TREATMENT PLANT APPROVAL 13/2023
Plumbing and Drainage Regulation 2019, part 4.

Approval

1. The **Wormsmart WSP1500PF** ("the system") described in the Specifications and Drawings in the attached Schedule and manufactured by **Property Werx Pty Ltd** (ABN 53 119 269 706 ("the manufacturer") has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code).

2. Approval is granted for the system as a **secondary** quality wastewater treatment system with **nutrient reduction**, subject to compliance by the manufacturer with the requirements of the *Plumbing and Drainage Regulation 2019*, part 4 and the conditions of approval detailed below.

3. This approval, the conditions of approval and the Schedule comprise the entire Chief Executive Approval document.

4. Any modification by the manufacturer to the design, drawings or specifications scheduled to this approval must be approved by the Chief Executive.

Conditions of approval

5. The manufacture, installation, operation, service, and maintenance of the systems must be in conformity with the conditions of this Treatment Plant Approval.

6. The system when tested by a certification accreditation body in accordance with AS1546.3:2017 was found to comply with the **secondary** 10 EP/1500 L level effluent criteria and must continue to meet the following requirements:

    (a) Secondary treatment

Table 2.1 (Abrev) AS1546.3:2017 Secondary effluent compliance criteria for an STS

Parameter	Advanced secondary effluent	
	90% of Samples	Maximum
BOD^5	≤ 20 mg/L	30 mg/L
TSS	≤ 30 mg/L	45 mg/L
*E. coli**	≤ 10 cfu/100 mL	30 cfu/100 mL
FAC[Þ]	Minimum 0.5 mg/L[†]	N/A
Turbidity [§]	N/A	10 NTU

* Where disinfection is required
Þ Where chlorine disinfection is required
† Minimum level, not 90% of samples
§ Where UV light is used for disinfection

Treatment Plant Approval
Approved by: Lindsay Walker
Delegated Authority
Department of Energy & Public Works

(b) Nutrient reduction capacity

During the testing of the Wormsmart WPS1500PF, the treated effluent was tested for total Nitrogen (TN) and total Phosphorus (TP) concentrations. The treatment process has the capacity to reduce the TN and TP concentrations as follows:

- Total N an average of 70.37 mg/L to 41.33 mg/L which represents a **reduction of 41.27%.**
- Total P an average of 11.64 mg/L to 9.83 mg/L which represents a **reduction of 15.55%.**

7. The system is to be installed where the treated water is disinfected via chlorination and dispersed via **subsurface irrigation** into the Land Application Area.

8. Each system must be serviced in accordance with the accreditation certificate issued by Global Certification Pty Ltd (certificate number 2536-2921-01) on 02 February 2023, and details supplied in the owner's operation and maintenance manual.

9. Each system must be supplied with,

   a. a copy of this Treatment Plant Approval document.
   b. details of the system.
   c. instructions for authorised persons for its installation.
   d. a copy of the owner's manual to be given to the owner at the time of installation.
   e. detailed instructions for authorised service personal for its operation and maintenance.

10. At each anniversary of the Treatment Plant Approval date, the supplier must submit to the Chief Executive a list of all systems installed in Queensland during the previous 12 months. Where the Chief Executive is notified of any system failures the Chief Executive may randomly select a number of installed systems for audit. The Chief Executive will notify the supplier's nominated NATA accredited laboratory which systems are to be audited for BOD^5 and TSS. The sampling and testing of the selected systems, if required, is to be done at the supplier's expense. The following results must be reported to the Chief Executive;

    a. Address of premises.
    b. Date inspected and sampled.
    c. Sample identification number.
    d. BOD^5 for influent and effluent.
    e. TSS for influent and effluent.

11. The Chief Executive may, by written notice, cancel this approval if the manufacturer/supplier fails —

    a. to comply with one or more of the conditions of approval, or
    b. within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.

