



WASTEWATER MANAGEMENT - CASE STUDY

Furneaux Lodge – Marlborough Sounds

Apart from being in a stunning area, Furneaux Lodge is an historic landmark at the top of Endeavour Inlet, Marlborough Sounds. This area is renowned for the native bush, the beautiful mountains and pristine waters. It was critical that the activities surrounding the facility did not impact on this important environment.

The owners recognised this and also the fact that the operations of this facility were highly seasonal. Therefore, the Advantex™ Recirculating Textile Packed Bed Reactor was identified as the method most suited to achieve the goals of this project.



Figure 1. Furneaux Lodge – Aerial view of the lodge and Endeavour Inlet.

In addition, this facility is only accessible by sea and has a very limited land area that is available for the utilities.

Using this set of criteria Innoflow Technologies NZ Ltd. (ITNZL) designed, produced and installed a wastewater management solution that met with the owner's high requirements, the council's strict resource consent conditions and the customer's high expectations from this facility.

The solution in this case was the use of Septic Tanks fitted with a Biotube® Effluent Filter gravity feeding to a Recirculating Textile Packed Bed Reactor (rtPBR) discharging through a UV Sterilisation unit to a constructed outfall deep in the ocean.

The following pages detail the system components and technical specifications. Also shown are the expected and required performance figures for this wastewater management system.

**Table 1. Design Constraints**

Constraint	Solution	Comment
Limited area for treatment plant	Utilise very small footprint of the Textile rPBR	The Textile Pods were configured specifically to meet site requirements
Access to site by sea only	Advantex™ Textile Pods did not present a problem to transport	The rtPBR process also has very low biosolids production meaning reduced costs for removal off site
Highly seasonal usage	Use rtPBR process designed for peak loading	The rtPBR process has a 100% turn-down ratio providing consistent performance under fluctuating loads
No area for disposal	UV disinfection and discharge to sea	A very high level of treatment was required to allow this option. The rtPBR process is proven under these conditions
Power supply limited	Utilise small kW pumps and UV Sterilisation	The pump starts are staggered and only run intermittently. The dosing frequency can be varied with the seasons
Remote location, limited onsite technical support	Use PBR process with programmable control system	Low operation and maintenance requirements for this process assist simple management of the system

**Figure 2. A low visual impact was important for this installation.**

**Table 2. Treatment System Performance**

Parameter	Required Value*	Expected Performance
BOD ₅	N/a	< 10 mg/ltr consistently
Suspended Solids	< 10 mg/ltr	< 10 mg/ltr consistently
Faecal Coliforms	< 1000 MPN per 100 mls	~ 200 MPN per 100 mls

* These figures are the set values in the Coastal Permit for this project issued by the Marlborough District Council

**Figure 3. Installing the tanks.**

The logistics of getting two companies, all of the equipment, 24 pods, 3 tanks, various heavy machinery and some aggregates to this site were interesting.

A lot of care was taken not to impact on the shoreline or the facility itself.

It was also important to achieve the installation within a specific time frame and ensure that the finished product did not detract from the surroundings.

The low footprint of the Advantex[™] rtPBR pods and flexibility in the arrangement of the units lent itself well to a customised installation such as this.

With a low visual impact, no noise and no odours produced from them it was not a problem to install the units along the rear of the chalets.

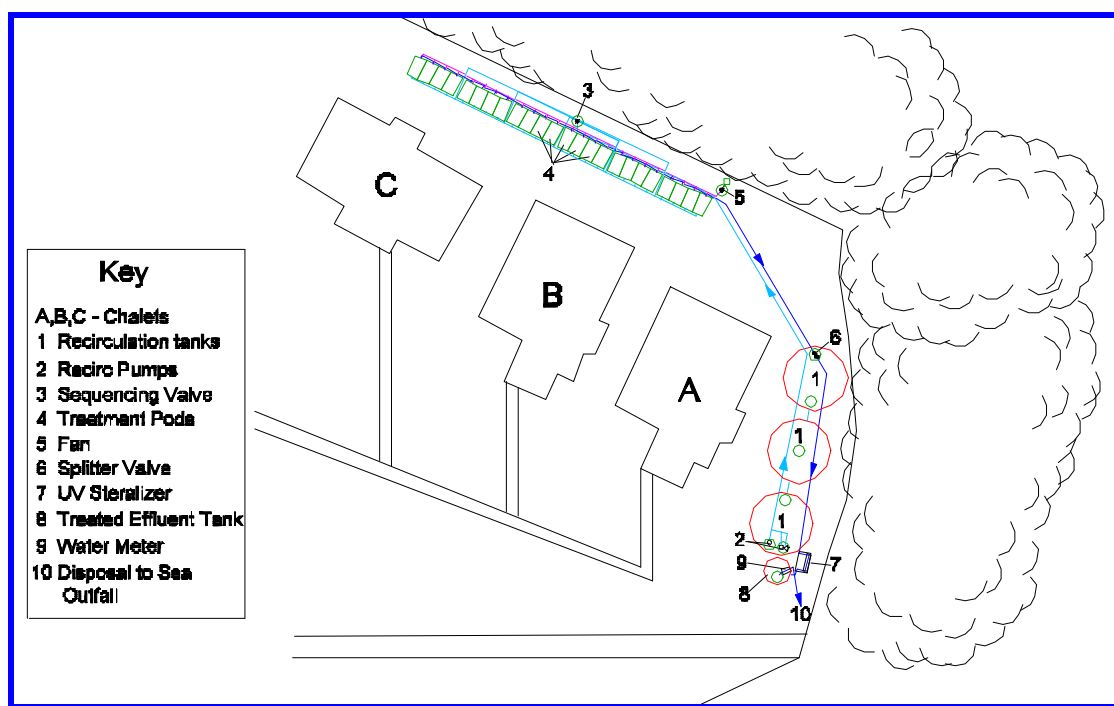
This photo also shows the septic tanks that were installed in the first stage of the upgrade.

**Figure 4. The rtPBR pods with the septic tanks in the background.**

**Table 3. System Summary**

System Component	Specification	Comment
Design Flow (Peak)	35 m ³ /day	Only reached ~ once a year
Primary and Transfer Tanks	Existing	By others
Septic Tanks	69 m ³	Installed in two stages
Recirculation Tank Size	33 m ³	3 x 11 m ³ tanks in series
Recirculation Pump	3 x Multi-stage Turbine (5")	At peak – 14 hours run time per day @ 0.56 kW per pump
Packed Bed Reactor Area	25 m ²	Installed along a thin strip directly behind the chalets
Treated Effluent Tank Size	N/a	
Discharge Pump	Existing	Reconfigured
UV Disinfection System	CH1	High transmissivity and low flow rate mean that the CT value is very high
Disposal	Sea Outfall	Testing is done around the outfall to ensure that there are no effects on the environment

The size and layout of the treatment system were important as the only available position for the plant was near the main entrance and the accommodation chalets. The rPBR was designed and constructed to fit within the available area and the finished plant is all flush at ground level to eliminate any visual impacts.

**Figure 5. Schematic as built of the wastewater treatment system.**