

Appendix: Waste Assessment

9. Introduction

9.1 The Kawerau district

The Kawerau District, in the Bay of Plenty region, has a total area of 2194 hectares and a population of 6921 at the 2006 census. Most of the area of the district is taken up by the town of Kawerau, and almost all the residents of the district live in the town. The district population at the last Census was 6921. The population has been declining since the mid 1990s and Statistics New Zealand predicts that the trend will continue into the future. Council is undertaking economic development initiatives which it hopes will reverse the trend.

The district economy is based on the forestry and wood processing sector and supporting engineering industries. Industrial activity is concentrated at a large industrial site outside town. The significant industries deal with their own waste. Kawerau is located in close proximity to Whakatane and residents of the two districts travel across boundaries for employment, shopping, recreation and other activities.

The urban nature of the Kawerau District and the independence of the significant industries mean that waste management is relatively straight forward for the Kawerau District Council (Council). The physical and social relationship with Whakatane means waste management here is affected by related decisions and practices in Whakatane.

9.2 Background

Section 50 of the Waste Minimisation Act 2008 (WMA) requires all territorial authorities to prepare a waste assessment as the first step of a comprehensive review of their waste management plans. A review consistent with WMA sections 50 and 51 must be conducted by 1 July 2012.

Council has been working toward waste minimisation for some time. It made a commitment to the 'Zero Waste' philosophy of waste management in 1999 and adopted a waste management plan (the Plan) in 2002. Since that time, Council has also signalled a range of further actions for waste management in its long term plans.

The aim of the Plan was to reduce waste to landfill by 70 percent. This was achieved in 2010. There have been no further reductions since that time and the capacity for further significant reductions is unlikely without significant additional cost. However over the period of the plan, investigation into initiatives to achieve further reductions are planned

9.3 Purpose of this waste assessment

This waste assessment has been undertaken with reference to the 'Waste Management and Minimisation Planning: Guidance for Territorial Authorities' prepared by the Ministry for the Environment (MfE) and to section 51 of the WMA, which outlines that a waste assessment must include:

1. A description of the collection, recycling, recovery, treatment, and disposal services provided within the territorial authority's district
2. A forecast of future demands
3. A statement of options
4. A statement of the territorial authority's intended role in meeting the forecast demands
5. A statement of the territorial authority's proposals for meeting the forecast demands (including infrastructure), and
6. A statement about the extent to which the proposals will protect public health, and promote effective and efficient waste management and minimisation

The primary purpose of the assessment is to provide focus for how Council can progress waste management and minimisation in an informed and effective manner. It should provide the information necessary to identify the key issues and priority actions to be included in a draft WMMP.

9.4 Scope

Council Controlled and non-Council Controlled Waste Streams

Waste assessment must go beyond those waste and material streams managed directly by councils; to include an assessment of current commercial and industrial waste streams. This Council is aware of its responsibility to plan for all waste generated in the District when considering waste services and infrastructure.

Council owns the sole waste transfer station in the Kawerau, where the majority of waste going to landfill from the District is deposited for transportation to landfill. Collections and facilities are either operated by or on behalf of Council and Council has detailed information about them.

Aside from the major industries, non-Council controlled waste in the District is minimal, with only a few companies are involved in waste transportation. Council has sufficient data to identify the areas that should be prioritised, and to outline the role Council could potentially play in reducing levels of non-domestic waste.

Consideration of Liquid and Gaseous Wastes

The MfE guidance 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". It goes on to suggest that liquid or gaseous wastes which are directly managed by the Council, or are disposed of to landfill, should be seriously considered for inclusion in a WMMP.

This waste assessment excludes liquid and gaseous wastes, except where these are considered to have implications for solid waste management.

The sewerage from the Kawerau network is treated at the wastewater treatment plant. The biosolids are treated by vermiculture and the liquid is infiltrated into the ground in accordance with resource consent. The waste from the less than 10 septic tanks in the District comes under regional Council jurisdiction. However the wastewater treatment plant is set up to handle any material pumped from the tanks as part of their regular maintenance requirements.

9.5 Overview of waste and recycling systems in Kawerau

Solid waste management and minimisation services provided by Council in this District include a collection service (for residual waste, recyclables and green waste) a transfer station, public information and waste reduction initiatives.

Solid waste management services are funded by a gate fee at the transfer station (for zero waste operations and closed landfill management) and targeted rates for residual waste collection. Residual waste going to landfill is first processed through the Council transfer station and then transferred to Tirohia Landfill near Paeroa.

Council offers collection services to all but less than six households/residential properties in the District. These rural properties make their own arrangements for refuse disposal. The recyclable (Zero Waste) collections are also provided to businesses. Council's waste services are described in section 3.1.

Waste management services beyond those supplied by the Council are provided by the private sector. Only a small number of private companies operate in the District and most use Council's transfer station with the balance of the waste going to the Whakatane Transfer Station. One company that operates mainly in liquid waste transports the liquid waste to its own facility in Whakatane.

Private companies target their services at those for whom the Council services are unsuitable. Reasons include that waste volumes are too for Council services to be competitive, or that there is a specific single-material waste stream which can be better dealt with through a private collection.

Council aims to establish a measure of control over the management of waste in the District through bylaws for on-site wastewater disposal systems, solid waste and trade waste.

10. Waste facilities servicing the Kawerau District

The tables in this section provide a summary of key strategic waste facilities that currently service households and businesses in the Kawerau District.

10.1 Disposal facilities

There are no sanitary landfills or cleanfills in the District open for the use of householders and businesses. The nearest landfills to the District are listed in the table below.

Name/Operator	Type	Key services/waste streams	Location	Capacity & Estimated Operational life
Rotorua District Council	Municipal Landfill	Non-hazardous residential, commercial and industrial waste, including special wastes (although bylaw may be reviewed to exclude these in the future).	SH 30, Atiamuri, Rotorua	Consented to 2030
H G Leach	Municipal Landfill	Non-hazardous residential, commercial and industrial solid waste, including special wastes. Sludges with less than 20% solid by weight are prohibited.	Tirohia, Paeroa	Consented to approx 2035
Envirowaste Services Ltd	Municipal Landfill	Non-hazardous residential, commercial and industrial solid waste, including special wastes. Sludges with less than 20% solid by weight are prohibited.	Hampton Downs, North Waikato	Consented to 2030

Note: The Rotorua District Council landfill does not accept waste from outside the Rotorua District on an ongoing basis. Envirowaste usually disposes of waste at the H G Leach Municipal Landfill in Tirohia.

There are two private landfills near Kawerau: Carter Holt Harvey and Norske Skog monofill for wood processing wastes. These are used only by the owners and only for very specific materials. They are not an option for future landfill disposal for the Kawerau District.

Kawerau District Council owns a landfill for which consents are still current. The landfill is no longer used however, as the consent requires the site to be lined for continued use. Lining the site would incur significant cost. To operating the landfill at a reasonable cost per tonne, residual waste would need to be brought into the district. As this would be contrary to Council's Zero Waste philosophy, waste is transported out of district and Council works on reducing quantities.

Because of these factors, and considering the distances required to access any other facilities, the most viable disposal option for the Kawerau District is the H.G. Leach Landfill in Tirohia.

10.2 Cleanfill facilities

The MfE Cleanfill Guidelines define cleanfill material and cleanfills as follows:

Cleanfill material 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 that 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 liquid waste.

Cleanfill A cleanfill is any landfill that accepts only cleanfill material as defined above.

