, and cooperate and coordinate, with territorial authorities, central government, Ngāi Tahu and industry, to achieve an integrated approach to the management of waste.

Policy 19.3.4 – Establish community waste transfer facilities

Enable the establishment and use of appropriate community facilities and services such as wastetransfer facilities and recycling centres throughout the region. This policy implements the following objective: Objective 19.2.2

Methods:

Should: (1) Encourage the use of community waste-transfer facilities and recycling centres through education and, where appropriate, enforcement action. (2) Support Ashburton District Council Waste Assessment 2015 10 Government and industry-led product stewardship programmes Territorial authorities:

Will: (3) Set out objectives and policies, and may include methods in district plans to enable the establishment of waste transfer facilities in appropriate locations. Should: (4) Encourage and promote the use of community waste transfer facilities.

1.6.3 Cross-Regional Collaboration

The Council is part of the Canterbury Waste Joint Committee (CWJC), which has been established to promote a regional approach to waste issues. This committee facilitates a joint fund that is available for projects appropriate to the region. This provides the advantage of funding and resourcing projects that can benefit the Canterbury area and facilitates improved communication and information sharing between the Councils. Collaborative projects include education and communication, eg The One Planet website, shared resources eg. Display stands for the national Love Food Hate Waste campaign and other waste minimisation projects.

2 Canterbury Region

This section presents a brief overview of key aspects of the region's geography, economy, and demographics.

2.1 Overview

The Canterbury Region covers 45,346km² of land, containing all river catchments on the east coast of the South Island from the Clarence River, north of Kaikoura, to the Waitaki River, in South Canterbury.

The region comprises ten territorial authorities and the Canterbury Regional Council (Environment Canterbury).



Figure 1: Map of Region and Territorial Authority Areas – Source: Environment Canterbury Regional Council

3 Our District

This section presents a brief overview of key aspects of the district's geography, economy, and demographics. These key aspects influence the quantities and types of waste generated and potential opportunities for the Council to manage and minimise these wastes in an effective and efficient manner.

3.1 Physical Characteristics

3.1.1 Overview – Key Statistics

Table 1: Key Statistics of Mackenzie District. Source: Statistics New Zealand

Population – 2013 Census	4,300
	All figures are for the usually resident population count.
Size	7,339 km²
Dwellings	1,818 occupied dwellings,
	1,449 unoccupied dwellings
Home ownership	53.6% (53.2% nationally)
	All figures are for households in private occupied dwellings.
	Excludes dwellings held in private trust.
Median weekly rent	\$160 (\$280 nationally)
	Households who do not have their home in a family trust, do no own their own home, and make rent payments. Median weekly rent is rounded to the nearest \$10
Median income	\$29,300 (national average \$28,500)
	A person's total personal income in the year ending 31 March 2013. Median income rounded to the nearest \$100
	Note: All figures are for the census usually resident population count aged 15 years and over.



Figure 2: Map of Mackenzie District

3.1.2 Geography

The Mackenzie District is geographically large, comprising 745,562 hectares, but its population is small by comparison. Whilst the tenth largest territorial authority geographically, the population of the Mackenzie District ranks 65th in size out of 67 districts in New Zealand.

Fairlie, Lake Tekapo and Twizel are the main towns within the district, will villages at Albury, Kimbell, Burkes Pass and Mount Cook. The District includes Aoraki Mount Cook National Park, and a number of notable geographic features.

3.1.3 Climate

The Mackenzie District has a dry temperate-continental climate with clear, crisp snowy winters and long, hot, dry summers. The cooler, winter season extends from June to September and is characterised by overnight temperatures below 0 degrees Celsius, with sunny winter days averaging 8 degrees Celsius. The warm summer season extends from November to February during which temperatures can exceed 30 degrees Celsius.



Figure 3: Temperature Range for Mackenzie District and New Zealand - Source: Quotable Valuations This graph shows the average minimum and maximum temperatures over the last 10 years. Summer data is recorded throughout January, autumn data throughout April, winter data throughout June and spring data throughout October.



Figure 4: Average Monthly Rainfall for Mackenzie District and New Zealand - Source: Quotable Valuations This graph shows the 10 year average monthly rainfall. Summer data is recorded throughout January, autumn data throughout April, winter data throughout June and spring data throughout October.

3.2 Demographics

3.2.1 Population

The estimated resident population (as recorded by Census) has been steadily increasing with a 9.4% population growth recorded between the 2006 and 2013 Censuses.

	2013 (Usually Res	Census sident)
Fairlie	696	
Tekapo	369	

Twizel	1,137
Mount Cook	195
Other areas / Rural	1,903
TOTAL	4,300

The district is split by population centres of the three urban areas of Fairlie, Tekapo and Twizel and rural and other settlements. This division is demonstrated by the figure below.



Figure 5: Rural / Urban Population Split - Source: Statistics New Zealand

The District experiences marked population fluctuations, particularly in Twizel, as a result of temporary residents and tourism, most notably during the summer months and public holidays. This fluctuating occupation results in highly variable levels of waste.

The following table shows population projections for the district, at the medium variant from a base of the 2013 Census data.

Table 3: Households and Projected Household Growth – Medium Variant

Population	2013 Census	2018	2023	2028	2033	2038	2043	% Per Annum
TOTAL	4,300	4,680	4,790	4,880	4,930	4,980	5,030	0.5%

Since population estimates have been in general accordance with Statistics New Zealand's medium variant projected populations for the District, as demonstrated by the following graph, it is assumed that population growth will occur at the projected rate demonstrated in the above table (Statistics New Zealand medium variant projected population for Mackenzie District).



Figure 6: Correlation between Statistics New Zealand Population Projections and Census Population

Projections for population growth rate in Mackenzie District compared to New Zealand are shown below.





Whilst the population of the district is projected to continue to grow, it is not anticipated that this growth will occur at the rate previously experienced by the district.

Like most areas of New Zealand, the population of Mackenzie District is expected to continue to age. The median age of the Mackenzie District was estimated to be 41.7 in 2013 (NZ = 38.0), compared to 39.9 in 2006 (NZ = 35.9) and 38.1 in 2001 (NZ = 34.8).

Statistics New Zealand predicts that the median age of the district will continue to rise, and at a rate faster than the national median increase, with projections of a district median age of 43.9 by 2043.



Figure 8: Age Composition Projections - Source: Statistics New Zealand

Similarly to national trends, the effects of the aging population will be most notable amongst the group aged 65 years and above. This will have an impact on future solid waste management, as older households are likely to be smaller.

3.2.2 Households and Dwellings

Whilst population counts can be an important measure used to assess volumes of waste, household numbers and dwelling numbers are also key measures. The following table shows these key demographic metrics for each of the three townships and the balance of the district.

A household is resident dwelling being a person who resides along or two or more people who usually reside together with shared facilities. This measure differs from dwelling numbers which record the number of building or structure (or its parts) that is used, or intended to be used, for human habitation. Dwellings can therefore include motels, hospitals and prisons.

Demographic indicators	Population (Usually resident)	Households (Occupied Dwellings)	Unoccupied Dwellings	
Fairlie	696	324	78	(19%)
Tekapo	369	207	249	(55%)
Twizel	1,137	513	765	(60%)
Other areas / Rural	2,098	774	57	(7%)
TOTAL	4,300	1,818	1,149	(44%)

The Mackenzie District is unique in the regard that the district has a significantly high proportion of non-residential ratepayers. This is most noticeable in the townships on Tekapo and Twizel. This imbalance should be considered when viewing trends for building consents within the district, noting that not all dwellings will be used a permanent residences. A consequence of this is a marked change in population of township (most notably Twizel) during peak times. Fluctuations in population levels throughout the year pose a major challenge for waste management. There is also a growing number of private dwellings being made available as short term accommodation rentals.

The following are measures of household numbers and projections of households, as measures of dwellings occupied by usually resident persons.

Table 5: Households and Projected Household Growth – Medium Projection – Source: Statistics New Zealand

2013 Census	2018	2023	2028	2033	2038	% Per Annum
1,800	1,900	2,100	2,200	2,300	2,400	0.8%

Projections for household growth rate within the district compared to New Zealand are below:



Figure 9: District and National Household Growth Rate Projections - Source: Statistics New Zealand

Growth in the number of households is projected to fluctuate. Environment Canterbury projections for household numbers and type within the Mackenzie District, depicted below, differ slightly from Statistics New Zealand projections however all projections indicate a moderate level of growth in household numbers within the district to 2038.

Figure 10: Household numbers and type, Mackenzie District: Medium projection 2013 (base) - 2038 Source: Environment Canterbury



Current and projected increases in household numbers (projected 0.8% growth per annum) are higher than corresponding population changes (average 0.5% per annum growth projected). There is a projected increase in population of 680 between 2013 and 2038 which equates to a 15.8 % increase. The corresponding increase in household numbers is 500 which equates to a 26.3% rise.

Comparison of the long term projections with actual increases over the 2006 – 2013 period illustrates a degree of variability in dwelling (including unoccupied residential buildings) growth across the district and potentially overall demand in excess of the long term projection. Dwelling growth over the seven years was 40% at Tekapo, 19% at Twizel and 9% at Fairlie.

The implication of this information is that demand for township waste management will be higher than long term population increase would indicate and that unanticipated structural change (driven by tourism and investor demand) may drive markedly higher demand for additional dwellings and a consequent requirement for extended services.

3.3 Economy

The OECD have noted the following driving forces behind current and projected household consumption patterns:

- 1. Rising per capita income
- 2. Demographics (more working women, more single person households, larger retirement population)
- 3. Accompanying changes in lifestyles leading to individualised buying patterns
- 4. Shift towards more processed and packaged products
- 5. Higher levels of appliance ownership
- 6. Wider use of services and recreation
- 7. Technology
- 8. Institutions and infrastructure that create the prevailing conditions faced by householders

The economy of the Mackenzie District is built on farming, tourism and hydro-electric development.

Pastoralism is the dominant form of agriculture in the region however more intensive land uses such as forestry, dairying, cropping and horticulture are becoming increasingly common and offer considerable scope to grow the local economy.

The district contains Lake Tekapo and Mount Cook, the international tourist icons, within its boundaries. These areas provide a platform from which to develop the tourism potential of the Mackenzie region. Other areas of the district are also benefiting from and experiencing tourism growth.

The water resources of the area have provided the base for an extensive hydro-electricity generation industry.

3.3.1 Gross Domestic Product (GDP)

GDP growth across the Canterbury region varies significantly. Mackenzie District GDP growth shows a marked increase from 2014 to 2015. Growth within the districts GDP is largely driving by tourism growth and resulting effects on supporting service and construction industries.



Figure 11: GDP Growth (12m moving average, December years) - Source: Infometrics

latest data point: year ending December 2015

GDP per capita for the Mackenzie District in the year ending March 2016 was 91% of the national per capita GDP value.



Figure 12: GDP per capita of Canterbury District in 2016 - Source: Ministry of Business, Innovation and Employment

The following graph shows the changes to GDP per capita that the Mackenzie District experiences. Changes per year are considered to be in response to the dominance of agriculture and tourism in the district's economy and then responsiveness of these industries to external factors.

Whilst growth fluctuates annually, growth year-on-year follows the general trend of growth in GDP per capita for New Zealand.

3.3.2 Industry Type

Industries vary considerable in terms of levels of waste intensiveness and are therefore a key indicator for waste management within a district. As a measure of industry types, business demographic data (sourced from the Statistics New Zealand register of economically significant businesses) for the year ended February 2013 showed that:

- There were 872 business locations (geographic units) within Mackenzie District, an increase of 6.7 percent from the year ended February 2006.
- There were 1,990 paid employees within the Mackenzie District, an increase of 11.2 percent from the year ended February 2006.

The 2013 employee count for the top five industry groups within the Mackenzie District are shown below as compared with national industry employee counts.

Figure 133: Industry by type – Mackenzie and New Zealand

	Mackenzie	District	New Zeala	New Zealand		
Industry	Employee	% of Tot	al Employee	% of Total		
	Count	Employee Coun	Count	Employee Count		
Accommodation & food services	580	29.1	134,440	6.9		

Agriculture, forestry & fishing	440	22.1	111,520	5.7
Education & training	140	7.0	167,240	8.6
Retail trade	140	7.0	195,870	10.1
Construction	120	6.0	124,870	6.4

The Mackenzie District has a higher proportion of its workforce involved in accommodation and food services and agriculture, forestry and fishing than New Zealand overall. This imbalance reflects the predominance of tourism and farming activities in the district economy.

3.3.3 Employment / Unemployment

The unemployment rate in the Mackenzie District is 1.9% for people aged 15 years and over, compared with 7.1 percent for all of New Zealand. The following graph demonstrates occupation types of people resident within the district.



3.3.4 Tourism Growth

Visitor numbers are a significant factor in planning in the Mackenzie District. The District has high visitor numbers due to the scenic and recreational opportunities which are generally derived from its outstanding natural features with people attracted to the lakes, mountains, ski fields, cycle trails and walking tracks.

There are significant differences between the resident population and visitor population numbers. The growth in dwelling numbers outlined below is ultimately sustained by the visitor demand.

Visitor numbers to the district are high and are growing strongly in terms of both historical levels and in relation to other regions of New Zealand. Tekapo is the most popular destination, with over 1.2 million visitors in 2015/16. The district wide increase in guest night accommodation provided in 2015/16 was 23% above the previous year.







Whilst tourism growth has a positive effect on the districts economy, it can pose negative consequence with regard to solid waste management, both regarding the volumes of waste generated and the expectation of visitors to scenic environments regarding the management of waste.

3.3.5 Land Use

The land use of the Mackenzie District is predominantly rural with high country farming occurring within the Mackenzie Basin.

There is a significant amount of community interest in the environmental value of the Mackenzie Basin. This has generated a high degree of complexity in relation to environmental planning within the district. A number of the Environment Court decisions associated with Council's District Plan Change Thirteen (PC13) have introduced constraints that limit the conversion of rural land in the Mackenzie Basin for residential development and restrict the intensification of this rural land.

This is not expected to impact the availability of land for subdivision and in turn the level of residential development and resulting increased demand for waste management in the short term. The area of residentially zoned land at Twizel and Fairlie is considered adequate to meet demand for the foreseeable future. The area of land available for development at Tekapo is sufficient for immediate needs and for the longer term if growth remains in line with the overall projection. The Environment Court decisions could have an impact at Tekapo in the medium term if the current extraordinary demand continues. Assumptions relating to waste management for the purposes of this assessment have been made assuming maintenance of current District Plan Zone Boundaries.

The extent of rural land activities is expected to remain static but changes in use are expected to be seem over time as more irrigation becomes available and more intensive farming practices and cropping occurs in the Fairlie Basin.

Minimal information is known about the waste management practices of rural businesses and residents. Although some make use of Councils wheelie bin collection services, many rural properties do not have access to this collection. It is assumed that they are the main users of Council Resource

Recovery Parks; however anecdotal evidence suggests that there may be some self-management of waste on farms.

3.3.6 Building Development

The district has experienced notable growth in construction in previous years as demonstrated below.



Figure 17: Building Consent Applications and Building Work Value (\$M)

It is anticipated that the number of building consent applications and value of building work will remain similar to 2016 (375 applications and \$54.8M) but building growth is not projected to increase at the same rate as has occurred previously.

Tekapo is anticipated to experience more commercial development as commercial zoned land is developed, whilst building development in Twizel will be largely residential.

The steady growth in construction, a relatively waste intensive sector, is likely to lead to increased waste generation, both in the short term with construction waste, and longer term effects relating to occupation of the buildings.

3.4 Implications of Economic and Demographic Trends

Generally, the district is experiencing strong growth, which is usually associated withincreases in solid waste output. Partially mitigating this is the trend in Twizel and Tekapo for unoccupied dwellings which have the potential to produce either more or less waste, depending on their occupied use as visitor accommodation. The current growth in building development is expected to lead to an increase in construction waste.