12. This approval may only be assigned with the prior written consent of the Chief Executive.

13. This approval expires on **04 December 2028** unless cancelled earlier in accordance with paragraph 10 above.

Lindsay Walker

Treatment Plant Approval
Approved by: Lindsay Walker
Delegated Authority
Department of Energy & Public Works

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ABN 61 331 950 314

Director
Plumbing, Drainage and Special Projects
Date approved: 04 December 2023

Treatment Plant Approval
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SCHEDULE

Specification & drawings for the

Wormsmart WPS1500PF

Attachment 1 – Wormsmart WSP1500PF CAB Certificate number 2536-2921-01
Attachment 2 – Wormsmart WSP1500PF Manual
Attachment 3 – Wormsmart WSP1500PF Wiring diagram
Attachment 4 – Wormsmart WSP1500PF Schematic diagrams

Attachment 1 – Wormsmart WSP1500PF CAB Certificate

PRODUCT CERTIFICATE OF REGISTRATION

Property Werx Pty Ltd T/A Wormsmart Australia

42 Production Drive, Wauchope, NSW 2446, Australia

Product Performance Testing

AS 1546.3:2017

Secondary Quality at 1500 L/day (10EP level) with nutrient reduction of 41.27% for Nitrogen and 15.55% for Phosphorus.

Model	Disinfection	Average Results over the Test Period	Servicing Frequency	Discharge	Manufactured and assembled
Wormsmart Plus WSP 1500PF	Optional with chlorination unit installed	TSS 18.27 mg/L BOD5 10.20 mg/L Nitrogen 41.33 mg/L Phosphorus 9.83 mg/L E coli 4.27 CFU/100mL	3 monthly if chlorine unit is attached	Pumped out of the system	Manufactured and Assembled: Tanks manufactured by Everhard Industries Assembled at 42 Production Drive, Wauchope, NSW 2446, Australia
The system took 5 weeks to achieve Secondary Level. Chlorine and worms were added during the test period.					

This Certificate of Conformance to the Product Certificate Scheme for "Domestic Wastewater Treatment Units (AWTS)" remains the property of Global Certification Pty. Ltd. and is granted subject to the terms and conditions of the Contract Application, in respect of the Product certified on this page and the attached schedule to the Certification of Conformance, bearing the same number as this certificate.

Managing Director

JAS-ANZ

CERTIFICATION DATE:	DATE OF ISSUE:	EXPIRY DATE:	CERTIFICATE #:
25 January 2023	2 February 2023	25 January 2028	2536-2921-01

GLOBAL CERTIFICATION

Global Certification Pty Ltd
Level 1, 135 Queen Street, Cleveland, 4163 QLD
1300 495 855 | www.globalcertification.com.au

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Queensland Government

Attachment 2 – Wormsmart WSP1500PF Manual

WORMSMART PLUS
TECHNICAL SPECIFICATIONS
AND
OWNERS MANUAL

WSP1500PF

Treatment Plant Approval
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Delegated Authority
Department of Energy & Public Works

HOW IT WORKS.

The Wormsmart plus is a package wastewater treatment plant that comprises of a primary vermi-compost plant followed by a sludge and sediment filter then a single pass trickling filter. It can be constructed with or without disinfection. It is an eco-friendly and sustainable alternative to existing mechanical treatment plants and comprises of 4 stages:

1>WASTEWATER ENTERS THE SYSTEM:

All grey and black water from the property is plumbed into the tank via a standard single line 100mm DWV pipe. This is a standard connection that would be found in most other septic and sewer connections.

2>NATURE DOES ITS WORK:

The primary tank contains worms that break down all of the organic waste and turn it into a organic humus, aerobic bacteria feed on and digest the humus and further treat the water as it passes through the organic matter and incorporated filter into a sub chamber.