There are no consented or known unconsented cleanfills within either the Kawerau or Whakatane Districts. The cleanfill sites that could be used by Kawerau resident in Whakatane are listed below.

Operator	Facility	Wastes accepted	Capacity
Jack Show	Cleanfill, Tauriko	Consented for cleanfill, green waste and construction waste	Unknown
Addisons	Cleanfill, Welcome Bay, Tauranga	Consented for cleanfill, green waste and construction waste	Consents recently expired
Poike Block Trust	Cleanfill, Tauranga	Cleanfill, demolition and construction waste	Consents recently expired

10.3 Transfer facilities

There is one transfer facility in the District. It is owned and operated by the Council. There is a transfer station in Whakatane which may be used for the disposal of some Kawerau refuse. The materials accepted, and fees charged, at the Kawerau Transfer Station are as follows:

Item	Activity	Fee
Cars	Fully recyclable loads	\$3
	Partially recyclable loads	\$6
	No recycling	\$10
All other vehicles	Residual waste (Trucks, Trailers, utes, vans and station wagons with back folded down)	\$200/tonne and minimum fee \$10

Item	Activity	Fee
Greenwaste	Trailers	\$5/m3
	Trucks (Council trucks and wheelie bin collection)	\$7/m3
Other Materials	Soil	\$6/m3
	Broken concrete	\$6/m3
	Tyres	\$5 each

Note: These prices include GST

Recycling material includes:

- Paper and Cardboard
- Plastics 1 & 2
- Steel
- Glass
- Green waste
- Wood
- Clothing

Liquid waste (septic tanks) is treated through the wastewater treatment plant and is not accepted at the transfer station. Asbestos material for contractors is not accepted at the transfer station. Contractors are provided with the Tirohira Landfill details and advised to make their own disposal arrangements.

The Whakatane Transfer station details are below:

Name/Operator	Type	Key services/waste streams	Location	Capacity and estimated operational life
Whakatane Refuse and Recycling Park – Waste Management NZ Ltd	Waste transfer and recycling centre	Accepts most waste and a wide range of recyclables (no liquid wastes accepted and a very limited range of hazardous materials including batteries only)	Te Tahī Street, Whakatane	NA

10.4 Recycling and processing facilities

There are a number of waste processing and recycling facilities available in the region or in neighbouring regions. These are listed below. The quantity of waste recycled at each facility is unknown

Name/Operator	Type	Key services/waste streams	Location	Capacity and estimated operational life
Transpacific Technical services Ltd	Liquid Waste dewatering and transfer	Liquid waste from Opotiki, Kawerau and Whakatane	Whakatane	NA
Industrial Traders	Scrap metal	All scrap metal including degassing white ware	Whakatane and Kawerau	NA
NZ Remediation/Materials Processing Ltd	Green waste composting	Green waste	Te Muanga, Tauranga	Some additional capacity, but unclear how much.
Envirofert	Organic waste processing	Green waste and some putrescible wastes	Tuakau, South Auckland	Not specified, but additional capacity available

11. Waste services provided in the Kawerau District

The tables in this section provide a summary of key waste services currently available to households and businesses in Kawerau.

11.1 Council-contracted services

Service	Provision	Service Provider
Residual waste collection Usually from 60L mobile garbage bins (MGBs)	Weekly to approximately 2710 customers	Waste Management Ltd under contract to Council
Dry recyclables collection of glass bottles/jars, plastic grades 1 & 2, aluminium/tin/steel cans, paper, and cardboard collected from a 60L recycling crates	Weekly to approximately 2910 customers	Operated by Council
Green waste collection from 240L MGBs	Fortnightly to approximately 2900 customers	Waste Management Ltd under contract to Council
Kawerau Transfer Station	Operation of refuse and recycling drop-off facility	Operated by Council
Waste transfer	Cartage of residual waste from Kawerau to Tirohia	Hubbard Contracting contract to Council
Landfilling	Landfilling of residual waste	H G Leach annual contract
Fly Tipping	Removal from public spaces	Various providers on behalf of Council
Litter removal from 60L litter bins or public spaces	From litter bins and MGBs in public spaces	Various providers on behalf of Council
Hazardous waste	Waste accepted at Transfer Station and transported to suitable disposal facilities outside District (Tirohia Landfill)	Council

Note: Council does not provide inorganic collections for unwanted bulky items and appliances. Individuals are expected to transport these to either the transfer station or other recycling facility for appropriate disposal

A charge per annum (in 2012/13 financial year) per 'waste service package' is added to residential properties rates bills to cover the costs of refuse collection for each separately used or inhabited part of a rating unit to which Council provides the weekly service. The green waste collection and recycled collection is paid for out of the general rates. The Zero Waste initiatives are paid for from the waste levy from government and general rates.

Lost or damaged wheelie bins and recycling crates are replaced at a one-off charge of \$10 each.

Other Council Programmes and Services

Other programmes or services provided by Council or by a partnership supported by Council cover the following:

- Bay of Plenty Waste Exchange
- Keep Kawerau Beautiful (coordinating with Keep NZ Beautiful)
- Daily litter patrol of streets.
- Zero Waste initiatives

11.2 Private services

There are a limited number of services available in Kawerau besides those provided by the Council. Transpacific Waste Management, as well as being contracted to the Council, also provides waste collection services (residual waste and recycling). Two other local companies also provide rubbish collections, with both using the Council's transfer station for disposal. They are:

- Handee Can Services and
- Foote Bins.

In addition, there is a second-hand/ charity store in Kawerau, although an assessment of this is considered to be outside the scope of this waste assessment.

These companies provide a variety of residual waste receptacles ranging from 44 gallon drums to 3m³ skip bins, with a variety of collection frequencies including on-demand collections. Foote Bins also undertakes cardboard processing. The target market is business and industrial customers, instances where volumes of waste are too large for Council collection services (section clearing, construction and demolition waste and the like.) and customers which are unable to use or have chosen not to use the Council collection service.

All private waste companies in Kawerau have been interviewed for the purposes of this waste assessment. They had no significant issues with waste management in the District.

12. Waste data

Council holds historical data from the 2006/07 financial year onwards for waste collected and sent to landfill, waste collected through recycling collections and subsequently re-processed, green waste, and litter and fly tipping removal (0.25% of total).

Year	2008/09	2009/10	2010/11	2011/12
Recycling (tonnes)	500	500	500	
Greenwaste (tonnes)	900	930	830	
Waste to landfill (tonnes)	2010	2184	2658	
Total (tonnes)	3410	3614	3988	

Note: The increase in waste to landfill in 2010/11 is attributed to a change in disposal costs at Whakatane Refuse and Recycling Park.

The residual waste streams are discussed in more detail below.

12.1 Waste to landfill

This waste stream includes all waste sent to landfill from the District, including the kerbside residual waste collections and all residual waste delivered directly to the Council's transfer station. Residual waste has three main sources; the Council kerbside collections 45%, commercial operators 45% (trucks) and residential 10% (cars, utes, trailers).

The green waste volume is derived by dividing the green waste volume by 6.18. This is the conversion figure derived from a mulching trial undertaken.

The recycling volumes were recorded by weight in 2008/09 but the material has not been required to be weighed until April 2012 when weighing was recommenced. The recycled collection now allows for additional material to be put out at the kerb for collection. Anecdotal evidence from the collection people is that the weight has increased.

Composition Data of Council Kerbside Collection

In June 2005, a sample of domestic kerbside refuse was collected from 165 Kawerau District Council wheelie bins. The sample, with a total weight of 1205kg was sorted into 20 categories, using a methodology consistent with Section 4.5 of the Ministry for the Environment's Solid Waste Analysis Protocol.

