

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

PERFORMANCE CERTIFICATE Devan Integra S-15 On-site Domestic Wastewater Treatment System, OSET NTP Trial 9, 2013/2014

System Tested

The **Devan Integra S-15 system** is a submerged aerated filter wastewater treatment unit. The manufacturer's rated design capacity is 1,500 litres/day. Total liquid volume is 6,270 litres (primary treatment 3000 litres; secondary treatment aeration chamber 1,650 litres; clarification chamber 1,500 litres; pump chamber 120 litres). Emergency storage is 1,530 litres. No tertiary treatment (such as UV disinfection) is incorporated. The manufacturer's stated service frequency is 6 monthly.

Test Flow Rate

The **Devan Integra S-15 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 2013 to July 2014 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 discharge pump was found to have an internal electrical fault and was replaced on 6 May. Power progressively increased from 12 April to 6 May, and reduced when the pump was replaced on 6 May. Inspection of the scheduled test results showed that only one set of results (6 May) were impacted by the pump fault with respect to BOD and TSS. With the manufacturer's agreement this set of results were substituted for replacement tests undertaken on 20 May (the same week day) and adopted for the AS/NZS technical analysis and OSET Benchmarking performance evaluation with the approval of SWANS-MAG.

A total of 37 treated effluent samples of organic matter (BOD₅) and 35 treated effluent samples of 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 benchmark period.

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 **Devan Integra S-15 system** achieved a performance level of **100%** for BOD₅ and **100%** for TSS based on the full set of 37 and 35 test results respectively in weeks 9 to 35, with no results exceeding the maximums. The **Devan Integra S-15 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings

The **Devan Integra S-15 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)	10	3	B	<5	<10	<20	<30	≥ 30
TSS (mg/L)	9	4	A	<5	<10	<20	<30	≥ 30
Total Nitrogen (mg/L)	31.6	4	D	<5	<15	<25	<30	≥ 30
NH ₄ - Nitrogen (mg/L)	22.1	10	D	<1	<5	<10	<20	≥ 20
Total phosphorus (mg/L)	4.6	0.5	B	<1	<2	<5	<7	≥ 7
Faecal Coliforms (cfu/100mL)	26,000	42,000	C	<10	<200	<10,000	<100,000	$\geq 100,000$
Energy (kWh/d) (mean)	0.93 ¹	0.05	A	0	<1	<2	<5	≥ 5

1 Power readings from 6 May only (excludes results impacted by electrical fault).

This Performance Certificate is specific to the **Devan Integra S-15** 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 **Devan Integra S-15 system** contact **Devan Plastics Ltd**, Tauranga, Ph: 07 578 8726, Email: alistair.bell@devan.co.nz.

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