KATE VALLEY LANDFILL

TRANSWASTE CANTERBURY

Welcome to the Kate Valley Landfill, the most comprehensively engineered waste management facility in the South Island of New Zealand. The 37-hectare site was designed and operates to the highest international standards, fully compliant with New Zealand landfill guidelines and the US Environmental Protection Agency and European Union standards for municipal waste landfills.

The design and operation of the Kate Valley Landfill addresses all the known environmental risks and concerns. In addition to being built on impermeable siltstone, the Landfill has a multi-layered liner that completely seals the base and sides of the Landfill.

The use of containerised waste transport has made waste handling safer and cleaner, and enabled more efficient unloading and disposing of waste within the Landfill. The choice of site even inspired an ambitious project to regenerate a coastal native forest at the adjacent Tiromoana Bush.

Read on to learn more about how the Landfill was constructed, how the environmental impacts are managed, the innovative use of containerised waste transport, safety, community engagement and the native forest regeneration project in Tiromoana Bush.

First … a short history of the Kate Valley Landfill

In 1996 Canterbury councils formed a joint committee to plan for managing the region's waste. The councils recognised that by working together and in partnership with private sector expertise they could develop a modern well-engineered landfill to the highest international standards to provide environmentally responsible waste management for the future.

Transwaste Canterbury Ltd is the name of the joint venture that owns and operates the Landfill. The public sector partners in the joint venture are Christchurch City Council and the District Councils of Ashburton, Hurunui, Selwyn and Waimakariri. The private sector partner is Waste Management NZ Ltd, the largest private waste company in New Zealand.

Transwaste began the search for a suitable location for a regional landfill. Kate Valley in the Waipara area of Hurunui District was chosen because of the underlying geology. Beneath the valley is a low permeable material called Tokama Siltstone. Low permeability simply means water can't soak through the ground. The land was purchased and the process began to secure the necessary resource consents to operate the Landfill. By March 2004 the resource consents had been granted and construction of the Landfill commenced. Over the next 14 months roads were upgraded or constructed and over 1.5 million cubic metres of soil and rock shifted to create the new Kate Valley Landfill that received the first waste in June 2005 on time and on budget.

Constructing the Landfill

Kate Valley was chosen for the Landfill because beneath the topsoil is a layer of a low permeable material called Tokama Siltstone that extends down to depths of 200 metres. With no known aquifers beneath the site the potential for water from within the Landfill mixing with groundwater is non-existent.

Even with excellent ground conditions providing natural containment, a multi-layered synthetic liner is used in the Landfill. Construction begins with shaping and compacting the siltstone to form a smooth natural liner. The synthetic liner is laid on top of this surface. It consists of upper and lower layers of high-density polyethylene, on either side of a layer of geo-synthetic clay lining. On top of this liner is placed a 10mm thick fabric layer to protect the liner. Then a 500mm permeable gravel leachate drainage blanket is applied on top of the liner to allow the flow of leachate out of the Landfill (see section below). Finally 3 metres of uncompacted waste are laid on top to further cushion the liners. Together these liners and layers provide Kate Valley Landfill with a containment system superior to the standards used in both the European Union and the USA for municipal waste landfills.

Managing the environmental impacts

Water management

Rainwater that falls onto the working areas of the Landfill soaks into the refuse and becomes part of the leachate that is collected and drained away. However, most of the rainfall on the site is channeled through a series of surface drains to a sedimentation pond about 300 metres downstream in the Kate Valley. Here the sediments carried by the rainwater settle before the water is released to flow down to the water supply pond about half a kilometre down stream. The supply pond water is used for dust control around the Landfill, and to maintain a year round water flow into the Kate Pond wetlands in Tiromoana Bush.

Leachate

Leachate is the liquid created by decomposition of organic material in the Landfill and rainfall. Leachate runs through the waste to a drainage blanket on top of the Landfill liner. From there the leachate flows through a system of collection pipes to a sump. At the sump the leachate is pumped out into storage tanks, where the organic matter in the leachate settles. From these tanks the leachate can either be used for surface irrigation on top of the Landfill, or can be injected back into the waste stockpile, where the rubbish may absorb some of it. This process can enhance the decomposition process creating landfill gas for electricity generation. If volumes get too great within the Landfill, it is sent for treatment at the Bromley sewage treatment plant in Christchurch.

Gas and electricity generation

Decomposing organic material in the Landfill produces gas, predominantly methane. To prevent methane, a greenhouse gas, escaping into the environment it is collected by a network of pipes and used as fuel to drive generators to produce electricity for the national power grid. At the end of 2014 two generators were installed producing about 2MW of electricity. Two more generators installed in July 2019 doubled the electricity production to 4MW. Any surplus gas is destroyed in a high temperature flare.

