On-site Effluent Treatment National Testing Programme (OSET NTP)

PERFORMANCE CERTIFICATE
BOPRC AWTS NI On-site Domestic Wastewater Treatment System,
OSET NTP Trial 6, 2010/2011

System Tested
The **BOPRC AWTS NI** is a submerged growth aerated media secondary treatment unit followed by a bark media tertiary treatment flume. Rated design capacity is 1,000 litres/day. Total liquid volume is made up of a 3,480 litres aerated treatment unit (primary treatment 2,000 litres; secondary treatment aeration 1,080 litres; clarification 260 litres; pump chamber 140 litres) plus a flume containing 2,000 litre of submerged bark media. No emergency storage is provided. Disinfection treatment is not incorporated.

Test Flow Rate
The **BOPRC AWTS NI** entered the trial at week 5 (29 November) and was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over a 7 month (31 week) period December 2010 to July 2011 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 3 weeks.

Testing and Evaluation Procedures
A total of 38 treated effluent samples of organic matter (BOD_5) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2000.

A total of 16 treated effluent samples of organic matter (BOD_5), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH_4-N), total phosphorus (TP) and faecal coliforms (FC) at generally six day intervals during weeks 23 through 35 were benchmarked and rated on their median values. In addition, the energy used by the treatment system was assessed on the mean of consumption levels over the 16 sample days, weeks 23 to 35.

AS/NZS 1547:2000 Secondary Effluent Quality Requirements
These requirements are that 90% of all test samples must achieve a BOD_5 of $\leq$ 20 g/m^3 and TSS of $\leq$ 30 g/m^3 with no one result for BOD_5 being >30 g/m^3 and no one result for TSS being >45 g/m^3. The **BOPRC AWTS NI** took some 13 weeks of media development to reach the BOD_5 performance level within the above requirements compared to the 8 weeks normally allowed. Hence, adopting 24 test results after 13 weeks media development the **BOPRC AWTS NI achieved a 100%** performance level for both BOD_5 and TSS, thus **meeting** the secondary effluent quality requirements of AS/NZS 1547:2000. It is surmised that if the bark media had been pre-washed prior to treatment system commissioning, then the normal media development period of 8 weeks would have enabled satisfactory performance to AS/NZS 1547 requirements to be achieved from week 9.

Benchmark Ratings
The **BOPRC AWTS NI achieved** the following effluent quality ratings for the sixteen benchmarking results, weeks 23 to 35.

Indicator Parameters	Median	Std Dev.	Rating	Rating System				
				A+	A	B	C	D
BOD_5 (g/m^3)	*4.0*	*1.71*	A+	*<5*	*<10*	*<20*	*<30*	*≥30*
TSS (g/m^3)	*4.0*	*1.71*	A+	*<5*	*<10*	*<20*	*<30*	*≥30*
Total nitrogen TN (g/m^3)	*5.92*	*2.81*	A	*<5*	*<15*	*<25*	*<30*	*≥30*
Ammonia Nitrogen NH4-N (g/m^3)	*0.86*	*1.87*	A+	*<1*	*<5*	*<10*	*<20*	*≥20*
Total phosphorus TP (g/m^3)	*2.88*	*0.24*	B	*<1*	*<2*	*<5*	*<7*	*≥7*
Faecal Coliforms FC (cfu/100mL)	*19,900*	*19,214*	C	*<10*	*<200*	*<10,000*	*<100,000*	*≥100,000*
Energy (kWh/d) (mean)	*2.48*	--	C	*0*	*<1*	*<2*	*<5*	*≥5*

This Performance Certificate is specific to the **BOPRC AWTS NI** model as specified above when operated at a flow rate of 1,000 litres/day, and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **BOPRC AWTS NI** contact Bay of Plenty Regional Council of Whakatane, (0800) 884 880.

Authorised By:
Ian Gunn, Technical Manager, OSET NTP
23 January 2012

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, PO Box 17-368, Greenlane, AUCKLAND 1546 Ph: (09) 579 2327 Fax: (09) 579 2324 E-mail: ian.gunn@xtra.co.nz