

**Rotorua District Council  
Waste Management and Minimisation Plan**

**June 2010**



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# Part A: Strategy

## 1. INTRODUCTION

This Waste Management and Minimisation Plan sets the way forward for the Rotorua District Council (the Council) to achieve its waste management and minimisation objectives. The Council has a legal obligation under the Waste Minimisation Act to “**promote efficient and effective waste management and minimisation within its district.**”

The Council provides a range of services including rubbish collection, recycling drop-off centre, greenwaste diversion, concrete crushing, transfer stations and the Atiamuri Landfill. In preparing this Waste Management and Minimisation Plan, Council has looked critically at the services provided, their effectiveness at minimising waste to landfill and the options available to further promote efficient and effective waste management and minimisation. This review has been documented in the Waste Assessment Report, a summary of which is provided in Part C of this Plan.

The Waste Management and Minimisation Plan has been prepared to document how the Council will promote waste management and minimisation and the Council's goals and objectives in this area. It has been prepared to fulfil the Council's obligations under section 43 of the Waste Minimisation Act. This requires the Council to have in place a Waste Management and Minimisation Plan which:

- sets objectives and policies for achieving effective and efficient waste management and minimisation
- details the methods to be used including methods for collection, recovery, recycling, treatment and disposal services. This includes facilities provided as well as other activities such as education and promotion
- details how implementation of the plan will be funded.

Part A of this Plan sets out the Council's objectives, goals and policies for waste management and minimisation. It also provides background on the legislative and policy framework within which Council is required to work as well as details of the current waste stream and how it is managed. It provides an overview of the Council's action plans, how these will be funded and how their effectiveness will be monitored and reported.

Part B of this Plan sets out the Action Plans for the Council's Waste Management and Minimisation Activities. The Action Plans are focused on the Waste Hierarchy of reducing, reusing, recycling, recovering, treating and disposing of waste.

Part C of the Plan provides an overview of the Waste Assessment Report detailing the options which Council has considered to meet the current and future demands for waste management and minimisation.

### 1.1 SCOPE OF THE PLAN

This Plan sets out how the Council will promote efficient and effective waste management and minimisation in the Rotorua District. It covers all aspects of solid waste, including the solid components of the wastewater treatment process. It does not include liquid wastes conveyed via the Council's sewage system which are addressed under the Council's wastewater activity plan.

### 1.2 CURRENT STATUS OF PLAN

This Plan was adopted by Rotorua District Council on 29 June 2010.

### 1.3 REVIEW OF PLAN

The Plan is required, under Section 50 of the Waste Minimisation Act, to be reviewed at least every six years. The Plan is therefore required to be reviewed no later than June 2016.

## 2. POLICY AND LEGISLATIVE FRAMEWORK

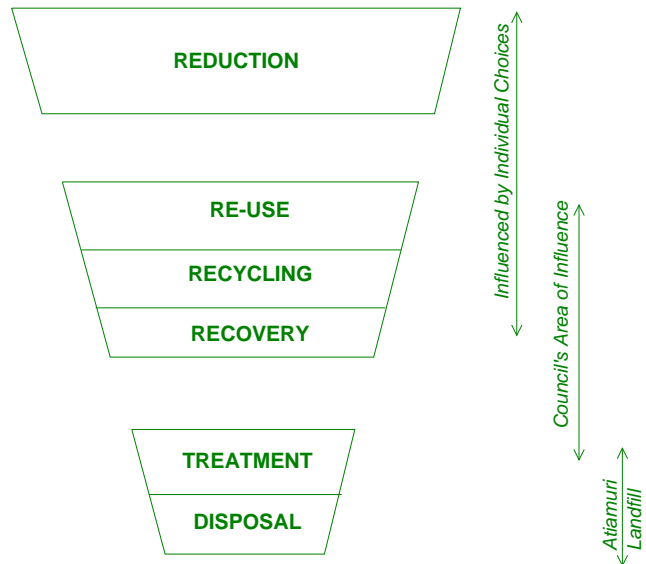
The Council is required to prepare and adopt a Waste Management and Minimisation Plan under the Waste Minimisation Act. The Plan must set out how Council will provide for waste management and minimisation within the District, in a way that considers:

- Reduction
- Reuse
- Recycling
- Recovery, and
- Treatment and disposal of waste

This list presents an order of priorities, which is often referred to as the Waste Hierarchy.

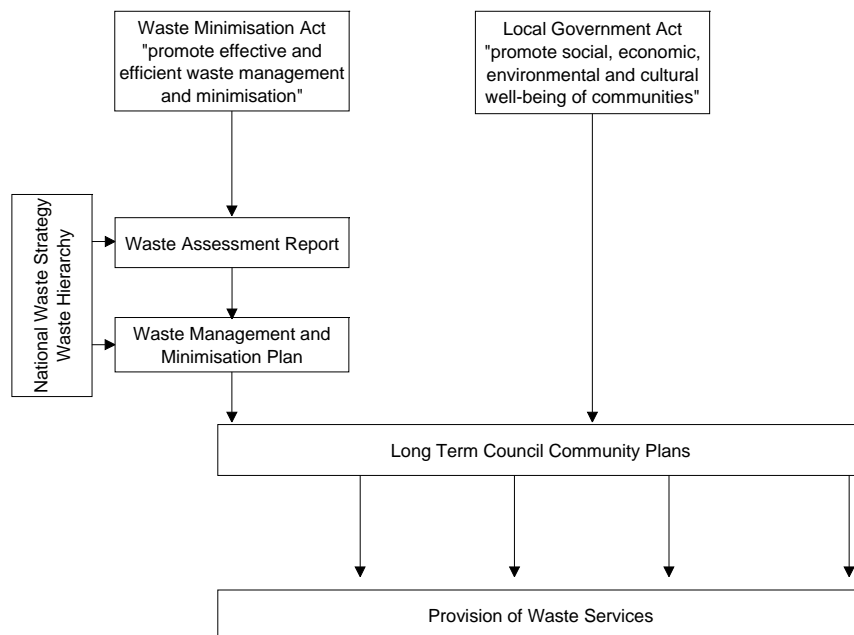
Individuals have a key role to play in waste minimisation, in the choices they make when purchasing and using products.

Reuse, Recycling and Recovery are Waste Minimisation methods which Council can have a key role in assisting with.



Treatment and Disposal of residual waste occurs via landfilling. For the Rotorua District, waste is taken to Atiamuri Landfill for disposal.

It is a legal requirement for the Council to have a Waste Management and Minimisation Plan, but this does not mean that the Plan sits in isolation. It is influenced by, and linked to, other Council Plans – principally the Long Term Community Council Plan – as well as central government policies and targets. The framework within which the Waste Management and Minimisation Plan sits is summarised in the figure below.



## 2.1 WASTE MINIMISATION ACT

The Waste Minimisation Act was passed in 2008. Under this Act, the Council has a statutory obligation to promote efficient and effective waste management and minimisation in the Rotorua District area. The Act also:

- allows for the introduction of product stewardship schemes
- imposes a waste levy that Council collects on behalf of central government. Some of this levy is returned to the Council to assist funding of waste minimisation measures
- requires Council to adopt a Waste Management and Minimisation Plan
- allows the Minister to set performance standards for waste minimisation. These standards would be binding on the Council if applied.

## 2.2 LOCAL GOVERNMENT ACT

The Local Government Act no longer includes specific provisions relating to waste management, however, the Council must still exercise all of its duties in relation to the Local Government Act. In particular, this includes undertaking its activities in a manner which gives effect to the purpose of local government, as set out in Section 10 of the Local Government Act, namely:

- "(a) to enable democratic local decision-making and action by, and on behalf of, communities; and*
- (b) to promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future."*

### Long Term Community Council Plan (LTCCP)

Under the Local Government Act, the Council must have a Long Term Community Plan (LTCCP) which sets out the desired community outcomes and how the Council will work to achieve these outcomes. Rotorua District Council's current LTCCP sets the community outcomes for 2009 – 2019. The table below shows how the Council's waste management and minimisation activities contribute to the community outcomes.

Community Outcome	How the Council Contributes
Safe and Caring Environment	By providing safe collection and disposal of refuse. By encouraging waste reduction and minimisation. By looking after our air, land and water resource.
Facilities and Services	By providing good quality infrastructure for the future.
Learning	By providing waste minimisation education.

## 2.3 NEW ZEALAND WASTE STRATEGY

The New Zealand Waste Strategy is the Government's primary policy on waste. Developed in partnership with local government in 2002, the Strategy has as its vision 'towards zero waste and a sustainable New Zealand'.

The Strategy has three goals:

- Lower the costs and risks of waste to society
- Reduce environmental damage from the generation and disposal of waste
- Increase economic benefit by using material resources efficiently.

The New Zealand Waste Strategy established 30 targets for managing waste. These targets are non binding on local authorities. The targets are currently under review.

### **3. WHERE ARE WE NOW?**

In order to manage and minimise our waste in to the future, we need to understand the way in which waste is currently managed, the services provided and the quantity and type of waste which is produced. This section of the Waste Management and Minimisation Plan presents a background of the current waste services and the amount and composition of waste produced within the Rotorua District. The Council is currently working and providing services at all levels of the waste hierarchy.

#### **3.1 WASTE REDUCTION**

Waste reduction is concerned with reducing the amount of waste which is generated. Council undertakes community education through the Keep Rotorua Beautiful programme and under the direction of council staff and the recycling committee. This includes:

- School visits to promote sustainable waste management
- Advertising campaigns in newspapers, radio and other publications
- Information brochures, pamphlets and internet based resources
- Information and support for the hotel industry via environment hotel programme
- Liaison with industry through Council's pollution control officers to reduce and manage waste
- Cleaner Production programme to assist participating businesses to reduce waste by undertaking business audits on energy, water and waste.

Council also encourages waste reduction by funding the majority of waste activities via user pays charges. These charges are imposed as gate fees for transfer station and landfill sites as well as via the charge for refuse bags over and above the number supplied each year.

Council encourages the commercial sector to reduce the amount of waste to landfill by funding the Cleaner Production Programme for businesses to receive a free waste audit and recommendations as to how they can reduce their waste. This is run on a voluntary basis, and requires the businesses involved to recognise a need to reduce waste and seek assistance via the programme. Inclusion in the programme commits the business to a follow-up audit to determine whether or not waste reduction initiatives have been implemented and have been successful. In addition to the Cleaner Production Programme, waste reduction in the commercial sector is encouraged by providing facilities for construction and demolition waste diversion at the landfill and via the differential pricing policy which has lower gate charges for disposing of material for diversion compared to the gate charges for landfill.

Tourism plays a significant role in the District and the District's economy. Waste reduction in the tourism sector is supported by the Council's general waste reduction and recycling facilities and services, as well as by the provision of recycling bins in public spaces and high tourism areas.

Another sector which plays a significant role in the District and its economy is the forestry sector. Over the last 10 years, the forestry industry has reduced the amount of waste generated and Council now receives minimal residual waste from forestry.



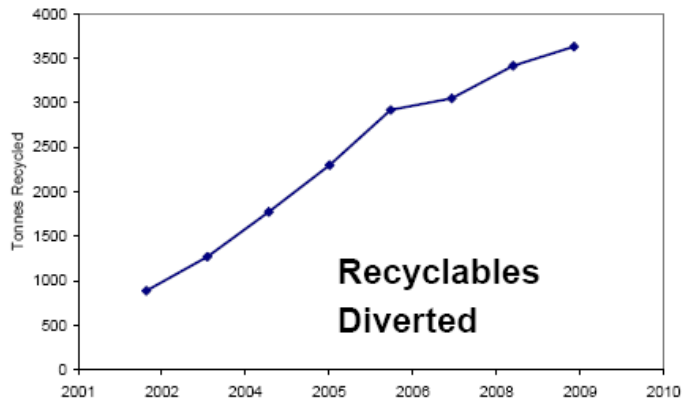
### 3.2 REUSE AND RECYCLING

Reuse is using what would otherwise be waste products in the same form as its original form. Examples include reuse of furniture or household items as second hand goods or reuse of building materials in other building and construction works. Recycling involves processing of materials to create new products.

The Council currently promotes and facilitates reuse and recycling of materials via the:

- recycling drop off centre in Rotorua
- recycling drop off centres at the rural transfer stations and landfill site
- concrete crushing facility at the landfill site
- separation of whiteware, scrap metal, tyres and vehicles at the landfill site for reuse or recycling

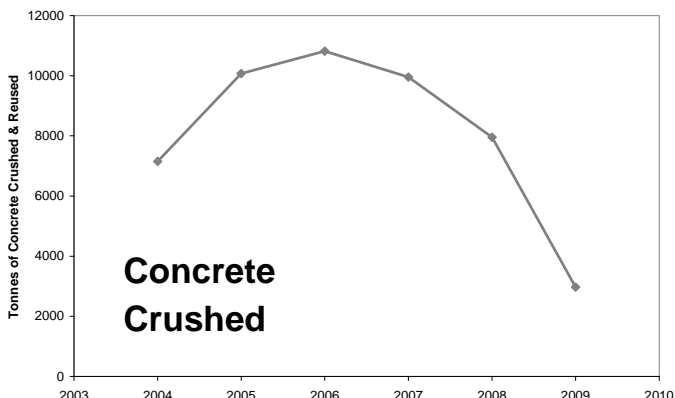
Council provides recycling services to some public events held throughout the District, as well as recycling bins in public places and areas with high tourism number (eg CBD).



The amount of recycling material being diverted has been steadily increasing over the last eight years. The graph above shows the amount of material which has been recycled. The recycling centre is well used by the community. Council surveys indicate approximately 75% of the community use the facility.

The amount of concrete crushed in recent years has decreased, as shown in the graph to the right. This is considered to be due to the recent downturn in economic activity as well as increased recycling within the construction and building industry itself.

