

A back-to-the future solution

Simple, reliable and low cost – the Advanced Enviro-Septic wastewater solution is breaking new ground in a range of local settings, as Environment Technology director **Dick Lamb** explains.

The combination of an old-style septic tank and an aerobic advanced secondary treatment and dispersal method is an innovation of simplicity that reached New Zealand in 2013. Developed in New Hampshire by Presby Environmental Inc. the Advanced Enviro-septic (AES) wastewater treatment system is known more for what it doesn't do than for what it does – it doesn't require a power connection, there is nothing to break down and there is no need for ongoing servicing. Testing of AES carried out in North America, Europe, and Australia consistently show advanced secondary treatment standards - and components come with a 20-year warranty.

Most homeowners and commercial users of mechanical wastewater treatment units are familiar with the ongoing servicing and maintenance requirements of these systems. At the NZ Land Treatment Collective conference in Gisborne earlier this year, the provided summary of the transactions included the following: “It was generally acknowledged that the more bells and whistles, the greater the chance of failure and the greater the need for more stringent management controls”.

AES provides a ‘Back to the Future’ solution – simplicity, reliability and low cost.

Regular sample testing and servicing requirements have become the norm with mechanical treatment systems to ensure consistent treatment quality in the field. As AES has no mechanical or electrical components, maintenance is required infrequently for the septic tank only – the aerobic treatment has occurred without any outside intervention for 30 years in early USA installations.

A recent installation at Onuku Marae on Banks Peninsular is a good example of a site and usage with multiple factors to consider in the design process - a remote, small disposal site, Category 5 massive clay soil and a nearby stream just over 20 metres distant. With the marae hosting the South Island Waitangi Day celebrations every three years along with tangi and regular gatherings throughout the year, it is an example of intermittent usage combined with occasional heavy loading. After examining other secondary treatment options, E2 Environmental of Christchurch chose to examine an AES solution in conjunction with Wastewater Design of Nelson. The brief was 55,000 litres over three days, and 170m² available for the disposal of the treated effluent to land.

A simple AES 166m² bed provided the resilient passive treatment and dispersal required. The bed is preceded by 55,000L of detention tankage after 23,000L of septic tankage with influent pumped up from the Marae buildings

25 metres below. The primary effluent is moved to the AES bed via flow-controlled dosing at a maximum of 2500 litres in 8 x 312L doses spread over 24 hours.

The flow control per dose to the AES bed is provided by a Krohne inductive unit interfaced with an N2P Controls specifically designed unit which includes the programmable timed control of the two submersible single-phase pumps in the lowest of the detention tanks. The pumps are set to operate alternately with level control provided by a pressure transducer which allows the pump operation to be controlled to an accuracy of one percent of the detention tankage volume. Alarms are raised if one pump fails to operate, the filter on the output of the septic tankage becomes partially blocked and if the detention tankage level reaches 75 percent capacity when contingency plans are in place to order a suction truck to provide additional reserve capacity. The alarm system includes a telemetry unit to send text messages to the service and management persons.



Part of the 166m² AES treatment and disposal bed.

Six weeks after the system was commissioned, 1000 attendees at this year's Waitangi celebrations proved AES to be an effective solution as the system functioned to plan. The system was shown to be based on conservative flow volumes as only 16,000 litres of influent was received on the main day of the celebration.

As well as residential applications, AES systems are used around the world in restaurants, schools, campgrounds, towns and National Parks – frequently in remote situations where the savings from the absence of maintenance requirements are magnified, and reliability, including

resistance to vandalism (no solar panels for the taking), is essential.

AES is also a cost-effective option for decentralised and municipal-scale treatment systems. Investigations are ongoing for solutions for towns such as Te Anau, Franz Joseph, and Glenorchy. Towns requiring wastewater upgrades could likely save a lot of money by adapting AES to their needs, both in capital and lifetime costs.

In Australia, numerous National Parks in Queensland have installed AES systems, while the Department of Conservation in NZ has installed AES at Lake Waikaremoana and other remote and sensitive areas in NZ.

AES is also bucking the trend by being trafficable – the passive venting system maintains aerobic conditions in the AES bed independently of the surface covering, allowing access to air. AES can be installed beneath carparks and driveways allowing an effective use of the available space.

With reasonable ground conditions in which to construct the bed, only a 200mm thickness of M4 or equivalent aggregate can provide for eight-ton axle loadings.

Greenwood Park Campground in Nelson has their newly installed 19,000L per day AES system designed by Tasman Consulting Engineers working beneath the driveway. This frees up large additional camping and parking areas which were previously required for failing sand-filter treatment and disposal.

The picture below shows the high level air exit vents from the AES treatment and dispersal pipework installed beneath the driveway.



PHOTO COURTESY OF RON O'HARA

Environment Technology (ET) promotes and distributes AES in New Zealand. The company's philosophy is to provide information on AES and let the simplicity and savings speak for themselves. Independent wastewater designers around the country are increasingly using AES for a wide range of situations.

Southland designer Don Moir of Ralph Moir & Associates remarks: "I have been designing wastewater systems in Southland since 1978 and I have to say that the AES system is quite simply the best solution that I have come across in all that time. My clients love it because it is maintenance-free

with no pumps or filters. The AES system provides secondary treatment to an extremely high level so it's very kind to the environment also. The feedback I have had from drainlayers has been positive and they find it very simple to install with very thorough manuals provided by the supplier."

ET provides professional assistance at all stages of the design/install process. They also provide a cost-free online training course to support designers, drainlayers or regulatory bodies wanting to familiarise themselves with AES procedures. Further information is available at their website www.et.nz **WNZ**



Digger installing the 35,000 litre detention tanks.



Six months after installation.