TechTreat Limited

CP2 System Homeowner's Manual

Aerated Wastewater Treatment System

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

PERFORMANCE CERTIFICATE TechTreat SS10 On-site Domestic Wastewater Treatment System, OSET NTP Trial 8, 2012/2013

System Tested

The **TechTreat SS10** on-site wastewater treatment system is a submerged aerated filter treatment unit. Rated design capacity is 2,000 litres/day. Total liquid volume is 6,420 litres (primary treatment 3,200 litres; secondary treatment aeration chamber 2,700 litres; recirculation chamber 160 litres; clarification: 200 litres; pump chamber 160 litres) with aeration blower airflow 80 litres/minute 18 hours/day). Emergency storage is 1,000 litres. No tertiary treatment (such as UV disinfection) is incorporated. It is a two tank system with primary treatment in the first tank and secondary treatment in the second tank, incorporating a submerged aerated filter media (90 sheets) with clarifier and recirculation.

Test Flow Rate

The **TechTreat SS10** 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 2012 to June 2013 followed by a 1 month (4 week) high load effects test in July 2013 involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 3 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. During this period an internal airline came loose and impacted performance until repaired, compromising three sets of results in weeks 14-16. With SWANS-MAG approval these three sets of results were excluded and the evaluation undertaken using 34 results.

A total of 16 treated effluent samples of organic matter (BOD_5), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH_4 -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.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD₅ of \leq 20 g/m³ and TSS of \leq 30 g/m³ with no one result for BOD₅ being >30 g/m³ and no one result for TSS being >45 g/m³. The **TechTreat SS10 system** achieved a performance level of **100%** for BOD₅ and **91%** for TSS based on the full set of 37 test results in weeks 9 to 35, with no results exceeding the maximums. The **TechTreat SS10 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings

The TechTreat SS10 system achieved the following effluent quality ratings for the sixteen benchmarking results in weeks 23 to 35.

Indicator Parameters	Median	Std Dev	Rating	Ratin	g System			
	meanan		runng	A+	А	В	С	D
BOD_5 (mg/L)	5.5	3.5	Α	<5	<10	<20	<30	≥30
TSS (mg/L)	12.5	11	В	<5	<10	<20	<30	≥30
Total nitrogen (mg/L)	23.5	5.8	В	<5	<15	<25	<30	≥30
NH₄- Nitrogen (mg/L)	11.2	5.9	С	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	3.6	0.6	В	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	63,000	67,000	С	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)**	2.0	0.1	С	0	<1	<2	<5	≥5
						441		

** <u>Note:</u> Overall energy rating reflects conditions at the test facility – power consumption for effluent pumping under field conditions will be specific to the distribution system as installed.

This Performance Certificate is specific to the **TechTreat SS10 system** 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 **TechTreat SS10 system** contact TechTreat Ltd, KeriKeri, Northland. Phone: (09) 407 1967 Mob: 027 447 2322

Authorised By:

Ray Hedgland, Technical Manager, OSET NTP 23 March 2014

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 10/20 Selwyn Rd, Howick AUCKLAND 2014 Ph: (09) 534 9247 Mob: 021 626 772 E-mail: <u>ray@hedgland.co.nz</u>



Thank you for installing a TechTreat Aerated Wastewater Treatment System. This booklet gives you all the information and instructions required to understand and manage your new system

Your TechTreat system requires servicing annually and this will need to be carried out by our trained technicians. We will contact you to arrange a suitable time to attend to your servicing needs

Servicing will include a general inspection of the tank area, irrigation and drainage. The septic tank will need to be pumped out (sludge removed) between 4-9 years as with any septic tank. We will notify you when this is required as our service technicians will monitor this on servicing.

How Does Your New System Work?

The TechTreat Wastewater Treatment System is made up of 2 tanks. The first is a standard septic tank and the second is an aeration tank which contains the treatment components

Household waste receives primary treatment in the septic tank and then passes into the aeration tank for secondary treatment

The treated effluent is discharged into the dripline irrigation field

The treated water produced has no smell and is completely safe for normal garden use

What To Do If Your Alarm Sounds

Your Wastewater Treatment System is fitted with an alarm that, if activated, will sound and the red light will come on (light located near control panel)

You can silence the audible alarm by flicking the alarm switch provided, however, do not ignore the red light – you must contact your service provider

In all cases - If your alarm is activated – call your service provider A qualified technician will assist you in diagnosing your system condition.