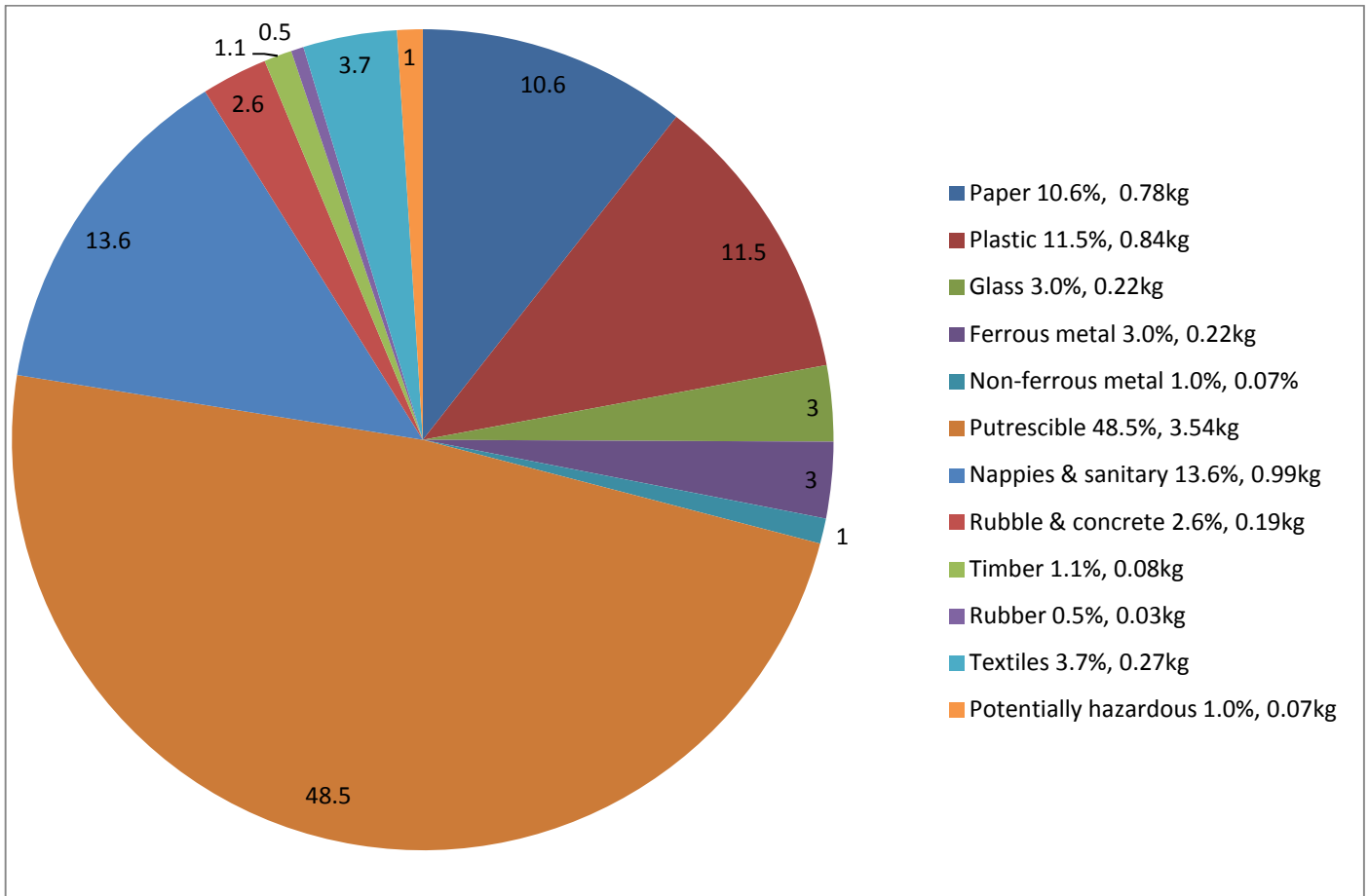
Audit results are shown in the table below.

Primary category	Proportion of total	Mean wt per bin
Paper	10.6%	0.78kg
Plastic	11.5%	0.84kg
Glass	3.0%	0.22kg
Ferrous metal	3.0%	0.22kg
Non-ferrous metal	1.0%	0.07kg
Putrescible (organic)	48.5%	3.54kg
Nappies & sanitary	13.6%	0.99kg
Rubble & concrete	2.6%	0.19kg
Timber	1.1%	0.08kg
Rubber	0.5%	0.03kg
Textiles	3.7%	0.27kg
Potentially hazardous	1.0%	0.07kg
TOTAL	100.0%	7.30kg

Analysis

1. Putrescible material, which includes food and garden waste, was the largest primary component of the waste, accounting for 48.5% of the total.
2. Nappies and sanitary, consisting primarily of disposable nappies, was the second largest primary component, comprising 13.6% of the total, followed by Plastic (11.5%) and Paper (10.6%).
3. The average bin weight was 7.30kg. This does not necessarily equate to an average weekly refuse generation, as not all households set out refuse every week.

Composition of Household Kerbside Refuse Collection (June 2005)



The above composition data is based solely on the residual waste collected from households. The composition of residual waste collected at the kerbside from other customers (businesses, community groups, etc) is unavailable.

Further diversion potential from kerbside refuse collections from householders

The tables below identify the key materials that are likely to be targeted for diversion if recycling and recovery rates are to be increased.

	Proportion of total	Wt/household set out
Recyclable materials		
Paper – recyclable	8.7%	0.63kg
Plastic - #1 & 2 bottles only	1.3%	0.10kg
Glass – bottles/jars	2.4%	0.17kg
Metal – steel cans	2.2%	0.16kg
Metal – aluminium cans	0.5%	0.04kg
Subtotal kerbside recyclable	15.1%	1.10kg
Compostable materials		
Putrescible – kitchen waste	42.3%	3.09kg
Putrescible – green waste	0.6%	0.04kg
Subtotal compostable	42.9%	3.13kg
Recoverable materials		
Clothing and textiles	2.2%	0.16kg
Subtotal recoverable	2.2%	0.16kg
Total divertible	60.2%	4.39kg

'Waste Not' which undertook the sampling for Council considered that the following materials could be diverted through the existing kerbside recycling and other common methods of diverting waste:

- Approximately 15% of refuse could be recycled using the existing kerbside recycling and paper collections.
- A further 43% could, theoretically, be composted by residents at home.
- However, not all kitchen waste is suitable for composting.
- Most of the clothing and textiles in the refuse would have been suitable for reuse or rags.

In total, 60% of Kawerau domestic refuse could be diverted from landfill disposal, this however, is a theoretical maximum, as no system diverts 100% of a material from a waste stream. The current recycling rate is 30%, there is however, based on 4kg per bin and 2000 weekly pickups a further 400 tonnes per year available for diversion.

The compostable portion can be placed in the green waste bin without compromising the disposal system. Further education is required to encourage residents to direct the material to other disposal streams. However, as people often currently find the size of a 60 litre bin restrictive for disposing of refuse, redirecting material may enable other material to be placed in the bin which would not result the anticipated reduction in waste to landfill.

In addition, Council offers residents a subsidised composting bin to encourage people to compost their waste thereby reducing waste.

Further Diversion Potential from Waste going to Landfill

While the tonnage divertible is not known, as a detailed assessment of the waste going to transfer station has not been undertaken, it is estimated that 600 tonnes (including wheelie bin collection) could be diverted from landfill if the generators of the waste were to sort at source.