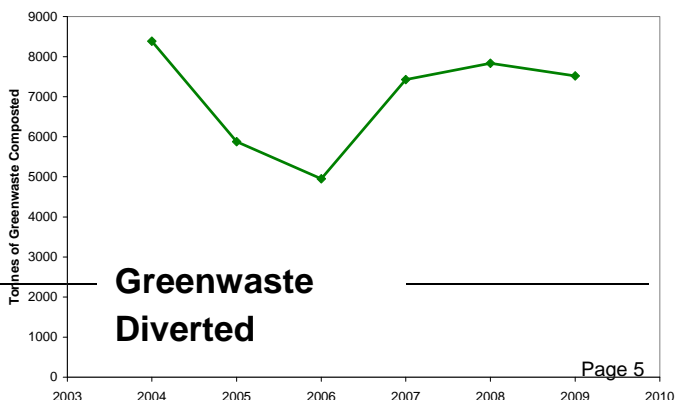
Council also runs occasional special waste services such as e-day (collection of electronic goods for reuse or recycling), and a second hand Sunday which occurs annually. The second hand Sunday promotes swapping of reusable goods on a neighbourhood basis.



### 3.3 RECOVERY

Recovery involves extracting materials or energy from waste for use in other processes. An example of this is recovery of the nutrients and minerals in greenwaste to produce compost.

The Council currently operates a greenwaste processing facility at the landfill site which accepts greenwaste for shredding and mulching. The Council also composts some of the sludge from the wastewater treatment plant and is currently undertaking a pilot plant trial of the Waste 2 Gold



project. The Waste 2 Gold project will treat all sewage sludge from the wastewater treatment plant and process this to provide a carbon source to be fed back in to the wastewater treatment plant. The Waste 2 Gold project can also produce a product which can be used to produce energy, biofuels or bioplastics.

### 3.4 TREATMENT AND DISPOSAL OF RESIDUAL WASTE

Council provides a residual waste collection service which includes:

- Weekly refuse collection from the Rotorua urban area and some rural areas. Refuse is collected in Council bags. Each household is provided with a set number of bags per year. Additional bags can be purchased from the Council and some supermarkets
- Twice weekly refuse collection from the Rotorua Central Business District
- Regular collection of litter from within the urban area, including maintenance of rubbish bins in public places
- Free to access skip bins for rural lakeside areas
- User pays transfer stations at Mamaku, Reporoa, Tarawera and Okere.

Council also follows up and responds to any reports of illegal dumping, with the dumped refuse being cleared and taken to landfill for disposal. Where possible, enforcement action is taken against persons dumping or disposing of refuse illegally.

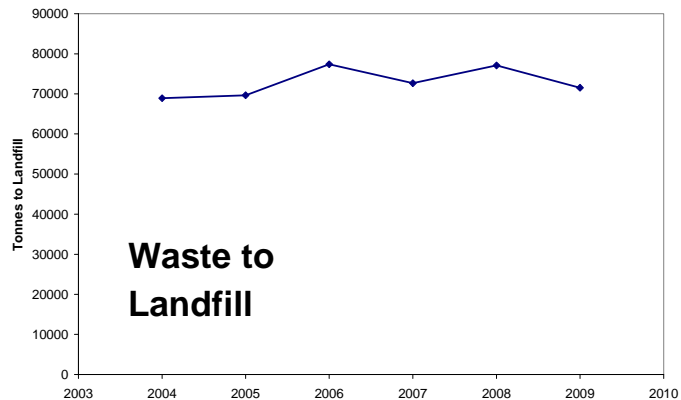
Refuse is disposed of to the Atiamuri Landfill. This is a modern facility with engineered liners, leachate collection (treatment of which occurs at the wastewater treatment plant) and operational record keeping. The landfill is designed and operated in accordance with the Landfill Guidelines and is 100% funded by user pays charges.

Council undertakes all monitoring necessary under its resource consents for the landfill site and reports the results of this monitoring to Environment Bay of Plenty. Council also monitors the amount of waste disposed of to landfill via weighbridge records and regular surveys of the landfill. These surveys determine the amount of landfill space used up by disposing of refuse as well as the amount of usable space (or life) left in the landfill.

There is 20 years remaining life at the landfill site under its current resource consents.

Council also provides a collection facility for household quantities of hazardous waste at the landfill sites. The Regional Council assists with the removal and disposal of the hazardous waste collected. Council's facilities are provided for domestic users only.

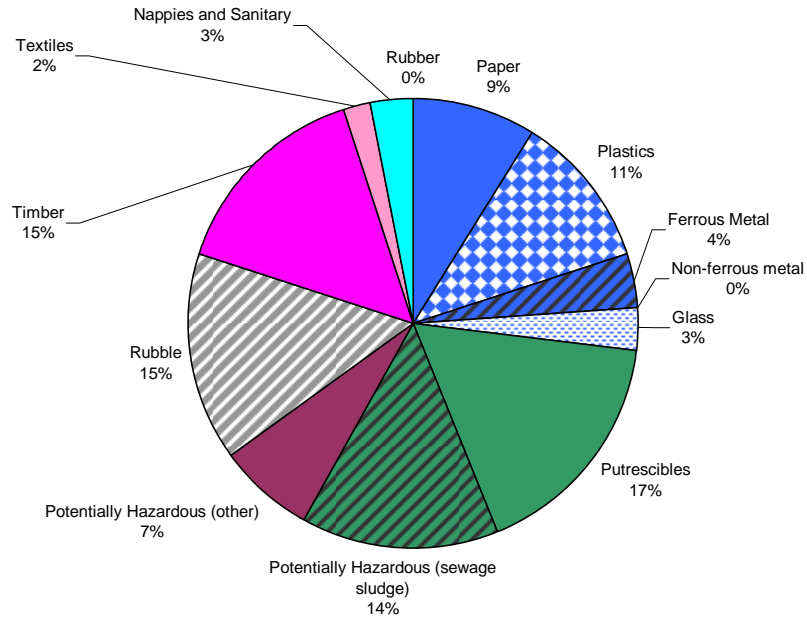
Hazardous material handling and disposal is controlled via Hazardous Substances legislation and there are strict controls on how users manage and dispose of their hazardous waste. Similarly, medical waste handling and disposal is also covered under separate legislation.



The graph to the right shows the amount of waste disposed to landfill in the last six years.

**Excluding the amount of cleanfill which is disposed to landfill the amount of waste disposed to landfill equates to 700 - 750 kg per person per year. This is just below the national average of 780 kg per person per year.**

In recent years, Council has been surveying the waste which enters the landfill to understand the composition of that waste. This is an important aspect of effectively managing and minimising the waste stream. By understanding the composition of the waste stream, minimisation efforts can be targeted at those components which will enable the greatest reduction in waste to landfill. The pie chart below shows the composition of waste to the Atiamuri Landfill.



The waste composition surveys show that:

- Potentially recyclable material - paper, plastic, metals, glass - accounts for 27% of the waste going to landfill
- Organic waste - putrescibles (green waste and kitchen waste) and sewage sludge, account for approximately 30% of the waste going to landfill
- Construction and demolition waste - rubble, timber - accounts for 30% of waste going to landfill

For this reason, Council has chosen to focus its waste minimisation efforts in these three areas - recyclables, organics and construction and demolition waste.

### 3.5 SUMMARY

The table below provides a summary of the existing waste management and minimisation services, how they are funded and the quantity of material which is involved. 'Gate charges' refer to the charges incurred when disposing refuse to the transfer stations or landfill.

Waste Hierarchy	Service Provided	Funding	Quantity of Material (2008-2009 financial year)
Reduce	Educational and promotional activities	General rates	Not able to be quantified.
Reuse and Recycle	Recycling drop off centres (in town, transfer stations, landfill sites)	Gate charges and general rates	3,630 tonnes
	Concrete and asphalt crushing	User pays	3,000 tonnes
	Whiteware, tyres, scrap metal etc	Gate charges	294 tonnes
Recovery	Greenwate and sewage sludge	User pays and gate charges	7,518 tonnes
Treatment and Disposal	Atiamuri Landfill	Gate charges	71,523 tonnes

#### 4. ROTORUA'S WASTE MINIMISATION AND MANAGEMENT TARGETS

Minimising the amount of waste sent to the landfill means not only that we can extend the life of the landfill but we can also make use of material which would otherwise have gone to landfill. As discussed in section 3 of this Plan, the majority of waste entering the landfill is either recyclable material, organic waste or construction and demolition waste. Council already provides services in these areas – via the recycling drop off centres, and the greenwaste processing and concrete / asphalt crushing at the landfill site. These activities divert just over 14,000 tonnes of waste from the landfill each year. However, the survey of waste going in to the landfill shows that there is room to improve the amount of waste diverted from landfill in these three categories. For this reason, the Council's targets for waste minimisation have been derived by considering the composition and quantity of waste entering the landfill and determining the amount of minimisation that could be achieved if diversion of recyclables, organic and construction and demolition waste was optimised.

The following sets out the Council's vision, objectives and goals for waste management and minimisation

##### ***Vision for Waste Management & Minimisation:***

***A community which is committed to the minimisation of waste to landfill in a manner which provides for the community's environmental, economic, social and cultural wellbeing.***

##### ***Objective 1***

***To achieve a 40% reduction in the amount of waste to landfill by 2020 compared to the 2010 baseline data***

##### ***Objective 2***

***To manage the Council's waste transfer and disposal sites in a manner which avoids, remedies or mitigates any significant adverse environmental effect***

The Council's targets for waste minimisation are therefore as follows:

- Target 1: Increase the tonnes of recyclables diverted from 3,630 tonnes per annum to 6,000 tonnes per annum by 2015**
- Target 2: Achieve 80% reduction in the amount of organic waste to landfill compared to 2010 baseline data by 2020**
- Target 3: Achieve 30% reduction in the amount of construction and demolition waste entering the landfill compared to the 2010 baseline data by 2020**

The above targets are not sufficient to completely eliminate the need to dispose of some refuse to landfill. Council's targets for waste management are as follows:

- Target 4: Achieve 100% compliance with resource consent conditions for the Atiamuri Landfill site and transfer station sites**
- Target 5: Manage the landfill in accordance with best practice guidelines and achieve a minimum compaction standard in order to maximise the remaining landfill life**

## 4.1 HOW WILL WE ACHIEVE OUR TARGETS?

Council has undertaken a critical review of the waste management and minimisation services provided and has undertaken an assessment of options for minimising and managing waste. This has been documented in the Waste Assessment Report required under section 51 of the Waste Minimisation Act, a summary of which is provided in Part C. The options which have been considered for the three main waste categories – recyclables, organics and construction and demolition waste – are summarised below, with Council's adopted option identified.

### 4.1.1 Recyclables

Recyclable materials include paper, cardboard, plastic, glass, metals. Diversion of recyclables from landfill currently occurs via the recycling drop off centre and the satellite drop off centres at the transfer station and landfill sites. The amount of material diverted by these drop off centres has been steadily increasing over recent years with approximately 3,600 tonnes diverted last year. In addition, private collections of commercial paper and cardboard divert approximately 2,100 tonnes per annum. Combined, these two operations represent total recycling of approximately 80 kg per person per year. This is consistent with the national average for recycling. The amount of material recycled through the recycling drop off centre is also comparable to the amount some communities are achieving through some kerbside collections.

The community usage of the drop off centre is very high, with approximately 9,000 vehicles per week during peak periods such as leading up to Christmas and 7,000 vehicles per week at other times of the year. The existing centre is considered to be at capacity as demonstrated by the queuing which users experience during peak periods.

One of the significant achievements of the recycling drop off centre has been the very high quality of recyclable materials which is produced. The drop off centre achieves very low levels of contamination of materials which, in turn, means that these can be sold at the best possible market price. If there was significant contamination in the material which was collected for recycling, the market price would decrease significantly or the material may be rejected outright.

The options which Council has considered are:

- Continue the existing facility
- Expand the existing drop off centre and provide additional satellite facilities
- Introduce a kerbside recycling collection using either
  - bags, with the householders required to separate their recyclables in to different bags
  - crates for all recyclables to be put in together
  - wheelie bins for all recyclables to be put in together
  - wheelie bins for all recyclables except glass, with a separate crate for glass

In terms of the kerbside recycling collection, the amount of recyclables which would be collected and potential contamination rates have been assessed by considering the experience of other communities throughout the country. For bag and crate collections, reported collection rates are similar to the amount of recycling which is currently achieved through the drop off centre. This is a reflection of the high level of community use of the recycling drop off centre.

Wheelie bins typically result in more recyclables being collected (up to twice as much), but are a more costly option and experience has shown that the contamination rates – particularly for paper/cardboard being contaminated with crushed glass – are high and the cost of sorting and separating the recyclables products can be very significant. These issues are not insurmountable but do incur additional costs in terms of separation and potential lower prices for sale of recyclable materials.

In assessing the options for recycling, Council is aware that there is support for a kerbside recycling collection, but does acknowledge the high level of diversion, high quality of product and relatively low cost achieved by the recycling drop off centre. The Council acknowledges that residents may prefer the convenience of a kerbside collection, however, note that there is a cost in providing such a service.

For this reason, the adopted option for providing recycling services is to expand the existing recycling drop off centre as well as to provide a satellite drop off centre at Ngongotaha.

Council will also continue to provide recycling bins in public spaces and areas with high tourism numbers, such as the central business area.

#### **4.1.2 Organic Waste**

Currently, organic waste is diverted from the landfill by composting of sewage sludge and shredding and mulching of greenwaste.

The Council is currently in the process of pilot planting a new Waste 2 Gold plant which will be used to treat the sewage sludge. This plant will convert the sewage sludge to produce a carbon source which can then be used to feed in to the sewage treatment process (the sewage treatment process currently requires carbon to be purchased and added to optimise the treatment). The process will also be able to produce energy (for input back to the electricity network) or bioplastics or biofuels. A pilot plant is being constructed in the 2010 / 2011 financial year, subject to this being successful, a full scale plant to treat the sewage sludge has been included in the LTCCP on successful completion of the pilot scale testing.

The Waste 2 Gold process is able to treat all organic waste streams and has a 94% recovery rate at laboratory scale for organic waste. That is, for every tonne of organic waste treated, the resulting solid residual is 60 kg. The process is also able to treat a combined waste stream of organic and inorganic waste and therefore there is significant potential to use the process to treat the waste before it enters the landfill. Not only would there be a significant reduction in the quantity of material disposed to landfill, the process would be able to produce energy, biofuels or bioplastic. The Council therefore intends to use the sewage treatment Waste 2 Gold full scale plant to trial this process on the solid waste stream. Subject to this trial being successful, Council intends to construct a full scale Waste 2 Gold plant at the landfill site.