Please see Alarm Test Procedure on following page

ALARM TEST PROCEDURE ALL AN-ALOGUE VERSIONS



A Practical Guide for TechTreat CP2 Treatment System

Your new home now has a modern septic tank/ treatment system. This system treats your household waste water and it needs Bacteria "Bugs" to operate correctly

General Do's and Don'ts

Please don't flush dangerous and damaging substances into your wastewater treatment System, this includes:

No Bleaches or Chlorine

These products are designed to kill bugs and will kill off the "bugs" in the tank causing smells and blocked filters

No Fats or Oils down drains

Fats and olis may block the tank filters and kill "bugs" in the tank

No Tea Leaves or Coffee Grounds down drains May block the filters

No Washing Paint Brushed or Disposing of Paints down drains Kill "bugs" in the tank and also residue is difficult and costly to remove

No Disposable Nappies, Nappy Wipes, Sanitary Pads, Tampons or Condoms

Kill 'bugs" and Difficult to break down and can block filters

Do not Turn The Power Off to the Septic System as There are Electrical Parts that Need Power to Operate the System

Please Do :

Use only use gentle biodegradable cleaning products

Try to avoid using washing machines, dishwashers, showers at the same time

Call your service agent if there are septic odours from the system Call your service agent if the audio visual alarm is activated

Please don't switch your system off even when you are going away

Please don't cover the tank lids with soil as we will need access to the manhole lids for maintenance. You can however use post peel or bark if you would like to cover the lids

Servicing Chart

The system should be serviced at least every 12 months by a TechTreat

approved technician

Function	3 monthly	9monthly	Annually
Anaerobic Chamber/			Qualified Person
Bio Filter/clean filter			Qualified Person
Air Blower/clean filter/			Qualified Person
Air Flow Path/Check			Qualified Person
Chlorinator if installed			Qualified Person
Pump Chamber/pressure			Qualified Person
test			
Outlet Filter/clean	Owner	Owner	Qualified Person
If Relevant			
Alarm System/check			Qualified Person
			Qualified Person
Irrigation field/			

Note: The desludging of the anaerobic chamber is the responsibility of the owner and should be carried out at least every 5 years or sooner if required

(monitor yearly)

Service Contract / Renewal Advice

This agreement is made between (Owner/Occupier):

of (Address) :

and the Authorised Distributor or their duly appointed agent

Business Name: TechTreat Limited

Business Address: 1 Sammaree Place Kerikeri

Business Phone Number & email: ph 0274472322 email techtreat@hotmail.com

The duration of the agreement is from:toto

The Authorised Distributor/Agent agrees for the period to the following:

• A factory- trained technician will make annual field service inspections during the service period

Inspections to include

1. Any adjustment, cleaning and field service of the unit necessary for proper operation

2. Inspection of the control panel and alarm plate, aeration blower, bio-mass sludge return, clarifier, filter, effluent quality, irrigation pump, and float alarm

- Both labour and materials will be charged for emergency service calls outside the call specified above
- In the event of any repairs being necessary on the purifier or electrical equipment during the first year because of damage which has occurred outside the warranty, then these repairs will be charged to include both labour and materials
- Complete a written report at the time of each annual inspection/service, providing a service report copy to the Customer and a copy to the Local Council
- This agreement does not bind TechTreat Limited or appointed agents to be responsible for the quality of effluent, However, it will at all times whenever possible, recommend how the effluent quality can be maintained at its maximum and alter/adjust the system during service calls in order to obtain the best possible effluent standard

In completing this agreement, the customer acknowledges that this Agreement is binding while they are the owner/occupier of the premises. There is an obligation by the Distributor/Agent and the homeowner to transfer this Contract to any new Owner/Occupier to comply with the relevant By-Law requirements.