- Council currently removes material from commercial loads of waste at the transfer station to reduce disposal volume. Currently approx 12 tonne per year is retrieved by doing this.
- Council has undertaken assessments for a number of businesses in the past to help them reduce their solid waste volume and will continue to offer this service if requested by businesses
- Council will undertake an evaluation of the waste arriving at the transfer station from commercial operators with a view to educating these operators on how to sort the waste so material can be diverted from the waste stream.

12.2 Refuse and recycling participation

The most recent participation survey for Council was conducted in 2011 through a telephone survey and showed the following participation rates:

	Participation Rate	Satisfaction Rate
Rubbish collection	100%	95%
Recycling	94%	95%
Transfer station	72%	85%

There are high participation rates in all three activity areas and corresponding high satisfaction rates. Hopefully this level of satisfaction is resulting in a high participation rate for waste diversion. Also indicates that new diversion initiatives may be accepted readily and implemented.

12.3 Summary and conclusions

Per capita waste generation was calculated to be 155kg per capita per annum through kerbside collections, and 384kg per capita per annum in total (kerbside collection, construction and demolition, commercial and residential; refuse and recycling).

Comparison of kilograms per capita

Location	Kg per capita
Kawerau	384
Whakatane	465
Tauranga	477
Rotorua	700
National Average	700-750

Kawerau is effectively an urban environment as all households have weekly collections and almost all people live in an urban environment. No significant development is occurring in the town, which means that construction and demolition waste is lower than in communities with more development.

Kawerau has taken initiatives to reduce waste to landfill since 2002 and the figures above show that the initiatives have been successful. Further reductions are likely to be minor and potentially costly however Council is committed to ongoing waste reduction and will be undertaking investigations on how to increase the quantity of recycling from commercial disposal.

Council is responsible for the transport and disposal of virtually all solid waste from the District. The Council therefore has a level of risk associated with its current financial exposure. Should the costs of transport and disposal increase unexpectedly and cost recovery at the transfer station not be increased, then the ensuing loss would need to be met by ratepayers. However Council also has a very high level of control over the waste going to landfill, and this provides a great opportunity to divert waste from landfill.

The high cost of transport from the District to the nearest facilities for residual waste and recycling, in addition to normal disposal or processing costs, makes finding local solutions and alternatives an especially high priority.

Compostable Material

The analysis shows that the largest feasibly divertible fraction remaining in the kerbside collected waste is organic waste. The two main materials are food waste and garden waste, with food waste from households being the largest single fraction.

If taken to landfill, compostable waste breaks down in the anaerobic environment producing methane. Methane is a greenhouse gas around 21 times more powerful than carbon dioxide and therefore this is a significant waste management issue for the District in terms of potential environmental impacts.

The community has been encouraged to put putrescible material into green waste wheelie bins as the composting can accommodate the small amount without any known issues. The impact of this is not known as an analysis of the wheelie bin contents has not been undertaken since the initiative commenced and a further analysis is not planned until 2014. However there has been no detectable reduction in weight of material in the wheelie bin truck but this could be due to people replacing the removed putrescibles with other refuse.

Dry Recyclables

There is still some recyclable material in the household residual waste stream that could be recycled through the kerbside recycling collection. A visual inspection of waste going to landfill from the transfer station shows that there is recyclable material currently going to landfill from non-household sources.

While retrieval of recyclable material that is easily retrieved from the waste stream (wood, metals, and plastics) occurs at the transfer station, much of the material that would be recycled is mixed with other waste and therefore irretrievable. To increase the recovery rate of the recyclable material, separation at source by the generator is considered to be the key.

The level of metal (ferrous and non-ferrous) brought to the transfer station is high.

13. Forecast future demand

13.1 Future demand

Factors Affecting Service Demand

A wide range of factors is likely to affect future demand for waste and resource recovery services and infrastructure and the influence of these is likely to vary over time. This means that predicting future demand has inherent uncertainties. Key factors in Kawerau's context are likely to include the following:

- Population growth and demographics
- Economic growth
- Recycling markets
- Local and central government policy
- Changes in lifestyles and consumption
- Community expectations
- New technologies

Expectations for Waste and Recycling Growth

In general, total waste volumes in Kawerau are unlikely to increase significantly in the foreseeable future. However the demand for services may change due to changes in lifestyle and community composition, and on increasing awareness of the costs and environmental impacts of waste disposal. It is unlikely that total waste volumes will decrease without intervention of some kind.

Statistics New Zealand has predicted population growth over the 25 years from 2006 to 2031, with low, medium and high growth options. The medium growth option predicts that Kawerau's population will drop over the coming years, due to net migration from the District and an ageing population. There is also expected to be a decrease in the occupancy rate from 3.5 people per household in 1986 to fewer than 2.5 people per household projected for 2021. This is a national trend, reflecting the shift towards smaller families and more people living alone.

The District population measured at the 2006 census was 6921, is lower than in previous censuses. Statistics New Zealand predicts an ongoing decline in population into the future.

The projections prepared by Statistics New Zealand are based on a number of assumptions, and do not take into account local and regional growth strategies. Council hopes that its economic

development strategy, growth in other parts of the region and ongoing demand for living in areas with good climate and low cost accommodation will encourage the population to at least remain static and hopefully increase slightly in the future.

Large Industry

The large forestry and wood processing plants, (pulp, paper and sawmills) generate considerable quantities of waste. The industries that generate the waste are actively seeking ways to minimise the waste or use it in alternative processes (heat, electricity and biofuels), which will convert the material from waste to a useable product.

This change is being driven by the internal cost of waste disposal and the financial need to make their businesses more profitable.

13.2 Alternative disposal options

Disposal Infrastructure

As discussed earlier in Section 2.0, landfill capacity within or near the District is an issue. The municipal landfill currently used presents no issue with capacity as such, but the distance for transport to this facility exposes the Council to a significant and ongoing cost. It is likely that transport costs will only increase in future.

Disposal infrastructure presents an issue for the region as a whole, as well as the Kawerau District – all councils in the Bay of Plenty, with the exception of Rotorua, currently transport their residual waste well out of the district for disposal.

Recycling Infrastructure

There is very little recycling infrastructure in the Eastern Bay of Plenty and recyclables are currently transported to Tauranga for processing, with the exception of a small amount of metals and cardboard.

However recycling infrastructure generally has capacity, with facilities in the Auckland region in particular currently importing recyclables from all over New Zealand.

Once again, transport costs are the key issue here. Development of more local recycling infrastructure, even if just pre-processing, would help to reduce exposure to this ongoing cost.

Organic Waste Infrastructure

The processing of green waste in an economic manner is a challenge. The demand for composted green waste is small and therefore only a minimal amount is sold.

There is a market for bulk composted material as a soil conditioner, but the processing costs need to be low to make the venture profitable.

Alternative Technologies

There are alternative technologies for converting waste to energy and reusable materials in the world. Some of these technologies are being explored by the large industries to increase their bottom line. If implemented, then Kawerau's residual waste will probably be processed locally with probable cost savings.

14. Options

The following subsections outline the broad options available to Council to manage its waste in order to meet future demand.