Optimising the waste minimisation potential of the Waste 2 Gold project relies on having a significant organic component to the total waste stream. For this reason, Council does not intend to introduce new services which would further encourage removal of the organic waste stream, such as kerbside greenwaste / kitchen waste collection, until such a time as the viability of the Waste 2 Gold process on the solid waste stream has been determined.

Therefore, the preferred strategy for minimising organic waste to landfill is:

- Continue with the existing diversion of greenwaste shredding and mulching, and sewage sludge composting
- Implement the Waste 2 Gold project for the sewage sludge waste stream (2010 - 2012)
- Trial the Waste 2 Gold process on the solid waste stream (2013-2015)
- If the above trial is successful, implement the Waste 2 Gold process by constructing a full scale Waste 2 Gold plant at the landfill site (2015)
- If the Waste 2 Gold project is not implemented full scale on the solid waste stream, revisit the feasibility, costs and benefits of a kerbside greenwaste and/or kitchen waste collection.

Outcomes of the Waste 2 Gold trial process and the progress against the strategy outlined above will be communicated via the Annual Report and Annual Plan process.

Council has provided \$850,000 funding for research and progressing the above strategy in its Annual Plan. Capital funding has also been included in the 10year plan for construction of a full scale biosolids processing facility using the Waste2 Gold technology.

#### **4.1.3 Construction and Demolition Waste**

Council provides for diversion of construction and demolition waste via the concrete and asphalt crushing plant at the landfill site. Material crushed is sorted and resold as aggregate for the building and construction industry. The amount of

waste diverted through this activity has varied from approximately 10,000 tonnes per annum a few years ago to 3,000 tonnes per annum last year. This is considered to be a result of recent downturn in economic activity and increased recycling / reuse within the construction and demolition industry itself. The landfill surveys do not show an increase in the construction and demolition materials corresponding to this drop off in the concrete crushing volumes and this confirms that the reduction in volumes is not due to material going to landfill.

Council will continue to operate the concrete and asphalt crushing facility and will, where practical, expand this to include provision for collection, sorting and resale of reusable timber or other construction and demolition materials.

#### **4.1.4 Refuse Collection**

There is a high level of satisfaction with the existing refuse collection and therefore Council intends to continue with the existing bag collection. As part of the Waste Assessment, consideration was given to a wheelie bin collection, however, the cost of providing this service, as well as potential impacts on waste quantities meant that this was not Council's preferred option. The bag collection is considered to provide a good balance between the Council's responsibility to provide for public health (by providing a fixed number of bags as part of the targeted rate) and a user pays regime to minimise waste (by requiring residents to purchase more bags if their waste generation is above the norm). In contrast, a wheelie bin service provides a greater capacity for rubbish disposal per house and may discourage other waste minimisation efforts.

Council will continue with its policy of providing additional rural collection services where there is a sufficient demand for those services and they can be provided at an appropriate cost. Where collection services are not provided, residents may dispose of refuse via the transfer station and landfill facilities or may dispose of refuse on site. Any refuse disposal on site must comply with the relevant provisions of the Regional Plans for disposal to land.

#### **4.1.5 Council will continue with its litter collection activities and removal of refuse from public rubbish bins. Council will also continue to remove illegally dumped refuse and will, where appropriate, prosecute offenders. Council maintains a record of incidents of illegal dumping and reviews this regularly to assist in determining whether further enforcement or additional services are considered necessary. Educational and Promotion Activities**

Council currently undertakes a number of education and promotion programmes for promoting waste minimisation to the wider public. Such programmes are critical to the success of any of the waste minimisation services which Council or other parties provide. Council will continue to undertake education and promotion activities and will, where funding permits, expand these services where appropriate.

These programmes include:

- Waste Minimisation and Pollution Control Officers
- Educational institutional visits
- Community awareness programmes via the media
- Signage and information at Council's waste management and minimisation facilities
- Information on the Council's website
- Support of Keep Rotorua Beautiful Committee

## **4.2 COUNCIL'S ROLE IN PROVIDING WASTE MANAGEMENT AND MINIMISATION SERVICES**

The role of the Council in providing services is influenced by three key Acts, these being the Waste Minimisation Act 2008, Local Government Act 2002 and Health Act 1956. These Acts do not dictate what territorial authorities role in waste management and minimisation should be, but rather place an onus on the Council to provide for public health and inform its community as to how services will be delivered and what its role will be.



The role of the Council can be pitched at any point along a spectrum from full control, to a laissez-faire approach. At one end of the spectrum, all the services are delivered by the Council and at the other end, all of the services are market delivered.

A full Council delivered model means that the Council provides all the resources and equipment necessary to undertake collection, recycling, diversion, composting and residual disposal. However, the risks are that best-value least cost outcomes will not be achieved; waste minimisation outcomes are unlikely to be optimised and access to markets for recovered or recyclable products may be difficult. At the other end of the spectrum, a laissez-faire approach may mean that only some services – those which are considered profitable – will be provided; costs may be high if there is insufficient competition and changes to market conditions may result in services being suddenly discontinued.

The majority of territorial authorities outside the major metropolitan centres do not have the critical mass to pursue strategies at either end of the spectrum. Instead they have adopted a "mix and match" strategy to develop solutions structured to their individual communities and the community's ability to pay. The Rotorua District Council has in the past, and will in the future, adopt such an approach.

The Council will adopt a role as Service Delivery Manager in order to match the Levels of Service to community expectations. Actual services will be contracted out so that the Council is able to obtain "best value-least cost" solutions. As Service Delivery Manager, the Council is also able to fulfil its obligations to report on waste minimisation and management efforts as required under the Waste Minimisation Act.

This position is set out in the following policy:

### ***Service Delivery Policy***

***Council will act as Service Delivery Manager in the delivery of actions contained within this Waste Management and Minimisation Plan. Where appropriate to achieve best value-least cost outcomes, service provision will be undertaken under Contract to Council***

#### **4.3 PROVIDING FOR PUBLIC HEALTH**

Section 44(b) of the Waste Minimisation Act requires the Council to ensure that the collection, transport and disposal of waste does not, or is not likely to, cause a nuisance.

Public health is provided for via this Waste Management and Minimisation Plan by including the following in the Action Plans set out in Part 2:

- A regular waste collection service provided to the urban and some rural areas of the District
- Provision of rural transfer stations at Tarawera, Reporoa, Mamaku and Okere
- Litter collection and removal of refuse from public rubbish bins
- Clean up of illegal dumping of rubbish
- Operation of the Atiamuri Landfill in a manner which meets current best practice guidelines and all applicable standards and resource consent conditions.

#### **4.4 PRINCIPLES FOR WASTE MANAGEMENT AND MINIMISATION**

Part B of this Waste Management and Minimisation Plan set out action plans for minimising our waste and reducing waste to landfill. These action plans are underpinned by the following principles:

<b>Minimisation Priorities</b>	Waste minimisation initiatives will be applied in the following priority <ul style="list-style-type: none"><li>- Reduction</li><li>- Reuse</li><li>- Recycling</li><li>- Resource Recovery &amp; Treatment</li><li>- Disposal</li></ul>
<b>Education</b>	The Council is committed to educating the community, enabling and encouraging them to attain the District's waste minimisation goals. The community shall be encouraged to take ownership of its waste and disposal
<b>Environment</b>	The actions and processes employed in implementing this Plan will be carried out in a manner that minimises the risk to the environment and the health and safety of the community.
<b>Funding</b>	As far as practicable, the cost of managing wastes are applied to the generators of those wastes, so that waste production is not subsidised by the rest of the community and to provide incentives for reduced waste generation.
<b>Implementation</b>	For effective and efficient delivery of services, activities described in this Plan shall be undertaken either by Council, or by contract to Council, at the discretion of Council.

## 4.5 PROPOSED ACTION PLANS & FUNDING

The action plans for achieving the Waste Management and Minimisation targets and objectives are set out in Part B of this Plan. Council has adopted a “user pays” philosophy for funding of waste management and minimisation activities. The specific funding streams for each activity and set out in the table below. 'Gate charges' refer to the charges incurred at entry to the transfer station and landfill sites.

Under s53 of the Waste Minimisation Act, the proceeds from the sale of any marketable product derived from recycling or reuse facilities and services provided by the Council must go towards funding the implementation of the Council's Waste Management and Minimisation Plan. Council complies with this requirement by allowing the contracted operator of the Council's facilities to collect revenue as an offset to the contract price for provision of services.

The Council has determined not to make provision for grants under section 47 of the Waste Minimisation Act.

The Council's share of the waste levy received under s31 of the Waste Minimisation Act is to be used to fund the Waste 2 Gold project. This project supports Objective 1 and Target 2 of the Waste Management and Minimisation Plan.

Priority Area	Method / Action	Funding
Reduction	1 Educational & Promotional programmes	General rates
	2 Cleaner Production Programme	Gate charges
	3 User pays for residual disposal	Gate charges
Recycling	4 Continue & expand drop off facilities	Funded from gate charges and general rates
	5 Concrete and asphalt crushing and resale of materials	Self funding/gate charges
	6 Separation of vehicle bodies, whiteware, scrap metal, tyres and their recycling	Gate charges
	7 Promote reuse and recycling facilities	General rates
	8 Second Hand Sundays	General rates
	9 Participate in national e-waste collection	Gate charges
	10 Collection and disposal of domestic tyres	Gate charges
Recovery and treatment	9 Greenwaste collection and processing	Gate charges
	10 Waste 2 Gold project	Gate charges at landfill/sewage targeted rate / waste levy
	11 Consider kerbside greenwaste/kitchen waste collection if Waste 2 Gold project does not proceed	General rates for consideration of scheme. Targeted rate if implemented
Disposal	12 Refuse collection	Targeted rates
	13 Continue to develop and operate Atiamuri Landfill	Gate charges
	14 Continue to operate transfer stations	Gate charges
	15 Equalise charges between transfer station and landfill	Gate charges
	16 Litter collection and clean-up and enforcement of illegal dumping	General rates
	17 Storage, treatment and disposal of household hazardous	General rates

Monitoring & reporting		wastes	
	18	Collect data on waste quantities and composition	Gate charges/general rates
	19	Report on performance	General rates

# Part B - Action Plans

To implement the preferred options for waste management and minimisation, Council has adopted and will implement five action plans as set out in this section of the Waste Management and Minimisation Plan. These action plans set policies and methods by which Council will implement the Waste Management and Minimisation Plan. The action plans have been developed in line with the waste hierarchy of reducing, reusing, recycling, recovering and treating and disposing of waste. There is also an action plan which describes monitoring and reporting requirements to track progress towards waste minimisation targets.

## Funding structure

The funding mechanism for each of the methods Council will use to implement this Waste Management and Minimisation Plan are set out in each of the Action Plans which follow. Council's guiding principle for funding of waste management and minimisation activities is:

*As far as practicable, the cost of managing wastes are applied to the generators of those wastes, so that waste production is not subsidised by the rest of the community and to provide incentives for reduced waste generation.*

In keeping with this principle, specific activities for waste management and minimisation are funded via gate charges at the disposal sites (landfill, greenwaste disposal, transfer station sites). Activities which promote waste minimisation to the wider community and which fulfil a public health requirement are funded from general rates.

## Targets and Measurements

As set out in Part A of this Plan, the Council's targets for waste management and minimisation are:

- Target 1 Increase the tonnes of recyclables diverted from 3,630 tonnes per annum to 6,000 tonnes per annum by 2015
- Target 2 Achieve 80% reduction in the amount of organic waste to landfill compared to 2010 baseline data by 2020
- Target 3 Achieve 30% reduction in the amount of construction and demolition waste entering the landfill compared to the 2010 baseline data by 2020
- Target 4 Achieve 100% compliance with resource consent conditions for the Atiamuri Landfill site and transfer station sites
- Target 5 Manage the landfill in accordance with best practice guidelines and achieve a minimum compaction standard in order to maximise the remaining landfill life

The following pages set out the Council's action plans for reusing, reducing, recycling, recovering, treating and disposing of waste. An action plan for monitoring and reporting on the effectiveness of the Waste Management and Minimisation Plan is also included.

## **ACTION PLAN 1: REDUCING OUR WASTE**

The most effective way of minimising waste is to not generate it in the first instance. This can be achieved through the appropriate design, manufacture and use of products, as well as through the choice of products that we, as individuals, purchase. Waste reduction is at the top of the Waste Hierarchy and is the top priority in terms of minimising and managing waste.

Council has no direct control over the way in which products are manufactured or in the purchasing choices that individuals make. Council will encourage people to reduce the amount of waste they generate by education and promotion programmes as well as by continuing to fund waste disposal on a user pays basis.

The Council's policy and methods for reducing waste are set out as follows. The methods support Targets 1, 2 and 3 and the achievement of Objective 1 of this Waste Management and Minimisation Plan.

### ***Policy 1: To promote and encourage the reduction of waste in the District***

#### **Method 1 Develop and deliver educational and promotional programmes**

Council will continue to raise awareness in the community about the effects of waste on the environment, and methods which individuals and households can use to minimise their waste. This includes:

- Continue to maintain Waste Minimisation and Pollution Control Officers
- Educational institutional visits
- Community awareness programmes via the media
- Signage and information at council's waste management and minimisation facilities
- Information on the Council's website
- Support of Keep Rotorua Beautiful and Rotorua Recycling Committees

Council will provide and deliver programmes in conjunction with Keep Rotorua Beautiful. This includes but is not limited to:

- Classroom and Field visits
- Media Campaigns
- Events and Promotions eg School Speech Competition, Clean-up NZ week
- Hands on Cleanups eg Lakefront, Stream Wombling etc
- Works with Community Groups and business on particular campaigns eg teambuilding exercises
- Graffiti Management

#### **Method 2 Facilitate Cleaner Production and waste reduction by local industry**

Council will continue to promote and facilitate waste reduction in the commercial and industrial sectors via the Cleaner Production programme. This programme is based on voluntary involvement from individual businesses. Council provides funding for a business audit which identifies potential savings in terms of energy use, water use and waste production. Follow up visits to audited businesses are an integral part of this programme.