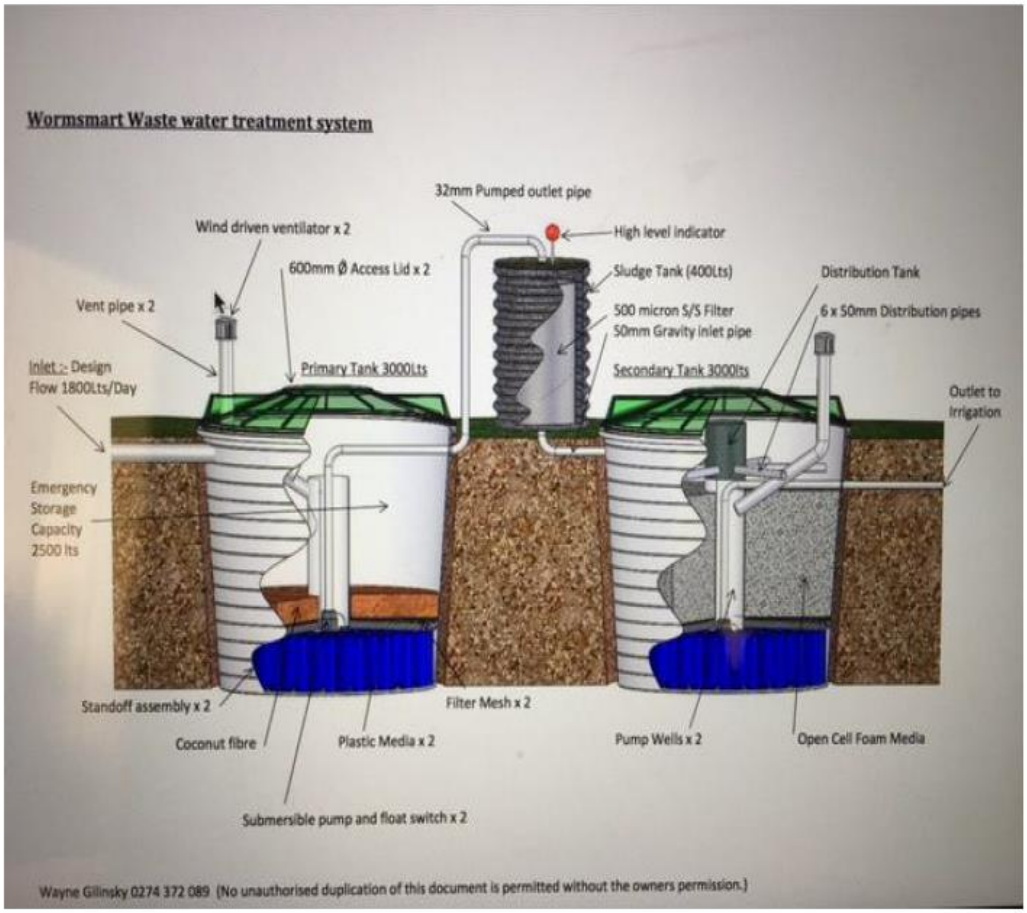
3>FURTHER PASSIVE FILTRATION:

From the primary tank the water is lifted via a high quality and low wattage submersible pump (if required) into a raised sludge and sediment filter. (This filter is easily accessible for cleaning and servicing). Gravity then sends the water to evenly disperse into the second tank where it slowly trickles through and gets further treated by aerobic bacteria.

4>DISPERSAL AND DISENFECTION:

If required the filtered water will pass through a choline disinfection unit before being dispersed out into the irrigation area where the organically nutrient rich water will work to improve the quality of your soil.

SCHEMATIC DIAGRAM



COMPONENTS LIST:

2x 3000 litre polypropylene tanks
1 x 400 litre advanced HDPE polymer sludge tank.
2 x SJE Rombus high water level alarms
1 x Reefe RV 155 Vortex pump (if required)
1 x Reefe RHS105VF drainage pump.

THE TANKS

TANK 1, 'the primary tank.'

