

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

PERFORMANCE CERTIFICATE BioCycle 8200 On-site Domestic Wastewater Treatment System, OSET NTP Trial 11, 2015/2016

System Tested

The **BioCycle 8200 system** is a Submerged Aerated Filter Wastewater Treatment Plant using Kompakt 2 tubular submerged fixed growth filter system [298 m² (2.16 m³)]. The manufacturers rated design capacity is 1,400 litres/day. Total operational liquid volume is 7,800 litres (Primary Chamber 2,900 litres; Anoxic chamber 600 litres; Aeration Chamber 2,800 litres; Clarification Chamber 1,200 litres; Pump Chamber 300 litres; Emergency storage 1,600 litres). No tertiary treatment (such as UV disinfection) is incorporated. It comprises a single 5 chamber concrete tank. The air blower is Thomas LP-80, 0.08kW, running continuously and operating a continuous venturi airlift recirculation pump at 40 lph. There is a 100mm Biotube effluent filter in the Primary Chamber and an Azud 130 micron final effluent filter. The discharge pump was a Davey D42A/B 0.90kW. The manufacturers stated service frequency is 6 monthly.

Test Flow Rate

The **BioCycle 8200 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 2015 to July 2016 followed by a 1 month (4 week) high load effects test involving 3 days at 1,500 litres/day followed by 2 days at 2,000 litres/day then 1,000 litres/day over the following 2 weeks.

Testing and Evaluation Procedures

A total of 37 treated effluent samples of organic matter (BOD₅) 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 (BOD₅), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH₄-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

The BioCycle 8200 plant had a number of major issues throughout the testing period requiring frequent operator attendance including: correction to wiring of the discharge pump, repair of a significant air leak, repair of a significant water leak and attendance to clean a clogged effluent filter on a number of occasions. **This number of structural and operational errors is considered by the Audit Group to be unsatisfactory.**

AS/NZS 1547:2012 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD₅ of ≤ 20 g/m³ and TSS of ≤ 30 g/m³ with no one result for BOD₅ being >30 g/m³ and no one result for TSS being >45 g/m³. The **BioCycle 8200 system** achieved a performance level of **100%** for BOD₅ 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 **BioCycle 8200 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012 at the test flow rate of 1,000 L/day (ie at 70% of the plants advised design capacity).

Benchmark Ratings

The **BioCycle 8200 system** achieved the following effluent quality ratings for the sixteen benchmarking results in weeks 20 to 35.

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD (mg/L)	4.5	1.4	A+	<5	<10	<20	<30	≥30
TSS (mg/L)	7.7	3.6	A	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	22.1	2.4	B	<5	<15	<25	<30	≥30
NH ₄ - Nitrogen (mg/L)	0.2	0.1	A+	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	4.4	0.3	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	54,000	23,660	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	6.3	1.9	D	0	<1	<2	<5	≥5

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This Performance Certificate is specific to the **BioCycle 8200** model as specified above when operated at a flow rate of 1,000 litres/day (70% of advised plants design capacity), and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **BioCycle 8200 system** contact Murray White of **BioCycle Systems**, Hamilton, P: 0800 246 292, or M: 0274 998 799 or E: murray@biocyclesystems.co.nz.

Authorised By:



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