#### **Method 3 Maintain a User Pays basis for residual waste disposal**

Council will continue to fund residual waste disposal on a 100% user pays basis. The gate charges imposed are sufficient to cover the actual costs of disposal.

#### **The Council's activities in the Waste Reduction area will be funded as follows:**

- Method 1 will be funded via general rates
- Method 2 will be funded by gate charges for residual waste disposal

- Method 3 does not require funding.

## **ACTION PLAN 2 REUSING AND RECYCLING**

Reuse involves using what would otherwise be a waste material in its original form, whereas recycling involves reprocessing material into other products. It is not possible to eliminate waste completely simply by waste reduction measures. Reuse and recycling are the next two tiers on the waste hierarchy. They allow the products to be used again (whether in the original form or reprocessed). This not only minimises the amount of waste which goes to landfill, but also minimises the amount of virgin material to be extracted to make products.

Council currently encourages reuse by promoting "Second Hand Sundays" and through its education and promotion programmes discussed in Action Plan 1. The Council also has a direct involvement in the reuse of tyres, concrete and asphalt. Tyres are separated from the waste stream and made available free of charge – eg for on-farm use. Concrete and asphalt is crushed and reused in the building and construction industry.

Recycling in Rotorua has been carried out by a main drop off centre in Te Ngae Road with satellite drop off centres at the landfill and transfer station sites. Council has undertaken a critical review of its recycling facilities and considers that the most efficient and effective form of recycling is to continue with the recycling drop off centre. This is because of the high level of usage of the facility, the high quality of product received and, as a consequence low contamination and rejection rates, and the comparatively low cost of the service. The Council acknowledges that the recycling drop off centre is at, or near, capacity and therefore intends to expand the drop off centre by adding a third bay and improving traffic flow through the site. A smaller satellite drop off centre will also be constructed subject to finding an appropriate site.

The Council's policy and methods for promoting reuse and recycling of waste is as follows. . These methods support Targets 1 and 3, and the achievement of Objective 1 of this Waste Management and Minimisation Plan.:

***Policy 2: To promote and encourage the reuse and recycling of discarded products that would otherwise be required to be disposed of as part of the waste stream***

### **Method 4 Continue to provide, and expand the recycling drop off facilities**

The Council will continue to provide a recycling drop off facility at the Te Ngae Road site and at the transfer station and landfill sites.

The Council will expand this facility to minimise queuing times during peak periods and to encourage further use of the facility. This expansion involves adding a third bay to increase the capacity by 50% and improving traffic flow through the site.

The Council will also provide an additional satellite facility at Ngongotaha to further encourage recycling, subject to identifying, securing and consenting an appropriate site.

Council has committed funding in the 2010/11 Annual Plan for expansion of recycling facilities.

The provision of recycling services has been assessed in detail in the Waste Assessment Report (a summary of which is provided in Part C of this Plan), with the continuation of drop off facilities identified as the preferred option in the Waste Assessment Report. This has been adopted by Council as the preferred option following consultation with the community.

Council will provide for additional commodities to be collected at the recycling drop off centres subject to legitimate and cost effective recycling or reuse options becoming available.

Council will continue to provide recycling bins in public areas and areas with high tourism numbers (eg central business district area).



**Method 5 Continue to provide concrete and asphalt crushing operations, including resale of crushed and sorted material**

The Council will continue to operate the concrete and asphalt crushing operations at the landfill site. This operation diverts between 3,000 and 10,000 tonnes of material from the landfill each year and allows this material to be reused by selling the crushed and sorted material to individuals and to the building and construction industry.

**Method 6 Continue to provide for separation of vehicle bodies, whiteware, scrap metal and tyres at the landfill site and arrange for their removal for recycling**

Council will continue to provide a facility at the landfill site for the separation of vehicle bodies, whiteware, scrap metal and tyres. Separation of these materials will be encouraged at entry to the landfill site and in the education and promotion programme set out in Action Plan 1. Council will facilitate the reuse or recycling of these materials by making tyres available for reuse (eg on-farm use) and arranging for recycling operators to collect and recycle metal products. Council will keep abreast of future options for appropriate disposal.

**Method 7 Continue to promote reuse and recycling services and facilities**

The Council will continue to promote the reuse and recycling services and facilities via Waste Minimisation Officers and the community education and promotion programmes detailed under Method 1, Action Plan 1.

Council will also continue to adopt a fee structure for waste disposal which encourages the use of recycling facilities rather than disposal. This will be achieved by adopting a user pays fee structure for residual disposal only.

**Method 8 Promote and facilitate Second Hand Sundays**

The Council will continue to promote and facilitate Second Hand Sundays as a means of encouraging reuse of goods and to encourage waste minimisation.

**Method 9 Participate in national e-waste collection**

The Council will continue to participate in a nationally organised annual e-waste collection as a means of encouraging diversion of e-waste from landfill.

**Method 10 Collection and disposal of Domestic Tyres**

Council will continue to provide a facility for collection of waste tyres from domestic sources and vehicles disposed to landfill. Council will arrange for the reuse and appropriate disposal of tyres collected.

**The Council's activities in the Reuse and Recycling area will be funded as follows:**

- Method 4 will be funded via gate charges and general rates. A minimum of 75% shall be funded by gate charges.
- Method 5 will be funded from resale of crushed material. Any shortfall is funded from gate charges.
- Method 6 will be funded by gate charges
- Methods 7 and 8 will be funded by general rates.
- Methods 9 and 10 will be funded by gate charges.

## **ACTION PLAN 3      RECOVERY & TREATMENT**

Recovery of waste involves the extraction of materials or energy from waste for further processing. It includes, but is not necessarily limited to processing organic waste to produce compost. Council's recovery efforts are focused on organic wastes. At present, Council provides a greenwaste processing facility at the landfill site. Greenwaste is collected separately, shredded and mulched. Council is also currently in the pilot plant process for the Waste 2 Gold project which will treat all sewage sludge from the Council's wastewater treatment plant. This process converts the sewage sludge in to a carbon source which will be used as part of the wastewater treatment process, as well as producing energy. The Waste 2 Gold process can be used on any organic waste. As the waste going to landfill has a significant organic component, Council plans to expand the Waste 2 Gold project to also treat the solid waste stream.

Options for managing and maximising diversion of organic waste have been considered in the Waste Assessment Report prior to preparing this Plan. A summary of the Waste Assessment Report is provided in Part C of this Plan. The methods set out below are the preferred option as identified in the Waste Assessment Report and as adopted by Council following consultation with the community.

The Council's policy and methods for recovery of waste are therefore as follows. The methods support Target 2 and the achievement of Objective 1 of this Waste Management and Minimisation Plan.

### ***Policy 3    To promote and encourage the recovery of useable products from the waste stream***

#### **Method 11    Continue to provide the current greenwaste collection and processing facility at the landfill site and composting at the wastewater treatment plant site until the Waste 2 Gold plant is fully operational**

Council currently diverts approximately 6,500 tonnes per annum of waste from the landfill by providing a separate greenwaste collection and processing facility at the landfill site. Users are encouraged to make use of this facility via a differential pricing policy (ie it is cheaper to dispose of organic waste at the greenwaste facility than at the landfill). Council will continue to provide this facility until such time as the Waste 2 Gold project is operational (refer Method 10 below). Council will promote this activity via the community education and promotion programmes detailed in Method 1.

Council will also continue to use the existing composting facility at the wastewater treatment plant until such time as the Waste 2 Gold plant is fully operational.

#### **Method 12    Pursue and implement the Waste 2 Gold project on the solid waste stream**

The Waste 2 Gold project is currently at a pilot plant scale for the sewage sludge waste stream. Once this pilot plant is proven, it will be expanded to a full scale plant to treat all of the sewage sludge. This full scale pilot plant will then be used to assess the viability of treating the solid waste stream.

Subject to confirmation of the viability of the Waste 2 Gold process for treatment of the solid waste stream, a full scale Waste 2 Gold plant would be constructed at the landfill site and would treat all incoming waste for disposal. The residual (inorganic) component of the waste stream would then be disposed of to the landfill. As the Waste 2 Gold process is able to treat all organic waste (ie not only greenwaste and kitchen waste, but also paper, textiles, nappies, timber), it is not beneficial to separate out greenwaste from the overall waste stream if a full scale Waste 2 Gold plant is to be constructed.

#### **Method 13    Consider a kerbside greenwaste / kitchen waste collection for separate composting, only if the Waste 2 Gold Project is not pursued for the solid waste stream**

As stated above, the viability of the Waste 2 Gold process on treating the solid waste stream relies on as much organic material as possible being retained within the general waste stream. However, if the Waste

2 Gold project is not pursued for any reason, it is prudent to separate the greenwaste and kitchen waste from the general waste stream. This is to be able to recover the nutrients from these wastes via the compost process, to minimise waste to landfill, and to minimise the effects of landfill gases and leachate.

Council will therefore reconsider, by way of a special consultative process, whether or not to provide a kerbside greenwaste and/or kitchen waste collection if the Waste 2 Gold project does not proceed for any reasons.

**The Council's activities in the Recovery area will be funded as follows:**

- Method 11 will be funded from a mixture of greenwaste charges and revenue from landfill gate charges
- Method 12 will be funded by gate charges, the sewage targeted rate and the Waste Levy.
- Method 13 will be funded by general rates (note: this is for the process of determining whether or not to pursue a greenwaste/kitchen waste collection. Any collection service provided will be funded by a targeted rate)

## **ACTION PLAN 4      COLLECTION, TREATMENT AND RESIDUAL DISPOSAL**

Council provides residual waste disposal services which includes the collection, transfer and disposal of waste. These services are provided to ensure that waste does not cause nuisance or public health issues.

Council collects refuse from urban and some rural properties on a weekly basis as well as from the CBD area on a twice weekly basis. Waste is also collected at the four rural transfer stations and transferred to the Atiamuri landfill site. Council also collects refuse from public rubbish bins as well as picking up any illegal dumping of refuse.

The residual disposal site in the Rotorua District is the Atiamuri Landfill. This landfill is an engineered landfill which complies with current landfill guidelines. Leachate is collected and treated at the Council's wastewater treatment plant. The landfill has approximately 20 years remaining under its current resource consent.

Council provides facilities for collection of domestic quantities of hazardous wastes only, and only at the Atiamuri landfill site. While there are no hazardous waste collection facilities provided at the rural transfer stations, this is considered appropriate given the issues associated with licensing and controlling such a facility at the rural transfer stations and the fact that rural hazardous waste is intended to be considered as a priority waste via the Product Stewardship provisions of the Waste Minimisation Act.

The Council's policy for collection, treatment and residual disposal is as follows. These methods support Targets 4 and 5 and the achievement of Objective 2 of this Waste Management and Minimisation Plan.

### ***Policy 4    To provide collection services and disposal facilities, that meet public health requirements, environmental guidelines and comply with consent conditions***

#### **Method 14    Collect waste from urban and serviced rural properties on a regular basis**

The Council will continue to collect refuse from the urban area, CBD and serviced rural properties on a regular basis. Collection will be weekly except for the CBD which will be a twice weekly collection.

Council will consider adding areas to the rural collection serviced area where there is a demand for these services and they can be provided at an affordable rate.

#### **Method 15    Council will continue to develop and operate the Atiamuri Landfill in accordance with resource consent conditions and best practice guidelines**

The Council will continue to manage and operate the landfill in accordance with the resource consent conditions for the site and current best practice. At this time, best practice is defined by the Centre for Advanced Engineering's (CAE) Landfill Guidelines. These guidelines cover site development, landfill operations and post-closure care. The Council has a Landfill Management Plan which will be reviewed on a regular basis and updated as necessary. This Landfill Management Plan sets out the details of the day to day operation and management of the landfill.

#### **Method 16    Continue to operate transfer stations at Okere, Reporoa, Mamaku and Tarawera**

Council will continue to operate the existing transfer stations at Okere, Reporoa, Mamaku and Tarawera. These will be operated in accordance with the resource consent conditions for each site. They will be operated as staffed sites, with charges being incurred for all persons disposing of refuse.

Council will consider a further site at Rotorua/East Rotoiti if an appropriate site can be identified.

#### **Method 17    Continue to fund the landfill and transfer station on a user pays basis with no differential between sites**

Council will continue to charge gate fees on a per weight basis to cover the costs of the landfill, transfer stations and other activities funded by the gate charges as stated throughout this Plan. The Council will also recover and administer the waste levy as required under the Waste Minimisation Act.

**Method 18 Continue litter collection services and clean-up and enforcement for illegal dumping**

Council will continue to provide litter collection services by providing rubbish receptacles in public spaces, clearing these of refuse and disposing to the landfill. The Council will also continue to clear any illegal dumping including investigating the dumping and undertaking prosecution action where appropriate.

Council will respond to complaints of illegal dumping with 24hours in urban areas and 48hours in rural areas. They shall be cleared when on public land and when on private land the owner notified. Council may assist with cleanup on private land. Appropriate action shall be taken if sufficient evidence can be found of who is responsible.

**Method 19 Provide a facility for collection of household quantities of hazardous waste and arrange for the appropriate treatment and disposal**

Although small in quantity, hazardous waste is potentially harmful to the environment and public health if inappropriately managed and disposed of. Several private operators and manufacturers provide programmes which manage components of the hazardous waste stream and it is considered that commercial quantities of hazardous waste are adequately managed via the private sector. To assist residents to deal with their hazardous waste, Council will provide a facility for collection of household quantities of hazardous wastes and will arrange for their appropriate storage, removal and disposal.

This service is provided for domestic quantities only. Commercial quantities or hazardous or medical waste are required to be managed by the commercial operator concerned in accordance with the appropriate legislative and regulatory requirements.

**The Council's activities in the Collection, Treatment and Residual Disposal area will be funded as follows:**

- Method 14 will be funded by targeted rates
- Methods 15 and 16 will be funded by 100% user pays gate charges in accordance with method 17
- Method 18 will be funded from the general rates
- Method 19 will be funded from general rates.

## **ACTION PLAN 5      MONITORING AND REPORTING**

The action plans set out in this Waste Management and Minimisation Plan have been developed to achieve a reduction in the amount of waste to landfill and to ensure that Council is fulfilling its obligations under the Waste Minimisation Act to promote effective and efficient waste management and minimisation. It is therefore necessary to monitor the effectiveness of these action plans in achieving Council's goals.