This is the vermi-culture chamber that comprises of a strong, robust, high quality and permanent 0.5mm plastic filter. The worms live on top of this filter and enjoy the comforts of either coconut fibre logs or hardwood compost, this provides a relatively dry and temperature-controlled habitat for them. All solid waste from the house that either passes through the plumbing or inputted directly into tanks top via a laser cut and child proof hatch is digested by the worms and the grey water passes into a sub chamber where a float controlled low wattage pump will activate at a certain level to pass the water into stage 2, the elevated sludge tank.

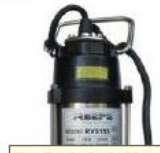
STAGE 2, The elevated sludge tank.

This stage is elevated in order to prevent the requirement for a pump and allow gravity to do the work, it also allows easy access as this is the chamber that requires servicing. It houses a 40 litre 180 micron stainless steel mesh basket that the water passes through and into a sub chamber with na in situ sludge filter. All of this is easily accessible via the removal of the aluminium lid.

TANK 2, trickle filtration and disinfection.

From the elevated sludge reciprocal, the water evenly and passively disperses into a tank filled with organic and in-organic components designed to further remove solids and be extensively treated via billions of aerobic bacteria clinging to the extensive surface area. If required a choline disinfection chamber will be installed at the end of this process so as not to kill the good bacteria.

The 3000 litre polymer Everhard septic tank. This product is used in the manufacture of both the primary and secondary systems of Wormsmart. They meet the requirements set out in ASNZ1546.1.2008 and we can offer a 10 year structural and installation warranty



The Reefe RVS155 vortex sump pump. This pump is used in your 1st or primary tank.

1.5 AMPS. 180 Watts. 90 litres per minute with a max head of 7m.

umping soft solids up to 15mm

The Reefe RVS155 vortex sump pump. This pump is used in your 1st or
primary tank.

1.5 AMPS. 180 Watts. 90 litres per minute with a max head of 7m.

Capable of pumping soft solids up to 15mm

The RHS105VF submersible drainage pump. Found in the second or secondary
tank.

3.4 AMPS. 0.75 KW. 105 litres per minute with a max head height of 32m.

Capable of pumping soft solids up to a size of 3mm. A strong versatile pump.

The SJE XT tank alert system. A weather proof and user friendly high water level alarm that works in conjunction with the Reefe pumps. It emitts an alarm sound of 85 decibels at 3m and has a "silent" button. It will auto reset once water level reseeds.

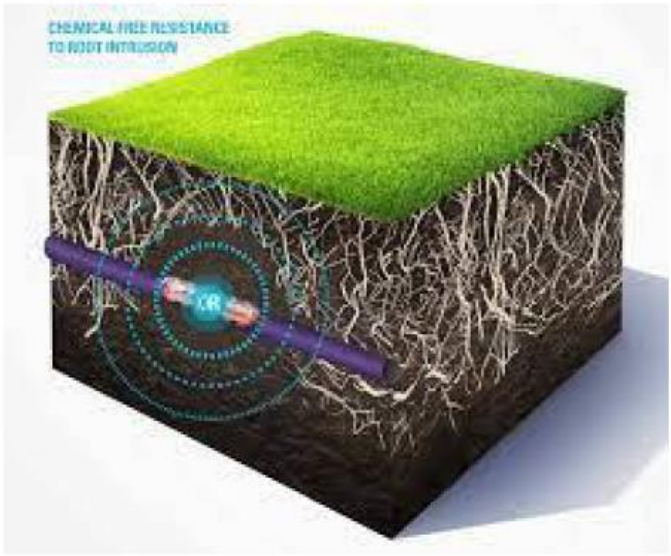
Situated at the tank it can also be placed in side the house.

EFFLUENT DISPOSAL FILED

Netafim Bio-Line AS is an excellent drip tube coloured for use with recycled water. It is the Lilac coloured version of Netafim's Techline AS and has a range of excellent features including:

- ***Anti Syphon:*** *won't suck any dirt or grit into the line that can cause blockages*
- ***Pressure Compensating:*** *Can be used on slopes and multi-levelled gardens and will water at the same rate at the high and low points.*

- ***Flow Rate (per dripper):*** *3lph*
- ***Tube Size:*** *13mm*
- ***Dripper Spacing:*** *30cm*



SYSTEM PERFORMANCE

The result of the performance evaluation demonstrated that the Wormsmart system meets the criteria for Secondary Effluent Quality at the 10 EP or 1500 litres per day level with nutrient reduction of 41.27% for Nitrogen and 15.53% for Phosphorus.

