

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

PERFORMANCE CERTIFICATE Allflow Klaro 9000 10PE On-site Domestic Wastewater Treatment System, OSET NTP Trial 7, 2011/2012

System Tested

The **Allflow Klaro** is a sequencing batch reactor aerated biological treatment unit. Rated design capacity is 2,000 litres/day. Total liquid volume is 6,500 litres [primary treatment 3,500 litres; aeration treatment 3,000 litres; clarification (within aeration chamber)]. A 500 litre pump chamber is provided, and emergency storage is 2,240 litres. No tertiary treatment (such as UV disinfection) is incorporated.

Test Flow Rate

The **Allflow Klaro** 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 December 2011 to August 2012 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

The sampling and testing programme was disrupted in weeks 11 and 24 by two high flow dose events triggered by control system malfunctions at the Rotorua Wastewater Treatment Plant. Subsequently two sets of atypical test results were set aside in evaluating the treatment performance of the **Allflow Klaro**. A total of 35 BOD₅ (biochemical oxygen demand) and 39 TSS (total suspended solids) treated effluent samples at generally six day intervals during weeks 11 to 41 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2012.

A total of 11 treated effluent samples of BOD₅, 15 of TSS, and 16 each for total nitrogen (TN), ammonia nitrogen (NH₄-N) and total phosphorus (TP) with 10 for faecal coliforms (FC) at generally six day intervals during weeks 28 through 41 were benchmarked and rated on their median values. In addition, the energy used by the treatment system and effluent discharge pump was assessed on the mean of daily consumption levels over weeks 28 to 41.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD₅ of $\leq 20 \text{ g/m}^3$ and TSS of $\leq 30 \text{ g/m}^3$ with no one result for BOD₅ being $>30 \text{ g/m}^3$ and no one result for TSS being $>45 \text{ g/m}^3$. The **Allflow Klaro** achieved a performance level of **100%** for BOD₅ and **97%** for TSS based on the test results in weeks 11 to 41, with no results exceeding the maximums. The **Allflow Klaro** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings

The **Allflow Klaro** achieved the following effluent quality ratings for the benchmarking results, weeks 28 to 41.

Indicator Parameters	Median	Std Dev.	Rating	Rating System				
				A+	A	B	C	D
BOD ₅ (g/m ³)	2	0.69	A+	<5	<10	<20	<30	≥30
TSS (g/m ³)	7	2.16	A	<5	<10	<20	<30	≥30
Total nitrogen TN (g/m ³)	37	5.16	D	<5	<15	<25	<30	≥30
Ammonia Nitrogen NH ₄ -N (g/m ³)	0.4	0.043	A+	<1	<5	<10	<20	≥20
Total phosphorus TP (g/m ³)	3.6	0.28	B	<1	<2	<5	<7	≥7
Faecal Coliforms FC (cfu/100mL)	9,400	15,300	B	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)**	0.98		A	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 **Allflow Klaro** 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 **Allflow Klaro** contact Allflow Equipment Ltd of Richmond, Nelson, (03) 543 9057.

Authorised By:

Ian Gunn, Technical Manager, OSET NTP
22 January 2013

**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**