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

**PERFORMANCE CERTIFICATE**
**AquaNova NR On-site Domestic Wastewater Treatment System,**
**OSET NTP Trial 8, 2012/2013**

## System Tested

The **AquaNova NR** on-site wastewater treatment system is a submerged aerated filter treatment unit. Rated design capacity is 1,800 litres/day. Total liquid volume is 7,600 litres (primary treatment 3,500 litres; secondary treatment aeration chamber 1,800 litres; clarification: 1,700 litres; pump chamber 600 litres) and aeration blower airflow 120 litres/minute continuous. Emergency storage is 1,000 litres. No tertiary treatment (such as UV disinfection) is incorporated. It is a two tank system with primary treatment and denitrification in the first tank and secondary treatment in a twin chamber second tank, incorporating submerged aerated filter media.

## Test Flow Rate

The **AquaNova NR** system was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2012 to June 2013 followed by a 1 month (4 week) high load effects test in July 2013 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 37 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 1547:2012.

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.

## AS/NZS 1547:2012 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 **AquaNova NR system achieved** a performance level of **97%** for $BOD_5$ and **100%** for TSS based on the full set of 37 test results in weeks 9 to 35, with no results exceeding the maximums. The **AquaNova NR system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

## Benchmark Ratings

**The AquaNova NR system achieved** the following effluent quality ratings for the sixteen benchmarking results in weeks 23 to 35.

| Indicator Parameters | Median | Std Dev | Rating | Rating System | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *A+* | *A* | *B* | *C* | *D* |
| *$BOD_5$ (mg/L)* | *5.5* | *4.6* | **A** | *<5* | *<10* | *<20* | *<30* | *≥30* |
| *TSS (mg/L)* | *16.5* | *8.3* | **B** | *<5* | *<10* | *<20* | *<30* | *≥30* |
| *Total Nitrogen (mg/L)* | *36.3* | *8.5* | **D** | *<5* | *<15* | *<25* | *<30* | *≥30* |
| *$NH_4$- Nitrogen (mg/L)* | *5.6* | *1.9* | **B** | *<1* | *<5* | *<10* | *<20* | *≥20* |
| *Total phosphorus (mg/L)* | *4* | *0.4* | **B** | *<1* | *<2* | *<5* | *<7* | *≥7* |
| *Faecal Coliforms (cfu/100mL)* | *40,000* | *60,000* | **C** | *<10* | *<200* | *<10,000* | *<100,000* | *≥100,000* |
| Energy (kWh/d) (mean)** | *3.5* | *0.1* | **C** | *0* | *<1* | *<2* | *<5* | *≥5* |

** **Note:** Overall energy rating reflects conditions at the test facility – power consumption for effluent pumping under field conditions will be specific to the distribution system as installed.

This Performance Certificate is specific to the **AquaNova NR system** 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 **AquaNova NR system** contact Everhard Industries Pty Ltd, Queensland, Australia or **AquaNova NZ Ltd** Ltd of Waiheke Island, Auckland, Phone: (09) 372 6600 Mob: 022 314 9419

**Authorised By:**
Ray Hedgland, Technical Manager, OSET NTP
23 March 2014

**On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 10/20 Selwyn Rd, Howick**
**AUCKLAND 2014 Ph: (09) 534 9247 Mob: 021 626 772 E-mail: ray@hedgland.co.nz**