4 Waste Infrastructure

The facilities available in Mackenzie area are a combination of those owned, operated and/or managed by Council, and those that are owned and/or operated by commercial entities or community groups.

This inventory is not to be considered exhaustive, particularly with respect to the commercial waste industry as these services are subject to change. It is also recognised that there are some small private operators and second-hand goods dealers that are not specifically listed. However, the data is considered sufficiently accurate for the purposes of determining future strategy and to meet the needs of the WMA.



Figure 18: Key Waste Facilities in the Mackenzie District

Resource Recovery Parks and Class 4 Cleanfill sites are located in each of the District's three main towns: Twizel, Tekapo and Fairlie.

The inventory of facilities and services has been generally categorised with reference to the waste hierarchy (as defined by the WMA).

4.1 Disposal Facilities

In April 2016, the Waste Management Institute of New Zealand (WasteMINZ) released the final version of the Technical Guidelines for Disposal to Land.² These guidelines set out new standards for disposal of waste to land and, if the Regional Council implements the new guidelines, then there will be significant changes to the operation of cleanfill sites in the region, including tighter controls.

The definitions of the four classes of landfills provided in the Guidelines are summarised below.

Class 1 - Municipal Landfill

A Class 1 landfill is a site that accepts municipal solid waste. A Class 1 landfill generally also accepts C&D waste, some industrial wastes, and contaminated soils. Class 1 landfills often use managed fill and clean fill materials they accept as daily cover. A Class 1 landfill is the equivalent of a "disposal facility" as defined in the WMA.

Class 2 - C&D/Industrial Landfill

A Class 2 landfill is a site which accepts non-putrescible wastes including construction and demolition wastes, inert industrial wastes, managed fill, and clean fill. C&D waste and industrial wastes from some activities may generate leachates with chemical characteristics that are not necessarily organic. Hence, there is usually a need for an increased level of environmental protection at Class 2 sites.

Class 3 – Managed Fill

A Class 3 landfill accepts managed fill materials. These comprise predominantly clean fill materials, but may also include other inert materials and soils with chemical contaminants at concentrations greater than local natural background concentrations.

Class 4 - Cleanfill

A cleanfill is a landfill that accepts only cleanfill materials. The principal control on contaminant discharges to the environment from clean fills is the waste acceptance criteria.

The wording used in the guidelines is provided in Appendix A.2.1

4.1.1 Class 1 Landfills

There are no Class 1 landfill disposal facilities (as defined above) in the Mackenzie District. Waste is current sent via road transport to AB Lime Landfill in Winton, Southland under the current contract with EnviroWaste. Other landfills in the vicinity include Timaru and Christchurch.

While there is a large distance from the Mackenzie to the landfill in Winton, the current collection and transport system consistently performs well.

 $^{^{\}rm 2}$ Technical Guidelines for the Disposal to Land. WasteMINZ , April 2016

4.1.2 Resource Recovery Parks

Resource Recovery Parks (RRP's) provide for those that can't or choose not to make the journey to a landfill, which is particularly relevant as there are no active landfills within the district. Waste can be dropped off at these sites by the public and commercial collectors after paying a gate fee, and the waste is subsequently transported to a Class 1 landfill or recycling facility.

Council owns three RRPs, with the operation of these contracted to EnviroWaste. All three parks accept residual waste, green/garden waste, recyclables including mixed recycling, electronic items, glass and metal, domestic quantities of waste oil, paint and hazardous substances, batteries, LPG cylinders and tyres.

Facility Description	Hours
Twizel Resource Recovery Park	Monday to Sunday: 12 to 4pm
Hooker Crescent, Twizel	
Tekapo Resource Recovery Park	Wednesday: 10am to 4.30pm
Murray Place, Tekapo	Sunday: 9 to 11.30am
	1 December to 31 January only – Saturday 9 to 11.30am
Fairlie Resource Recovery Park	Tuesday and Thursday: 2.30 to 4.30pm
Dobson View Road, Fairlie	Saturday and Sunday: 12.30 to 4.30pm
	All RRP's are closed on Christmas Day, Boxing Day, 1 st and 2 nd January, Good Friday and ANZAC Day.

Table 6: Resource Recovery Parks in the Mackenzie District

4.1.3 Closed Landfills

There are 6 closed landfills in the district. These are listed in the table below.

 Table 7: Closed landfills in the Mackenzie District

Location	Date closed
Albury Landfill, Landfill Road, Albury	2001
Fairlie Landfill, Mill Road, Fairlie	2001
Tekapo Landfill, Murray Place, Tekapo	2001
Twizel Landfill, Ostler Road, Twizel	2001
Haldon Landfill, Haldon Station, Twizel	2001
Burkes Pass Landfill, State Highway 8, Burkes Pass	2001

4.1.4 Class 2-4 Landfills

Research estimates that waste disposed of to land other than in Class 1 landfills, accounts for approximately 70% of all waste disposed of. At present, these operators are not required to pay the waste levy to central government.³ Other disposal sites include Class 2-4 landfills and farm dump.

There are three consented Class 4 cleanfill sites in the district; Ostler Road, Twizel, Fox View Road, Fairlie and within the Tekapo Resource Recovery Park on Murray Place.

In the MFE's 2002 "A Guide to the Management of Cleanfills" 'cleanfill' is defined as: Material that, when buried will have no adverse effect on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick which are free of:

- combustible, putrescible, degradable or leachable components;
- hazardous substances;
- products or materials derived from hazardous waste treatment, hazardous waste;
- stabilisation or hazardous waste disposal practices;
- materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances; and
- liquid waste.

4.1.5 Assessment of Residual Waste Management Infrastructure

It is considered that the provision of three RRP's and cleanfill sites in the district provides residents and travellers with a range of disposal options. However, it is recognised that farm dumps are common practice and that some waste may be disposed of outside the district at other facilities. It is considered these practices are driven by convenience and cost and this, therefore, limits Council's options in using disposal prices as a mechanism to drive more preferable waste management practices. Increasing disposal prices could have the result of simply driving more waste to Class 2-4 disposal sites rather than incentivising recovery.

4.2 Hazardous Waste Facilities and Services

The hazardous waste market comprises both liquid and solid wastes that, in general, require further treatment before conventional disposal methods can be used. The most common types of hazardous waste include:

- Organic liquids, such as those removed from septic tanks and industrial cesspits;
- Solvents and oils, particularly those containing volatile organic compounds;
- Hydrocarbon-containing wastes, such as inks, glues and greases;
- Contaminated soils (lightly contaminated soils may not require treatment prior to landfill disposal);
- Chemical wastes, such as pesticides and agricultural chemicals;
- Medical and quarantine wastes;
- Wastes containing heavy metals, such as timber preservatives; and

³ Ministry for the Environment (2014) Review of the Effectiveness of the Waste Disposal Levy. The report estimates 56% of material disposed to land goes to non-levied facilities, 15% to farm dumps and 29% to levied facilities.

• Contaminated packaging associated with these wastes.

A range of treatment processes are used before hazardous wastes can be safely disposed.

Most disposal is either to Class 1 landfills or through the trade waste system. Some of these treatments result in trans-media effects, with liquid wastes being disposed of as solids after treatment. A very small proportion of hazardous wastes are 'intractable', and require exporting for treatment.

These intractable hazardous wastes include polychlorinated biphenyls, pesticides, and persistent organic pollutants.

Domestic quantities of most hazardous waste can be dropped into one of the district's RRP's, where it will be transported to an appropriate disposal facility.

4.2.1 Agrecovery Rural Recycling programme

This recycling programme provides New Zealand's primary sector with responsible and sustainable systems for the recovery of 'on farm' plastics and the disposal of unwanted chemicals. It currently provides three nationwide programmes:

- Containers for the recovery of agrichemical, animal health and dairy hygiene plastic containers;
- Wrap for the recovery of used silage wrap and pit covers; and
- Chemicals for the disposal of unwanted and expired chemicals in agriculture.

4.3 Recycling and Reprocessing Facilities

Glass is currently transported to Road Metals processing and storage site in Twizel, where it is crushed and used in roading materials. There are currently no other recycling or reprocessing facilities within the district, with all other recycling being transported outside the district for processing.

4.3.1 Recycling and Reprocessing Facilities Outside the District/City

There are a range of recycling and reprocessing facilities where materials are transported to. Below is a table of facilities that are currently used. It is noted that these vary from time to time and that individual Mackenzie residents may use many other facilities outside the district.

Facility	Description				
Agrecovery	Accept unwanted agrichemicals and empty containers. Collection from properties (some charges apply).				
EcoCentral	Sorting of mixed recycling				
Everitt Enterprises	Scrap metals recycling				
Fat Man	Used cooking oils				
Road Metals	Glass				
Timaru Metal Recyclers	Scrap metals recycling				

Table 8: Other Recycling and Reprocessing Facilities

4.3.2 Assessment of Recycling and Reprocessing Facilities

Within the context of current legislative and policy arrangements there is reasonable provision for ewaste collection and recovery within the region – although there is still scope for greater levels of recovery. The cost of separate disposal of e-waste compared to landfilling is a disincentive for greater recovery.

While there are a range of recycling and reprocessing facilities within the greater region, transport availably and costs present a barrier to accessing these. Additional facilities within the district would be an advantage, however it is considered that low volumes within the district are likely to make these unviable.

Further opportunities for mattress recycling, E-waste disposal, treated timber processing and composting would be particularly beneficial to increase waste diversion.

5 Waste Services

5.1 Council-provided Waste Services

The Council provides a three bin service to the main settlement areas in the district including Albury, Fairlie, Kimbell, Burkes Pass, Tekapo and Twizel. Other rural properties located along the collection route between the townships can also voluntarily opt into the service, provided a suitable and safe location can be identified for the truck to collect the bins.

The collection type and frequency of the kerbside collection is outlined in the table below. Recycling includes paper, newspaper, cardboard, ferrous and non-ferrous metal tins, can and foil, plastics #1, 2, 3, 4 and 6 (excluding polystyrene). Glass bottles and jars are collected in a separate crate. There is currently no food or greenwaste collection at the kerbside.

5.1.1 Council-contracted Collection Services

The table below outlines the key refuse and recycling collection services provided by Council.

5.1.1.1 Kerbside Collection of Refuse and Recycling

Table 9: Council Kerbside Refuse and Recycling Collections

Kerbside collection service	Charges/funding	Materials and bin sizes	Collection frequency	Contractor and contract review dates
Three bin kerbside collection	User pays charges or description of funding type e.g. rates funded, targeted rate	 120 litre red lidded wheelie bin: residual waste 240 litre yellow lidded wheelie bin: mixed recycling 45 litre blue crate: glass jars and bottles 	Red/residual and yellow/recycling collected on alternating weeks, blue/glass collected weekly	EnviroWaste Contract expires October 2021

The aim of the larger recycling wheelie bin and smaller residual waste bin is to encourage residents to separate their waste and reduce the amount of waste sent to landfill. For example, a household is likely to run out of space in their red, residual waste bin if they are not separating recycling into their yellow bin. It is considered that this is an effective approach to encourage waste minimisation and should be maintained. The Council receives a small number of requests for larger or extra red wheelie bins, which are usually due to a property being used for short term accommodation rental or from home based medical waste. The Council will provide a second set of bins to property owners where requested at an additional charge. The associated charge is for a full set of bins, based on the overall
service, with no separate charge for a single red wheelie bin. An additional glass crate can be provided to a property at no extra charge.

The kerbside collection is aimed at servicing residential properties, however commercial properties can opt into the service if the levels of collection suit their needs. Where a commercial property joins the service, the solid waste charge is added onto the property rates.

Envirowaste currently operate one truck for all collections. This was purpose built for the Mackenzie contract and is able to collect a mix of either rubbish and glass or recycling and glass. During the busy summer period a second collection truck has been brought in to manage extra volumes. Over the Christmas/New Year period, an extra rubbish collection has been offered to Tekapo over the past three years and to Twizel for the past two years due to the high number of holiday homes in these towns. This one-off additional collection is timed with when most holiday makers will be leaving the district to return home and seeks to avoid rubbish being left in wheelie bins at unattended homes. This additional service has been well received by residents in Tekapo and Twizel. At present, the service has not been extended to other areas within the district as they tend to have a larger permanent resident base, however Council will continue to review this.

Collection days are split over the different areas, with Twizel being collected on Monday and Tuesday, Tekapo on Wednesday and Burkes Pass, Kimble, Fairlie and Albury on Thursday. There are no scheduled collections on Fridays. Under the current service contract, there are no kerbside collections on Christmas Day, New Year's Day and Good Friday, any collections that fall on these days are rescheduled and advertised within the affected areas

5.1.2 Other Council Services

In addition to the services described above, the Council provides litter bins in public places. This is held under a separate contract with Whitestone Contracting (managed under the Community Facilities department of Council). This contract is due to expire in June 2018.

Other waste related functions include clean-up of illegal dumping. This issue occurs on an infrequent basis and is managed on a case by case basis.

5.1.3 Waste Education and Minimisation Programmes

Council currently supports a range of waste education programmes including EnviroSchools and Paper 4 Trees, both school based waste education programmes, and Love Food Hate Waste, a nationwide food waste reduction campaign. In addition to these, Council runs various waste minimisation education projects including providing subsidised home composting systems, cloth nappy packs, reusable coffee cups, reduction of single use plastics, such as plastic shopping bags and media campaigns.

Council continually reviews existing projects and seeks new methods of promoting waste minimisation. The Council also works in with waste minimisation projects led by community groups or schools were suitable opportunities arise.

5.1.4 Solid Waste Bylaws

In addition to key strategic waste infrastructure assets, Council also has responsibilities and powers as regulators through the statutory obligations under the WMA. Council operates in the role of regulator with respect to:

- management of litter and illegal dumping under the Litter Act 1979;
- trade waste requirements; and
- nuisance related bylaws.

Waste-related bylaws must not be inconsistent with the Council's WMMP.

The Mackenzie Solid Waste Bylaw was adopted in October 2013. The purpose of the bylaw is to:

- 4.1.1. Protect the health and safety of the public and persons involved in the collection or disposal of waste;
- 4.1.2. Assist with the implementation of the Council's Waste Management and Minimisation Plan;
- 4.1.3. Promote safe, efficient and effective waste management, including maximising the recovery of re-usable and recyclable resources; and
- 4.1.4. Provide for the appropriate collection, transportation and disposal of waste, re-usable and recoverable resources.

The provisions of the solid waste bylaw will be taken into account during the review of Council's WMMP.

5.1.5 Litter Control and Enforcement

As previously identified, management or litter within the town centres and clean-up of any illegal dumping as required is undertaken by Whitestone Contracting.

5.1.6 Public Litter Bins

Public litter bins are provided in the town centres of Twizel, Tekapo and Fairlie as well as the smaller settlements of Burkes Pass and Albury. Each bin station consists of three bins for rubbish, recycling and glass.

The high volume of tourists travelling through the district, staying in campervans and short term holiday home rentals, has placed increased pressure on public litter bins.

Solar compacting rubbish bins have been installed in the Lake Tekapo Village centre to accommodate the high volume of rubbish received in the public litter bins. In addition, one coin operated bin was installed by the Lake Tekapo effluent dump station in March 2018, with a second one under construction. These coin bins are intended to provide an opportunity for tourists to dispose of their waste and reduce the pressure on the village litter bins. The issue of tourist waste throughout the district will require ongoing consideration.

5.1.7 Abandoned Vehicles

Abandoned vehicles are very rare in the Mackenzie District and are dealt with on a case by case basis.

5.1.8 Rural and Farm Waste

It is understood that a large number of farms use one of the 'three B' methods of waste management – bury, burn, or bulk storage on property.

It is recognised that these methods for the management of farm wastes are not ideal and may, in some cases, have the potential to have a negative impact on the environment. However the 'three Bs' are perceived to have 'no cost' compared to alternatives which have financial cost associated.