Table A1 Results showing compliance to secondary standard at 1500 litre (10EP) capacity

	90% of Samples	Number of Samples >30 and ≤45 TSS >20 and ≤30 BOD_5 >10 and ≤30 E coli	% Compliance
TSS	≤30 mg/L	0	100%
BOD_5	≤20 mg/L	4	90.24%
E coli	≤10 cfu/100 ml	4	90.24%
FAC	Minimum 0.5mg/L	0	100%

Test		Averages	% pass at secondary level	Highest	lowest	% of influent	% Reduction
TSS	mg/l	18.27	100%	30	6	4.64%	95.36%
BOD_5	mg/l	10.20	90.24%	28	<2	3.12%	96.88%
Nitrogen	mg/l	41.33	Nutrient Reduction	77.8	19	58.73%	41.27%
Phosphorus	mg/l	9.83	Nutrient Reduction	15.8	5.1	84.45%	15.55%
pH	-	6.48	N/A	6.97	5.43	N/A	
Alkalinity	-	166	N/A	240	120	N/A	
Turbidity	NTU	29.29	N/A	58.9	15.44	N/A	
FAC	mg/l	0.71	100%	1.38	0.5	N/A	>0.05mg/l
Reactor chamber temp	°C	21.71	100%	28.1	16.2	N/A	
Dissolved Oxygen	mg/l	0.92	100%	2.14	0.4	N/A	
E coli	CFU/100 mL	4.27	90.24%	30	<1	0.0000476%	99.99%
Sample Code	varied	N/A					