In addition, Council is required, under the Waste Minimisation Act, to report on its performance in achieving waste minimisation with the services, facilities, and activities provided or funded in accordance with its Waste Management and Minimisation Plan.

This Action Plan sets out how this monitoring and reporting will be carried out.

### ***Policy 5    To monitor and report on waste quantities and track progress towards targets***

#### **Method 20    Collect waste data in a consistent manner and measure progress towards targets**

Council will collect data on its waste quantities and waste composition to measure progress towards the targets set out in Part A of this Plan. This includes:

- Collecting data on the amount of waste managed (collected, handled and diverted) by the Council and the amount of waste taken to landfill. This includes undertaking surveys in accordance with the national Solid Waste Analysis Protocol.
- Working with private waste collectors to obtain waste quantity data where appropriate
- Regularly undertaking solid waste analysis protocol surveys to measure waste composition

The data collected will assist with reporting under Method 21 as well as provide a basis for future waste assessments and reviews of the Waste Management and Minimisation Plan.

#### **Method 21    Report on performance in achieving waste minimisation**

Council will report on its performance in achieving waste minimisation to the community and to the Waste Advisory Board (as required under the Waste Minimisation Act) on an annual basis. This includes:

- Reporting via the Council's Annual Report as to the effectiveness of the actions in the Waste Management and Minimisation Plan in achieving the Council's waste targets
- Recommending, as appropriate, any changes to the Waste Management and Minimisation Plan required to achieve the Council's waste targets
- Reporting to the Waste Advisory Board as required by the provisions of the Waste Minimisation Act.

**The Council's Monitoring and Reporting activities will be funded as follows:**

- Method 20 will be funded from gate charges and general rates
- Method 21 will be funded from general rates.

## MONITORING FRAMEWORK

PRIORITY AREA	PARAMETER	PURPOSE	FREQUENCY
Reduction	Cleaner Production Programme	Reduction in Commercial waste	Annually
	No. of Educational Programmes	Reduction in waste	Annually
Recycling	Mass of recycling by commodity	Measure quantity of recycling	Monthly
Recovery and Treatment	Mass of C & D material recycled	Measure quantity of recycling	Monthly
	Mass of organic waste reprocessed by process	Measure quantity of material reused	Monthly
Disposal	Swap analysis	Determine composition data in waste stream and origin	Bi-annually
	Volume of landfill	Define space of landfill	Monthly
	Mass of landfill	Measure quantity of waste disposed	Monthly
	Volume of Transfer Station waste	Determine volumes from remote sites	Monthly
	Volume of priority hazardous waste	Determine volume of hazardous waste disposed separately to landfill	Annually
General	No. of complaints	Recorded by Customer Service	Continuous
	Illegal Dumping	Cost	Annually

## REPORTING FRAMEWORK

TO	PARAMETER	PURPOSE	FREQUENCY
Council	All	Measure performance	Annually
External Organisations i.e. MfE Waste Minz	As required	To be determined	As required

# Part C – Overview of Waste Assessment

Draft - Not Council Policy





**Rotorua District Council  
Overview of Waste Assessment Report**

**March 2010**



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# 1. INTRODUCTION

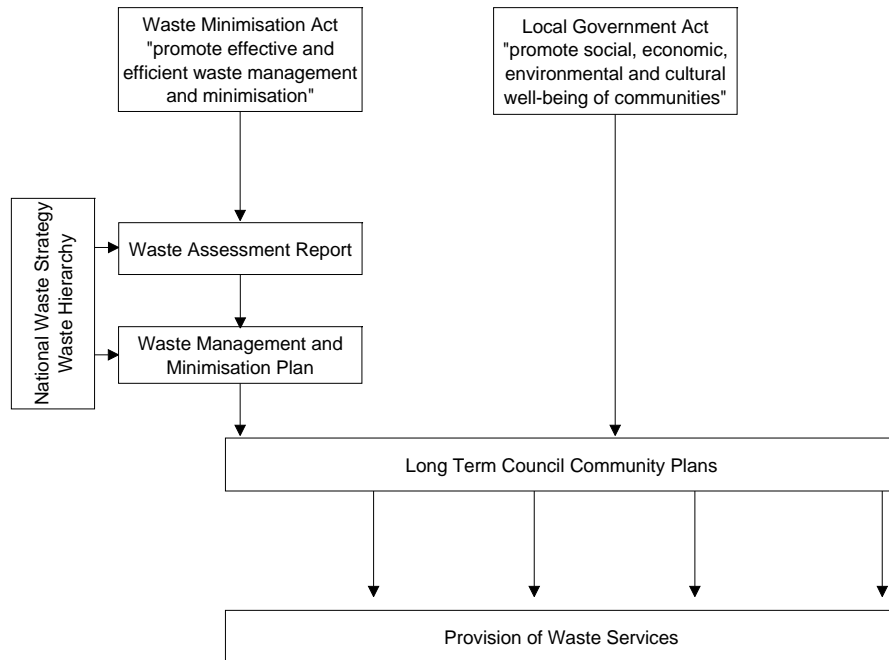
The Rotorua District Council has a statutory responsibility to promote effective and efficient waste management and minimisation within the Rotorua District (Section 42, Waste Minimisation Act 2008). As part of this responsibility, the Council is required to undertake a Waste Assessment which, in turn, assists in developing the Council's Waste Minimisation and Management Plan. A Waste Assessment Report has been prepared by environmental engineering and resource management consultancy Good Earth Matters Consulting Ltd. This document presents an overview of the Waste Assessment Report. A copy of the full report is available upon request.

The structure of the Waste Assessment Report is as follows:

- Section 1 provides an introduction to the Waste Assessment Report
- Section 2 presents the legislative and policy framework within which Council undertakes its duty to promote waste management and minimisation
- Section 3 details the existing services provided within the District
- Section 4 presents an assessment of the current and future demand for waste services
- Section 5 details the options which have been considered for meeting the future demand
- Section 6 presents an assessment framework and assesses the suitability of each of the options
- Section 7 details the Council's intended role in providing waste services to meet the future demand

# 2. LEGISLATIVE AND POLICY FRAMEWORK

The diagram below summarises the legislative and policy framework within which the Council is required to undertake its waste management and minimisation activities. The principal legislation is the Waste Minimisation Act which requires the Council to promote effective and efficient waste management and minimisation within its district. Any activities which the Council engages in must also be consistent with the overriding purpose of the Local Government Act which is to enable democratic local decision-making and action by, and on behalf of, communities, and to promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future.



The Waste Minimisation Act 2008 establishes the Council's responsibility for waste management and minimisation. Specific responsibilities and requirements under the Waste Minimisation Act are set out below.

- Council must adopt a Waste Management and Minimisation Plan
- Prior to reviewing or amending a Waste Management and Minimisation Plan
- The Act provides for products to be declared a "priority product" for which a product stewardship scheme must be developed as soon as practicable. To date, there are no priority products defined under the Act. The Ministry for the Environment has recommended agricultural chemicals, used oil and refrigerated gases be investigated and considered for declaration as priority products.
- The Act provides the ability to impose a levy on waste disposed of. The purpose of the levy is to raise revenue for promoting and achieving waste minimisation; and increase the cost of waste disposal to recognise that disposal imposes costs on the environment, society, and the economy.
- If a territorial authority provides a waste collection services it must do so promptly, efficiently and at regular intervals
- The Act provides for the Council to make bylaws for managing and minimising waste

### **New Zealand Waste Strategy**

The New Zealand Waste Strategy was published in 2002 and set in place a national (non-statutory) framework to address the management and minimisation of waste. It has three core goals, namely lowering the social costs and risks of waste; reducing the damage to the environment from waste generation and disposal; and increasing economic benefit by more efficient use of materials. The strategy is currently under review and a new strategy is expected to be released late 2010.

### **Long Term Council Community Plan (LTCCP)**

The Table below summarises the Rotorua District's community outcomes and how the Council contributes to these outcomes by providing waste management and minimisation services.

**Contribution to Community Outcomes**

<b>Community Outcome</b>	<b>How the Council Contributes</b>
Safe and Caring	By providing safe collection and disposal of refuse.
Environment	By encouraging waste reduction and minimisation. By looking after our air, land and water resource.
Facilities and Services	By providing good quality infrastructure for the future.
Learning	By providing waste minimisation education.

### 3. EXISTING WASTE MANAGEMENT AND MINIMISATION SERVICES

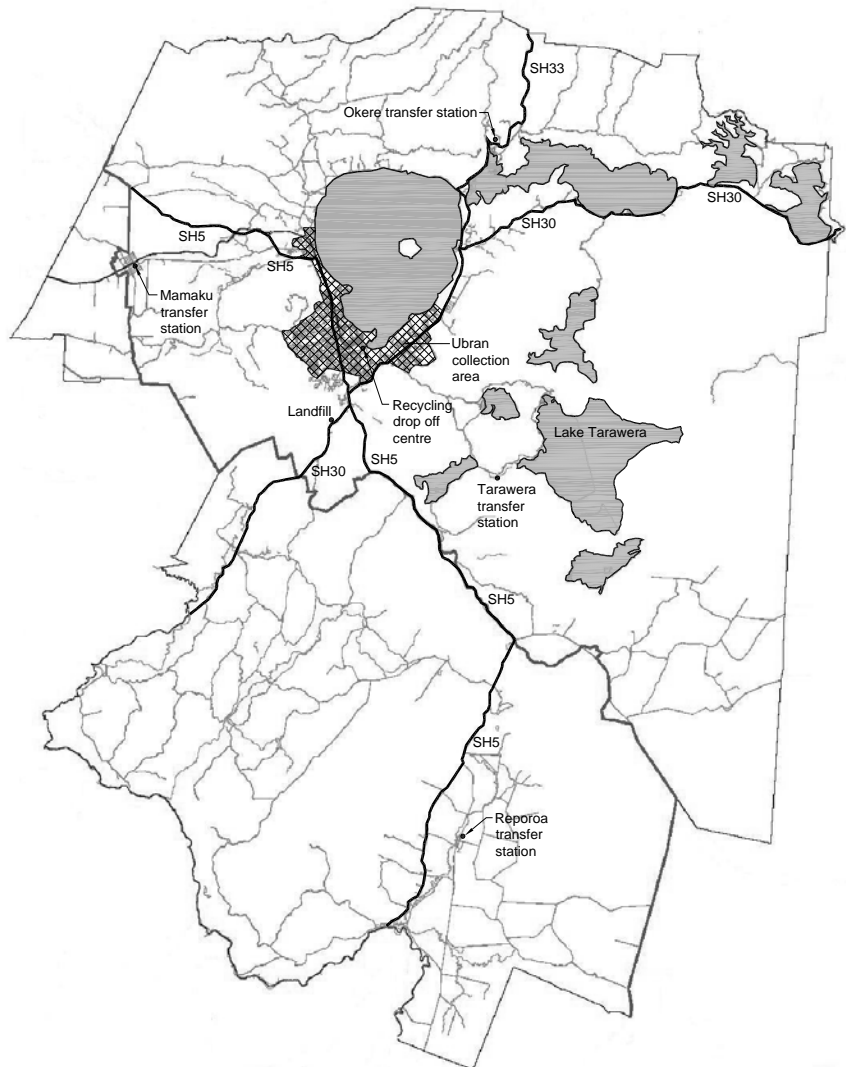
Existing waste management and minimisation services provided in the District are:

#### Council Provided Services:

- Atiamuri Landfill
  - Refuse disposal
  - Hazardous waste (residential)
  - Concrete crushing
  - Greenwaste
  - Recycling (metal, whiteware, tyres, recyclables etc)
- Rural transfer stations at Okere, Tarawera, Reporoa and Mamaku
- Recycling drop-off and processing facility
- Kerbside refuse collection
- Education programmes
- Cleaner Production (commercial sector initiative)