Given the large rural make-up of the Mackenzie District, this is an important issue which requires further attention. It is considered that further education of the environmental impacts of these practices and improved awareness of the available waste disposal options to the rural sector is required.

5.1.9 Hazardous Waste

Domestic quantities of hazardous waste can be dropped into the district's RRP's. This service is well used by the public.

5.2 Assessment of Council-provided Solid Waste Services

Is it considered that the provision of the kerbside service provides suitable waste collection throughout the townships areas and in particular ensures residents have sufficient opportunity to recycle. In addition, the location of RRP's and cleanfill sites in each of the three main towns provides the opportunity to dispose of larger quantities of domestic and commercial waste and provides disposal facilities to rural properties outside of the kerbside collection areas. These sites also provide the opportunity to dispose of greenwaste, metal, E-waste and cleanfill that is not accepted through the kerbside service.

While it is considered that the current services and facilities are sufficient for the township areas, particularly given the small size of the district, it is recognised that rural areas could benefit from additional support to ensure waste is disposed of appropriately. As previously discussed, rural waste has been a topic of recent research and will continue to be given further consideration to improve waste services to rural properties.

An area which may require further review is the opening hours of the RRP's to ensure that these continue to allow the public sufficient access to these facilities. Where opening hours are limited, there may be other options to provide disposal facilities, such as the new coin operated bins in Lake Tekapo, or recycling stations in a publicly accessible area.

5.3 Funding for Council-provided Services

Properties who receive the kerbside service pay a fixed annual solid waste charge. This is funded partially as a private good by those who receive the service as well as funding from the general rate.

5.4 Non-Council Services

There are a small number of private contractors that offer residual waste and recycling collections in the District. The Council does not currently license private operators, but is aware of the following companies operating within the district:

- Residual and recycling collections: EnviroWaste, Waste Away, Delta, Garbo
- **Metal:** Millar's Metals, Everitt Enterprises, Timaru Metal Recyclers.

• **Other:** Fat Man (used cooking oil), Fulton Hogan (waste oil).

It is also noted that the Department of Conservation (DOC) provide collections for the Aoraki/Mount Cook National Park that are separate to Council services.

5.4.1 Assessment of Non-Council Services

It is considered that there are limited private waste services in the district and these are largely restricted to commercial waste, with the majority of households being provided with the Council kerbside collection and access to the three recovery parks. There are a number of non-Council providers servicing the commercial sector. It is considered that all of these provide both waste and recycling options that contribute positively towards waste management and minimisation. It is also recognised that the DOC collections for the National Park have a strong focus on waste minimisation, with mixed recycling, glass and food waste separated from residual waste.

6 Situation Review

Waste to Class 1-4 Landfills

6.1 Definitions Used in this Section

The terminology used in this section to distinguish sites where waste is disposed of to land are taken from the National Waste Data Framework which, in turn, are based on those in the WasteMINZ Technical Guidelines for Disposal to Land (summarised in section **4.1**).

6.2 Overview of Waste to Class 1-4 Landfills

The waste received through Council services originates from a variety of sources, these include:

- kerbside collections;
- waste received at the RRP's and clean fill sites in Twizel, Tekapo and Fairlie; and
- public litter bins.

All residual waste is transported to AB Lime in Winton, a Class 1 landfill. Cleanfill is accepted at Council's three Class 4 Cleanfill sites.

6.3 Waste Quantities

6.3.1 Waste to Class 1 Landfills

Currently all municipal solid waste collected in the Mackenzie is disposed of at AB Lime in Winton, a Class 1 landfill, including construction and demolition waste. The amount of waste sent to landfill, as determined from the weights disposed of at the landfill, is shown in the graph below.





6.3.2 Other Waste Disposed of to Land

6.3.2.1 Class 2 - 4 Landfills

A 2011 MFE report on non-levied disposal facilities stated:⁴

No information about cleanfill quantities was compiled for this report because the few sites with available data are unlikely to be indicative of what is happening around the country.

⁴ Ministry for the Environment (2011) *Consented Non-levied Cleanfills and Landfills in New Zealand: Project Report.* Wellington: Ministry for the Environment

Several other studies have attempted to quantify the disposal of waste to Class 2-4 landfills, often on a per capita basis, with widely-varying results. In practical terms, the lack of precise data about disposal of waste to Class 2-4 landfills presents difficulties in reliably monitoring changes over time in the disposal of major waste streams, such as construction and demolition waste.

There are three consented Class 4 cleanfill sites in the district, located in Twizel, Tekapo and Fairlie. Data of waste disposed at these sites is via estimated volume and is therefore subject to some discrepancy. From October 2017, cleanfill data received in Twizel has been measured in weight due to the installation of a weighbridge.





6.3.3 Farm Waste Disposed of On-site

Very little research has been conducted on the quantity of waste generated on farms and disposed of on-site. There are two substantive pieces of research, including one conducted in the Waikato and Bay of Plenty in 2014⁵ and a 2013 study of farm waste in Canterbury⁶. The Canterbury study found that 92% of the farms surveyed practised one of the "3B" methods (burn, bury, or bulk store indefinitely) for on-site disposal of waste.⁷ The studies calculated average annual tonnages of waste for four different types of farm in the regions. As farm waste generated from specific farm types is likely to be comparable across the country, it is considered that this data is suitable for applying to other regions, subject to if the correct number of farm types being used for the calculations.

The presence of hazardous wastes including agrichemicals and containers, treated timber, paints, solvents, and used oil was noted in the study. The management techniques applied to these materials was identified as being variable and often of concern.

The data from the Canterbury report was applied nationally, on a regional basis, in a 2014 study that produced a database of non-municipal landfills for the Ministry for the Environment.⁸ The report considered "non-municipal landfills" to include "cleanfills, industrial fills, construction and demolition fills, and farm dumps".

⁵ GHD (2014) *Rural Waste Surveys Data Analysis Waikato & Bay of Plenty*, Waikato Regional Council Technical Report 2014/55, July 2014

⁶ GHD (2013), Non-natural rural wastes - Site survey data analysis, Environment Canterbury Report No.R13/52

 ⁷ GHD (2013), Non-natural rural wastes - Site survey data analysis, Environment Canterbury Report No.R13/52
 ⁸ Tonkin & Taylor (2014), New Zealand Non-Municipal Landfill Database, prepared for Ministry for the Environment

Based on the data contained in the 2013 Canterbury and 2014 Waikato/BOP and national studies, the 267 farms within our district are estimated to have generated an average of 7,137.9 tonnes of waste per farm per annum. Of this total, it is estimated that 6,568.1 tonnes per farm (92%) is disposed of on the farm through burial, burning, or indefinite bulk storage.

On-farm disposal of farm waste in district/city- tonnes/annum	Dairy	Livestock	Arable	Viticulture	TOTAL
Number of farm holdings (2012)	18	204	39	0	
Non-natural rural waste (T/farm/annum)	6.1	8.9	7.4	5.5	
Domestic waste (T/farm/annum)	0.6	0.08	1.1	0	
Organic materials (T/farm/annum)	21.2	21.2	3.2	10	
Total waste generated (T/farm/annum)	27.8	30.3	11.7	15.5	
Total tonnes/annum per farm, disposed of on-farm	25.6	27.9	10.8	14.26	
Total waste disposed of on-farm (T/annum)	460.8	5,687.5	419.80	0	

Table 10: Estimated On-farm Disposal of Farm Waste in the Mackenzie District

Of this 7,137.9 tonnes of waste, 31% (2,214 tonnes per annum) is non-natural rural waste. This waste stream includes materials such as scrap metal, treated timber, fence posts, plastic wraps and ties, crop netting, glass, batteries, and construction and demolition wastes.

Over two-thirds of farm waste is organic materials (4,831 tonnes per annum), which the survey found to include animal carcasses and crop residues.

6.3.4 Summary of Waste Disposed of to Land

The previous sections of this assessment have quantified the disposal of solid waste to land through three separate mechanisms: waste to Class 1 landfills, farm waste disposed of onsite, and waste to Class 2-4 landfills. The disposal of solid waste to land is summarised in the table below.

Table 11: Waste Disposed of to Land – 2016/17 year.

Waste disposed of to land	Tonnes	% of total	Tonnes/capita/
			annum

Levied waste to Class 1 landfills	1,620.73	19.26	0.35
Cleanfill	228.24	2.71	0.05
Farm waste disposed of on-site	6,568.1	78.03	1.40
TOTAL	8,417.07		1.8

It has been estimated that, in the 2016/17 year, a total of 8,417.07 tonnes of solid waste was disposed of to land.

It should be noted that the reliability of the estimates for the different types of waste disposal varies. The data on waste to Class 1 landfills is reliable, being based on weighbridge records. However, the accuracy of cleanfill cannot be determined, as this includes an estimation of the material on a cubic metre basis which is then converted to tonnes. The estimate of farm waste is potentially the least reliable, being based on data from a relatively small study of farms in Canterbury and the Waikato and Bay of Plenty.

As the waste data is from 2016/17 records, the population estimate from Statics New Zealand projected population of 4,680 for 2018 has been used, rather than 4,300 from the 2013 census. The lack of a current population count also adds some unreliability to the overall totals.

6.3.5 Composition of Waste to Class 1 Landfills

Solid Waste Analysis Protocol (SWAP) was undertaken in September 2016 for kerbside waste in the Mackenzie District. This SWAP was designed to determine the composition and average weight per red wheelie bin of domestic waste in Twizel, Tekapo and Fairlie. The SWAP was undertaken in a "shoulder season" to avoid the seasonal influences of low volumes in winter and peak volumes in summer from the tourist season, as well as being clear of any public or school holidays. Therefore, it is recognised that this information does not show any changes to the waste composition which may result from population changes during peak periods, particularly from the occupation of the large number of holiday homes in Tekapo and Twizel.

This data collected relates solely to kerbside waste and has not been extended to waste received at the recovery parks.

The graph below illustrates the primary composition of a 120 litre red, residual waste wheelie bin from the 2016 SWAP. The composition is presented in this section using the 12 primary classifications in the SWAP.



The above composition data from the 2016 SWAP has been combined with annual domestic kerbside waste tonnages for each town to calculate the overall composition of domestic kerbside waste sent to Class 1 Landfills. This data is shown in Table 12 below:

Composition of domestic kerbside waste to Class 1		
Landfill	% of total	Tonnes 2016 year
Paper	5.9%	41.4
Plastic	10.7%	74.8
Organic	49.6%	347.7
Ferrous metal	3.5%	24.6
Non-ferrous metal	1.4%	9.9
Glass	2.7%	19.2

Table 12: Composition of domestic kerbside waste to Class 1 Landfill

Textiles	4.7%	32.8
Sanitary	8.7%	60.9
Rubble	7.8%	54.8
Timber	2.5%	17.7
Rubber	0.6%	4
Potentially hazardous	1.8%	13
TOTAL	100.0%	700.7 tonnes

6.4 Activity Source of Waste

This section presents the activity source of levied waste disposed of at Class 1 municipal landfills from the Mackenzie District. The composition uses six of the seven "activity sources" specified in Volume One of the New Zealand Waste Data Framework. Virgin excavated natural material, the seventh activity source, which would be primarily soil used as cover material, has not been used.

The Waste Data Framework was established in Mackenzie recovery parks in 2016. The main categories have been adopted, with an additional category of "Township residual waste", which was added to allow for further analysis of waste for the district. This category accounts for waste sent to landfill which is collected from the township public litter bins. This is an area of interest in relation to assessing the impact of tourism levels on waste generation however, for comparison with other districts, it is included in the "Industrial/Commercial/Institutional" category.

The data from the Fairlie RRP site is incomplete for the period shown below and has therefore been excluded from this report. It is considered that the data from the Tekapo and Twizel sites provides an adequate overview of waste for the district. The data for waste collected at the RRPs as shown below was determined prior to the installation of the weighbridge in Twizel and was accepted on an estimated cubic metre basis. This is contrary to the kerbside waste data, which is weighed on the collection truck and recorded in tonnes. To assess the data, all values are required to be in either volume or weight and therefore one of the sets of data needs to be converted. For the purpose of this analysis, it is considered likely that there be more uncertainty around the estimated volume of waste at the recovery park gate. To avoid further compromise of this data and, to account for the reasonably consistent make up and density of the waste collected at the kerbside, the kerbside data has been converted to volume.

Table 13: Activity Source of Waste to Class 1 Landfills

Activity source of levied waste to Class 1 landfills from Mackenzie District (Tekapo and Twizel only)	General waste - excludes special waste and cleanfill	
	% of total	Cubic metres
		2016-17
Construction & demolition	3%	118m ³
Domestic kerbside	38%	1553m ³
Industrial/commercial/institutional	16%	648m ³
Landscaping	0%	2m ³
Residential	11%	464m ³
Township litter bins	32%	1286m ³
TOTAL		

Whilst the accuracy of the data for the Twizel RRP has improved as a result of the installation of the weighbridge, the data still requires the use of conversion rates between volume and weight for data from the Fairlie and Tekapo sites.

The district is experiencing high levels of development, however it is considered that the bulk of this building industry waste is captured through commercial skips on building sites and therefore underrepresented in the waste collected through Council services.

Whilst kerbside waste accounts for the largest portion of waste (38%), the waste collected from township litter bins is the second largest source (32%). It is considered that litter bin waste is a high proportion due, in part, to bulk dumping of waste by travelling visitors, such as camper vans and from short stay visitors who may have limited opportunities for waste disposal in their accommodation. Changes to bin locations and signage to discourage bulk dumping are being trialled in Twizel and a new coin operated bulk waste bin was installed in the Lake Tekapo Village in March 2018 to provide additional disposal options to travellers. Results will be monitored to gauge the effectiveness of these measures on an ongoing basis.

Figure 22: Residual waste composition for Twizel and Tekapo



The National Waste Data Framework has been adopted at all three Resource Recovery Parks, however data from the Fairlie site is incomplete. This issue has now been resolved so that future data will be collected, however the graph above reflects data collected solely from Twizel and Tekapo. It is noted that the three townships differ in their makeup, with Twizel and Tekapo having a higher component of holiday homes and tourism compared to Fairlie which has a more stable residential base with a rural influence. Therefore, the graph above provides an overall indication of where the waste sources for the district originate, however this may alter slightly when Fairlie data is included, due to the differing activities between the townships.

This data includes waste accepted at the Resource Recovery Parks, collected through the kerbside collection and that collected from Council litter bins. It does not include waste managed through private contractors, such as commercial skips for restaurants or building sites.

The data relied on has been measured in cubic metres. All waste collected at the recovery parks during 2016/17 was accepted on an estimated cubic metre basis. Rather than converting this to tonnes using estimated conversion rates, it is considered that retaining the data in cubic metres allows more accuracy in the comparison between categories.

6.5 Diverted Materials

6.5.1 Overview of Diverted Materials

General mixed recycling collected via the kerbside service and from material dropped to the RRP's is sent to EcoCentral's Materials Recovery Facility (MRF) in Christchurch, where material is sorted and sent to different markets. Glass is collected separately and is currently sent to Road Metals site in Twizel, where it is crushed for re-use.

Other materials that are received in small quantities, such as LPG cylinders, e-waste and used oil, are transported to suitable facilities as required.

6.5.2 Kerbside Recycling and Drop-Off Facilities

Tonnes/annum	2012-13	2013-14	2014-15	2015-16	2016-17
Kerbside recycling	160.79	217.23	299.59	371.03	223.31
Drop-off facilities	44.28	56.72	74.86	71.38	65.08
Glass (kerbside and drop-off facilities)	227.56	209.20	166.64	146.91	340.66
TOTAL	432.63	483.15	541.09	589.32	629.45

Table 14: Kerbside Recycling and Drop-Off Facilities

Prior to July 2017 general recycling and glass which was dropped into the recovery parks attracted a small charge. Council removed this charge to encourage customers to improve separation of recycling and thereby reduce the volume of waste sent to landfill. It is anticipated that this change to allow for free recycling drop off will result in increased volumes being received at the recovery parks as the public become more aware of the change.

