



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

### PERFORMANCE CERTIFICATE Austin Bluewater AB2K OSET NTP Trial 12, 2016/2017

#### **System Tested**

The Austin Bluewater AB2K submerged aerated filter wastewater treatment system participated in Trial 12 of the On-site Effluent Treatment National Testing Programme (OSET NTP). This commenced on 24 October 2016 and ran over nine months (39 weeks) during which the treated effluent discharge was monitored generally every six days. The test flow rate was 1,000 L/day to represent the daily domestic wastewater flow from a 3-bedroom dwelling with 5 to 6 occupants. Note that the manufacturers advised design capacity for this plant is 1600 L/day.

#### **Test Flow Rate**

The Austin Bluewater AB2K submerged aerated filter wastewater treatment 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 October 2016 to June 2017 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres/day then 1,000 litres/day over the following 3 weeks.

#### **Testing and Evaluation Procedures**

A total of 39 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 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<sub>5</sub>), total 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 tested and the results 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.

#### **General Performance**

In terms of effluent quality the Austin Bluewater AB2K plant performed well overall, with very low and stable BOD and TSS results. Good nitrification was achieved throughout with very low levels of NH<sub>4</sub>-N. Denitrification was initially moderate but it declined through the test with increasing TOXN and TN and available alkalinity reduced. The plant handled the high flow test well with respect to BOD and TSS but had a sharp increase in NH<sub>4</sub> with no significant improvement over the following two weeks. Bacteria removal was good throughout for a secondary treatment plant without disinfection producing effluent with a median of 7600 cfu/100 ml (ie a 3.2log reduction).

The plants power usage of 1.75 kWh/day was typical for a package secondary treatment plant.

Apart an unfortunate incident when the manufacturer unfortunately left the power 'off' after the plant was insulated the plant operated without attendance throughout the trial.

Service requirements are 6 monthly where disposal is to dripline.

#### **AS/NZS 1547:2012 Secondary Effluent Quality Requirements**

These requirements are that 90% of all test samples must achieve a BOD<sub>5</sub> of  $\leq 20 \text{ g/m}^3$  and TSS of  $\leq 30 \text{ g/m}^3$  with no one result for BOD<sub>5</sub> being  $>30 \text{ g/m}^3$  and no one result for TSS being  $>45 \text{ g/m}^3$ . The Austin Bluewater AB2K plant had **97% of BOD<sub>5</sub>** results and **97% of TSS** results within the **Secondary Effluent Quality** requirements for both the 90%ile and maximum limits above. **The Austin Bluewater AB2K plant thus achieved AS/NZS 1547 secondary effluent quality performance requirements** when operated at 1,000 L/day, which is only 62% of the manufacturers advised design capacity of 1600 L/day.

#### **Benchmark Ratings**

The Austin Bluewater AB2K system achieved the following effluent quality ratings over the sixteen benchmarking results in weeks 20 to 35 (when operated at 1,000 L/day or 62% of the advised plants design capacity):



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Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD (mg/L)	2	0	A+	<5	<10	<20	<30	≥30
TSS (mg/L)	1	1	A+	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	27.6	6	C	<5	<15	<25	<30	≥30
NH <sub>4</sub> - Nitrogen (mg/L)	0.04	2	A+	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	2.4	0.4	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	7,600	6,900	B	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	1.75	0.3	B	0	<1	<2	<5	≥5

This Certificate of Performance applies to an Austin Bluewater AB2K wastewater treatment plant with a rated capacity of 1600 L/day, constructed from a single precast concrete tank comprising 6 chambers: 2 Primary (1970L each), 2 Aeration (700L each), Clarifier (540L), Pump Chamber (850L), and fitted with 6 blocks of Bioblok 150 growth media in the aeration tanks plus an 80Lpm air blower, and having 1400L emergency storage capacity.

This certificate is valid for 5 years from 20 December 2017. For the full OSET NTP report on the performance of the Austin Bluewater AB2K wastewater treatment plant contact Lew Austin, Mobile 021 356 736 or Email: [lew@austinbluewater.co.nz](mailto:lew@austinbluewater.co.nz)

**Authorised By:**

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