#### Private services include:

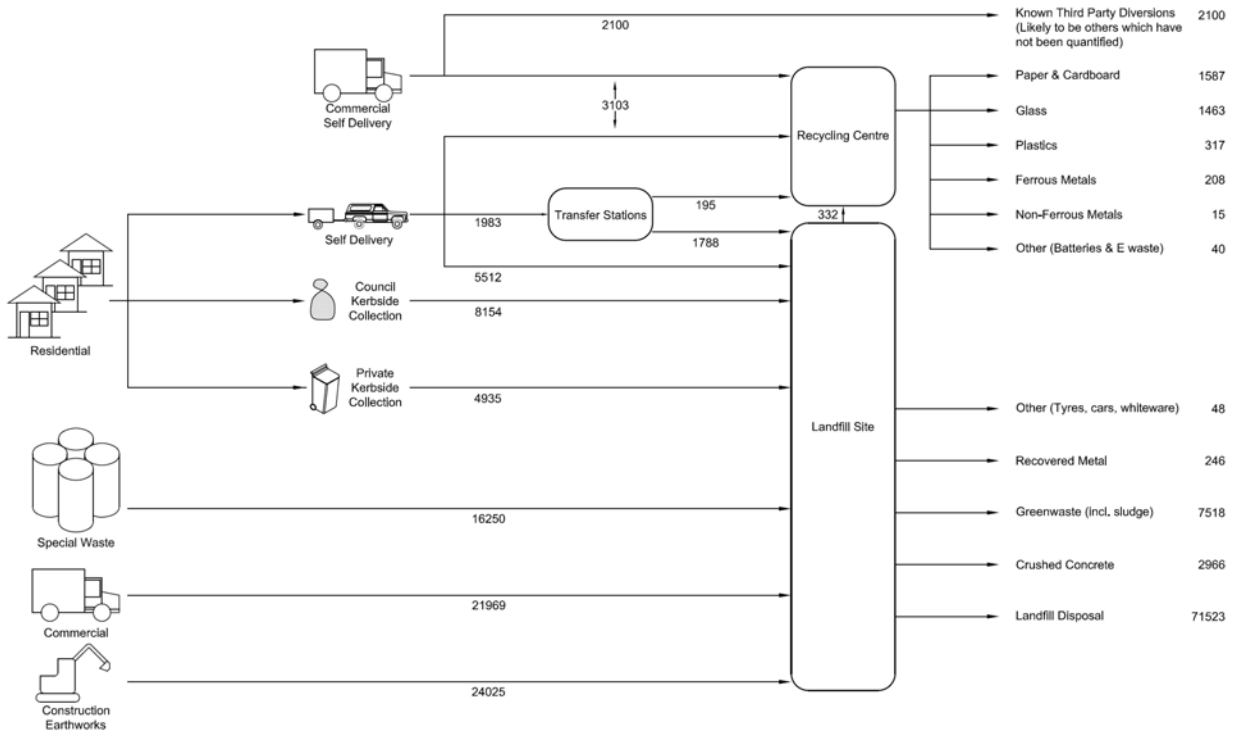
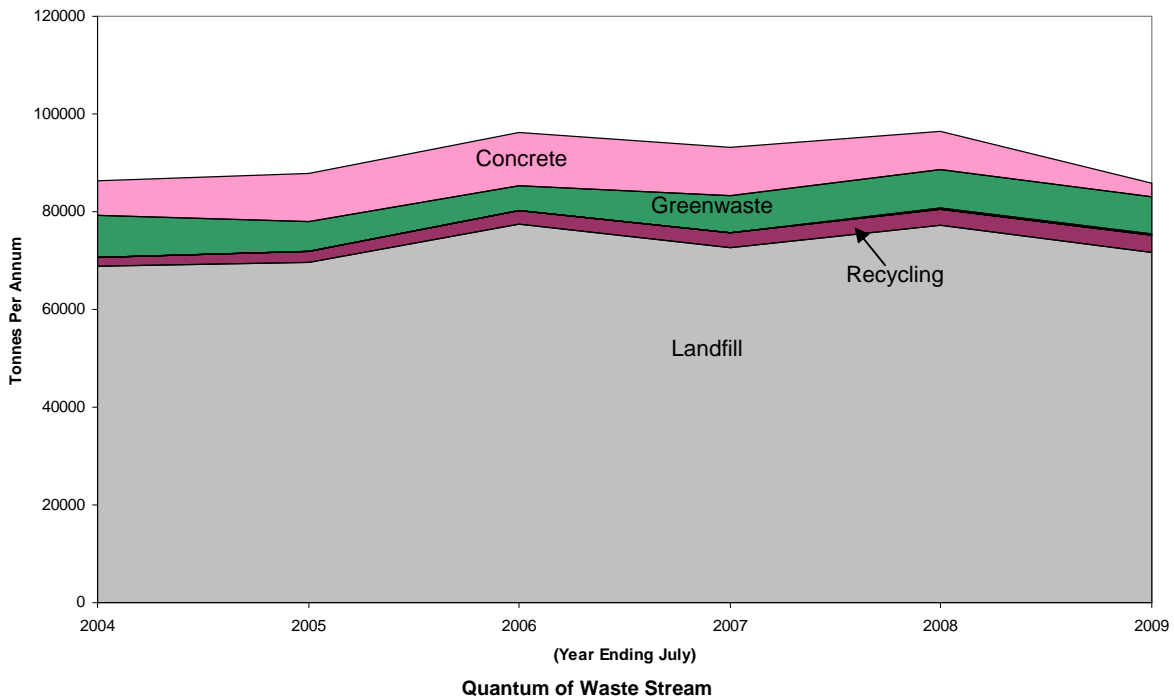
- Private kerbside refuse collection services
- Private greenwaste collection
- Private paper and cardboard collection (major commercial producers)
- Scrap metal dealers
- Timber and building materials recyclers
- Second-hand retailers



### 4. ASSESSMENT OF CURRENT AND FUTURE DEMAND

To assess future demand for services it is first necessary to benchmark the current level of waste generation, the composition of waste and the extent of existing waste diversion methods. The graph on the next page summarises the total quantum of the waste stream which is managed by Council. This includes all private operations which use any of the Council facilities (landfill, transfer station, greenwaste processing, concrete crushing or recycling drop off centre).

For the purpose of the waste assessment, the July 2008-June 2009 financial year data was adopted as the base year. For this year, a breakdown of the waste in terms of its source and destination was developed from the data available. This is summarised in the diagram on the following page. Based on the 2008 - 2009 year approximately 19% of the total waste stream is diverted from landfill.

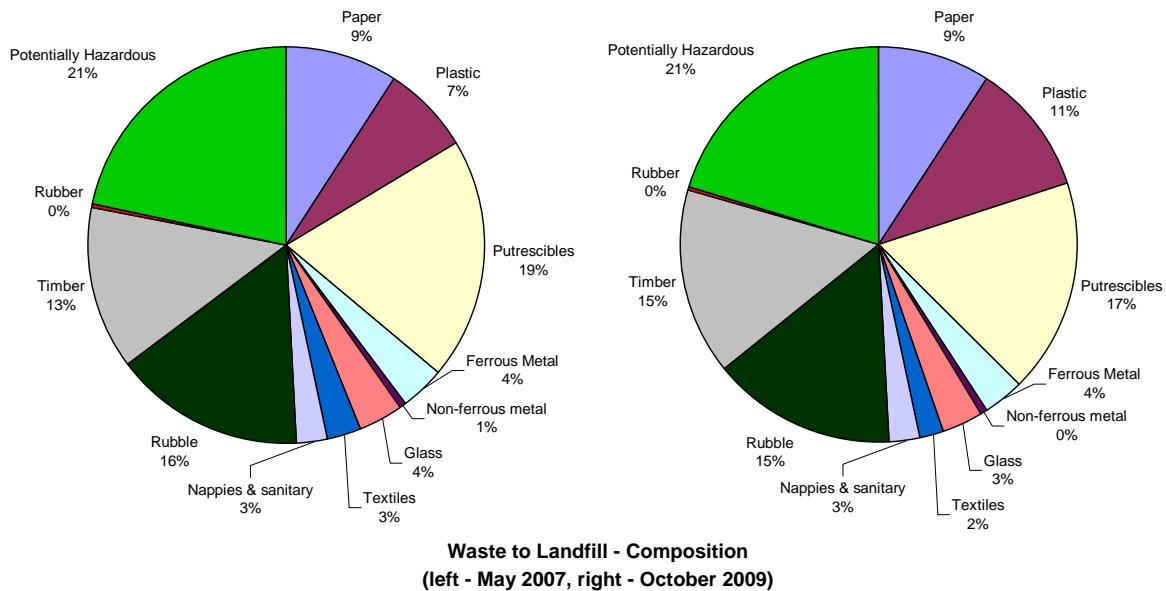


The estimated per capita waste generation in Rotorua is estimated at 1,000 kg/person/year which is above the national average of 780 kg/person/year. However, excluding cleanfill (which is often not taken to landfill in other communities) the per capita waste generation in Rotorua is estimated at 700-750 kg/person/year which is slightly lower than the national average.



## 4.1 WASTE COMPOSITION

The composition of waste received at the landfill was surveyed by Waste Not Consulting on behalf of the Council in 2007 and 2009. The pie charts below provides a comparison between the composition data for these surveys. There is no significant difference in composition between 2007 and 2009.



## 4.2 EXTENT OF WASTE DIVERSION

### Recyclables (Paper, Plastic, Metals, Glass)

From the known volumes of waste collected at the recycling centre and the composition data for waste entering the landfill, it is estimated that Council is currently capturing approximately 40% of the total recyclables in the domestic waste stream. This follows a sustained period of increased yield at the recycling centre which has seen a 309% increase in collected materials between 2002 and 2009.

The total recyclables currently recovered therefore equate to 145 kg per household in the district. This compares well with other communities, including those with kerbside recycling. Kerbside recycling rates depend on what method of collection is used, and while collection rates are often higher for some methods, the percentage of collected material which can be utilised may be lower due to contamination issues.

In the 2008-2009 year, 3,630 tonnes was recycled through the council's recycling services. A further 2,100 tonnes of paper and cardboard is known to have been recycled by private providers. In total, this equates to 80 kg/person/year recycled for the Rotorua District. Ministry for the Environment report the national average of recycling as 83 kg/person/year (2006 estimate).

### 4.2.1 Putrescible Waste Diversion

Currently, putrescibles are diverted via on-property diversion (eg composting, worm farms) or via delivery to the greenwaste facility at the landfill site.

The extent of on-property diversion is unknown. The Environmental Perceptions Survey in June 2006 found 62% of respondents say that they compost. This is similar to the 2002 survey results which found that 61% of respondents say that they compost. However, the extent to which people compost is unknown (ie do they compost all, or only a portion of, their greenwaste).

Approximately 6,500 tonnes of greenwaste is diverted each year by the Council's greenwaste processing facility. This represents just over 50% of the total greenwaste stream.

#### 4.2.2 Concrete and Asphalt Diversion

Currently, council provides facilities for diversion of concrete and asphalt via the crushing plant located at the landfill site. Concrete and asphalt are materials which are directly linked to the building and construction industry and therefore are likely to follow trends in economic and building patterns. In previous years, up to 10,000 tonnes per annum of concrete and asphalt has been diverted from landfill via the concrete and asphalt crushing facility. However, in 2008-2009 this fell to 3,000 tonnes per annum. This decrease did not correlate with an increase in cleanfill in the landfill and therefore is a result of downturn in the industry and/or increased recycling within the construction and demolition sector itself.

#### 4.3 FUTURE DEMAND

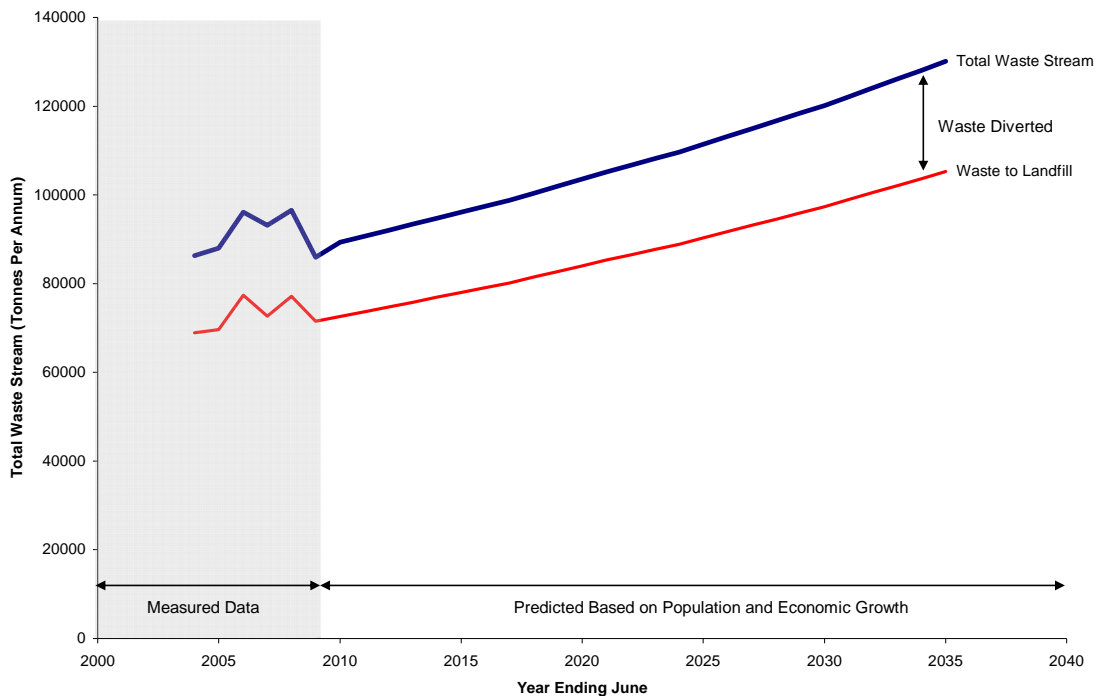
Future demand for waste services needs to be considered with respect to two issues:

1. Increase quantity of waste to be managed (either via diversion or residual disposal) due to increasing population and/or economic growth.
2. Increased demand for services and facilities to increase waste minimisation.

Both of these issues are considered in the Waste Assessment Report.

#### Population and Economic Growth Factors and Effect on Waste Quantities

Using predicted population growth values and allowance for economic growth in the region a prediction of waste generation has been made, assuming the same level of service delivery is provided by Council as is currently occurring. This prediction is shown in the graph below. The significant decrease in waste quantities in 2008-2009 is a result of a significant decrease in the amount of concrete and asphalt crushed. The graph below shows a 50% increase in the waste stream by 2035 if no further diversion or minimisation occurs.



**Predicted Total Waste Stream and Waste to Landfill with No New Initiatives  
(Assumes Status Quo Service Delivery)**

## **Demand for Increased Services**

Changes in demand for services (either in terms of capacity of service, or service type) in the future may result from extension of serviced areas; change in community expectations leading to additional services being provided; and legislative or national policy changes leading to additional services being required.

### ▪ Demand for Refuse Collection Services

Council currently provides a refuse collection service to the urban area, as well as along some rural roads. Council's annual surveys of ratepayers indicate a high level of satisfaction with the current service from those who receive that service. Within the serviced area, there is satisfaction with the refuse collection provided and little demand for a change in service provision and / or additional refuse collection services. Outside of the serviced area, the only area where there is some demand for a refuse collection service is the Waikite Valley area.

Demand arising in the future for extension to collection areas will be dependent on the development of rural areas. Council's policy with respect to provision of refuse services assumes that properties of more than 50 ha will dispose of refuse on site. If this assumption remains valid, it is considered that demand for extension to collection areas will arise where more intensive development (e.g. lifestyle blocks, rural-residential developments) are permitted.

### ▪ Demand for Waste Diversion Services

There is a low level of satisfaction with recycling services currently provided by Council when compared to national average and other provincial councils. The level of satisfaction is also significantly lower than the level of satisfaction with refuse collection services. The majority of the community consider that it is important to reduce waste. 80% of the respondents to the Environmental Perceptions survey use recycling services and 60% use composting to reduce their waste. Additional recycling services were seen as the main way that households can be encouraged to reduce their waste. This indicates a demand for additional recycling / diversion services, although this level of demand has not been tested in terms of willingness to pay for additional services.