14.1 Waste reduction, communication, consultation and partnerships

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's role
Continue to provide some information about services	<p>Social/Cultural: awareness of waste issues and behaviour will not change significantly</p> <p>Environmental: waste reduction is not encouraged to a great extent</p> <p>Economic: low cost option with small budget for communication</p>	The community will not change their behaviour and therefore future demand is likely to continue on baseline predictions – i.e. waste to landfill will not significantly change	Continue to provide some information
Provide frequent and detailed information about waste services and waste prevention (e.g. nappy schemes, Love Food, Hate Waste) and minimisation, alongside engagement with the community through a Waste Focus group, consultation processes and community leadership (e.g. waste champions, celebrating success)	<p>Social/Cultural: community will be more aware of options, more engaged in the waste management process and should take a higher level of ownership of the issue</p> <p>Environmental: diversion from residual waste should increase with resultant reduction in environmental impact</p> <p>Economic: providing more frequent and detailed information to community will require more budget within the Council.</p> <p>Engagement with the community through consultation events and Waste Focus Group meetings are relatively low cost.</p>	<p>Analysis of data suggests there is significant potential to reduce, reuse and recycle more waste. Zero waste philosophy supports this approach.</p> <p>Community should reduce their reliance on residual waste collections. Demand for recycling services will increase.</p>	Council to produce and deliver more information, and work more closely with the community through Waste Focus Group and proactive consultation processes
Council forms a partnership with the community following the 'Zero Waste' philosophy to jointly make decisions regarding waste management issues, and develop initiatives and systems that involve the community and provide for more local management of waste	<p>Social/Cultural: community will be strongly engaged in the waste management process, with a high level of ownership of the issue and increased awareness.</p> <p>Council will need to take the risk of working with the community on these issues rather than having sole control of decisions. However as community are involved in making decisions about waste management, any service changes should be easier to introduce and participation should be higher.</p>	<p>Community should further reduce their reliance on residual waste collections.</p> <p>Demand for recycling services will increase further.</p>	<p>Council will take less of a sole-control approach to waste management issues, and will instead share decision making and risk management with the</p> <p>Community. The community will need to take responsibility for the decisions they are helping to make, and become more involved in delivery and participation.</p>

	<p>Environmental: diversion from residual waste should increase above previous options with resultant reduction in environmental impact</p> <p>Economic: council may need to appoint a Council officer (either as part of an existing role or a new role) to lead on waste management strategy issues and work with the community to make decisions</p>		
<p>In conjunction with the above, work in partnership with businesses to encourage 'cleaner production' approaches and better waste management</p>	<p>Social/Cultural: the business community will be more aware of and engaged with waste management issues, and will be encouraged to take more responsibility for the impact their business has on the community</p> <p>Environmental: diversion from residual waste should increase above previous options with resultant reduction in environmental impact</p> <p>Economic: once again Council may need to appoint a Council officer (either as part of an existing role or a new role) to lead on waste management strategy issues and work with the business community to address their waste issues.</p> <p>Businesses themselves may save money through taking a 'cleaner production' approach.</p>	<p>Business community should further reduce their reliance on residual waste collections.</p> <p>Demand for recycling services will increase further.</p>	<p>Council will need to commit resources toward working directly with the business community on these issues</p>
<p>Investigate and establish partnership arrangements with other local Councils</p>	<p>Social/Cultural: greater sharing of knowledge and experience, and improved cooperation between communities</p> <p>Environmental: potential to establish facilities to recover materials and or energy from waste streams that Council may not have the capability to do operating alone</p> <p>Economic: opportunity to achieve economies of scale and enhance local economic development through enhanced local processing.</p>	<p>There are likely to be benefits from working closely with neighbouring authorities (in particular those with a commitment to Zero Waste), and BoPRC to establish organic waste and recycling infrastructure and to share knowledge and experience</p>	<p>Establishing links and communication at key levels in Council</p>

14.2 Organic waste

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's role
<p>Continue existing services, with additional encouragement for home composting.</p>	<p>Social/Cultural: community will be more informed about garden waste options.</p> <p>Environmental: diversion from residual waste should increase slightly, with a resultant reduction in environmental impact.</p> <p>Economic: there would be a small cost to Council in encouraging home composting (subsidizing home composting bins). Cost of the green waste collection may reduce slightly if less tonnage is collected through eh system.</p>	<p>Analysis of data shows that there is still green waste in the household residual waste stream, and the overall residual waste stream.</p> <p>Customers will be more likely to divert green waste from landfill, and manage it in ways that keeps it from the Council waste stream thus reducing demand for Council service</p>	<p>Continue to provide existing kerbside collection, and add information on home composting, shredding services, and any other initiatives (e.g. subsidised composting bins)</p>
<p>Encourage residents to include food waste into green waste collection.</p>	<p>Social/Cultural: may discourage home composting, although impact likely to be small as garden waste collection already exists.</p> <p>Environmental: it would reduce the environmental impact of waste. Waste avoidance and resource recovery would improve.</p> <p>Economic: there would be a small cost for promoting the service. Economic benefit through beneficial use of organic materials, and reduced landfill costs. Supports lesser quantity of residual waste.</p>	<p>Analysis of data shows that the single largest component of the waste stream is food waste, both from householders and businesses.</p> <p>To divert this waste from landfill, a change in how people handle food waste is required. There would be reduced demand for residual collection and disposal.</p>	<p>Collection would be in existing garden waste bins for householders.</p> <p>Ensure green waste processing managed so nuisance not generated.</p>
<p>Improve existing organic waste processing for the District that would accommodate green waste and food waste and have a market for end product – for example, contained windrow composting, vermicomposting, or anaerobic digestion.</p>	<p>Social/Cultural: social and cultural impacts would depend how this is implemented – e.g. a high level of community involvement would have a positive social and cultural impact. Could provide additional employment for the District</p> <p>Environmental: by selling the end product, a valuable resource is not lost to the Environment.</p> <p>Economic: the process needs to be self sufficient financially so additional processing costs need to result in additional value of end product.</p>	<p>The processing of organic waste needs to be cost effective. Material can be processed into compost but the market is weak so minimal process cost options need to be used.</p>	<p>Council will be required to lead any initiatives in this area.</p>

14.3 Recycling

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's role
Council recycling collection – expand the range of recyclable material that can be collected from more customer groups.	<p>Social/Cultural: no impacts identified</p> <p>Environmental: waste recovery would be promoted, recovery maximised and the environmental impact of waste reduced by diverting more waste from landfill</p> <p>Economic: more material would be recovered, and materials would be used more efficiently.</p>	Analysis shows that there is still recyclable material in the residual waste collection stream. Increasing the range of materials in the recycling collection may increase demand for this service.	Identify further materials that could be added to the recycling collection systems. Investigate with receivers of existing recyclables if additional material types can be added to the recycling stream.
Eliminate fee at Transfer Station for recyclables.	<p>Social/Cultural: there is a possibility of positive social impacts as financial restraint of recycling removed. May reduce fly tipping.</p> <p>Environmental: recycling could increase and the environmental impact of waste reduced by diverting more waste from landfill</p> <p>Economic: more material would be recovered, however existing fee generated from recyclables at Transfer Station would be lost, so equivalent value would need to be added to rates.</p>	There is still recyclable material in the household residual waste stream, and also waste going direct to Transfer Station.	Council to review the fee structure at Transfer Station to encourage more recycling as part of the Long Term Plan
Introduce a bylaw to support and enforce recycling systems	<p>Social/Cultural: could be difficult to educate and communicate some sectors of the community about the need for a by-law; could also prompt some negative reaction. Extent of impact would depend to an extent how this is implemented – e.g. a high level of community involvement would have a more positive social and cultural outcome</p> <p>Environmental: additional recyclables (and organic waste if this service is provided) could be diverted from the residual waste collection</p> <p>Economic: more material would be recovered from the residual waste collection, further reducing transport and disposal costs</p>	This may increase demand for recycling services slightly	Council could alter bylaws to require more recycling, however Council will use publicity to encourage recycling and provide a system that encourages recycling

