

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

### PERFORMANCE CERTIFICATE Humes FR1 On-site Domestic Wastewater Treatment System, OSET NTP Trial 4, 2008/2009

#### System Tested

**Humes FR1** submerged fixed film media treatment unit. Rated design capacity 1,300 litres/day. Total liquid volume 4,900 litres (primary treatment 2,490 litres; secondary treatment aeration 1,290 litres, clarification 1,120 litres). Emergency storage is provided externally. No tertiary treatment (such as UV disinfection) is incorporated.

#### Test Flow Rate

The **Humes FR1** was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 person household) over an 8 month (35 week) period November 2008 to July 2009 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres per day followed by 1,000 litres/day over the following 3 weeks.

#### Testing and Evaluation Procedures

A total of 37 treated effluent samples of organic matter (BOD<sub>5</sub>) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated as to meeting 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<sub>5</sub>), suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH<sub>4</sub>-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.

#### Meeting AS/NZS 1547:2000 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD of  $\leq 20 \text{ g/m}^3$  and TSS of  $\leq 30 \text{ g/m}^3$ . The **Humes FR1** system **achieved** a performance level of **100%** for BOD and **97%** for TSS.

#### Benchmark Ratings

The **Humes FR1** system **achieved** the following effluent quality ratings:

Indicator Parameters	Median	Std Dev.	Rating	Rating System				
				A+	A	B	C	D
<b>BOD (g/m<sup>3</sup>)</b>	<b>4.5</b>	<b>1.9</b>	<b>A+</b>	<5	<10	<20	<30	≥30
<b>TSS (g/m<sup>3</sup>)</b>	<b>8.0</b>	<b>7.3</b>	<b>A</b>	<5	<10	<20	<30	≥30
<b>Total nitrogen TN (g/m<sup>3</sup>)</b>	<b>13.8</b>	<b>1.3</b>	<b>A</b>	<5	<15	<25	<30	≥30
<b>Ammonia Nitrogen NH<sub>4</sub>-N (g/m<sup>3</sup>)</b>	<b>2.4</b>	<b>0.9</b>	<b>A</b>	<1	<5	<10	<20	≥20
<b>Total phosphorus TP (g/m<sup>3</sup>)</b>	<b>4.3</b>	<b>0.4</b>	<b>B</b>	<1	<2	<5	<7	≥7
<b>Faecal Coliforms FC (cfu/100mL)</b>	<b>100,000</b>	<b>42,299</b>	<b>D+</b>	<10	<200	<10,000	<100,000	≥100,000
<b>Energy (kWh/d) (mean)</b>	<b>5.2</b>		<b>D</b>	0	<1	<2	<5	≥5

This Performance Certificate is specific to the **Humes FR1** 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 **Humes FR1** system contact Humes Pipeline Systems of Rotorua.

#### Authorised By:

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