### ▪ Demand Arising from Legislative or National Policy Changes

The Waste Minimisation Act, and the New Zealand Waste Strategy set out some targets which may affect the type or level of service which is provided by Council. In general these are:

- Naming of priority products and the requirement for a "Product Stewardship Scheme" to be developed for priority products. A Product Stewardship Scheme is normally operated by the manufacturers or distributors of the product.
- The Minister may set performance standards for territorial authorities. These may be set for all territorial authorities or for one or more territorial authorities only.
- The discussion document for the current review of the New Zealand Waste Strategy proposed a waste reduction target of a 20% reduction in per capita waste compared to 2010 levels to be achieved by 2015.

## **5. OPTIONS FOR MEETING FUTURE DEMAND**

### **5.1 WASTE COLLECTION & RESIDUAL DISPOSAL**

In terms of options for meeting future demand for waste collection and residual disposal, there are two considerations:

- Firstly, alternative collection methods to the current bagged collection
- Secondly, increased area for service provision.

At this stage, the only demand for an extension of the serviced area is from residents within the Waikite Valley area. Service provision to this area has been costed by the Council's business unit, Castlecorp, and Council is considering how this would affect rates both in the new collection area and across the district.

The Table below summarises the alternative collection mechanisms which have been considered.

Refuse Collection Options		
	Bag Collection (Current System)	Wheelie Bins
Description	Fixed number of bags provided. Users can purchase additional bags if required.	Council provides wheelie bin to users. Funding is via targeted rate.
Collection frequency	Weekly (unless a putrescible waste collection is provided, in which case fortnightly may be possible)	Weekly (unless a putrescible waste collection is provided, in which case fortnightly may be possible)
Collection method	Manual collection	Automated collection
Health and Safety	Potential issues with manual lifting, working on roads, unacceptable materials in bags	Issues associated with bag collection are prevented with automated collection
Effect on Waste Quantities	None - Status Quo situation. The limit on the number of supplied bags may encourage a degree of waste minimisation	Depending on the size, wheelie bins are unlikely to encourage waste minimisation.
Costs	\$1.87 million per annum	\$2.5 - 2.5 million per annum

The Council currently uses the Atiamuri Landfill site for residual disposal. There is sufficient space at the landfill to meet the future residual disposal needs for a further 20 years under the current resource consents and the current level of diversion. Landfill life can be increased if there is additional waste diversion or minimisation and with a variation to the existing resource consent to allow an increase in the final height of the landfill. As the current residual disposal facility provides sufficient life for the anticipated future demands, alternative residual disposal options have not been considered.

## 5.2 RECYCLABLE MATERIAL - MINIMISATION OPTIONS

The District Council currently provides recycling facilities via the recycling drop off centre in Te Ngae Road, Rotorua. Further facilities are provided at the Atiamuri Landfill and Council's transfer stations at Mamaku, Reporoa, Tarawera and Okere. In addition, there are some private recycling service providers who principally collect paper and cardboard from the commercial sector

Options for providing recyclable services are:

- Continue existing drop-off facilities
- Expand existing drop-off facilities (in terms of capacity and number of sites)
- Provide kerbside collection services
- No service provided

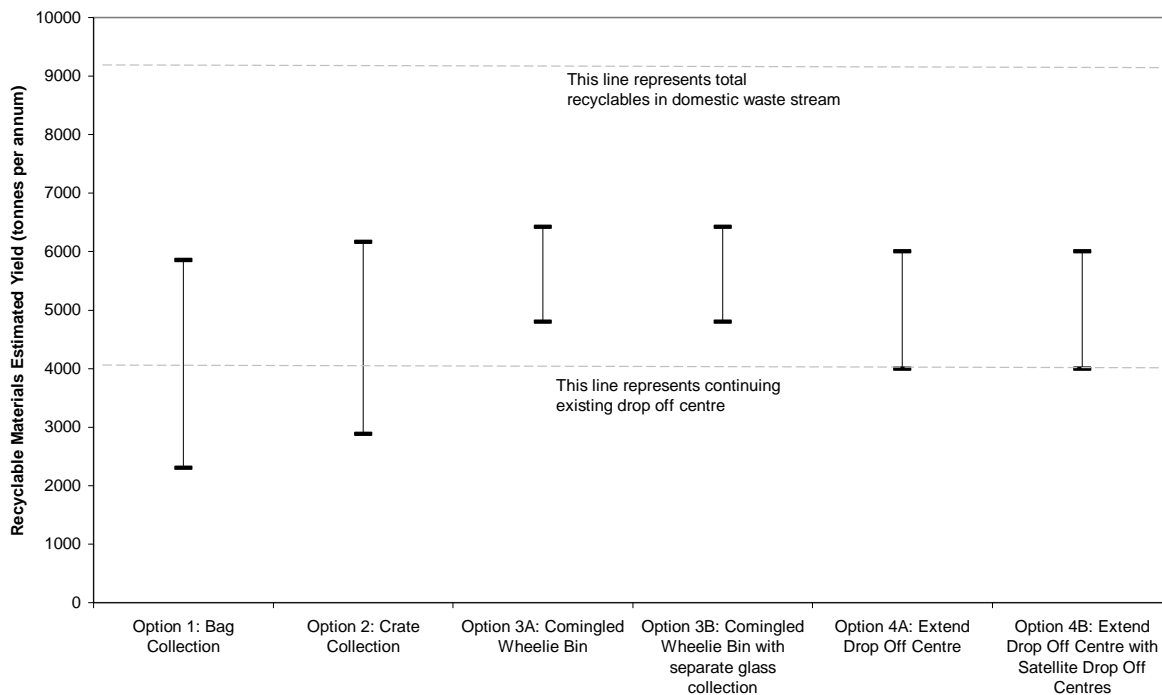
Key issues which have been considered in the assessment of recycling options are:

- Health and Safety - recycling industry is moving away from manual collection systems to automated methods, generally utilising wheelie bins
- Receptacle type – the type of receptacle used affects the amount of material collection and the general ease of use
- Contamination rates - some councils have reported high contamination rates, particularly with comingled wheelie bins which result in higher sorting costs and/or lower product yields. In some instances, contamination rates in the order of 15-30% have been reported for some co-mingled collection systems. Increasingly glass is collected separately to reduce contamination due to broken glass.
- Product markets - higher quality materials with low contamination rates generally fetch higher prices on the open market. Currently, the recycling drop off centre is able to achieve a very high level of product quality and, as a result, a premium price is achieved. Indications are that the sale price of the recyclable material would decrease significantly if contamination became a significant issue.

- Sorting facilities - depend greatly on method of collection whereby sophisticated machinery or long manual lines may be required for completely comingled recyclables, compared to basic sorting lines for materials sorted by householders.
- Overall diversion rate - Council is wanting to ensure that any new system would result in an overall increase in the total diversion rates.

The following options have been assessed in terms of materials recovery (yield), and costs with the results of this analysis shown in the graph and table below:

- Option 1 - Kerbside recycling with recyclables collected in bags (eg supermarket bags)
- Option 2 - Kerbside recycling with recyclables collected in plastic crates
- Option 3A - Kerbside recycling using comingled wheelie bin (all recyclables in 1 bin)
- Option 3B - Kerbside recycling using wheelie bins with separate glass collection (in crate/bag)
- Option 4A - Maintain existing level of service and facilities with no significant changes
- Option 4B - Expand existing recycling centre to increase capacity and improve traffic flow through the site. Provide an additional satellite recycling centre subject to an appropriate site being identified, secured and consented.



Recycling Options		
Option	Total Capital Costs	Total Operating Costs
1: Bag Kerbside	\$4.48 - 4.51 m	\$0.97 m
2: Crate Collection	\$4.68 - 5.72 m	\$1.00 m
3A: Comingled Wheelie Bin	\$10 - 11.6 m	\$1.77 m
3B: Wheelie bin with separate glass collection	\$5.45 - 6.76 m	\$1.19 m
4A: Existing Drop Off Centre	-	\$0.3 m
4B: Expand Drop Off Facilities	\$0.8 – 1.0 m	\$0.9 m

## 5.3 GREENWASTE AND PUTRESCIBLE WASTE - MINIMISATION OPTIONS

### Greenwaste Diversion Opportunities

The majority of greenwaste diverted to landfill is sourced from the commercial and industrial sector. This includes general commercial waste (excluding commercial kerbside collections), construction and demolition and landscaping and earthworks. The options for improving greenwaste diversion from landfill are:

- a. Continue with existing system and attempt to maximise diversion via promotion, education and strengthening of the differential pricing policy (ie greater differential between landfill and greenwaste disposal).
- b. Improved capture of greenwaste via bylaws requiring separation from all commercial operators
- c. Improved capture of greenwaste via greenwaste kerbside collection. Note: this may increase the amount of waste being managed by Council as those currently composting on site may choose to use kerbside collection.

It is considered that there are two processing options available:

1. Firstly, a continuation of the existing situation whereby a contractor is paid to shred and mulch the greenwaste at the landfill site. The greenwaste is transferred to the contractor's ownership. It is considered that the additional increase in greenwaste volumes could be accommodated on site, although additional shredding equipment may be necessary.
2. Secondly, Council's existing composting facility at the wastewater treatment plant could be used to produce compost. This plant is able to process approximately 10,000 tonnes per annum.

### Kitchen And Food Waste Diversion Options

The majority of kitchen and food waste received at the landfill is sourced from kerbside collections and commercial / industrial deliveries to the landfill.

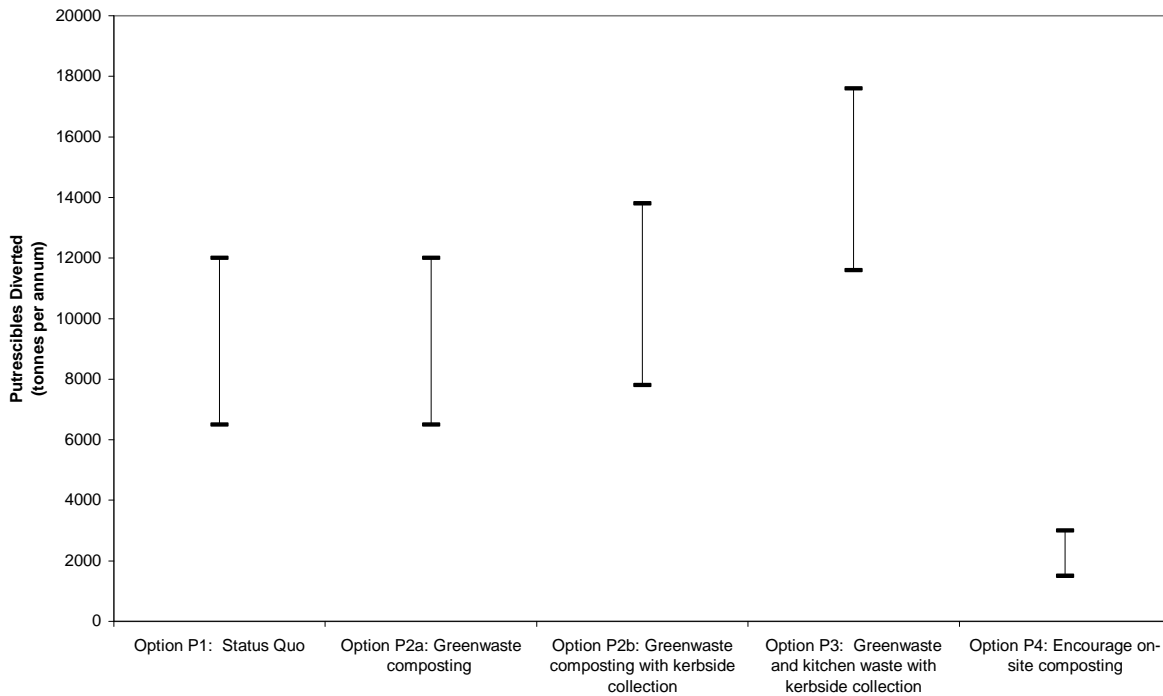
- 55% of kitchen and food waste received at the landfill is from kerbside collections (council and private collections)
- 39% of kitchen and food waste received at the landfill is from commercial and industrial self-delivery to the landfill.

### Options Considered

The options considered for putrescible waste diversion are as set out below.

- Option P1 - Status Quo system with the possibility of low cost initiatives to optimise yields to up to 12,000 tonnes/yr
- Option P2A - Increased use of composting facility at wastewater treatment plant. Yields would be as for Option P1.
- Option P2B - Utilise Council composting facility with addition of a kerbside collection of greenwaste (wheelie bin). Potential yields would be up to 13,800 tonnes/yr
- Option P3 - Composting of kitchen and greenwaste including a kerbside collection. This would utilise the existing composting facility but it would need to be expanded. Yields up to 17,600 tonnes/yr could be achieved.
- Option P4 - Encourage on-site composting, such as worm farms or other proprietary compost bins. Yields are highly variable depending on the participation rate of the community and costs depend completely on the level of financial assistance offered by Council.

The potential diversion effect and costs of these options are presented in the graph and table on the following page.



Putrescible Waste Options		
Option	Total Capital Costs	Total Operating Costs
P1: Status Quo	-	\$0.11 m
P2A: Greenwaste Composting with Self-Delivery	\$0 - 1.6 m	\$0.45 m
P2A: Greenwaste Composting with Kerbside Collection	\$1.7 - 4.2 m	\$1.35 m
P3: Kitchen and Greenwaste Composting	\$1.7 - 5.1 m	\$1.56
P4: Encourage On-Site Composting	\$0 - 0.9 m	-

#### 5.4 WASTE 2 GOLD PROJECT - MINIMISATION OPTION

Council is currently piloting a "Waste 2 Gold" project for management of their sewage sludge. The process involves wet oxidation to achieve partial breakdown of all forms of organic waste to produce acetic acids and remove nutrients. The acetic acid is intended to be recycled as a carbon source for the sewage treatment plant, but could also be used to produce biofuel. A pilot plant for treating sewage sludge is currently in construction. If this is successful, it is proposed to construct a full scale plant for sewage sludge processing. This full scale plant will then be run as a pilot plant for considering treatment of the solid waste stream.