How the Kate Valley Landfill operates

… containerised transport is truly innovative

Waste is transported to the Kate Valley Landfill in sealed containerised trucks. This has many benefits for the community, safety and the operation of the Landfill. Sealed containers prevent waste escaping in transit and littering the roadside. Containers are only collected from partner councils' waste transfer stations when they are full, reducing unnecessary journeys and ensuring efficient use of trucks and containers. Arriving at the Landfill authorised waste haulage vehicles pass over a weighbridge to weigh in and receive acceptance of their load. Vehicle movements are recorded to monitor compliance with resource consent requirements and allocate waste to a location within the Landfill.

From the weighbridge vehicles proceed to a container park located alongside the Landfill. Here trucks unload their sealed full containers and collect empty containers, without having to enter the Landfill or leave the sealed road surface. This keeps vehicles clean and ensures a fast and efficient turn around. Specialised off-road tipper trucks collect the full containers and unload them in the Landfill. The waste is spread out, inspected and compacted using a 55-tonne compacter to ensure minimal space is used. Local soils are spread daily over compacted waste to prevent odours, rainwater infiltration, windblown litter and scavenging from birds and rodents. Regular monitoring reveals few pest problems, and no seagulls despite the close proximity to the coast.

Separating waste transport from the Landfill operations has many benefits. It ensures transport trucks spend very little time at the Landfill, as there's no waiting to unload waste. With a smaller number of dedicated vehicles unloading waste containers it's much safer and more efficient than every vehicle unloading waste in the Landfill. The system avoids disruptions at transfer stations when the Landfill is closed due to high winds or very wet conditions, as trucks can still collect and deliver full containers to the Landfill. Transport of waste can occur seven days a week, over longer hours than the Landfill operates increasing the efficiency of waste transportation in Canterbury without adverse effects on the operation of the Landfill.

This is a safe place to work and visit

Since the Kate Valley Landfill opened there have been no serious injuries to staff or visitors. That's because both the Board, and Waste Management NZ Ltd who has the contract to operate the Landfill, place great importance on the day-to-day implementation of health and safety policies and practices. The Board receives a detailed Health and Safety report from Waste Management each month.

We'll continue to manage the Landfill for years to come

The Kate Valley Landfill is consented to operate until 2040, 35 years after it opened in 2005. Thereafter Transwaste will continue a programme of aftercare for a further 30 years, monitoring and managing the site until waste decomposition processes, such as the production of methane gas, have finished. The Landfill will be grassed and planted and used for conservation and recreation.

CONSERVATION
INTRODUCING TIROMOANA BUSH

Before people arrived in New Zealand, lowland coastal forest covered the hills surrounding the Kate Valley Landfill in the Waipara area of Hurunui District. After some 700 years of human settlement, only a few remnants of the original forest remain. Transwaste, who wanted to develop the Landfill, put forward an ambitious plan in their resource consent application to regenerate the bush and open it for public access. Consent was granted to Transwaste on the basis it would protect, restore and manage a 407-hectare Conservation Management Area, called Tiromoana Bush.

Dr David Norton, a professor at the University of Canterbury's Te Kura Ngahere | School of Forestry, was contracted to prepare *The Tiromoana Bush Restoration Management Plan* in 2004 which was updated in 2012 and 2017. The Plans have recommended removal of sheep and cattle, exclusion of deer and pigs, an annual programme of planting, control of mammal predators (possums, stoats, and rodents) and biodiversity monitoring, as well as development of the walking tracks and associated interpretation.

The site is protected in perpetuity by a QEII National Trust Open Space Covenant. A 20-kilometre deer fence was built and approximately 1 hectare of restoration planting takes place each year. Regular monitoring and photographing of vegetation and landscape, birds and animal pests enables progress to be assessed. 177 native plants and 22 native bird species have been recorded. Examples of successful plantings include Kahikatea planted in 2006 around Kate Pond that grew 4-5 metres in height within 13 years. Mammalian predators are now controlled on a regular basis.

Rainwater and runoff is collected at the Landfill and filtered before being released into the Kate Stream that runs into Kate Pond. By managing the water flow year-round the wetlands have grown to 12 hectares in size and now support a wide variety of birdlife.

Transwaste will continue to fund the restoration and maintenance work during the operational life of the Landfill. After the Landfill has closed revenue from forestry activity will provide a sustainable source of funding for future restoration and maintenance work at Tiromoana Bush. More information about the restoration project is on the website

tiromoanabush.nz

Tiromoana Walkways

Walking tracks by regenerating bush and wetlands were constructed in 2006 and extended in 2017/2018. The bush is open year round, only closing at times of high fire risk. A walkways brochure with a detailed map of the tracks, lookouts, picnic spots, toilets and beach access is available.

tiromoanawalkways.nz

We support our local community

The Kate Valley Landfill Community Trust was set up to fund charitable and community activities in the local community. Transwaste makes yearly contributions to the Trust based on the annual volume of waste. Since 2005 the Trust has given over $1 million to groups and projects in the Amberley – Waipara area.

Want to know more?

For more information contact us or visit our website

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www.transwastecanterbury.co.nz

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