Owner/Occupier Signature..... Signature Authorised Distributor/Appointed Agent..... SS10/CP2 Aerated Wastewater System

Process Description of System	Aerated submerged fixed film me Fine bubble aeration	dia
Volumes		
 Total operational volume 	2000L/day	
 No of tanks 	2	
Total liquid volume	6420L	
 Emergency storage 	1000L	
Filter	Simtech STF-110 Septic Tank Br	istle Filter
(AS/NZS 1546 standards)	(primary septic tank)	
Aeration	Option 1 Option	2
 Type 	Blower Blowe	_
 Make/Model 	Thomas AP80 Nitto I	B80
Run time	12 hrs 18 hrs	
• kW	0.051kW 0.050	~~~
Irrigation pump	To be specified if needed	
Recirculation	Sludge return from Clarification to	o Septic
	(air operated)	
Electrical controls & alarms	Air & high water alarms (audio ar 10A circuit breaker	ld visual)





50

On-Site Wastewater Systems

List of Water Tolerant Plants Suitable for on-site Wastewater Disposal Systems (from Auckland Council)

General Matters to Consider When Planting a Land Disposal Area:

Plants that are suitable for planting in moist conditions, such as those associated with wastewater land disposal fields need to be selected on the basis of both their tolerance for such moist conditions and for their potential for high level of growth/high transpiration of moisture in such conditions.

Standard lawn grass is a proven effective high transpiration plant species in such conditions, as are a large number of other plant species seen in typical domestic gardens.

Consideration need to be given to effects of roots from plants and from trees in particular on wastewater distribution pipe networks/emitter lines in land application systems. Potential for root intrusion/disruption to the pipe system must be considered prior to selection and planting of a plant or tree species.

Advise on such matters can be obtained from garden centre specialists and landscaping consultants.

Native Plants Suitable for Moist Conditions in the Auckland/Northland Region:

The following list covers native plant species which are considered to be suitable for planting in moist conditions, such as those associated with wastewater disposal fields in Auckland/Northland situations. They are all tolerant or fond of moist conditions and are all native to the region.

Grasses, ground covers, and other plants

Astelia grandis (swamp astelia)

Large clump forming plant with bright green, flax-like foliage. Female plants produce upright panicles of orange berries in the centre of the plant. This endemic species will not tolerate eutrophic conditions and prefers peat soils.

Blechnum novaezealandiae (kiokio)

Large, robust fern growing to 1 or even 2m, hardy species that tolerates most conditions, but does best in well drained, shady areas.

Carex

There are many members of this genus which grow naturally in damp to wet areas. They all have quite fine drooping foliage and are vigorous in moist conditions. Most prefer very light shade. The following species have been identified for their suitability:

Carex Dissita

Endemic species with dull green to reddish tufts often 0.5m tall (although this can vary). Tolerates a range of swampy habitats, but is also noted to grow on drier soils under forest cover.

Carex flagellifera

Endemic species with dense spreading reddish-brown tufts to 0.5m tall. Prefers damp soil and full sun, but is noted to thrive in a variety of habitats including boggy pasture.

Carex geminate

Robust and vigorous endemic species that grows to 1.5m tall. Thrives in a range of wet habitats. Suitable for a larger area.

Carex Lessoniana

Robust and vigorous endemic species that grows to 1.5m tall. Similar to C.geminata in that the species is spreading and suitable for a large wet area.

Carex secta (purei, makura)

Endemic species that exhibits tall spreading tussocks. Has been noted to grow to 3m tall, widespread in swampy areas. Useful in the creation of bird habitat.

Carex virgata

Endemic species that forms dense, light green tussocks up to 1m tall. Thrives in a variety of habitats including swamps, drain margins, seepages and wet pastures. Useful in the creation of bird habitat.

Cortaderia fulvida (toetoe)

Branching from the base and forming a clump to 4m high. Long strap-shaped leaves with redorange coloured veins, flower heads cream yellow. New shoots exhibit pale waxy cover on lower parts (unlike pampas grass). Prefers good drainage and semi-shade. Will struggle to compete if dried out in summer.

Cyperus ustulatus (toetoe upoko-tangata, giant umbrella sedge)

Vigorous leafy sedge growing to 1m in open damp places. Tolerates immersion in standing water within a range of habitats from seepages to wetlands.

Dicksonia squarrosa (wheka, tree fern)

Tree fern up to 7m tall that exhibits tolerance of wet open ground and floods. Found to shelter and accumulate with other native plants. The base of the fern attracts biodiversity. Useful application to streambank and seepage habitats.

Elastostema rugosum (parataniwha)

Herbaceous plant up to 0.5m tall that spreads by rhizomes. Bronze coloured foliage with serrated edge. Grows on moist sites in light to heavy shade. Intolerant of dry habitats.

Hypolepis dicksonioldes

Large fern that prefers fertile moist, but well-drained ground, grows vigorously and spores into planted areas with abundance. Does however, die back during winter.

