



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

PERFORMANCE CERTIFICATE TechTreat TXT OSET NTP Trial 12, 2016/2017

System Tested

The TechTreat TXT treatment plant comprising a submerged aerated filter (SAF) in series with a recirculating textile filter packed bed reactor (RTF) 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 TechTreat TXT plant tested had a rated capacity of 1500 L/day and comprised three tanks. Two RELN 3200L plastic septic tanks, one as a 2-stage primary tank and the other comprising the SAF (1840L with 53m² of Reln submerged media sheets) plus Clarifier/recirculation chamber (200L) and a discharge pump chamber (160L). The third tank comprised a 0.48m² packed bed textile filter box containing 24 sheets of Autex Textile filter (1200mm x 600mm). There was a Thomas AP80 Airblower for intermittent aeration plus Airlift from SAF to the RTF at 3.84x recirculation rate. The emergency storage comprised 1130L. The service requirement is annual.

Test Flow Rate

The TechTreat TXT treatment plant was tested at 1,000 L/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 L/day then 1,000 L/day over the following 3 weeks. Note that the manufacturer's advised design capacity for this plant is 2,000 L/day.

Testing and Evaluation Procedures

A total of 39 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.

General Performance

Apart from a discharge pump float switch failure during the plant commissioning/media development phase the TechTreat TXT treatment plant operated unattended throughout the trial. The plant performed well, with very low and stable BOD and TSS results from Week 8 onwards. There was a steady improvement in both nitrification and denitrification from Week 5 to Weeks 14 and 17 respectively. Overall, the plant achieved very low levels of NH₄-N, moderately low levels of TOXN resulting in low Total Nitrogen of <15 mg/L. The plant handled the high flow test well with respect to BOD and TSS but had a short but sharp increase in NH₄-N and TN levels. Bacteria removal was good throughout.

The plants power usage was low for a package secondary treatment plant at 1.48 kWh/day.

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 TechTreat TXT plant had **100% of BOD₅** results and **100% of TSS** results within the **Secondary Effluent Quality** requirements for both the 90%ile and maximum limits above. **The TechTreat TXT plant thus achieved AS/NZS 1547 secondary effluent quality performance requirements** when operated at 1,000 L/day, which is 67% of the manufacturer's advised normal flow design capacity.



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Benchmark Ratings

The TechTreat TXT 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 67% of the advised plants design capacity):

Indicator Parameters	Median	Std Dev	Rating	Rating System				
				A+	A	B	C	D
BOD (mg/L)	2	0.9	A+	<5	<10	<20	<30	≥30
TSS (mg/L)	2	1.4	A+	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	13.5	3.4	A	<5	<15	<25	<30	≥30
NH ₄ - Nitrogen (mg/L)	2.1	3.5	A	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	2.7	0.5	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	3,000	16,300	B	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	1.5	0.05	B	0	<1	<2	<5	≥5

This Certificate of Performance applies to the TechTreat TXT treatment plant with a rated capacity of 1,500 L/day as described in the 'System Tested' above.

This certificate is valid for 5 years from the date below. For the full OSET NTP report on the performance of The TechTreat TXT treatment plant comprising a submerged aerated filter (SAF) in series with a recirculating textile filter packed bed reactor (RTF) contact TechTreat Ltd, Dave Snowden, Mobile 0274 472 322 or Email: techtreat@hotmail.com

Authorised By:

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