6.5.3 Composition of Kerbside and Drop-Off Recycling

Since August 2016, all general recycling has been sent to EcoCentral in Christchurch for sorting. Previously, recycling was sorted by hand at the Twizel RRP. Due to this change, only the data from EcoCentral has been used for this report. As data from an entire financial year has not yet been collected, the data below shows recycling composition from the 2017 calendar year.

Recycling collected at the kerbside and from drop offs into the recovery parks, inclusive of that from the township litter bins are mixed and sent to EcoCentral. Therefore, the data below shows the composition of this recycling, rather than being differentiated by collection sources.

Composition of municipal recycling – 2017 year	% of total	Tonnes/ annum
Mixed paper	25.8%	144
Glass bottles & jars	63.8%	355
Plastic containers	6.2%	34.5
Aluminium cans	0.5%	2.7
Steel cans	1.8%	10
Contamination	1.9%	10.6
TOTAL	100%	558

Table 15: Composition of Municipal Recycling in the Mackenzie District

6.5.4 Commercially-Collected Diverted Materials

There are limited commercial collections within the District, with the exception of collections from the Aoraki/Mount Cook National Park, which are managed by the Department of Conservation and should be considered within the this category. The data in the table below is not complete in terms of all commercial collections, but includes the majority of diverted materials outside of Council managed waste flows.

Table 16: Commercially-Collected Diverted Materials

Diverted materials, excluding council kerbside recycling collections	Tonnes/annum 2017
General recycling (Cardboard/paper/containers/tins/cans)	130.87
Class	112 7/
Glass	115.74
Food waste	136.41
TOTAL	381.01

The food waste detailed in this table is solely from Aoraki/Mount Cook National Park, this is collected by the Department of Conservation and transported to Redruth's organic facility in Timaru.

6.5.5 Diversion of Organic Waste

Garden/green waste is accepted at the three RRP's and are chipped at each site as required. The chipped material is currently available to local residents for landscaping and gardening use at no cost.

At present there is no food waste collection or drop off facilities within the district.

Although not quantified in this assessment, organic waste is diverted from landfill disposal through other means including the chipping of considerable quantities of vegetation by arborists, much of which is disposed of as mulch.

The following table estimates the quantity of diverted organic waste in the district for 2016/17.

 Table 17: Diversion of Greenwaste- 2016/17

Organic waste diversion –	Tonnes per
2016/17	annum – 2016/17
Greenwaste	231.35 tonnes

Greenwaste is accepted at the recovery parks on an estimated volume. This data has been converted to weight for ease of comparison with other waste streams. With the installation of the weighbridge in Twizel, greewaste is now recorded in tonnes, however the Fairlie and Tekapo sites will continue to use estimate volumes.

The Council subsidies two home compositing options to help residents reduce the volume of food and greenwaste sent to landfill, which is usually through their red wheelie bin. These are the outdoor Earthmaker compost bin and Bokashi sets. Considering the SWAP results which show that the average red, residual waste wheelie bin contains 50% organic waste, home composting options have the potential to divert significant volumes of waste from landfill.

7 Performance Measurement

7.1 Current Performance Measurement

This section provides comparisons of several waste metrics between the Mackenzie District and other territorial authorities. The data from the other districts has been sourced from a variety of research projects undertaken by Eunomia Research & Consulting and Waste Not Consulting.

7.1.1 Per Capita Waste to Class 1 Landfills

The total quantity of waste disposed of at Class 1 landfills in a given area is related to a number of factors, including:

- the size and levels of affluence of the population;
- the extent and nature of waste collection and disposal activities and services;
- the extent and nature of resource recovery activities and services;
- the level and types of economic activity;
- the relationship between the costs of landfill disposal and the value of recovered materials;
- the availability and cost of disposal alternatives, such as Class 2-4 landfills; and
- seasonal fluctuations in population (including tourism).

By combining Statistics NZ population estimates and the Class 1 landfill waste data in section **6.3.1**, the per capita annual waste to landfill from the district in 2013/14 can be calculated as shown in Table 18 below. The estimate includes special wastes but excludes non-levied cleanfill materials.

Table 18: Waste Disposal per Capita – Mackenzie District

Calculation of per capita waste to Class 1 landfills	
Population (Stats NZ 2013 year estimate)	4300
Total waste to Class 1 landfill (tonnes 2013/14 year)	1371
Tonnes/capita/annum of waste to Class 1 landfills	0.318

 Table 19: Per Capita Waste to Class 1 Landfills Compared to Other Districts

Overall waste to landfill (excluding cleanfill and	Tonnes per capita
cover materials)	per annum
Gisborne District 2010	0.305
Waimakariri District 2012	0.311
Mackenzie District 2013/14	0.318

Westland District 2011	0.331
Carterton/Masterton/South Wairarapa Districts 2015	0.352
Ashburton District 2014/15	0.366
Tauranga and WBoP District 2010	0.452
Napier/Hastings 2012	0.483
Southland region 2011	0.500
Wellington City & Porirua City 2015	0.507
Christchurch City 2012	0.524
Taupo District 2013	0.528
Kāpiti Coast District 2015	0.584
Wellington region 2015	0.608
New Plymouth District 2010	0.664
Hamilton City	0.668
Queenstown Lakes District 2012	0.735
Rotorua District 2009	0.736
Auckland region 2012	0.800
Upper Hutt City & Hutt City 2015	0.874

Districts with lower per capita waste generation tend to be rural areas or urban areas with relatively low levels of manufacturing activity. The areas with the highest per capita waste generation are those with significant primary manufacturing activity or with large numbers of tourists.

7.1.2 Per Capita Domestic Kerbside Refuse to Class 1 Landfills

The quantity of domestic kerbside refuse disposed of per capita per annum has been found to vary considerably between districts. There are several reasons for this variation, as discussed below.

Kerbside refuse services are used primarily by residential properties, with small-scale commercial businesses comprising a relatively small proportion of collections (typically 5-10%). In districts with more businesses using kerbside wheelie bin collection services, an increase which can be related to the scale of commercial enterprises and the services offered by private waste collectors, the per capita quantity of kerbside refuse can be higher. There is relatively little data in most areas on the proportion of businesses that use kerbside collection services so, it is usually not possible to provide data solely

on residential use of kerbside services. In the Mackenzie, business use of the kerbside service is relatively low, although like many areas, there are no detailed records to determine this level.

The type of service provided by councils has a considerable effect on the per capita quantity of kerbside refuse. Councils providing wheelie bins (particularly 240-litre wheelie bins) or rates-funded bag collections generally have higher per capita collection rates than councils that provide user-pays bags. The effect of rates-funded bag collections is reduced in those areas where council limits the number of bags that can be set out on a weekly basis.

Evidence indicates that the most important factor determining the per capita quantity of kerbside refuse is the proportion of households which use private wheelie bin collection services. Households which use private wheelie bins, particularly larger, 240-litre wheelie bins, tend to set out greater quantities of refuse than households using refuse bags. Therefore, it can be assumed that the higher the proportion of households using private wheelie bins in a given area, the greater the per capita quantity of kerbside refuse generated will be. It is considered that a contributing factor to the low per capita quantities in the Mackenzie is due to the majority of households in the district using the Council service.

Other options that are available to households for the disposal of household refuse include burning, burying, or delivery direct to a disposal facility. The effect of these on per capita disposal rates varies between areas, with residents of rural areas being more likely to use one of these options.

The disposal rate of domestic kerbside refuse for the Mackenzie has been calculated to be 157 kg per capita per annum in 2016 year.

The table below compares the per capita rate of disposal of kerbside refuse in the Mackenzie District with other urban areas in New Zealand. Data for the other districts has been taken from SWAP surveys conducted by Waste Not Consulting.

 Table 20: Per Capita Disposal of Kerbside Refuse – Comparison with Other Areas

District and year of survey	Kg/capita/annum	Comment
Christchurch City 2011	110	Fortnightly 140-litre refuse wheelie bin. Weekly organic collection
Mackenzie District 2016	157	Fortnightly 140-litre refuse/240-litre recycling and weekly 45-litre glass
Auckland Council 2012	160	Range of legacy council services.
Hamilton City 2013	182	Rates-funded refuse bags, max. 2 per week

Tauranga City and Western Bay of Plenty District 2014/15	201	User-pays bags in Tauranga. No council service in WBoP.
Wellington region 2014/15	206	Estimate based on SWAP surveys at Silverstream landfill and Kāpiti Coast
Taupo District 2013	212	User-pays refuse bags
Hastings District/Napier City 2016	225	User-pays refuse bags (Hastings) & rates-funded bags max. 2 bags/week(Napier)
Rotorua District 2009	216	Council rates-funded Kleensaks. No kerbside recycling service

Of the urban areas that have been assessed, Christchurch City has the lowest per capita disposal rate of kerbside refuse. This is associated with the diversion of organic waste through the council's kerbside organic collection and the Council's high market share.

Rotorua District has the highest disposal rate of the urban areas shown in the table. This is associated with the high proportion of households in Rotorua that use private collector wheelie bin services and the absence of kerbside recycling services.

7.1.3 Per Capita Kerbside Recycling

Per capita recycling rates for the Makenzie District are calculated in Table 21.

Kerbside recycling	2017
Kerbside recycling	453.64
Population estimate	4,680
Kg/capita/annum	97kg

Table 21: Per Capita Kerbside Recycling – Kg/Capita/Annum

It is considered that the larger 240 litre wheelie bin for mixed recycling and the weekly 45 litre glass crate provides sufficient capacity and ease for residents to recycle. This convenience for recycling, combined with the smaller 120 litre red waste bin, encourages residents to separate recycling to avoid having insufficient capacity for their residual waste. This promotes high per capita kerbside recycling rates.

Table 22: Per Capita Kerbside Recycling – Kg/Capita/Annum

District	Kg/capita/annum	System type
Napier City Council	52 kg	Fortnightly bags or crates
Wellington region	53 kg	Various systems
Ashburton District	62 kg	Weekly bags or crates depending on area
Tauranga City Council	65 kg	Private wheelie bin collection service
Invercargill City Council	69 kg	Fortnightly 240-litre wheeled bin, commingled
Waipa District	73 kg	Weekly/Fortnightly 55-litre crate, separate paper collection
Waikato District	74 kg	Weekly 55-litre crate, separate paper collection
Dunedin City	77 kg	Fortnightly 240-litre wheeled bin, fortnightly crate for glass
Horowhenua District	81 kg	Weekly crate
Auckland Council	84 kg	Fortnightly 240-litre commingled wheelie bins or 140-litre wheelie bin with separate paper collection
Waimakariri District Council	85 kg	Fortnightly 240-litre wheeled bin, commingled
Hamilton City Council	86 kg	Weekly 45-litre crate, separate paper collection
Palmerston North City	87 kg	Fortnightly 240-litre wheeled bin for commingled materials alternating with 45-litre crate for glass
Mackenzie District Council	97kg	Fortnightly 240-litre recycling bin and weekly 45-litre glass crate

Christchurch	109 kg	Fortnightly 240-litre wheeled bin

7.1.4 **Diversion Rate - by Material Type** Graph: Diversion rate by material type – 2017



An increase in recycling collected at the RRP's is expected following the removal of the disposal charge for recycling in July 2017.

It is noted that the kerbside recycling category consists of recycling from yellow bins and that glass collected at the kerbside is included under the general glass category.

7.1.5 Diversion Potential of Waste to Class 1 Landfills

Table 23: Diversior	n potential	of	kerbside	waste	to	Class	1	Landfill
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	Fairlie	Tekapo	Twizel	Combined
Recyclable materials				
Paper - Recyclable	0.80 kg	0.45 kg	0.46 kg	0.55 kg
Plastics - # 1-7 containers	0.22 kg	0.28 kg	0.25 kg	0.25 kg
Steel cans	0.11 kg	0.10 kg	0.08 kg	0.09 kg

Aluminium cans	0.02 kg	0.03 kg	0.04 kg	0.03 kg			
Glass bottles/jars	0.28 kg	0.32 kg	0.32 kg	0.31 kg			
Subtotal	1.43 kg	1.17 kg	1.15 kg	1.23 kg			
Compostable materials							
Kitchen waste	3.65 kg	5.15 kg	3.26 kg	3.80 kg			
Greenwaste	3.50 kg	0.21 kg	2.28 kg	2.13 kg			
Subtotal	7.16 kg	5.36 kg	5.55 kg	5.92 kg			
TOTAL – POTENTIALLY DIVERTABLE	8.58 kg	6.53 kg	6.70 kg	7.15 kg			

Materials considered divertable are those which are already being recovered or otherwise diverted from landfill disposal elsewhere in New Zealand. It is recognised that no system established for the recovery of waste materials is capable of diverting 100% of that material from the waste stream. The estimate that is presented, therefore, represents a theoretical maximum, rather than the proportion of the waste stream that is likely to be recovered should a full suite of diversion initiatives be established.

The table above, which includes data from the 2016 SWAP, shows that 7.15kg or 56.1% of a standard red wheelie bin could be diverted. In separating data for individual towns, Twizel and Tekapo are slightly lower than this average, with Fairlie slightly higher. However, all areas show that kitchen and garden waste categories represent the greatest potential to divert waste.

8 Future Demand and Gap Analysis

8.1 Future Demand

There are a wide range of factors which are likely to affect future demand for waste minimisation and management. The extent to which these influence demand could vary over time and may differ by locality. Because of this, predicting future demand has inherent uncertainties. Key factors for the Mackenzie District are likely to include the following:

- Overall population growth;
- Economic activity;
- Changes in lifestyle and consumption;
- Changes in waste management approaches;
- Changes to tourism numbers and types;
- Number of non-resident home owners;
- Kerbside collection areas (possible expansion); and
- National influences such as product stewardship schemes and legislation changes.

In general, the factors which have the greatest influence on potential demand for waste and resource recovery services are population and household growth, construction and demolition activity, economic growth, and changes in the collection service or recovery of materials.

8.1.1 Population

The Statistics New Zealand population projections for the Mackenzie District are shown in Table XX.

Table 24: Households and Projected Household Growth – Medium Variant

Population	2013 Census	2018	2023	2028	2033	2038	2043	% Per Annum
TOTAL	4,300	4,680	4,790	4,880	4,930	4,980	5,030	0.5%

These projections indicate that the district's population will increase by 0.5% per annum, which may see the population grow to 5,030 in the 30 year period from the 2013 census.

8.1.2 Economic Activity

For reference, Figure 23 below shows the growth in residual waste in the Organisation for Economic Co-operation and Development (OECD) plotted against gross domestic product (GDP) and population.

Figure 23: Municipal Waste Generation, GDP and Population in OECD 1980 - 2020



Source: OECD 2001.

Research from the UK⁹ and USA¹⁰ suggests that underlying the longer-term pattern of household waste growth is an increase in the quantity of materials consumed by the average household and that this in turn is driven by rising levels of household expenditure.

It is considered that the relationship between population, GDP, and waste is sound, as population growth will generate proportionately increased quantities of waste and increased economic activity is associated with the production and consumption of goods which, in turn, generates waste.

Total GDP is also a valuable measure as it accounts for the effects of population growth as well as changes in economic activity. The chart above shows that residual (municipal) solid waste growth tracks above population growth but below GDP. However, it should be noted that the exact relationship between GDP, population, and waste growth will vary according to local economic, demographic, and social factors.

The Mackenzie District is experiencing a significant level of building development, however with a large portion of this development being focused on commercial accommodation and holiday homes, this development does not relate directly to population growth. The district is also experiencing strong growth in the tourism sector, encompassing a range of different types of travellers. This economic change leads to increases in waste production.