Table A2 Effluent average results from Wormsmart

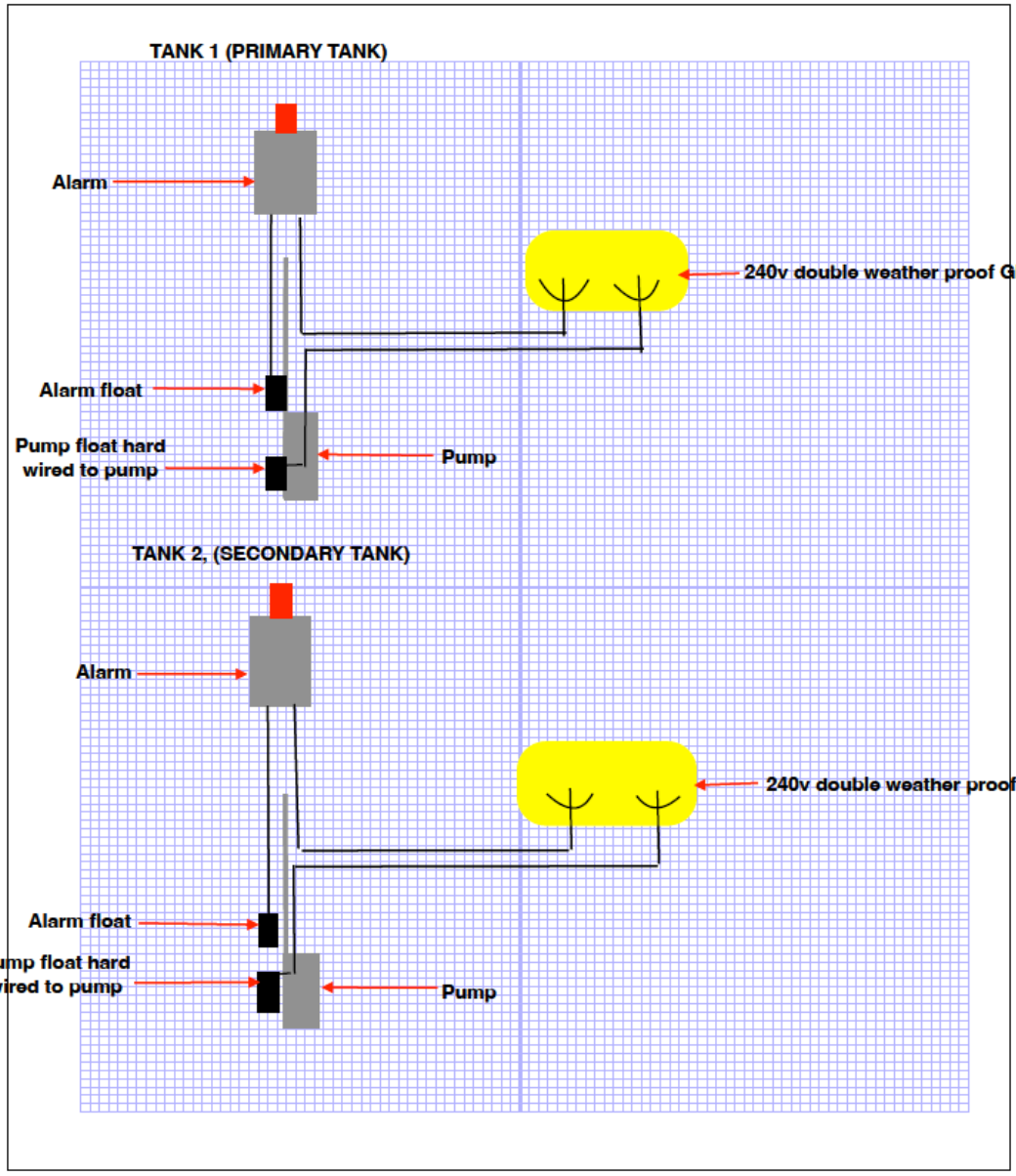
SUMMARY

Congratulations on the purchase of your new Wormsmart system! Your system has been designed and manufactured using the highest quality materials available, to give you many years of trouble-free wastewater treatment. As the homeowner, you play an important part in helping your system to work properly, providing you hassle-free treatment. Simply put, the most important part of looking after your system is to use environmentally friendly cleaning products (including laundry detergent, dishwasher powder, dishwashing liquid, hand soap, etc). While worms are extremely resilient some chemicals will kill them - they definitely prefer eco-friendly products, Please do not introduce any harsh chemicals to your system including bleach, and solvents. Avoid washing paintbrushes and disposing of paint down the drains. Please also refrain from using toilet flushing products that go inside the cistern or clip on to the toilet bowl, as these chemicals will kill the good bacteria in any septic system and may harm your system's worms. Your Wormsmart system will love food and organic waste However, never flush nappy liners, baby wipes, cotton wool, sanitary products, condoms, etc as these do not decompose. Your local authority regulations dictate how regularly your system must be serviced. Maintenance should be undertaken by a suitably qualified Service Agent and records sent to the Council. In between services, in the unlikely event that your Wormsmart develops a problem, the first sign will be an unpleasant odour. If there are any foul smells coming from your system, call Wormsmart on 1800WORMSMART. Any wet patches or ponding on the ground may suggest damage to your drainage field. Contact your Service Agent to arrange for repairs. If your Wormsmart system has electricity connected to it, there will be an alarm box mounted on the tank or at the house. If there is a problem with your pump, the red light will come on with an audible buzzer to alert you to contact your Service Agent. We wish you many happy years of trouble-free wastewater treatment.