14.4 Transfer station wastes

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's role
<p>Introduce a bylaw or other regulatory mechanism to encourage more source separation of wastes such as C&D</p>	<p>Social/Cultural: social and cultural impacts would depend how this is implemented – e.g. a high level of community involvement would have a positive social and cultural impact</p> <p>Environmental: additional recyclable or clean fill material could be diverted from the residual waste stream</p> <p>Economic: the construction industry may experience additional costs in separating these wastes at source</p>	<p>Analysis shows that there is C&D waste still going to landfill.</p> <p>Demand for alternative services will increase – such as C&D waste recycling and access to clean fill disposal</p>	<p>Council will work with the community and private sector to encourage the recycling of C&D waste</p>
<p>Divert more wastes at the Transfer Station through pricing tools, changed layout and more reuse and recycling options</p>	<p>Social/Cultural: social and cultural impacts would depend how this is implemented – e.g. a high level of community involvement would have a positive social and cultural impact</p> <p>Environmental: additional recyclable or clean fill material could be diverted from the residual waste stream</p> <p>Economic: increased diversion of waste at the transfer station would probably have additional operational costs. However reduced waste to landfill would have a positive economic benefit.</p>	<p>Analysis of data and experience elsewhere suggests that more waste could be diverted from landfill at the transfer station stage.</p> <p>Less residual waste will need transporting to landfill disposal.</p> <p>Demand for various recycling and recovery facilities will increase.</p>	<p>Council considers the existing fee structure is high and should provide incentive to recycle. Continuing to talk to users about recycling and provide best possible facilities</p>

14.5 Hazardous wastes

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's role
Continue to provide a drop-off facility at the Kawerau Transfer Station for hazardous materials (e.g. lead based paints and asbestos)	Council may wish to lead on the provision of more reuse, recycling and recovery facilities, or to work with the community and private sector to encourage the development of these services. In this area in particular, there is significant potential to work with the community (e.g. local non-profit community groups).	Tonnage of hazardous waste is relatively small and not predicted to increase. Ongoing costs should therefore remain fairly stable.	Ensure hazardous waste dropped off is disposed of appropriately. Continue to provide information about how to deal with hazardous waste to communities.
Continued disposal of Biosolids	<p>Social/Cultural: existing treatment and disposal process meets various regulatory requirements.</p> <p>Environmental: the biosolids have been assessed as having low heavy metal levels. The environmental impact of disposal is minimal. Processing in to a soil improver product mitigates a large proportion of the environmental impact.</p> <p>Economic: cost to dispose of and process the biosolids is currently low compared to other communities</p>	The existing treatment and disposal process of biosolids will meet future demands, meet environmental standards and is low cost.	Continue to meet environmental standards.

14.6 Refuse collection, treatment and disposal (including cleanfill)

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's Role
Council residual waste collections – continue status quo	<p>Cultural/Social/Environmental: no new impacts</p> <p>Economic: the Council is currently over budget on residual waste transport and disposal costs.</p>	Would not impact on status quo prediction of demand.	Maintain existing service arrangements.
Council residual waste collections – change service configuration to further reduce the quantity of waste collected; for example reducing service frequency to fortnightly, change receptacle from bins to bags	<p>Cultural/Social: international experience shows that residual waste collections are most successfully reduced (e.g. frequency reduced to fortnightly or container size reduced) when paired with the introduction of a food waste collection. There are other mechanisms that could reduce waste quantities collected – e.g. change from MGBs to bags or introducing user pays. This could also prompt a negative social reaction. There is potential for problems with increased fly tipping although there is little evidence to suggest this is likely to be a significant issue</p> <p>Environmental: reducing residual waste to landfill and encouraging more diversion of recycling will help to recover more materials and to achieve environmental goals</p> <p>Economic: there would be savings on residual waste collection, transport and disposal, but more would need to be spent on recycling/recovery services.</p>	<p>Analysis shows that a large amount of recyclables is still in the residual waste stream.</p> <p>Experience suggests that only restricting access to the residual waste service will change this significantly.</p> <p>Would reduce future service demand for residual collection but could increase demand for recycling/composting services.</p>	<p>Negotiate service changes and alter service delivery.</p> <p>Service changes could be developed in partnership with the community, or with the Council having sole responsibility.</p>
Refuse disposal for the District – continue status quo, using transfer station and transporting out of District to landfill.	<p>Social/Cultural: no impacts identified</p> <p>Environmental: ongoing transport of waste out of the District will continue to have a negative environmental impact</p> <p>Economic: the current fee structure covers the cost for handling, transporting and landfilling residual refuse.</p>	Increase in prices at transfer stations could increase demand for recycling services	Maintain existing systems, and review charges at Kawerau Transfer Station to ensure full cost recovery takes place.

Option	Strategic assessment	Comment and analysis of impact on future demand	Council's Role
Residual disposal for the District – Council develops a facility for disposal, whether landfill or energy from waste facility	<p>Social/Cultural: social and cultural impacts would depend how this is implemented – e.g. a high level of community involvement would have a positive social and cultural impact. Could provide additional employment for the District</p> <p>Environmental: the overall environmental impact would depend on the type and scale of facility chosen, and whether the facility is used by customers outside the District with associated transport impacts</p> <p>Economic: if the facility is constructed to a capacity exceeding that of the District (which is very likely) then use of the facility could be offered on a commercial gate fee basis to other parts of the region, and nearby regions. Depending on the scale and type of facility chosen, this could have a beneficial economic impact for the District.</p>	Would not impact on status quo prediction of demand for residual waste disposal; however facility would be provided locally rather than relying on external parties/regions	<p>Council could decide to reopen closed landfill if considered cost for landfilling out of district were more than operating own landfill.</p> <p>Council could be involved in facilitating the development of a waste to energy project that created jobs and a cheaper disposal option for Kawerau...</p>
Other waste streams – hazardous waste disposal arrangements.	<p>Social/Cultural: Reduction in potential for threat to human health from hazardous materials by provision of effective management of hazardous waste streams</p> <p>Environmental: Reduction for potential for environmental damage by provision of effective management of hazardous waste streams</p> <p>Economic: Cost to dispose of hazardous waste will vary</p> <p>Depending on materials requiring disposal.</p>	Provision of hazardous collection facilities will continue to provide for safe disposal of hazardous waste.	Council to continue to provide a facility for disposal/processing of hazardous waste.
Other waste streams - provide ongoing alternative option for some C&D wastes e.g. cleanfill disposal, further processing.	<p>Social/Cultural: no impacts identified</p> <p>Environment: less waste would be transported to landfill disposal.</p> <p>As long as cleanfill and reprocessing guidelines are applied and materials restricted, little environmental impact.</p> <p>Economic: Cost for disposal would be reduced.</p>	Quantities of construction and demolition waste change as the economy fluctuate.	<p>Council could work with companies generating construction and demolition waste to encourage sorting at source.</p> <p>Continue to seek and develop re-use options so more construction and demolition waste can be recycled.</p>