8.1.3 Changes in Lifestyle and Consumption

It is anticipated that community expectations relating to recycling and waste minimisation, will drive increased demand for waste minimisation services, such as recycling and organics.

Consumption habits will affect the waste and recyclables generation rates. For example, there has been a national trend related to the decline in newsprint. In New Zealand, the production of newsprint has been reducing since 2005, when it hit a peak of 377,000 tonnes, before falling to 276,000 tonnes

⁹ Eunomia (2007), *Household Waste Prevention Policy Side Research Programme*, Final Report for Defra, London, England

¹⁰ EPA, 1999. National Source Reduction Characterisation Report For Municipal Solid Waste in the United States

in 2011.¹¹ Further indication of the decline in paper consumption comes from the Ministry for Primary Industry statistics shown in Figure 24.



Figure 24: Apparent Paper Consumption per Capita

8.1.4 Changes in Waste Management Approaches

As there are a range of drivers, the methods and priorities for waste management are likely to continue to evolve as increasing emphasis is placed on diversion of waste from landfill and recovery of material value. These drivers include:

- **Statutory requirement** in the Waste Minimisation Act 2008 to encourage waste minimisation and decrease waste disposal with a specific duty for TAs to promote effective and efficient waste management and minimisation and to consider the waste hierarchy in formulating their WMMPs.
- **Requirement in the New Zealand Waste Strategy 2010** to reduce harm from waste and increase the efficiency of resource use.
- Increased cost of landfill. Landfill costs have risen in the past due to higher environmental standards under the RMA, introduction of the Waste Disposal Levy (currently \$10 per tonne) and the New Zealand Emissions Trading Scheme. Whilst these have not been strong drivers to date, there remains the potential for their values to be increased and to incentivise diversion from landfill.
- **Collection systems**. In brief, more convenient systems encourage more material. For example, an increase in the number of large wheeled bins used for refuse collection, drives an increase in the quantities of material disposed of. Conversely, convenient recycling systems with increased capacity help to increase the amount of recycling recovered.
- Waste industry capabilities. As the nature of the waste sector continues to evolve, the waste industry changes to reflect a greater emphasis on recovery. The industy is developing models and ways of working which will help to enable effective waste minimisation in cost-effective ways.
- Local policy drivers, including actions and targets in the WMMP, bylaws, and licensing.
- **Recycling and recovered materials markets**. Recovery of materials from the waste stream for recycling and reuse is heavily dependent upon the recovered materials having an economic

¹¹ http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=10833117

value. This is especially applicable for recovery of materials by the private sector. Markets for recycled commodities are influenced by prevailing economic conditions and, most significantly, by commodity prices for the equivalent virgin materials. This risk is allied with the wider global economy through international markets.

8.1.5 Summary of Demand Factors

The analysis of factors driving demand for future waste services suggests that changes in demand will occur over time although, no dramatic shifts are expected. If new waste management approaches are introduced, these may have the potential to shift material between disposal and recovery management routes.

Population and economic growth will drive moderate increases in the waste generated. It is likely that biggest change in demand will result from changes within the industry, with economic and policy drivers leading to increased waste diversion and waste minimisation.

8.1.6 Projections of Future Demand

Whilst population growth within the Mackenzie District is projected to be relatively gradual, the District is experiencing strong tourism related growth with increasing numbers visiting the area and prompting modest development in the accommodation sector. This poses difficultly in projecting future waste volumes and seasonal changes in pressure on waste services. The collection of further information relating to population and tourism growth trends, may assist in this assessment in the future.

8.2 Future Demand – Gap Analysis

The aim of waste planning at a TA level is to achieve effective and efficient waste management and minimisation. The following 'gaps' in the Mackenzie District's waste management and minimisation practices have been identified as summarised below.

8.2.1 Waste Streams

Priority waste streams which could be targeted to further reduce waste to landfill within the district include:

- Additional kerbside recyclables from domestic and commercial properties;
- Recycling facilities accessible outside of RRP opening hours;
- Event recycling;
- Organic waste collection, particularly food waste from domestic and commercial properties;
- Possible recycling of industrial and commercial plastic a significant part of the waste stream which may be able to be recycled;
- Education of management of farm waste. This waste source is relatively unknown in terms of quantity. Increased awareness of the problems associated with improper disposal may drive demand for better services;
- Management of construction and demolition waste timber in particular is a significant part of the waste stream which may be able to be recovered;
- Product stewardship schemes;
- Biosolids;

- Waste tyres these may not be a large proportion of the waste stream, however the effectiveness of the management of this waste stream is unknown. Issues with management of this waste stream have recently been highlighted nationally;
- Mattress dismantling and recycling; and
- Polystyrene packaging/cool food boxes.

8.2.2 Hazardous Wastes

All three RRPs accept domestic quantities of hazardous household wastes, such as paint, used oil, batteries and LPG cylinders. It is important that the collection and storage of these items are carefully managed for safety and environmental reasons.

8.2.2.1 Asbestos Removal

Some commonly used products that contain asbestos include roof tiles, wall claddings, fencing, vinyl floor coverings, sprayed fire protection, decorative ceilings, roofing membranes, adhesives and paints. The most likely point of exposure is during building or demolition work.

A system is currently being established where the public can dispose of small quantities of asbestos containing materials. This will involve the sale of Hazibags which will be taken to the building site for the asbestos material to be correctly wrapped by the builder or home owner and then returned to the RRP for appropriate storage before being transported to a disposal facility. It is recognised that the original Twizel dwellings from the hydro-electric project period have a number of construction products containing asbestos. The Hazibag system is aimed at ensuring these materials do not end up mixed with general construction waste following renovations. It is considered that any large scale works would be undertaken by a licenced asbestos handler and large volumes of waste would be transported directly to an appropriate landfill outside the district.

8.2.2.2 Medical Waste

The Pharmacy Practice Handbook states:¹²

4.1.16 Disposal of Unused, Returned or Expired Medicines

Members of the public should be encouraged to return unused and expired medicines to their local pharmacy for disposal. Medicines, and devices such as diabetic needles and syringes, should not be disposed of as part of normal household refuse because of the potential for misuse and because municipal waste disposal in landfills is not the disposal method of choice for many pharmaceutical types. Handling and disposal should comply with the guidelines in NZ Standard 4304:2002 – Management of Healthcare Waste.

Work is underway between Regional Council and the District Health Board to provide options for the disposal of sharp medical waste.

8.2.2.3 E-waste

Without a national product stewardship scheme, the e-waste treatment and collection system will continue to be somewhat precarious. Currently, companies tend to cherry-pick the more valuable

¹² https://nzpharmacy.wordpress.com/2009/06/09/disposal-of-unwanted-medicines/

items, such as computers and mobile phones. As a result, those items which are more difficult or expensive to treat, such as CRT TVs and domestic batteries, will often be sent to landfill.

E-waste is accepted at the three RRPs. Some items are accepted at no charge, while others incur a small charge. When a suitable volume of items has been received, these are transported to a suitable e-waste recycler. Mobile phones are collected and donated to charity for fundraising, eg. Starship hospital, as opportunities and volumes permit.

The cost of recycling TV's is high and, while an optional charge is in place to accept TV's and send these to a recycler, the majority of TV's are sent to landfill at a cheaper rate to the customer.

One of the barriers to recycling of e-waste in the Mackenzie is that these materials are not accepted through the kerbside service and residents have to make the effort to take them to a RRP and, pay a charge that may be higher than disposal as residual waste, or through their residual kerbside bin.

9 Initial Review of the 2012 Waste Management and Minimisation Plan

The 2012 WMMP was prepared following the change from a bag kerbside collection service and Council managed RRP's to a contracted service including a three bin kerbside collection and contractor operated RRP's. The WMMP noted the positive progress this change in service created, however at the time of writing, there was some uncertainty regarding how the new systems would operate.

Overall, it is considered that the 2012 WWMP, being the first WMMP, has set a constructive direction for solid waste services and, as a result, the district has made positive advances in waste management and minimisation.

9.1 Key Issues

The 2012 WMMP provided a vision that *"The Mackenzie District minimises its waste and disposes of it with the least effect on the environment"*. This vision is reinforced by three goals:

- 1. Protection of public health from solid waste;
- 2. Protection of the environment from solid waste.
- 3. Provide effective and efficient solid waste services in a sustainable manner.

The significant issues identified in the 2012 WMMP include:

1. Further waste minimisation

It was recognised that there was scope to further reduce the quantity of waste being landfilled, particularly construction waste and recyclable materials.

2. Emissions Trading Scheme

The plan highlighted that there would be additional costs associated with the Emission Trading Scheme obligations

3. Disposal fees

The plan notes that the Council collects revenue from customers disposing of waste at the RRP's.

With regard to these goals and issues, it is considered that Council has made continuous progress towards the vision and goals of the 2012 WMMP through the provision of effective and efficient services which protect the public and environment from solid waste. The current kerbside collection provides an effective service to residents, and some businesses, to collect waste in an appropriate manner whilst also encouraging recycling through the sizes of the collection bins and collection frequency. This is illustrated through the district's high per capita rates of kerbside recycling and relatively low per capita rates of residual waste. In addition, Council's waste minimisation education and projects contribute to the district's aim to reduce waste to landfill.

The Council continues to collect revenue from customers at the RRP's, with an aim to recover costs of residual waste disposal. Changes have been made to the charges for divertible materials since the 2012 WMMP. This includes the introduction of a charge for metal due to the incurred cost of disposal.

In the past, this disposal had returned an income. Other changes include the removal of charges for the disposal of general recycling at the RRPs, a move which encourages waste minimisation.

9.2 Other Issues Not Addressed

The overall volume of residual waste managed through Council systems remained stable for a number of years following the adoption of the WMMP in 2012. Despite a sharp increase in 2015/16, volumes have since reduced again. It is difficult to determine the cause of changes to waste volumes and it is acknowledged that this will continue to pose limitations in the future.

Over the life of the WMMP, there has been a large increase in tourism, with a particular shift towards the use of holiday homes as short term rentals. These changes will continue to influence solid waste generation including the driving of the potential need for additional kerbside waste as well as increased pressure on public litter bins.

Since the introduction of the kerbside bin service in 2011, waste volumes data has improved. This has been strenghtened further by the installation of the Twizel weighbridge in 2017. Further data collected from the 2016 SWAP and ongoing data collection under the National Waste Data Framework highlight the waste sources and types of waste where future waste minimisation efforts can be targeted.

9.3 New Guidance

New Guidance from MFE on Waste Management and Minimisation Planning was released during the development of this Waste Assessment. The 2012 WA and WMMP, while consistent with the guidance at the time they were written, do not fully align with the most recent, 2015 MFE Guidance. This new guidance increases the emphasis on the funding of plans, the inclusion of targets and places greater weight on how actions are monitored and reported. The 2012 WA and WMMP, developed prior to this change, did not provide data in accordance with the National Waste Data Framework, as is now suggested.

9.4 Actions from the 2012 WMMP

Kerbside Collection Options

Review collection service in 2020	Undertake the review before the collection contracts expire in 2021.	Due: 2020	Programmed for completion in 2020
Every 5 years, prior to			
the statutory review of			
the WMMP, undertake			
random visual sample	Will provide useful information for	Due:	Completed 2010
of bins to determine	monitoring and strategic planning.	2017	Completed 2016
composition and help			
with any planning for			
WMMP.			

Resource Recovery Park Options

Polystyrene: investigate options for receipt of smaller quantities with payment.	Some customers may wish to dispose of polystyrene appropriately in small quantities. Currently, only commercial quantities are received. Due to its high volume and high handling and processing cost a charge must be made.	Due 2012/13	No suitable options have been found
Tyres: Determine methodology for collection, storage and end use.	Tyres are likely to be banned from landfill. Tyre dumps need to be addressed as they cause a range of issues and tyres should be recycled in an environmentally responsible manner.	Due: 2012/13	Tyres are currently being shredded

Recycling Options

Will help the MRF run at capacity and reduce costs.	Due 2012/13	in 2016, all recycling now sent to EcoCentral for sorting
yres: Determine hethodology for ollection, storage and nd use.Tyres are likely to be banned from landfill. Tyre dumps need to be addressed as they cause a range of issues and tyres should be recycled in an environmentally responsible		Tyres are currently being shredded
	Will help the MRF run at capacity and reduce costs. Tyres are likely to be banned from landfill. Tyre dumps need to be addressed as they cause a range of issues and tyres should be recycled in an environmentally responsible manner.	Will help the MRF run at capacity and reduce costs.Due 2012/13Tyres are likely to be banned from landfill. Tyre dumps need to be addressed as they cause a range of issues and tyres should be recycled in an environmentally responsible manner.Due 2012/13

Recovery Options

Investigate and implement options for construction waste recovery.	Construction waste diversion will reduce ETS obligations.	No set date	Investigation into feasibility of sending construction waste to a pyrolysis
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treatment plant is ongoing

No charges have

Treatment Options

Investigate options to implement a small To provid charge for hazardous service fro waste drop off.	e some cost recovery for this om users.	Due: 2010/11	to encourage the public to dispose of these wastes in an appropriate manner.
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Community Participation And Information Options

assessed	of bins have taken place to improve the quality of recycling
	are assessed

Write a protocol regarding non- compliance with site rules. (Contractor to complete)	Repeated non-compliance of site rules may require follow-up.	N/A	Contractor regularly reports on health and safety issues and incidents.

Environmental Protection Options

Consider implementing an Environmental Management System	A plan would provide comprehensive strategy for managing environmental issues.	Due: 2013/14	This is managed as part of the current waste services contract
Progress Sustainable Options			
Consider improved sustainability reporting for the solid waste activities to enable data to be gathered and collated to benchmark future initiatives against.	Provides benchmarking for activities	Due: 2016/17	A range of data is continually collated and analysed in relation to solid waste activities.

10 Statement of Options

This section identifies a range of options available to Council to address the key issues that have been identified in this Waste Assessment. An initial assessment has been made as to the strategic importance of each option, the impact of the option on current and future demand for waste services, and Council's role in implementing each option. Options presented in this section are subject to further investigation and assessment of cost implications prior to implementation.

10.1 Key Issues to Be Addressed by WMMP

10.2 Regulation

Ref	Option	lssues Addressed	Strategic Assessment	Impact on Current/Future Demand	Councils' Role
R1	Monitor and review existing Bylaw	Ensure Bylaw remains current, effective and consistent with WMMP	Social/Cultural: Opportunity to raise awareness of waste issues and services Environmental and Health: Ensure waste services take into account environmental and health impacts	Reinforces WMMP goals and effective waste management and minimisation	Instigate Bylaw review when required

10.3 Measuring and Monitoring

Ref	Option	lssues Addressed	Strategic Assessment	Impact on Current/Future Demand	Councils' Role
М1	Conduct regular audits of kerbside waste	Following the Solid Waste Audit Protocols, a waste audit of residual residential wheelie bins was undertaken in 2016, this data has been	Social/Cultural: offers potential improvements to awareness of what our waste consists of and encourages waste minimisation. Health: would offer education regarding potential health risks of	Ongoing data collection would allow for improvements to the analysis of waste composition over time and the identification of all priority waste streams or products to be	Initiate regular waste audits, investigate option to include as a requirement of future waste management contracts.

		valuable in understanding the composition of kerbside waste.	waste and appropriate method of disposal. Environmental: identification of waste streams to target for waste minimisation. Economic: new waste minimisation projects would incur additional costs.	identified and targeted through education or other means. Continued use of the National Waste Data Framework will allow for comparison with other districts.	
M2	Continue data collection from Resource Recovery Parks under the National Waste Data Framework	Currently all loads accepted at the Resource Recovery Parks are recorded under the National Waste Data Framework and will allow analysis of waste sources and comparison with other districts	Existing – no change required.		Monitor the accuracy of data recording, investigate option to include as a requirement of future waste management contracts.

10.4 Education and Engagement

Ref	Option	Issues Addressed	Strategic Assessment	Impact on Current/Fut ure Demand	Councils' Role
	Continue	Council	Social/Cultural:	Previous and	Initiate and manage,
EE1	existing	currently	Improved community	current	or co-ordinate with
	education	promotes a	awareness of waste	programmes	community groups a
	programme	number of	issues and options to	have been	range of relevant

	s and add	education	minimise waste,	selected on	educational
	new programme s as opportuniti	programmes aimed at waste minimisation, such as	potential for community groups to form with added social benefits.	priority issues, such as reducing food and	programmes. This may be solely education or involve subsidy of products
	arise	nappy packs, home compost systems, support of Love Food Hate Waste, plastic bags and straw free movements	Health: would allow education regarding potential health risks of waste and appropriate method of disposal Environmental: expected increase in waste diversion. Economic: increased costs to run programmes, but possible savings in reduction of residual waste costs	waste to landfill and from popular waste issues, such as plastic bags. Flexibility to select programmes on these merits is required to address issues as they arise.	to aid waste minimisation. Examples of programmes include (but not limited to): • Home composting systems and worm farming;Food waste minimisation or food rescue programmes;Clot h nappies; Single use items such as takeaway coffee cups, plastic bags, straws;Product packaging
EE3	Work with local event organisers to encourage waste minimisation	Provide support and resources to event organisers to promote and implement waste minimisation systems	Social/Cultural: increase awareness of waste minimisation Environment: reduced waste generated from local events Economic: possible cost savings to local events from reduction of disposal fees.	Improved waste minimisation at local events	Develop educational resources, consider new resources and investigate options for food waste disposal.

10.5 Collection & Services

Ref	Option	lssues Addressed	Strategic Assessment	Impact on Current/Future Demand	Councils' Role
CS1	Continue existing kerbside service and review methods to improve service and to expand types of materials that can be accepted for recycling		Kerbside waste and recycling collection provides an effective and accessible method of collecting waste and diverting recyclables to urban communities. Wheelie bins provide for safe storage and collection of waste to protect the health of residents.	Data shows that there is a significant proportion of food and garden waste in the residual waste stream and a smaller amount of other recyclables that are included with residual waste that could be diverted.	Review the current kerbside system at the end of the current contract and look for any improvements . I
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CS2	Investigate food waste or organics collection	Reduce volume of food and organic waste sent to landfill	Social/Cultural: improved service to allow residents to dispose of food/organic waste in a more appropriate manner than through their red wheelie bin. Environmental: reduction of food/organic waste sent to landfill. Economic: implementation will require funding, but will result in reduced landfill disposal costs.	Food/organic waste has been identified as a major component of residual kerbside waste, therefore such change would result in a significant reduction in waste to landfill.	Investigate options and implement new system
CS3	Investigate kerbside inorganic collection (eg. Furniture, appliances etc), possibly community	Reduce waste to landfill	Social/Cultural: if community led, this will allow for social connections and sharing of household items. If Council led, would allow for easy disposal of household items.	Reduction of waste to landfill	Investigate options and implement new system

	or Council collection		Environmental: reduction of waste to landfill. Economic: If Council led, will likely require funding		
CS4	Investigate E-Waste collections	Reduce volume of E- Waste to landfill	Social/Cultural: improved service and allow residents to dispose of E- Waste in an appropriate manner. Environmental: allow E- Waste to be recycled or re-used rather than being sent to landfill. Economic: funding required for new service.	Would require reliable markets to accept E-Waste items.	Investigate options and implement new system.

10.6 Infrastructure

Ref	Option	lssues Addressed	Strategic Assessment	Impact on Current/Future Demand	Councils' Role
IN1	Review current facilities for public to dispose of waste and recycling.	To ensure adequate and effective waste and recycling disposal options are available.	Social/Cultural: allow the public to easily dispose of waste and recycling in an appropriate manner. Environmental: ensure waste is managed appropriately, avoid littering, maximise recycling. Economic: Potential costs associated with possible	Public to have range of adequate waste and recycling disposal options.	Review and monitor existing services and adapt or introduce new facilities where appropriate.
			changes such as extended		

			RRP opening hours, new public recycling facilities.		
IN2	Accept additional types of materials at RRP's for waste diversion	Provide opportunities for the public to recycle or divert additional types of material as improved technology or facilities become available.	Social/Cultural: provide new opportunities to the public to divert waste, increase awareness of waste issues. Environmental: improve waste diversion. Economic: there may be costs associated with managing new systems, but is is possible that such a change would result in a reduction to landfill disposal costs.	Public would be able to divert new types of waste resulting in a reduction in waste to landfill.	Monitor new opportunities and investigate as these arise.

10.7 Leadership and Management

Ref	Option	Issues Addressed	Strategic Assessment	Impact on Current/Future Demand	Councils' Role
LM1	Continue collaboration with other Canterbury district councils through the Canterbury Waste Joint Committee	This joint committee allows collaborative efforts and funding for projects which provide a consistent message throughout Canterbury	Social/Cultural: increase awareness of waste issues. Health: allows education regarding potential health risks of waste and appropriate method of disposal. Environmental: opportunities to improve waste diversion	The collaboration with other neighbouring councils provides opportunities for consistent messaging, data and cost sharing.	Continue to work with the Canterbury Waste Joint Committee and support applicable projects.

			for shared resourcing and project costs		
LM1	Collaboration with local community groups	Joint projects or support to promote waste management and minimisation	Social/Cultural: opportunities to support local community groups with interests in waste management and minimisation. Environmental: opportunities to improve waste diversion.	Opportunities arise where support can be given, rather than fully resourcing projects to improve waste diversion and awareness	Communicat with interested parties and identify opportunities as they arise.
			Economic: opportunities for shared resourcing and project costs.		

11 Council's Intended Role

11.1 Statutory Obligations and Powers

Councils have a number of statutory obligations and powers in respect of the planning and provision of waste services. These include the following:

- Under the WMA, each Council "must promote effective and efficient waste management and minimisation within its district" (s 42). The WMA requires TAs to develop and adopt a Waste Management and Minimisation Plan (WMMP).¹³
- The WMA also requires TAs to have regard to the New Zealand Waste Strategy 2010. The Strategy has two high levels goals: 1) 'Reducing the harmful effects of waste'; and 2) 'Improving the efficiency of resource use'. These goals must be taken into consideration in the development of Council's waste strategy.
- Under Section 17A of the Local Government Act 2002 (LGA), local authorities must review the provision of services and must consider options for the governance, funding and delivery of infrastructure, local public services and local regulation. There is substantial cross over between the section 17A requirements and those of the WMMP process, particularly in relation to local authority service provision.
- Under the LGA Councils must consult the public about their plans for managing waste.
- Under the Resource Management Act 1991 (RMA), TA responsibility includes controlling the
 effects of land-use activities that have the potential to create adverse effects on the natural
 and physical resources of their district. Facilities involved in the disposal, treatment or use of
 waste or recoverable materials may carry this potential. Permitted, controlled, discretionary,
 non-complying and prohibited activities and their controls are specified within the District
 Plan, thereby defining further land-use-related resource consent requirements for wasterelated facilities.
- The Litter Act 1979 installs TAs the power to make bylaws, issue infringement notices, and require the clean-up of litter from land.
- Provisions of the the Health Act 1956 for the removal of refuse by local authorities have been repealed by local government legislation. The Public Health Bill is currently progressing through Parliament. This is a major legislative reform, reviewing and updating the Health Act 1956, but it contains similar provisions for sanitary services compared to those currently contained in the Health Act 1956.
- The Hazardous Substances and New Organisms Act 1996 (the HSNO Act) provides minimum national standards that may apply to the disposal of a hazardous substance. However, under the RMA, a regional council or TA may set more stringent controls relating to the use of land for storing, using, disposing of, or transporting hazardous substances.
- Under current legislation and the new Health and Safety at Work Act the Council has a duty to ensure that its contractors are operating in a safe manner.

¹³ The development of a WMMP in the WMA is a requirement modified from Part 31 of the LGA 1974, but with even greater emphasis on waste minimisation.

The Mackenzie District Council, in determining their role, needs to ensure that their statutory obligations, including those noted above, are met.

11.2 Overall Strategic Direction and Role

The overall strategic direction and role of Council is presented in the Waste Management and Minimisation Plan.

12 Statement of Proposals

Based on the options identified in this Waste Assessment, and Council's intended role in meeting forecast demand, a range of proposals are put forward. Actions and timeframes for delivery of these proposals will be identified in the Draft Waste Management and Minimisation Plan.

It is expected that the implementation of these proposals will meet forecast demand for services in addition to supporting Council's goals and objectives for waste management and minimisation. These goals and objectives will be confirmed as part of the development and adoption of the Waste Management and Minimisation Plan.

12.1 Statement of Extent

In accordance with section 51(f), a Waste Assessment must include a statement addressing the extent to which the proposals will (i) ensure that public health is adequately protected; (ii) promote effective and efficient waste management and minimisation.

12.1.1 Protection of Public Health

The Health Act 1956 requires Council to ensure that the provision of waste services adequately protects public health.

Council's WA has identified potential public health issues associated with each of the options. Appropriate initiatives to manage these risks would be a part of any implementation programme.

In respect of Council-provided waste and recycling services, public health issues can be addressed through setting appropriate performance standards for waste service contracts, ensuring that performance is monitored and reported on, and confirming that there are appropriate structures within the contracts for addressing issues that may arise.

Privately-provided services will be regulated through local bylaws.

Uncontrolled disposal of waste, for example in rural areas and in cleanfills, will be regulated through local and regional bylaws.

It is considered that, subject to any further issues identified by the Medical Officer of Health, the proposals would adequately protect public health.

12.1.2 Effective and Efficient Waste Management and Minimisation

The WA investigates current and future quantities of waste and diverted material, and outlines Council's role in meeting the forecast demand for services.

It is considered that the process of forecasting has been robust, and that Council's intended role in meeting these demands is appropriate in the context of the overall statutory planning framework.

Therefore, it is considered that the proposals will promote effective and efficient waste management and minimisation within the Mackenzie District.

Appendices

A.1.0 Medical Officer of Health Statement



Community & Public Health

South Canterbury Office 18 Woollcombe Street PO Box 510, TIMARU Telephone: 03 687 2600 Facsimile: 03 688 6091

10 May 2018

Angie Taylor Solid Waste Manager Mackenzie District Council 53 Main Street, Timaru

Dear Angie,

Waste Minimisation Act 2008 : Mackenzie District Council Waste Assessment 2018

Thank you for inviting the Medical Officer of Health to comment on the Mackenzie District Council Waste Assessment as required by the Waste Minimisation Act 2008.

Waste management is a core sanitary service, provided by Councils to protect public health. The main issues for public health with regard to waste management and waste minimisation are:

- Identification of the various types of wastes and collection/disposal methods
- Satisfactory collection and disposal of waste so that public health risks are controlled and mitigated
- Addressing hazardous waste, including medical wastes, asbestos waste and electronic waste (e-waste)
- Consideration of future population demands and consumption rates on the current system and mitigation strategies put into place
- Regional co-ordination of waste management and waste minimisation
- Ensuring that a waste disposal service is accessible to all residents/ratepayers
- Reducing legislative and cost barriers that inhibit mitigation of public health issues related to waste
- The health impacts of climate change and the contribution that effective waste management and waste minimisation can make to reduction in greenhouse gas emissions

The Mackenzie District Council has a number of challenges with regards to waste management such as the size of the district compared to its population, the effects of tourism on waste management and the fluctuating volume of waste, along with the impact of rural and farm waste.

In this context I make the following comments;

Council's activities are acknowledged and supported by the Medical Officer of Health, particularly:

- Council's response to the high volume of tourists travelling through the district and the impact this can have on waste services,
- conscientious auditing and reporting practices, and
- collaboration with neighbouring authorities

The Council is to be commended for its support of waste education programmes such as EnviroSchools and Paper 4 Trees, along with its own waste minimisation education projects. Having Council support these initiatives is an integral aspect of promoting current methods of waste minimisation while also educating future generations about the importance of waste reduction.

The Council's efforts towards recycling and reuse of waste are also acknowledged and encouraged. E-waste volumes are rising in other council regions, and will likely increase in the Mackenzie District, potentially posing a hazard for the environment and human health. With regard to e-waste, other councils have reported a rise in e-waste volumes and it would not be unreasonable to make a similar assumption for the Mackenzie District. Growing volumes of ewaste pose a hazard to both the environment and human health. As e-waste is not currently accepted via the kerbside collection service in the Mackenzie District, further efforts should be made to investigate other potential methods of disposal and recycling as noted in option CS4.

Rural and farm waste is also an important issue for the Mackenzie District, with a large number of farms using bury, burn, or bulk storage on their property as their methods of waste management. As the quantity of waste disposed in this manner is unknown to Council, the potential environmental impact of this practice cannot be measured accurately. It is noted that Council has acknowledged the difficulty in providing rural areas with the necessary support to ensure waste is appropriately disposed of. The Medical Officer of Health supports the Council's decision to further investigate solutions for improving waste services for rural properties.

I note the information in the assessment that the average red, residual waste wheelie bin contains 50% organic waste, and home composting options have the potential to divert significant volumes of waste from landfill and I commend Council for the actions they are taking to encourage home composting. However, home composting alone is likely to be insufficient to make a major reduction in the volume of organic waste going to landfill. Reduction in this particular waste stream has two important benefits: extending the life of existing landfills and reduction in the amount of landfill gas generated (primarily methane which is a potent greenhouse gas). The latter has important effects on health and environment beyond the district through its contribution to climate change.

The assessment noted a number of priority waste streams in section 8.2.1 that could be targeted to further reduce waste to landfill. I support the decision to investigate these waste streams and I strongly encourage investigating/implementing food waste or organics collection (see CS2).

Once again thank you for your work in managing this important service which has significant public health value to South Canterbury communities. If you require further information please, in the first instance, contact one of the Health Protection Officers at our Timaru office.

Yours sincerely

N

Dr Cheryl Brunton Medical Officer of Health

A.2.0 Glossary of Terms

Class 1-4 Landfills	Classification system for facilities where disposal to land takes place. The classification system is provided in A.2.1 below for reference.
Cleanfill	(properly referred to as a Class 4 landfill) Any disposal facility that accepts only cleanfill material. This is defined as material that, when buried, will have no adverse effect on people or the environment.
C&D Waste	Waste generated from the construction or demolition of a building including the preparation and/or clearance of the property or site. This excludes materials such as clay, soil and rock when those materials are associated with infrastructure such as road construction and maintenance, but includes building-related infrastructure.
Diverted Material	Anything that is no longer required for its original purpose and, excluding commercial or other waste minimisation activities, would be disposed of or discarded.
Domestic Waste	Waste from domestic activity in households.
ETS	Emissions Trading Scheme
ICI	Industrial, Commercial, Institutional
Landfill	A disposal facility as defined in s7 of the WMA, excluding incineration. Includes, by definition in the WMA, only those facilities that accept 'household waste'. Properly referred to as a Class 1 landfill.
LGA	Local Government Act 2002
Managed Fill	A disposal site requiring a resource consent to accept well- defined types of non-household waste, e.g. low-level contaminated soils or industrial by-products, such as sewage by-products. Properly referred to as a Class 3 landfill.
MFE	Ministry for the Environment
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NZ	New Zealand
NZWS	New Zealand Waste Strategy

Putrescible, garden, greenwaste	Plant based material and other bio-degradable material that can be recovered through composting, digestion or other similar processes.
RRP	Resource Recovery Park
RTS	Refuse Transfer Station
Service Delivery Review	As defined by s17A of the LGA 2002. Councils are required to review the cost-effectiveness of current arrangements for meeting the needs of communities within its district or region for good-quality local infrastructure, local public services, and performance of regulatory functions. A review under subsection (1) must consider options for the governance, funding, and delivery of infrastructure, services, and regulatory functions.
ТА	Territorial Authority (a city or district council)
Waste	As defined by the WMA:
	 a) Anything disposed of or discarded, and b) Includes a type of waste that is defined by its composition or source (for example, organic waste, electronic waste, or construction and demolition waste); and c) To avoid doubt, includes any component or element of diverted material, if the component or element is disposed or or discarded.
WA	Waste Assessment as defined by s51 of the WMA. A Waste Assessment must be completed whenever a WMMP is reviewed
WMA	Waste Minimisation Act 2008
WMMP	A Waste Management and Minimisation Plan as defined by s43 of the WMA
WWTP	Wastewater treatment plant

A.2.1 Classifications for Disposal to Land

In the 'Technical Guidelines for Disposal to Land' (2016) the following definitions are given:

Class 1 - Landfill

A Class 1 landfill is a site which accepts residual solid waste as defined in this Guideline. A Class 1 landfill generally also accepts C&D waste, some industrial wastes and contaminated soils. Class 1 landfills often use managed fill and clean fill materials they accept, as daily cover.