Phormium tenax (harakeke, flax)

Fast growing clump-forming flax with large stiff leaves to 3m. Full exposure and sun. Moist to wet conditions. Does not have deep or wide roots. Easily propagated from split fans or grown from seed. Attracts birds, especially Tui.

Trees and Shrubs

Consideration needs to be given to the effects of roots on wastewater distribution pipe networks. This problem can be more significant for large tree species.

Carpodetus serratus (putaputaweta, marbleleaf)

Lowland forest tree up to 7m tall. Large bunches of cream coloured flowers appear in spring followed by black berries.

Coprosma areolata

Species that grows to 4m tall. Low tolerance to drought, with medium to high fertility.

Coprosman robusta (karamu, shining karamu)

Shrubs or small trees growing to 3m+, with glossy green leaves. Masses of orange-red fruit in autumn are attractive to birds. Hardy plant.

Coprosma tenuicaulis (swamp coprosma)

Endemic species that grows to 3m tall. Leaves pale green with slender branches. Will tolerate a range of swampy to boggy habitats including standing water.

Cordyline australis (ti kouka, cabbage tree)

Palm-like in appearance with large heads of linear leaves and panicles of scented flowers. Sun to semi-shade. Prefers damp to moist soil. Grows eventually to 12m+ height.

Dacrycarpus dacrydioides (kahikatea, white pine)

Tree that grows to 40m. Moderately growing species, which prefers wetland and boggy environments. Application of this species must consider the possible impact of its root systems on the wastewater disposal field.

Geniostoma rupestre (hangehange)

Common forest shrub with pale green glossy foliage, growing to 2-3m. Tiny flowers give off strong scent in spring. Looks best in sunny position where it retains a bushy habit, and prefers well-drained soil.

Hebe stricta (koromiko)

Shrub or small tree growing to 2-5m in height. Natural forms have white to bluish flowers. Plant in full sun. Tolerates exposure. (NB Many cultivars and hybrids are available commercially, but these are all unsuitable for use near existing natural vegetation).

Laurelia novae-zealandiae (pukatea)

Large upright tree (to 30m) with attractive bright green foliage and distinctive whitish bark. Fast growing and able to handle a wide variety of soils. It will tolerate periodic flooding, breathing roots develop in water logged soils. Can be grown from seed. Tolerant of some sun and frost. Not tolerant of wind.

Leptospermum scoparium (manuka)

Shrub or small tree growing to 4m+ in height. Ubiquitous shrub varying in form throughout New Zealand. Ideal to provide shelter for other plants as it is quick growing and hardy. Requires fill sun. Hardy and tolerant of difficult conditions, including water logging and drought.

Melicytus (mahoe)

A fast growing yet long lived tree to 7m height. Prefers well drained fertile soils. Tolerates some frost, wind and sun. Birds are attracted to the blue berries.

Pennantia corymbosa (kaikomako)

Slow growing species that will reach 12m in moist, fertile sites. Useful species application in bank stabilisation or wetland habitats.

Plagianthus betulinus (ribbonwood)

Fast growing species to 15m. Similar application to that of Pennantia corymbosa.

Rhopalostylis sapida (nikau)

New Zealand's only native palm, with red berries attractive to birds. Requires light shade, plenty of moisture and protection from wind when young. Grows well in areas of permanent dampness.

Syzygium maire (maire tawake)

Attractive and moderately growing wetland tree to 15m with bronze foliage, large bunches of reddish fruit and distinctive whitish bark. Requires a sheltered sunny position. Tolerates some frost.

Vitex lucens (puriri)

Fast growing to 20m in fertile, open but sheltered conditions. Will struggle with poor drainage during adolescence.

Warranty

Your 'TechTreat CP2' Sewage Treatment System is guaranteed to be free of any defects in materials or workmanship at the time of installation.

During the twelve months following installation, a cost free maintenance program is provided which includes your first annual service.

Should any mechanical or manufactured part/s fail as a result of defect within twelve months of installation, the part/s will be replaced free of charge.

Pumps supplied with your system come with a two year warranty.

The RELN septic tanks supplied with your system come with a manufacturers fifteen year warranty.

This warranty is governed in total by the "Conditions of Sale"

Warranty Excludes Defects Due To:

- Failure to use the system in accordance with the Owner's Manual
- Changes to surrounding landscaping after installation
- Actions of a third party
- A force majeure event
- Modifications or repairs undertaken without the consent of TechTreat Ltd
- Failure where applicable to fence and plant irrigation field