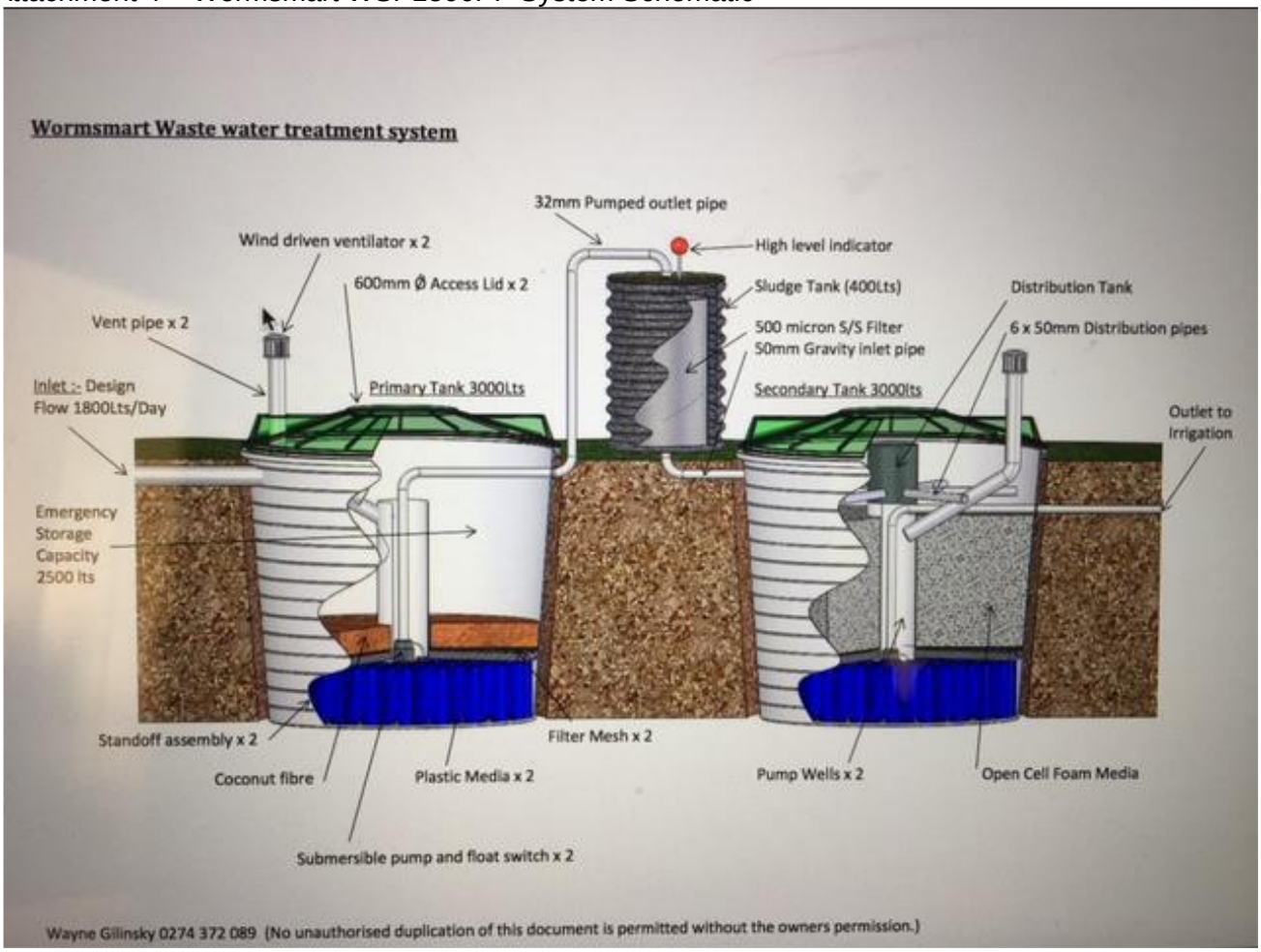
http://www.lanfaxlabs.com.au/ provides handy information on waste water and septic system use.

Attachment 3 – Wormsmart WSP1500PF Wiring diagram

WORMSMART PLUS
Pump and alarm connection guide



Attachment 4 – Wormsmart WSP1500PF System Schematic



INSTALL PLAN

Date:
Name:
Address:
Council Reference:
Responsible Person: