



*Sound environmental management is good business*

# CAWTHRON MARLBOROUGH ENVIRONMENT AWARDS 2017



## JUDGES' REPORT

### MARINE

### OUTWARD BOUND WASTE TREATMENT

<b>INTERVIEWED</b>	Simon Graney and Vic Koller
<b>DATE</b>	20 December 2016
<b>JUDGES</b>	Paul Gillespie, Jim Jessep, Bev Doole

#### INTRODUCTION

The sea, the bush and the river is the classroom for Outward Bound at Anakiwa and they go above and beyond their compliance requirements to ensure their environment is looked after.

Outward Bound were ahead of their time in 1999 when they installed a waste treatment plant to pump treated sewage to land via wetland filtering rather than discharging into the sea.

Eighteen years on it has proved to be an effective and sustainable system. Under the watchful eye of maintenance manager Vic Koller



there has been continual improvement to the oxygen-fed micro-organism system, nitrogen levels have fallen significantly and sewage is kept out of the sea.

Judges were also impressed at the educational value. Students are involved in dumping their own waste into the treatment process and since its installation more than 27,000 Outward Bound students, instructors and community members have learnt about the benefit to the environment of good waste treatment.

## GENERAL INFORMATION

Outward Bound is at the head of the Grove Arm in the Marlborough Sounds and is run by a not-for-profit Trust.

The school offers outdoor challenges and adventures “to create better people, better communities and a better world”. About 1800 people, ranging from 16-82 years old, attend each year.

Activities over the 21-day courses include sailing, kayaking and a solo night out in the bush. During these activities students collect their waste in a sealed “poo bucket” – a recycled 10L paint bucket with lid – rather than pollute the sea and land. They are responsible for emptying their buckets into the waste treatment system back at the school.

However the bulk of the sewage and wastewater comes from the school, staff housing, and neighbouring public toilets. It is put through a five-stage operation, which is based in a shed with cleaning area attached.

Stage 1: A coarse screen takes out large particles such as plastic and rubbish before the waste goes into the concrete mixing tank.

Stage 2: Oxygen is added to the mix to enable micro-organisms (the system’s “workers”) in the large aeration tanks to break down the waste. A work area is set up for students to empty their poo buckets, water-blast and sterilize them.

Stage 3: After aeration the waste settles and separates. Sludge is pumped back into the primary tank while the clear wastewater moves through to anaerobic treatment tanks to reduce the nitrogen loading. Since introducing this stage last year, nitrogen has dropped from 25g/m<sup>3</sup> to 5g/m<sup>3</sup>, well below the 20g/m<sup>3</sup> allowed.

Stage 4: The wastewater is filtered through a pebble bed and pumped several hundred metres inland to a purpose-built wetland where reeds feed on any remaining waste.

Stage 5: UV filter and chlorine treatment are the final step before the cleaned water is discharged to nearby gravel trenches. The water quality is much improved since the days of discharging to the sea, with E.coli counts down to 0-20cfu/100ml. The safe swimming guideline is less than 550 cfu/100ml.

E.coli is an indicator bacteria of human and animal faeces in water. Excessive E.coli means the water is unsafe to drink or swim in and can cause skin and respiratory infections.

In 2000, an Outward Bound group reported skin rashes and vomiting after kayaking on the Rai River, which flows into the Pelorus Sound. Council investigations showed very high E.coli levels which were traced back to dairy cows defecating in the river.

Outward Bound stopped using the river because of the health risk and met with Council, farmers and Fish & Game to seek an improvement in farming practices and drop in E.coli levels. The students were involved in the monitoring, sampling throughout the day to provide data and raise awareness. Since then farmers have built cattle crossing to keep cows out of the river, fenced off streams and worked with the community, including Outward Bound students, on riparian plantings. E.coli levels and water quality in the Rai has improved and Outward Bound is kayaking there again.



Outward Bound is at the end of the Queen Charlotte Track and their wastewater system also services the Council's public toilets near the Anakiwa jetty. These facilities are under pressure as tourist numbers and track use grow. An increasing number of mountain bikers were also using the hose on the jetty to wash down their bikes, with run-off of silt and chain oil into the sea. Even though Outward Bound do not use mountain bikes Vic saw the need for a concrete pad and wash-down area to cater for the track users, and worked to have this built with the help of Council funding.

The efforts of Outward Bound to look after the water in their bay are reflected in the Council's marine monitoring results. Anakiwa has a top rating of Acceptable water quality for summer swimming and Low Risk of Illness through recreational use (based on three years of data). [www.lawa.org.nz](http://www.lawa.org.nz)

## PROBLEMS AND HOW THEY HAVE BEEN TACKLED

- Maintenance of the waste treatment plant: There are a lot of people depending on the smooth running of the system. It is checked by Vic every day with the approach of anticipating issues and fixing them before they arise. A local contractor steps in if Vic is away.
- Health risk from poo buckets: There is a high risk of pathogens when dealing with human waste. A consultant was engaged to assess the risks and review processes for emptying and cleaning the poo buckets. Protective clothing, eye, mouth and face protection is worn. Buckets are cleaned over a mounted waterblaster and sterilized with Sterigene. Trade apprentices built an extension to the treatment shed to improve washing facilities and house the protective clothing.
- Potential noise nuisance to neighbours: A sound-insulated cupboard has been built for the waterblaster pump so neighbours are not disturbed.
- Rai River pollution: The decision to stop kayaking on the Rai River raised public awareness about the high E.coli contamination. Outward Bound worked with Council, farmers, and Fish and Game to monitor the issue and help improve the water quality in the river, which flows into the Havelock Estuary.

- Financial limitations: Outward Bound relies on external fundraising, trusts and benefactors for its income. The wastewater treatment system has been installed and maintained on a tight budget. Credit is given to Vic for his ability to research cost-effective solutions and work his many connections in the community to purchase or recycle equipment, such as the UV treatment system.

## SUMMARY

Outward Bound has led the way with land-based waste treatment in the Marlborough Sounds. Their system went in 18 years ago and has proved to be reliable, sustainable and an important education tool.

The judges were impressed at the research and initiative that went into developing the sewage system when there was no compliance requirement to do so. Staff recognized the potential impacts on the marine environment and put a solution in place.



Outward Bound has a significant sphere of influence with the large number and wide range of people taking part in their courses over the years. Using the waste treatment system as a learning tool has spread the message about the importance of effective sewage treatment and good water quality for the marine environment and everyone who uses it.

As the number of people living and holidaying in the Sounds increases, the Outward Bound wastewater system provides a robust model for waste treatment on a community scale rather than relying on individual septic tanks.

As a not-for-profit Trust, Outward Bound is to be commended for its investment and effort in finding cost-effective and efficient solutions to dealing with their wastewater and then spreading the word through their students and wider community.

But the bottom line is: there is no smell, and it works.

## SUGGESTIONS

- Research the species of grass planted in the wetland. Mixed species may attract wildlife and be more visually appealing. There is also potential for wetland management such as an island in the middle to provide bird nesting habitat.
- Create a programme for students to monitor the marine environment in the bay, focusing on water quality. Tie this in with a general understanding of the coastal ecology – what's there, how it is doing, and potential threats
- Give more prominence to your wastewater story on the website.
- Introduce school children to what you are doing at Outward Bound by arranging a field day for young EnviroSchool representatives. Contact Annie McDonald, Education Officer at Marlborough district Council: [annie.mcdonald@marlborough.govt.nz](mailto:annie.mcdonald@marlborough.govt.nz)