Class 1 landfills require:

- a rigorous assessment of siting constraints, considering all factors, but with achieving a high level of containment as a key aim;
- engineered environmental protection by way of a liner and leachate collection system, and an appropriate cap, all with appropriate redundancy; and
- landfill gas management.

A rigorous monitoring and reporting regime is required, along with stringent operational controls. Monitoring of accepted waste materials is required, as is monitoring of sediment runoff, surface water and groundwater quality, leachate quality and quantity, and landfill gas.

Waste acceptance criteria (WAC) comprises:

- residual solid waste; and
- for potentially hazardous leachable contaminants, maximum chemical contaminant leachability limits (TCLP) from Module 2 Hazardous Waste Guidelines Class A4.

WAC for potentially hazardous wastes and treated hazardous wastes are based on leachability criteria to ensure that leachate does not differ from that expected from non-hazardous residual solid waste.

For Class 1 landfills, leachability testing should be completed to provide assurance that waste materials meet the WAC.

Class 2 Landfill

A Class 2 landfill is a site which accepts non-putrescible wastes including C&D wastes, inert industrial wastes, managed fill material and clean fill material as defined in these Guidelines. C&D waste can contain biodegradable and leachable components which may result in the production of leachate – thereby necessitating an increased level of environmental protection. Although not as strong as Class 1 landfill leachate, Class 2 landfill leachate is typically characterised by mildly acidic pH, and the presence of ammoniacal nitrogen and soluble metals, including heavy metals. Similarly, industrial wastes from some activities may generate leachates with chemical characteristics that are not necessarily organic.

Class 2 landfills should be sited in areas of appropriate geology, hydrogeology and surface hydrology. A site environmental assessment is required, in addition to an engineered liner, a leachate collection system, and groundwater and surface water monitoring. Additional engineered features such as leachate treatment may also be required.

Depending on the types and proportions of C&D wastes accepted, Class 2 landfills may generate minor to significant volumes of landfill gas and/or hydrogen sulphide. The necessity for a landfill gas collection system should be assessed.

Operational controls are required, as is the monitoring of accepted waste materials, sediment runoff, surface water and groundwater quality, and leachate quality and quantity.

Waste acceptance criteria comprises:

- a list of acceptable materials; and
- maximum ancillary biodegradeable materials (e.g. vegetation) to be no more than 5% by volume per load; and
- maximum chemical contaminant leachability limits (TCLP) for potentially hazardous leachable contaminants.

For Class 2 landfills, leachability testing should be completed to provide assurance that waste materials meet the WAC.

Class 3 Landfill – Managed/Controlled Fill

A Class 3 landfill accepts managed fill materials as defined in these Guidelines. This comprises predominantly clean fill materials, but may also include other inert materials, and soils with chemical contaminants at concentrations greater than local natural background concentrations but less than specified maximum total concentrations.

Site ownership, location and transport distance are likely to be the predominant siting criteria. However, as contaminated materials (in accordance with specified limits) may be accepted, an environmental site assessment is required in respect of geology, stability, surface hydrology and topography.

Monitoring of accepted material is required, as are operational controls, and monitoring of sediment runoff and groundwater quality.

Waste acceptance criteria comprises:

- a list of acceptable solid materials; and
- maximum incidental or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and
- maximum chemical contaminant limits.

A Class 3 landfill does not include any form of engineered containment. Due to the nature of material received it has the potential to receive wastes that are above soil background levels. The WAC criteria for a Class 3 landfill are therefore the main means of controlling potential adverse effects.

For Class 3 landfills, total analyte concentrations should be determined to provide assurance that waste materials meet the WAC.

Class 4 Landfill - Cleanfill

Class 4 landfill accepts only clean fill material as defined in these Guidelines. The principal control on contaminant discharges to the environment from Class 4 landfills is the waste acceptance criteria.

Stringent siting requirements to protect groundwater and surface water receptors are not required. Practical and commercial considerations such as site ownership, location and transport distance are likely to be the predominant siting criteria, rather than technical criteria.

Clean filling can generally take place on the existing natural or altered land without engineered environmental protection or the development of significant site infrastructure. However, surface water controls may be required to manage sediment runoff.

Whilst extensive characterisation of local geology and hydrogeology is not usually required monitoring of both accepted material and sediment runoff is required, in addition to operational controls.

Waste acceptance criteria comprises:

- virgin excavated natural materials (VENM), including soil, clay, gravel and rock; and
- maximum incidental inert manufactured materials (e.g. concrete, brick, tiles) to be no more than 5% by volume per load; and
- maximum incidental or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and
- maximum chemical contaminant limits are local natural background soil concentrations.

Materials disposed to a Class 4 landfill should pose no significant immediate or future risk to human health or the environment.

The WAC for a Class 4 landfill should render the site suitable for unencumbered potential future land use, i.e. future residential development or agricultural land use.

The WAC for a Class 4 landfill are based on the local background concentrations for inorganic elements, and provide for trace concentrations of a limited range of organic compounds.

Note: The Guidelines should be referred to directly for the full criteria and definitions.

A.3.0 National Legislative and Policy Context

A.3.1 The New Zealand Waste Strategy 2010

The New Zealand Waste Strategy 2010 provides the Government's strategic direction for waste management and minimisation in New Zealand. This strategy was released in 2010 replacing the 2002 Strategy.

The New Zealand Waste Strategy 2010 has two goals. These are to:

- reduce the harmful effects of waste
- improve the efficiency of resource use.

The strategy's goals provide direction to central and local government, businesses (including the waste industry), and communities on where to focus waste management efforts. The strategy's flexible approach ensures waste management and minimisation activities are appropriate for local situations.

In preparing their waste management and minimisation plan (WMMP) councils are required under section 44 of the WMA, to have regard to the New Zealand Waste Strategy, or any government policy on waste management and minimisation which replaces the strategy. Guidance on how councils may achieve this is provided in section 4.4.3.

A copy of the New Zealand Waste Strategy is available on the Ministry's website at

www.mfe.govt.nz/publications/waste/new-zealand-waste-strategy-reducing-harm-improving-efficiency.

A.3.2 Waste Minimisation Act 2008

The purpose of the Waste Minimisation Act 2008 (WMA) is to encourage waste minimisation and a decrease in waste disposal to protect the environment from harm and obtain environmental, economic, social and cultural benefits.

The WMA introduced tools, including:

- waste management and minimisation plan obligations for territorial authorities;
- a waste disposal levy to fund waste minimisation initiatives at local and central government levels; and
- product stewardship provisions.

Part 4 of the WMA is dedicated to the responsibilities of a council. Councils "must promote effective and efficient waste management and minimisation within its district" (section 42).

Part 4 requires councils to develop and adopt a WMMP. The development of a WMMP in the WMA is a requirement modified from Part 31 of the Local Government Act 1974, but with even greater emphasis on waste minimisation.

To support the implementation of a WMMP, section 56 of the WMA also provides councils the ability to:

- develop bylaws;
- regulate the deposit, collection and transportation of wastes;
- prescribe charges for waste facilities;
- control access to waste facilities; and
- prohibit the removal of waste intended for recycling.

A number of specific clauses in Part 4 relate to the WMMP process. It is essential that those involved in developing a WMMP read and are familiar with the WMA and Part 4 in particular.

The WMA provides a regulatory framework for waste minimisation that had previously been based on largely voluntary initiatives and the involvement of territorial authorities under previous legislation, including Local Government Act 1974, Local Government Amendment Act (No 4) 1996, and Local Government Act 2002. The purpose of the WMA is to encourage a reduction in the amount of waste disposed of in New Zealand.

In summary, the WMA:

- Clarifies the roles and responsibilities of territorial authorities with respect to waste minimisation e.g. updating WMMPs and collecting/administering levy funding for waste minimisation projects.
- Requires that a TA promote effective and efficient waste management and minimisation within its district (Section 42).
- Requires that when preparing a WMMP a TA must consider the following methods of waste management and minimisation in the following order of importance:
 - Reduction;
 - o Reuse;
 - Recycling;
 - Recovery;
 - o Treatment;
 - o Disposal;
 - Put a levy on all waste disposed of in a landfill;
 - o Allows for mandatory and accredited voluntary product stewardship schemes;
 - Allows for regulations to be made making it mandatory for certain groups (for example, landfill operators) to report on waste to improve information on waste minimisation; and
 - Establishes the Waste Advisory Board to give independent advice to the Minister for the Environment on waste minimisation issues.

Various aspects of the Waste Minimisation Act are discussed in more detail below.

A.3.3 Waste Levy

From 1st July 2009 the Waste Levy came in to effect, adding \$10 per tonne to the cost of landfill disposal at sites which accept household solid waste. The levy has two purposes, which are set out in the Act:

- to raise revenue for promoting and achieving waste minimisation
- to increase the cost of waste disposal to recognise that disposal imposes costs on the environment, society and the economy.

This levy is collected and managed by the MFE who distribute half of the revenue collected to TA on a population basis to be spent on promoting or achieving waste minimisation as set out in their WMMPs. The other half is retained by the MFE and managed by them as a central contestable fund for waste minimisation initiatives.

Currently the levy is set at \$10/tonne and applies to wastes deposited in landfills accepting household waste. The MFE published a waste disposal levy review in 2014.¹⁴ The review indicates that the levy may be extended in the future:

"The levy was never intended to apply exclusively to household waste, but was applied to landfills that accept household waste as a starting point. Information gathered through the review supports consideration being given to extending levy obligations to additional waste disposal sites, to reduce opportunities for levy avoidance and provide greater incentives for waste minimisation."

A.3.4 Product Stewardship

Under the WMA, if the MFE declares a product to be a priority product, a product stewardship scheme must be developed and accredited to ensure effective reduction, reuse, recycling or recovery of the product and to manage any environmental harm arising from the product when it becomes waste.¹⁵ No Priority Products have been declared at the time of writing this assessment.

The following voluntary product stewardship schemes have been accredited by the Minister for the Environment:¹⁶

- Agrecovery rural recycling programme;
- Envirocon product stewardship;
- Fonterra Milk for Schools Recycling Programme;
- Fuji Xerox Zero Landfill Scheme;
- Holcim Geocycle Used Oil Recovery Programme (no longer operating);
- Interface ReEntry Programme;
- Kimberly Clark NZ's Envirocomp Product Stewardship Scheme for Sanitary Hygiene Products;
- Plasback;
- Public Place Recycling Scheme; and
- Recovering of Oil Saves the Environment (R.O.S.E. NZ);
- Refrigerant recovery scheme;

¹⁴ Ministry for the Environment. 2014. Review of the effectiveness of the waste disposal levy, 2014 in accordance with section 39 of the Waste Minimisation Act 2008. Wellington: Ministry for the Environment ¹⁵ Waste Management Act 2008 2(8)

¹⁶ http://www.mfe.govt.nz/waste/product-stewardship/accredited-voluntary-schemes

- RE:MOBILE;
- Resene PaintWise; and
- The Glass Packaging Forum.

Further details on each of the above schemes are available on: http://www.mfe.govt.nz/waste/product-stewardship/accredited-voluntary-schemes

A.3.5 Waste Minimisation Fund

The Waste Minimisation Fund has been set up by MFE to help fund waste minimisation projects and to improve New Zealand's waste minimisation performance through:

- Investment in infrastructure;
- Investment in waste minimisation systems and
- Increasing educational and promotional capacity.

Criteria for the Waste Minimisation Fund have been published:

- 1. Only waste minimisation projects are eligible for funding. Projects must promote or achieve waste minimisation. Waste minimisation covers the reduction of waste and the reuse, recycling and recovery of waste and diverted material. The scope of the fund includes educational projects that promote waste minimisation activity.
- 2. Projects must result in new waste minimisation activity, either by implementing new initiatives or a significant expansion in the scope or coverage of existing activities.
- 3. Funding is not for the ongoing financial support of existing activities, nor is it for the running costs of the existing activities of organisations, individuals, councils or firms.
- 4. Projects should be for a discrete timeframe of up to three years, after which the project objectives will have been achieved and, where appropriate, the initiative will become self-funding.
- 5. Funding can be for operational or capital expenditure required to undertake a project.
- 6. For projects where alternative, more suitable, Government funding streams are available (such as the Sustainable Management Fund, the Contaminated Sites Remediation Fund, or research funding from the Foundation for Research, Science and Technology), applicants should apply to these funding sources before applying to the Waste Minimisation Fund.
- 7. The applicant must be a legal entity.
- 8. The fund will not cover the entire cost of the project. Applicants will need part funding from other sources.
- 9. The minimum grant for feasibility studies will be \$10,000.00. The minimum grant for other projects will be \$50,000.00.

Application assessment criteria have also been published by the Ministry.

A.3.6 Local Government Act 2002

The LGA provides the general framework and powers under which New Zealand's democratically elected and accountable local authorities operate.

The LGA contains various provisions that may apply to councils when preparing their WMMPs, including consultation and bylaw provisions. For example, Part 6 of the LGA refers to planning and decision-making requirements to promote accountability between local authorities and their communities, and a long-term focus for the decisions and activities of the local authority. This part includes requirements for information to be included in the Long-Term Plan (LTP), including summary information about the WMMP.

More information on the LGA can be found at ww.dia.govt.nz/better-local-government.

A.3.6.1 Section 17 A Review

Local authorities are now under an obligation to review the cost-effectiveness of current arrangements for meeting community needs for good quality infrastructure, local public services and local regulation. Where a review is undertaken local authorities must consider options for the governance, funding and delivery of infrastructure, local public services and local regulation that include, but are not limited to:

- a) in-house delivery;
- b) delivery by a CCO, whether wholly owned by the local authority, or a CCO where the local authority is a part owner;
- c) another local authority; and
- d) another person or agency (for example central government, a private sector organisation or a community group).

Local Authorities have three years from 8 August 2014 to complete the first review of each service i.e. they must have completed a first review of all their services by 7 August 2017 (unless something happens to trigger a review before then).

Other than completion by the above deadline, there are two statutory triggers for a section 17A review:

- The first occurs when a local authority is considering a significant change to a level of service
- The second occurs where a contract or other binding agreement is within two years of expiration.

Once conducted, a section 17A review has a statutory life of up to six years. Each service must be reviewed at least once every six years unless one of the other events that trigger a review comes into effect.

While the WMMP process is wider in scope – considering all waste service provision in the local authority area – and generally taking a longer term, more strategic approach, there is substantial crossover between the section 17A requirements and those of the WMMP process, in particular in relation to local authority service provision. The s17A review may however take a deeper approach

go into more detail in consideration of how services are to be delivered, looking particularly at financial aspects to a level that are not required under the WMMP process.

Because of the level of crossover however it makes sense to undertake the s17A review and the WMMP process in an iterative manner. The WMMP process should set the strategic direction and gather detailed information that can inform both processes. Conversely the consideration of options under the s17A process can inform the content of the WMMP – in particular what is contained in the action plans.