14.7 Measuring and monitoring

Option	Strategic assessment	Comment & Analysis of impact on Future Demand	Council's Role
<p>Status quo – occasional</p> <p>SWAP audits, participation surveys, and monitoring of waste flows through contracts</p>	<p>No new impacts</p>	<p>Would not impact on status quo prediction of demand.</p>	<p>Maintain existing service arrangements.</p>
<p>Increase monitoring to provide more information in certain areas, such as commercial waste composition, and waste management in rural areas, need for seasonal services.</p> <p>This should assist with gaining a clearer understanding of how those not using waste collection services are managing their waste disposal.</p>	<p>Social/Cultural: could raise awareness of waste management and alternative disposal options.</p> <p>Environment: if data highlights areas where additional services could be provided, localized issues addressed or certain customer groups targeted, then diversion of waste from landfill could be increased.</p> <p>Economic: if the above is achieved, transport and disposal costs would be reduced along with income. There may be additional costs for new programmes put in place.</p>	<p>There are some gaps in knowledge and understanding of the waste streams in the District.</p> <p>Availability of more data, and tailoring of services accordingly, could increase demand for recycling services and reduce waste to landfill.</p> <p>Availability of more data, assessment of, for example, complaints, unlawful disposal incidents and nuisance information and tailoring of services accordingly, could increase demand for recycling services and reduce waste to landfill.</p>	<p>Council to initiate and oversee research, studies and audits and feed results in to future iterations of WMMP and action plans.</p>

15. Council's role

15.1 Background

Council has a number of statutory obligations in respect of the planning and provision of waste services. These include the following:

- Under the WMA Council “must promote effective and efficient waste management and minimisation within its district”.
- The WMA also requires territorial authorities (TAs) to develop and adopt a Waste Management and Minimisation Plan (WMMP)
- Under the Local Government Act 2002, Council must consult the public about its plans for managing waste
- Under the Resource Management Act 1991, 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 district planning documents, thereby defining further land-use-related resource consent requirements for waste-related facilities.
- Under the Litter Act 1979 TAs have powers to make bylaws, issue infringement notices, and require the clean-up of litter from land.
- The Health Act 1956. Health Act provisions for the removal of refuse by local authorities have been repealed by local government legislation. The Public Health Bill is currently progressing through Parliament. It is a major legislative reform reviewing and updating the Health Act 1956, but it contains similar provisions for sanitary services to those currently contained in the Health Act 1956.

- The Hazardous Substances and New Organisms Act 1996 this 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.

Council aims to establish a measure of control over the handling of waste in the district through its solid waste bylaw... This bylaw largely focuses on the management of waste on private properties, such as accumulation and storage issues.

The bylaw also aims to protect the general public from waste creating a nuisance or annoyance or becoming a danger to health and also provides for the protection of waste collectors and the public by prohibiting hazardous materials being placed out for collection.

Council views its role in the provision of waste management services as being not only to meet its statutory obligations but to promote sustainable management of the District's resources.

Council adopted a Zero Waste approach in 1999, and this has been one of the key principles of the existing waste management plan.

Council's role in specific areas is outlined in the WMMP. It should be noted Council will ensure that public health is adequately protected in taking forward any of the proposed actions described in the statement of options.

16. Statement of Proposals

Council has agreed that a high level Statement of Proposals will be included in the Waste Assessment and the actions will be expanded in more detail in the Plan itself.

16.1 Medical Officer of Health statement

As a requirement of undertaking the waste assessment the Medical Officer of Health has been consulted with. The feedback provided to the Draft Waste Assessment is shown in the table below.

Section	Action sought
Introduction – Background	Investigate reduction initiatives and continue to progress waste management and minimisation practices in keeping with the Zero Waste philosophy.
Introduction – Consideration of liquid and gaseous wastes	Conduct an assessment of liquid and gaseous wastes.
	Include a reference for the statement that bio-solids have been assessed in detail at a regional level and an explanation of the basis for the conclusion that they are generally effectively managed by the private sector.
	Consult with the Medical officer of Health before public consultation during the review of any bylaw which has implications for public health.
Introduction – Overview of waste and recycling systems in Kawerau	Confirm how and where all the companies collecting waste and recycling in the district dispose of their collections.
	If Council's collection services do not include all households in the district, provide further information to show how the other households dispose of their waste.
Section 2 – Waste facilities servicing the Kawerau district	Include some information about the quantity and type of waste disposed of outside the district.
Cleanfill facilities	Seek advice from BOP Regional Council about cleanfills operating closer to Kawerau.
Transfer facilities	Provide more detail of what recyclables are and are not accepted at the transfer station.
	Clarify whether liquid waste is accepted at the transfer station.
	Clarify how hazardous substances, asbestos-containing material and infectious material are disposed of.
Recycling and processing facilities	Outline the type and quantity of waste are received from the waste facilities servicing the Kawerau district.
Section 3 – Waste services provided in the Kawerau district: Council contracted services	Provide more detailed information on how hazardous substances and bulky inorganic items and appliances are managed to prevent inappropriate disposal
Section 4 – Waste data	Clarify whether the information presented in the table is weight or volume.
	Clarify what quantity of waste is generated from litter or fly tipping removals.
Composition data of council kerbside collection	Gather more information on the composition of waste arriving at the transfer facility which is sourced from commercial operators.
Further diversion potential	Consider extending good waste management and minimisation practices to organisers of events in the district.
	Explore new diversion initiatives for putrescible waste e.g. home composting.
Summary and conclusions	Include more information to support the conclusion that further reductions are likely to be minor and potentially costly.
	Strengthen the programme to education the community and promote the reduction of waste which could potentially be diverted from landfill.
Section 5 – Forecast future demand: Disposal infrastructure	Consider exploring the opportunity to share resources and services with other Councils to provide a landfill site closer to, or within the district to provide a regional waste solution.
	Aim to identify the risks to health that waste minimisation practices can pose if they are not managed appropriately or safely.
General	Confirm how households which do not receive collection service dispose of waste, including sewage sludge and hazardous substances.

16.2 Population growth and demographics

Population Growth

Statistics New Zealand has predicted a small but gradual decline for Kawerau's population based on the 2006 and previous censuses.

Since 2010, Council has taken an active role in economic development to reverse the trend. It is hoped that there will not be significant change in population over the period of the plan.

In general, it is not anticipated that population growth will be a significant factor in putting pressure on waste management services.

Household Trends

The composition of the households in Kawerau, high percentage of youth, older people and Maori is not expected to change significantly. These groups all have specific waste disposal profiles.

A change in the profile may result in a change in waste volumes but this will not be significant with other initiatives (education) occurring.

16.3 Economic growth

Economic growth has traditionally been correlated with waste production. Higher levels of economic activity leads to greater production and consumption of goods and this in turn can lead to higher quantities of waste.

A common measure of economic growth is Gross Domestic Product (GDP).

In recent time, GDP growth has fallen sharply and at the time of writing this report NZ experienced several years of negative economic growth. Economic forecasts vary however with some predicting an extended period of weak growth before the economy recovers to previous historical levels. Kawerau has had very small or negative economic growth for a number of years.

In terms of planning for waste facilities and services however it is important to ensure demand is met and so it is prudent to take a more optimistic view. Below are GDP forecasts to 2016 which indicate a return to growth of around 3% per annum by 2010.

On the basis of the correlation noted above, the trend in GDP would indicate a reduction in waste over the coming year followed by a return to historical levels of waste growth. However, for Kawerau there would need to be a significant local growth change to significantly impact waste volumes.

16.4 Recycling markets

Recovery of materials from the waste stream for recycling and reuse is heavily dependent on the recovered materials having an economic value. This holds true particularly for recovery of materials in the private sector.

Markets for recycled commodities are influenced by prevailing economic conditions and most significantly by commodity prices for the equivalent virgin materials.