##### Waste 2 Gold to treat Solid Waste

The Waste 2 Gold process will in theory process all organic material in the waste stream. This includes paper, greenwaste, kitchen waste, textiles, sanitary products, timber, and biosolids. Council has advised that the system could be used to treat the domestic kerbside refuse collection as a whole and would not require prior separation of the treatable organic portion from the inorganic portion of the waste stream. The process would convert the organic component of the waste stream to produce energy, bioplastics or biofuels. The residual inorganic component would then be disposed to landfill or separated into broad components (eg metals) for recovery. If a full scale system were to be feasible, it would likely be constructed at the existing landfill site.

The Waste 2 Gold system differs from the other options for waste minimisation as it does not require source separation of the different components of the waste stream. One of the major benefits of the Waste 2 Gold project is that it can treat all forms of organic waste in the waste stream, not just the green or kitchen components. Therefore, there would be no reason to encourage diversion of organic materials from the general waste stream if the Waste 2 Gold project were to proceed.

The diversion yield for the Waste 2 Gold option is:

- Stage 1: Sewage Sludge 9,400 tonnes per annum
- Stage 2: Treatment of all waste to landfill 30,900 tonnes per annum

At this stage, costs have only been estimated for the sewage sludge pilot plant operations. Estimates completed by Scion Ltd state that there is a net benefit (rather than cost) for processing waste via the Waste 2 Gold process. These estimates are yet to be confirmed for the full scale biosolids plant and it is unclear how they translate through to processing costs for the solid waste stream. For the purpose of the waste assessment, processing of waste via Waste 2 Gold process has been assumed to be a no cost item (ie no net cost and not net benefit)

## 5.5 CONSTRUCTION AND DEMOLITION WASTE - MINIMISATION OPTIONS

In terms of the SWAP analysis categories, construction and demolition waste comprises the following categories:

- Rubble 11,100 tonnes per annum to landfill (16 % of landfill)
- Timber 9,540 tonnes per annum to landfill (13% of landfill)

Currently, Council achieves a significant amount of C&D diversion via the concrete crushing plant located at the landfill site. Approximately 3,000 tonnes per annum is processed via the concrete crushing plant, however, this has been up to 10,000 tonnes per annum in the past.

Two options have been considered for construction and demolition waste removal:

- a. Encourage diversion of the "easily divertable" waste via communication and assistance to landfill users; differential pricing policy; and providing a place for storage of timber at the landfill site (which can then be made available for other users to collect, free of charge). This option would not involve any additional cost to Council, but could achieve an additional 900 - 1,000 tonnes per annum diversion.
- b. Require, via bylaw, that rubble and timber be diverted from landfill for all commercial and industrial users of the landfill. This could achieve an additional 10,000 tonnes per annum diversion, assuming that only 50% of the material is suitable for reuse. Such an increase is likely to require additional infrastructure at the landfill site to manage the increased quantities for diversion.

## 5.6 RESOURCE RECOVERY CENTRE

A resource recovery centre allows for the separation and collection of reusable or resaleable material prior to disposal to landfill. For Rotorua, there is already the makings of a resource recovery programme as a result of current diversion practices. A resource recovery centre is not likely to cause a significant increase in the amount of diversion, but could be developed to provide a "one-stop shop" for users. Such an approach allows for consistent branding across the diversion activities and could make diversion a more "user friendly" experience which would in turn, encourage some additional diversion. A potential layout for a resource recovery park - incorporating the existing activities - is being developed to enable a cost estimate to be undertaken.

## 5.7 EDUCATION AND PROMOTION OF WASTE MINIMISATION

Council currently undertakes a number of education and promotion programmes for promoting waste minimisation to the wider public. Such programmes are critical to the success of any of the waste minimisation options which have been presented in the waste assessment report. It is recommended that these programmes continue and, where budget provisions allow, be expanded.



## 6. ASSESSMENT OF OPTIONS

To assess the suitability of each option, a number of assessment factors have been developed. All factors have been expressed on a 1 to 5 scale with scoring of different options for a particular waste type relative to each other. For example, the least preferable option for a particular assessment factor will receive a '1' score while the most preferable option for a particular assessment factor will receive a '5' score. The scoring system only considers the portion of a products life-cycle for which the Council has control.

The assessment factors are set out below. Combined, the assessment factors cover environmental, economic and social/cultural factors. As such, the assessment is considered to provide an indication of the relative sustainability of each option.

- **Waste Minimisation Effect**  
This factor relates solely to the amount of material diverted from the landfill.
- **Beneficial Reuse of Material.**  
This factor considers the ability of the option to beneficially reuse the otherwise waste material. For example, a high quality, nutrient rich compost product will receive a higher score than a low grade mulch.
- **Transportation Requirements**  
This factor considers the transportation requirements for collection of waste materials. For example, systems requiring multiple trucks for collection will be scored lower than options not requiring additional collection vehicles.
- **Cost of Service**  
This factor is self explanatory
- **Convenience / User Acceptability**  
This factor considers the convenience of the system for the end user. Options which make it as easy as possible for users to divert material are scored highest.
- **User Accountability**  
This factor considers whether the system is a "put out and forget" system where the user does not have to consider the effects of their waste generated; or whether a system requires the user to take accountability for their waste generation.
- **Risks**  
This factor considers whether the option is high or low risk. Risks include for example, volatility of market prices for recyclable materials; risk of contamination.

The Table over the page provides the assessment scoring of the options included in the Waste Assessment Report. Preferred options in each of the different components of the waste stream are highlighted.

Waste Type	Option	Treatment / Processing	End Use	Delivery Mechanism		Assessment				Overall Score				
				Domestic Serviced	Domestic Unserviced	Commercial / Industrial	Waste Minimisation Effect	Beneficial Re-use of Material	Transportation Requirements		Cost of Service	Convenience / user acceptability	User accountability	Risks
Organic Waste	Status Quo	Shredding	Mulch	Self-delivery	Self-delivery	Self-delivery	2	1	5	4	2	4	22	
	Composting at Council facility	Composting	Medium grade compost	Self-delivery	Self-delivery	Self-delivery	2	3	5	3	2	4	23	
	Kitchen and Greenwaste	Composting	Medium-high grade compost	Kerbside Collection	Self-delivery	Self-delivery	3	3	2	1	5	2	20	
	Encourage on Site Composting	Composting / Vermiculture	Medium grade compost	n/a	n/a	n/a	1	3	5	4	2	5	21	
	Waste 2 Gold	Wet oxidation	Biofuels, bioplastics, energy	Refuse collection	Self-delivery	Self-delivery	5	5	5	5	5	1	3	29
Biosolids	Waste 2 Gold	Wet oxidation	Biofuels, bioplastics, energy	n/a	n/a	n/a	5	5	5	5	5	1	3	29
Recyclable Material	Existing drop off centre	Self sorting by users	High quality recyclable product	Self-delivery	Self-delivery	Self-delivery	2	5	3	5	2	4	5	26
	Expand drop off centre(s)	Self sorting by users	High quality recyclable product	Self-delivery	Self-delivery	Self-delivery	3	5	3	4	3	4	5	27
	Bag Collection +drop off centre	Manual or semi-automatic sorting	Medium quality recyclable product	Kerbside Collection	Self-delivery	Self-delivery	2	4	2	3	4	3	4	22
	Crate collection +drop off centre	Semi-automatic sorting line	Medium - Low quality product	Kerbside Collection	Self-delivery	Self-delivery	3	2	1	3	4	2	3	18
	Wheelle bin collection +drop off	Fully automated sorting line	Low quality recyclable product	Kerbside Collection	Self-delivery	Self-delivery	4	2	1	1	1	5	2	17
C&D	Status Quo	Crushing plant	Construction materials	Self-delivery	Self-delivery	Self-delivery	3	5	5	5	3	4	3	28
	Skip Bins for Commercial Users	Crushing plant	Construction materials	Self-delivery	Self-delivery	Collection	4	5	4	4	4	4	3	28
	Bylaws / Regulatory Mechanism	Crushing plant	Construction materials	Self-delivery	Self-delivery	Self-delivery	5	5	5	3	2	4	3	27
Reusable Goods	Resource Recovery Park	Repair and resale	Reuse	Self-delivery	Self-delivery	Self-delivery	3	5	3	3	4	4	3	25
	Second Hand Sundays	Resale / gifting	Reuse	n/a	n/a	n/a	2	5	5	5	2	4	5	28

## 6.1 PREFERRED OPTIONS

Based on the assessment presented above, the preferred options for meeting current and future demand for waste management and minimisation are:

- Waste 2 Gold project for organic wastes. It is noted that this project remains in the early stages and the techniques are still to be demonstrated at pilot plant level for both biosolids and solid waste streams. However, if the pilot plant processes confirm the feasibility and economic performance of the Waste 2 Gold project, this process will result in significant waste minimisation achievements while being economically sustainable. Maximisation of the benefits of Waste 2 Gold for the solid waste stream relies on not separating out greenwaste from the general waste stream. For this reason, it is recommended that the status quo situation (of providing separate greenwaste facilities at the landfill site) for greenwaste continue until a final decision on the feasibility of Waste 2 Gold for the solid waste stream is made.
- Expansion of the recycling drop off facilities for diversion of recyclable material. This notwithstanding, it is recognised that there has been community feedback in support of a kerbside recycling service, and it is recommended that community consultation on a potential kerbside service be carried out. Such consultation will confirm the level of willingness to pay for the convenience of a kerbside collection service.
- Maintain the existing concrete and asphalt crushing service. Further increases in the amount of material diverted are achievable with further promotion of the facility, particularly encouraging users with easily divertable loads upon entry to the landfill site.

## 7. COUNCIL'S ROLE IN PROVIDING SERVICES

The role of the Council in providing services is influenced by three key Acts, namely Waste Minimisation Act 2008; Local Government Act 2002; and Health Act 1956. Section 42 of the Waste Minimisation Act states "A territorial authority must promote effective and efficient waste management and minimisation within its district." The Act does not dictate what territorial authorities role in waste management and minimisation should be, but rather it places an onus on the Council to inform its community as to how services will be delivered and what its role will be.

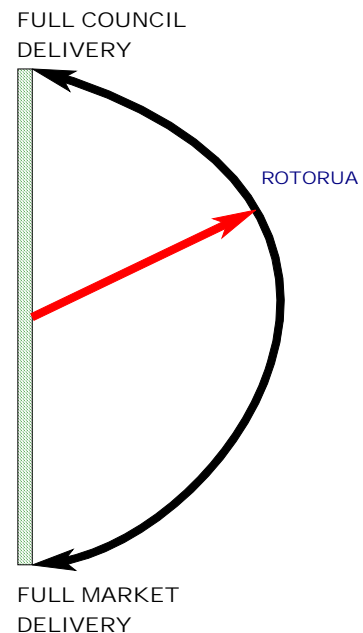
The role of the Council can be pitched at any point along a spectrum from full control, to a laissez-faire approach. At one end of the spectrum, all the services are delivered by the Council and at the other end all of the services are market delivered. This can be represented diagrammatically in the figure to the right.

A full Council delivered model means that the Council provides all the resources and equipment necessary to undertake collection, recycling, diversion, composting and residual disposal. The key risks with this model is that unless the scale of the operation achieves critical mass, it is likely that the:

- Services being provided do not generate best value-least cost outcomes
- Waste diversion and waste minimisation outcomes are unlikely to be optimised
- Access to markets for recovered or recycled products is volatile or unpredictable.

On the other hand, the full market delivered model relies on the private sector to provide all of the infrastructure and services sought. The key risks with this model are that:

- The market will only provide services that are "profitable"
- Where insufficient competition exists the costs to "customers" will become unsustainable
- Changes in market conditions may result in services being suddenly discontinued.



The majority of territorial authorities outside the major metropolitan centres do not have the critical mass to pursue strategies at either end of the spectrum. Instead they have adopted a "mix and match" strategy to develop solutions structured to their individual communities and the community's ability to pay. In Rotorua's situation, it is considered that the best value-least cost outcomes will be achieved by:

- Continuing to undertake the refuse collection using contracted services. This includes all aspects of the current litter collection and removal of illegal dumping
- Providing and maintain recycling drop off centres as the most effective and efficient means of recycling
- Expanding the existing recycling drop off centre to increase capacity and improve traffic flows
- Providing a satellite recycling drop off centre
- Continuing to provide and manage a greenwaste operation until such time that the Waste 2 Gold project is confirmed as viable and becomes operational
- Committing to reassessing the viability of a kerbside kitchen / greenwaste collection if the Waste 2 Gold project is not implemented
- Continuing with the provision of facilities for crushing the concrete component of C&D waste and providing additional facilities for the separation and reuse of other C&D products at the existing landfill site.

Summary of Council's Intended Service Provision				
Service	Service Delivery Manager	Service Provider	Rationale	Flexibility to meet future demand
Residential refuse collection	Council	Contractor	Public health issues managed	✓
Recycling drop off centre(s)	Council	Contractor	Quality control of product forwarded for processing	✓
Composting	Council	Contractor	Diversion from residual waste stream	✓
C&D - concrete crushing and separation for reuse	Council	Contractor	Diversion from residual waste stream	✓

### Protection of Public Health

The existing refuse collection will continue on a weekly basis to all properties which are currently serviced. The Council will continue to consider requests for extension of this service and will extend the service where there is a support from the residents for this extension and the service can be provided in a cost effective manner. The Council will also continue to provide litter collection services, refuse bins in public spaces and clean up, investigation and, where appropriate, prosecution of instances of illegal dumping. Residual disposal is achieved via the fully engineered and consented Atiamuri Landfill. There is sufficient landfill space remaining to provide for the expected future demand for residual disposal. The Council's waste minimisation efforts will further assist to extend landfill life. It is therefore considered that the proposed activities adequately protect public health.

### Promotion of Effective and Efficient Waste Management and Minimisation

The Waste Assessment report has assessed options for the predicted future demand for waste management and minimisation services. These options have been assessed in terms of the Waste Minimisation Effect; Beneficial Reuse of Material; Transportation Requirements; Cost of Service; Convenience / User Acceptability; User Accountability; and Risks. The options which are recommended are those which are assessed as most preferable in accordance with the above factors. Therefore, it is considered that the recommended proposals promote effective and efficient waste management and minimisation.