

Mei Te Vai Ki Te Vai

Restoring the Health of Our Lagoons

About land-based wastewater disposal

The Mei Te Vai Ki Te Vai project management unit (PMU) has completed environmental investigations confirming the need for new reticulated wastewater infrastructure in Muri. This new infrastructure will service the sensitive coral sands area in Muri where more intensive development has occurred – this will help restore the health of the lagoon.

We have identified options for this new infrastructure – both options involve constructing a wastewater treatment plant to treat effluent to a ‘secondary’ level.



We're looking at two possible ways to dispose of treated wastewater – either onto land, or into the ocean. **This guide explains the land-based disposal option.**

What is 'secondary treatment'?

Secondary treatment is an additional stage of wastewater treatment after 'pre-treatment' and 'primary treatment'. It uses a biological process to digest and remove dissolved organic matter from wastewater. Pre-treatment removes any large solids from the wastewater. Primary treatment removes smaller solid particles, usually through settlement in a pond or tank. Both pre-treatment and primary treatment improve the quality of the wastewater significantly. Secondary treatment uses a biological process to digest and remove dissolved organic matter from wastewater.

What is land-based disposal?

Land-based disposal involves either spraying treated wastewater onto land using an irrigation system, or drip-feeding it beneath the soil using irrigation pipes. The PMU has concluded that the sub-soil drip-feed option is more suitable for Rarotonga.

Land disposal enables plants to reuse the remaining nutrients in treated wastewater, and the soil has a natural ability to filter out pathogens. A well-designed system enables pathogens to decay within the ground, preventing them from getting into streams or aquifers. A wide range of plants can be grown on the land being fed by the treated wastewater. Land use options include golf courses, trees, and farming certain crops that absorb nutrients.

How much land does it use?

Land-based disposal for a new reticulated wastewater system for the developed Muri coastal area will need a total of 18 hectares (44.5 acres) of land:

1. About 2 hectares (5 acres) for the treatment plant, and
2. At least 16 hectares (39.5 acres) for drip-feeding treated wastewater into the soil

If other areas around Rarotonga need to be connected to the system in future, more land would be needed.

What kind of land can be used?

Whether land is suitable or not depends on a combination of things such as slope, distance from the treatment system, soil type and rainfall. Initially, some land will be needed in the Muri area. The PMU is very keen to hear from anyone who has land they can offer to the project, and will assess any land offered to see if it is suitable.

How might it affect our environment and community?

- The system re-uses both nutrients and water, which support plant growth, so it could promote sustainable crop production
- Land disposal needs a large area of flat to rolling land, which would need to be acquired or leased. Once the system is running, the land can only be used for certain uses
- Public health risks are low for subsoil systems, and the land is even suitable for growing some food crops
- There is potential income from crop farming (if adopted), but also an ongoing need for local people to manage these crops
- If it's not operated and maintained regularly and properly, the system could fail. This could cause unplanned discharges and/or unpleasant effects like odour
- Rarotonga may not be able to operate and maintain the system without support from overseas.

Land disposal is used successfully in places around the world

Below are two relevant examples of successful subsoil drip-feed systems in New Zealand.

Omaha, Auckland, New Zealand



This system was installed in Omaha, a coastal community, in 1989, and upgraded in 2002. It distributes treated tertiary treated wastewater over about 20 hectares of land – a combination of spray irrigation in a tree plantation and subsurface drip in the golf course. This project supports growth in a sandy coastal area, and helps manage wastewater in an area where seasonal changes make wastewater management challenging.

Above: Omaha Golf Course – the greener areas are being fed by the wastewater system

Pauanui, Coromandel, New Zealand



This system was installed in Pauanui, a coastal community, in 2009. It distributes tertiary treated waste using a subsurface drip system over a combination of parks, planted road median strips and a grassed air field. Located on a thin spit of sand, the area's population fluctuates due to holiday visitors. As some of its drinking water supply is drawn from shallow bores, the system had to be carefully designed to prevent contamination.

Left: Road median strips in Pauanui, fed by the wastewater system