	Pre 2008 per ton	2008 per ton	2012 per ton
Aluminium	\$1000	\$100	\$1200
Copper	\$8000	\$4000	\$7000
Steel	\$700	\$100	\$200
Plastics	\$280	\$200	-

The change in markets significantly alters the level of recycling that occurs by individuals and also the profitability of recycling of the Transfer Station.

While the price fluctuation affects the profitability of recycling, if the goal is to remove material from landfilling, then recycling will continue.

It seems likely that any increase in demand for processing would be able to be met by the private sector, contingent on the ongoing transport of recyclables to these markets.

Development of a more localised recyclables processing market would require the Council, business and community groups working together to identify potential opportunities.

16.5 Changes in lifestyles and consumption

Household waste growth is not just a New Zealand phenomenon. In 1997 OECD countries produced 540 million tonnes of MSW annually (approximately 500kg per person). Waste grew at an average annual rate of 1.8% between 1980 and 1985, 3.6% between 1985 and 1990, and 1% between 1990 and 1997.

A report by the OECD 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

16.6 Central government regulation

A number of key policies and pieces of legislation may influence demand for refuse and recycling services in Kawerau District. These are discussed in the following subsections.

The Waste Minimisation Act 2008

The Waste Minimisation Act 2008 (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.

Emissions Trading Scheme (ETS)

Landfill operators will have obligations to report their emissions and surrender New Zealand Units (NZUs) under the Emissions Trading Scheme (ETS). They won't receive an allocation NZUs. Like all New Zealanders, they're likely to notice a small increase in energy prices due to the ETS.

Operators of landfills whose waste stream contains some element of household waste will have obligations under the TES. Landfill operators will have obligations for the methane emitted through the biodegradation of organic waste.

Landfill operators will have obligations to collect data in order to calculate and report their greenhouse gas emissions over the calendar year by 31 March 2013 and surrender sufficient emission units by 31 May 2014.

16.7 NZ Waste Strategy targets

The Ministry for the Environment's 2010 New Zealand Waste Strategy (reducing harm, improving efficiency) goals are to reduce the harmful effects of waste and improving the efficiency of resource use. The Strategy has a flexible approach to enable waste management and minimisation activities to be appropriate for local situations. The strategy builds on the good work already undertaken in communities.

The Strategy reiterates that territorial authorities have a statutory responsibility to promote effective and efficient waste management and minimisation in accordance with the Waste Minimisation Act.

16.8 Proposals to meet forecast demands

Of the options detailed earlier in the assessment the following actions are proposed to be undertaken to minimise the volume, impact and cost of solid waste

Communicate and Educate

Objective	Specific actions	New or existing action?	Implementation timeframe
Community and Council working together.	Provide information about waste services, waste prevention and waste reduction, including potential pH risks, to the Community.	Ongoing	Ongoing – Council is lead agency
Lead waste reduction initiatives	Engage directly with the community (including businesses) and encourage businesses in a 'cleaner production' approach	Ongoing	Immediate – Council is likely to be joint lead agency
	Continue to work with schools through the 'Paper 4 Trees' programme	Ongoing	Ongoing – Council supports financially
	Continue to build partnership working with other local councils and regional authority	Existing	Ongoing – Council is lead agency
	Lead waste projects, proactively offer waste minimisation advice to the community	Existing	Ongoing

Take Direct Action - Foster New Ideas

Objective	Specific actions	New or existing action?	Implementation timeframe
Community and Council work together	Work with BOP councils advocating for a regional approach in waste facility provision by participating in Waikato and Bay of Plenty Waste Liaison Group	Expansion of existing action	Ongoing
New, local initiatives and infrastructure	Review service delivery options for collections of recycled, residual and green waste by: <ul style="list-style-type: none"> • looking at costs • level of service offered • alternatives 	Existing	Ongoing typically 3 yearly
Consider environmental impact	Review methods of disposing of refuse delivered to transfer station by: <ul style="list-style-type: none"> • Reviewing costs • disposal options • increasing recycling at transfer station 	Existing action	Yearly
Use resources more efficiently	Review disposal of recycled material by: <ul style="list-style-type: none"> • investigate how other TLAs dispose of recycling • evaluating costs and income • reviewing 'shop' option at transfer station 	Existing action	Yearly
	Sponsor initiatives by organisations or individuals that may reduce residual refuse	Existing action	Yearly
	Continue to take action to reduce fly tipping by: <ul style="list-style-type: none"> • fencing off easy disposal points • prosecuting identified offenders • increasing monitoring • removing rubbish quickly • assessing complaints received 	Existing action	Ongoing
	Continue to be aware of alternatives for refuse disposal (energy, electricity) and consider options before long term contracts/arrangements put in place	Existing action	Ongoing.

Change the Rules, Monitor and Feed Back

Objective (s)	Specific Actions	New or existing action?	Implementation timeframe and Council's role
Community and Council work together Consider environmental impact Use resources more efficiently	Review other options for increasing source separation of non household waste.	Expansion of existing action	2013/14 financial year – Council is lead agency for review, and may be joint agency for decisions.
	Review pricing at the transfer station facility annually to ensure true cost of residual waste disposal is recovered, and reuse/recycling is encouraged.	Expansion of existing action	Immediate – Council is lead agency for review.
Community and Council work together Taking a waste hierarchy approach Consider environmental impact Use resources more efficiently	Increase monitoring to provide more information, especially regarding non-household waste composition, how those not using waste collection services are managing their waste disposal.	Expansion of existing action	2012/13 financial year and ongoing from that time – Council holds a monitoring role.
	The Council will regularly review progress on this Action Plan and towards achievement of our goals, objectives and targets. Progress will also be reported annually through the Annual Plan, and regularly through Council newsletters and the website.	Expansion of existing action	Immediate and ongoing
Community and Council work together Taking a waste hierarchy approach Consider environmental impact Use resources more efficiently	Provide additional encouragement for home composting of food and garden waste in partnership by subsidising compost bins.	Expansion of existing action	By end of 2012/13 financial year – Council is lead agency
	Encourage residents to include food and garden waste in greenwaste bins by advertising.	Expansion of existing action	Ongoing
	Investigate how composted material can be used beneficially at no cost to Council.	2012/13	Minimal cost
	Continue to monitor actions occurring outside district with green and organic waste.	New	Ongoing

Recycling (glass, paper, cardboard, metals, plastic)

Objective (s)	Specific Actions	New or existing action?	Implementation timeframe and Council's role
Community and Council work together Taking a waste hierarchy approach Consider environmental impact Use resources more efficiently	Continue the kerbside recycling collection: encourage householders to put out additional recycling.	Expansion of existing action	Council is lead agency.
	Recycling collection: investigate whether additional materials can be included in the kerbside recycling collection with recycled processing company.	Expansion of existing action	Immediate and ongoing – Council is lead agency
	Work with community (including existing private collection providers) to improve the recycling collection services available to industry and businesses.	Existing	By end of 2013/14 financial year -Council is joint lead agency.
	Work with business and industry to encourage more recycling and waste reduction at source.	Existing	Provide expertise to business to reduce waste (waste audits)

Hazardous/liquid/gaseous wastes

Objective	Specific actions	New or existing action?	Implementation timeframe
Community and Council work together Taking a waste hierarchy approach Consider environmental impact Use resources more efficiently	Continue to provide a drop-off facility at the Kawerau Transfer Station for hazardous materials, e.g. lead-based paints and chemicals.	Existing	Council is lead agency
	Continue to treat Bio-solids from wastewater treatment plant using vermiculture.	Existing	Ongoing
	Provide information to residents and contractors on appropriate disposal of asbestos through newsletter.	New action	Council lead agency