A.3.7 Resource Management Act 1991

The Resource Management Act 1991 (RMA) promotes sustainable management of natural and physical resources. Although it does not specifically define 'waste', the RMA addresses waste management and minimisation activity through controls on the environmental effects of waste management and minimisation activities and facilities through national, regional and local policy, standards, plans and consent procedures. In this role, the RMA exercises considerable influence over facilities for waste disposal and recycling, recovery, treatment and others in terms of the potential impacts of these facilities on the environment.

Under section 30 of the RMA, regional councils are responsible for controlling the discharge of contaminants into or on to land, air or water. These responsibilities are addressed through regional planning and discharge consent requirements. Other regional council responsibilities that may be relevant to waste and recoverable materials facilities include:

- managing the adverse effects of storing, using, disposing of and transporting hazardous wastes
- the dumping of wastes from ships, aircraft and offshore installations into the coastal marine area
- the allocation and use of water.

Under section 31 of the RMA, council responsibility includes controlling the effects of land-use activities that have the potential to create adverse effects on the natural and physical resources of their district. Facilities involved in the disposal, treatment or use of waste or recoverable materials may carry this potential. Permitted, controlled, discretionary, noncomplying and prohibited activities, and their controls, are specified in district planning documents, thereby defining further land-use-related resource consent requirements for waste-related facilities.

In addition, the RMA provides for the development of national policy statements and for the setting of national environmental standards (NES). There is currently one enacted NES that directly influences the management of waste in New Zealand – the Resource Management (National Environmental Standards for Air Quality) Regulations 2004. This NES requires certain landfills (e.g., those with a capacity of more than 1 million tonnes of waste) to collect landfill gases and either flare them or use them as fuel for generating electricity.

Unless exemption criteria are met, the NES for Air Quality also prohibits the lighting of fires and burning of wastes at landfills, the burning of tyres, bitumen burning for road maintenance, burning coated wire or oil, and operating high-temperature hazardous waste incinerators. These prohibitions aim to protect air quality.

A.3.8 New Zealand Emissions Trading Scheme

The Climate Change Response Act 2002 and associated regulations is the Government's principal response to manage climate change. A key mechanism for this is the New Zealand Emissions Trading Scheme (NZ ETS) The NZ ETS puts a price on greenhouse gas emissions, providing an incentive for people to reduce emissions and plant forests to absorb carbon dioxide. Certain sectors are required to acquire and surrender emission units to account for their direct greenhouse gas emissions or the emissions associated with their products. Landfills that are subject to the waste disposal levy are required to surrender emission units to cover methane emissions generated from landfill. These disposal facilities are required to report the tonnages landfilled annually to calculate emissions.

The NZ ETS was introduced in 2010 and, from 2013, landfills have been required to surrender New Zealand Emissions Units for each tonne of CO_2 (equivalent) that they produce. Until recently however the impact of the NZETS on disposal prices has been limited. There are a number of reasons for this:

- The global price of carbon crashed during the GFC in 2007-8 and has been slow to recover.
 Prior to the crash it was trading at around \$20 per tonne. The price has been as low as \$2, although since, in June 2015, the Government moved to no longer accept international units in NZETS the NZU price has increased markedly (currently sitting at around \$19 per tonne¹⁷).
- The transitional provisions of the Climate Change Response Act, which were extended in 2013 (but have now been reviewed), mean that landfills have only had to surrender half the number of units they would be required to otherwise. These transitional provisions were removed in January 2017 which will effectively double the price per tonne impact of the ETS.
- Landfills are allowed to apply for 'a methane capture and destruction Unique Emissions Factor (UEF). This means that if landfills have a gas collection system in place and flare or otherwise use the gas (and turn it from Methane into CO₂) they can reduce their liabilities in proportion to how much gas they capture. Up to 90% capture and destruction is allowed to be claimed under the regulations, with large facilities applying for UEF's at the upper end of the range.

Taken together (a low price of carbon, two for one surrender only required, and methane destruction of 80-90%) these mean that the actual cost of compliance with the NZETS has been small for most landfills – particularly those that are able to claim high rates of gas capture. Disposal facilities have typically imposed charges (in the order of \$5 per tonne) to their customers, but these charges have mostly reflected the costs of scheme administration, compliance, and hedging against risk rather than the actual cost of carbon.

The way the scheme has been structured has also resulted in some inconsistencies in the way it is applied – for example class 2-4 landfills and closed landfills do not have any liabilities under the scheme. Further, the default waste composition (rather than a SWAP) can be used to calculate the theoretical gas production, which means landfill owners have an incentive to import biodegradable

¹⁷ https://carbonmatch.co.nz/ accessed 25 October 2016

waste, which then increases gas production and which can then be captured and offset against ETS liabilities.

Recently, however the scheme has had a greater impact on the cost of landfilling, and this is expected to continue in the medium term. Reasons for this include:

- In June 2015, the Government moved to no longer accept international units in NZETS. This
 has had a significant impact, as cheap international units which drove the price down cannot
 be used. Many of these were also of dubious merit as GHG offsets¹⁸. This has resulted in a
 significant rise in the NZU price.
- The transitional provisions relating to two-for-one surrender of NZUs were removed from 1 January 2017, meaning that landfills will need to surrender twice the number of NZUs they do currently effectively doubling the cost of compliance.
- The United Nations Climate Change Conference, (COP21) held in Paris France in November December of 2015, established universal (but non-binding) emissions reduction targets for all the nations of the world. The outcomes could result in growing demand for carbon offsets and hence drive up the price of carbon. Balanced against this however is the degree to which the United States, under the new Republican administration, will ratify its commitments.

These changes to the scheme mean that many small landfills which do not capture and destroy methane are now beginning to pay a more substantial cost of compliance. The ability of landfills with high rates of gas capture and destruction to buffer the impact of the ETS will mean a widening cost advantage for them relative to those without such ability. This could put further pressure on small (predominantly Council owned) facilities and drive further tonnage towards the large regional facilities (predominantly privately owned).

If for example, the price of carbon were to rise to \$50 per tonne, the liability for a landfill without gas capture will be \$65.50 (based on a default emissions factor of 1.31 tonnes of CO₂e per tonne of waste), whereas for a landfill claiming 90% gas capture (the maximum allowed under the scheme), the liability will be only \$6.55. This type of price differential will mean it will become increasingly cost competitive to transport waste larger distances to the large regional landfills.

More information is available at www.climatechange.govt.nz/emissions-trading-scheme.

A.3.9 Litter Act 1979

Under the Litter Act it is an offence for any person or body corporate to deposit or leave litter:

- In or on any public place; or
- In or on any private land without the consent of its occupier.

The Act enables Council to appoint Litter Officers with powers to enforce the provisions of the legislation.

¹⁸ http://morganfoundation.org.nz/wp-content/uploads/2016/04/ClimateCheat_Report9.pdf

The legislative definition of the term "Litter" is wide and includes refuse, rubbish, animal remains, glass, metal, garbage, debris, dirt, filth, rubble, ballast, stones, earth, waste matter or other thing of a like nature.

Any person who commits an offence under the Act is liable to:

- An instant fine of \$400 imposed by the issue of an infringement notice; or a fine not exceeding \$5,000 in the case of an individual or \$20,000 for a body corporate upon conviction in a District Court.
- A term of imprisonment where the litter is of a nature that it may endanger, cause physical injury, disease or infection to any person coming into contact with it.

Under the Litter Act 1979 it is an offence for any person to deposit litter of any kind in a public place, or onto private land without the approval of the owner.

The Litter Act is enforced by territorial authorities, who have the responsibility to monitor litter dumping, act on complaints, and deal with those responsible for litter dumping. Councils reserve the right to prosecute offenders via fines and infringement notices administered by a litter control warden or officer. The maximum fines for littering are \$5,000 for a person and \$20,000 for a corporation.

Council powers under the Litter Act could be used to address illegal dumping issues that may be included in the scope of a council's waste management and minimisation plan.

A.3.10 Health Act 1956

The Health Act 1956 places obligations on TAs (if required by the Minister of Health) to provide sanitary works for the collection and disposal of refuse, for the purpose of public health protection (Part 2 – Powers and duties of local authorities, section 25). It specifically identifies certain waste management practices as nuisances (S 29) and offensive trades (Third Schedule). Section 54 places restrictions on carrying out an offensive trade and requires that the local authority and medical officer of health must give written consent and can impose conditions on the operation. Section 54 only applies where resource consent has not been granted under the RMA. The Health Act enables TAs to raise loans for certain sanitary works and/or to receive government grants and subsidies, where available.¹⁹

Health Act provisions to remove refuse by local authorities have been repealed.

A.3.11 Hazardous Substances and New Organisms Act 1996 (HSNO Act)

The HSNO Act addresses the management of substances (including their disposal) that pose a significant risk to the environment and/or human health. The Act relates to waste management primarily through controls on the import or manufacture of new hazardous materials and the handling and disposal of hazardous substances.

Depending on the amount of a hazardous substance on site, the HSNO Act sets out requirements for material storage, staff training and certification. These requirements would need to be addressed

¹⁹ From: MfE 2009: Waste Management and Minimisation Planning, Guidance for Territorial Authorities.

within operational and health and safety plans for waste facilities. Hazardous substances commonly managed by TAs include used oil, household chemicals, asbestos, agrichemicals, LPG and batteries.

The HSNO Act provides minimum national standards that may apply to the disposal of a hazardous substance. However, under the RMA a regional council or TA may set more stringent controls relating to the use of land for storing, using, disposing of or transporting hazardous substances.²⁰

A.3.12 Health and Safety at Work Act 2015²¹

The new Health and Safety at Work Act, passed in September 2015 replaces the Health and Safety in Employment Act 1992. The bulk of the Act came into force from 4 April 2016.

The Health and Safety at Work Act introduces the concept of a Person Conducting a Business or Undertaking, known as a PCBU. The Council will have a role to play as a PCBU for waste services and facilities.

The primary duty of care requires all PCBUs to ensure, so far as is reasonably practicable:

1. the health and safety of workers employed or engaged or caused to be employed or engaged, by the PCBU or those workers who are influenced or directed by the PCBU (for example workers and contractors)

2. that the health and safety of other people is not put at risk from work carried out as part of the conduct of the business or undertaking (for example visitors and customers).

The PCBU's specific obligations, so far as is reasonably practicable:

- providing and maintaining a work environment, plant and systems of work that are without risks to health and safety
- ensuring the safe use, handling and storage of plant, structures and substances
- providing adequate facilities at work for the welfare of workers, including ensuring access to those facilities
- providing information, training, instruction or supervision necessary to protect workers and others from risks to their health and safety
- monitoring the health of workers and the conditions at the workplace for the purpose of preventing illness or injury.

A key feature of the new legislation is that cost should no longer be a major consideration in determining the safest course of action that must be taken.

WorkSafe NZ is New Zealand's workplace health and safety regulator. WorkSafe NZ will provide further guidance on the new Act after it is passed.

A.3.13 Other legislation

²⁰ From: MfE 2009: Waste Management and Minimisation Planning, Guidance for Territorial Authorities.

²¹ http://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html#DLM6564701

Other legislation that relates to waste management and/or reduction of harm, or improved resource efficiency from waste products includes:

- Hazardous Substances and New Organisms Act 1996
- Biosecurity Act 1993
- Radiation Protection Act 1965
- Ozone Layer Protection Act 1996
- Agricultural Chemicals and Veterinary Medicines Act 1997.

For full text copies of the legislation listed above see www.legislation.govt.nz.

A.3.14 International commitments

New Zealand is party to international agreements that have an influence on the requirements of our domestic legislation for waste minimisation and disposal. Some key agreements are the:

- Montreal Protocol
- Basel Convention
- Stockholm Convention
- Waigani Convention
- Minamata Convention.

More information on these international agreements can be found on the Ministry's website at www.mfe.govt.nz/more/international-environmental-agreements.



Community & Public Health

South Canterbury Office 18 Woollcombe Street PO Box 510, TIMARU Telephone: 03 687 2600 Facsimile: 03 688 6091

10 May 2018

Angie Taylor Solid Waste Manager Mackenzie District Council 53 Main Street, Timaru

Dear Angie,

Waste Minimisation Act 2008 : Mackenzie District Council Waste Assessment 2018

Thank you for inviting the Medical Officer of Health to comment on the Mackenzie District Council Waste Assessment as required by the Waste Minimisation Act 2008.

Waste management is a core sanitary service, provided by Councils to protect public health. The main issues for public health with regard to waste management and waste minimisation are:

- Identification of the various types of wastes and collection/disposal methods
- Satisfactory collection and disposal of waste so that public health risks are controlled and mitigated
- Addressing hazardous waste, including medical wastes, asbestos waste and electronic waste (e-waste)
- Consideration of future population demands and consumption rates on the current system and mitigation strategies put into place
- Regional co-ordination of waste management and waste minimisation
- Ensuring that a waste disposal service is accessible to all residents/ratepayers
- Reducing legislative and cost barriers that inhibit mitigation of public health issues related to waste
- The health impacts of climate change and the contribution that effective waste management and waste minimisation can make to reduction in greenhouse gas emissions

The Mackenzie District Council has a number of challenges with regards to waste management such as the size of the district compared to its population, the effects of tourism on waste management and the fluctuating volume of waste, along with the impact of rural and farm waste.

In this context I make the following comments;

Council's activities are acknowledged and supported by the Medical Officer of Health, particularly:

- Council's response to the high volume of tourists travelling through the district and the impact this can have on waste services,
- conscientious auditing and reporting practices, and
- collaboration with neighbouring authorities

The Council is to be commended for its support of waste education programmes such as EnviroSchools and Paper 4 Trees, along with its own waste minimisation education projects. Having Council support these initiatives is an integral aspect of promoting current methods of waste minimisation while also educating future generations about the importance of waste reduction.

The Council's efforts towards recycling and reuse of waste are also acknowledged and encouraged. E-waste volumes are rising in other council regions, and will likely increase in the Mackenzie District, potentially posing a hazard for the environment and human health. With regard to e-waste, other councils have reported a rise in e-waste volumes and it would not be unreasonable to make a similar assumption for the Mackenzie District. Growing volumes of ewaste pose a hazard to both the environment and human health. As e-waste is not currently accepted via the kerbside collection service in the Mackenzie District, further efforts should be made to investigate other potential methods of disposal and recycling as noted in option CS4.

Rural and farm waste is also an important issue for the Mackenzie District, with a large number of farms using bury, burn, or bulk storage on their property as their methods of waste management. As the quantity of waste disposed in this manner is unknown to Council, the potential environmental impact of this practice cannot be measured accurately. It is noted that Council has acknowledged the difficulty in providing rural areas with the necessary support to ensure waste is appropriately disposed of. The Medical Officer of Health supports the Council's decision to further investigate solutions for improving waste services for rural properties.

I note the information in the assessment that the average red, residual waste wheelie bin contains 50% organic waste, and home composting options have the potential to divert significant volumes of waste from landfill and I commend Council for the actions they are taking to encourage home composting. However, home composting alone is likely to be insufficient to make a major reduction in the volume of organic waste going to landfill. Reduction in this particular waste stream has two important benefits: extending the life of existing landfills and reduction in the amount of landfill gas generated (primarily methane which is a potent greenhouse gas). The latter has important effects on health and environment beyond the district through its contribution to climate change.

The assessment noted a number of priority waste streams in section 8.2.1 that could be targeted to further reduce waste to landfill. I support the decision to investigate these waste streams and I strongly encourage investigating/implementing food waste or organics collection (see CS2).

Once again thank you for your work in managing this important service which has significant public health value to South Canterbury communities. If you require further information please, in the first instance, contact one of the Health Protection Officers at our Timaru office.

Yours sincerely

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Dr Cheryl Brunton Medical Officer of Health