garden Master

Waste Water Treatment System

Owner's Manual

garden Master ELITE Wastewater Treatment System

Thank you for purchasing the **Garden Master "Elite"** Aerated Wastewater Treatment System (AWTS).

Your Garden Master AWTS is fully automatic in operation and requires little owner intervention to ensure years of service. It is useful that the owner/operator of the system understand some of the broad concepts of the system operation.

This manual has been written to provide this simple explanation and to serve as a future reference so that you can ensure that the system is operating effectively at all times.

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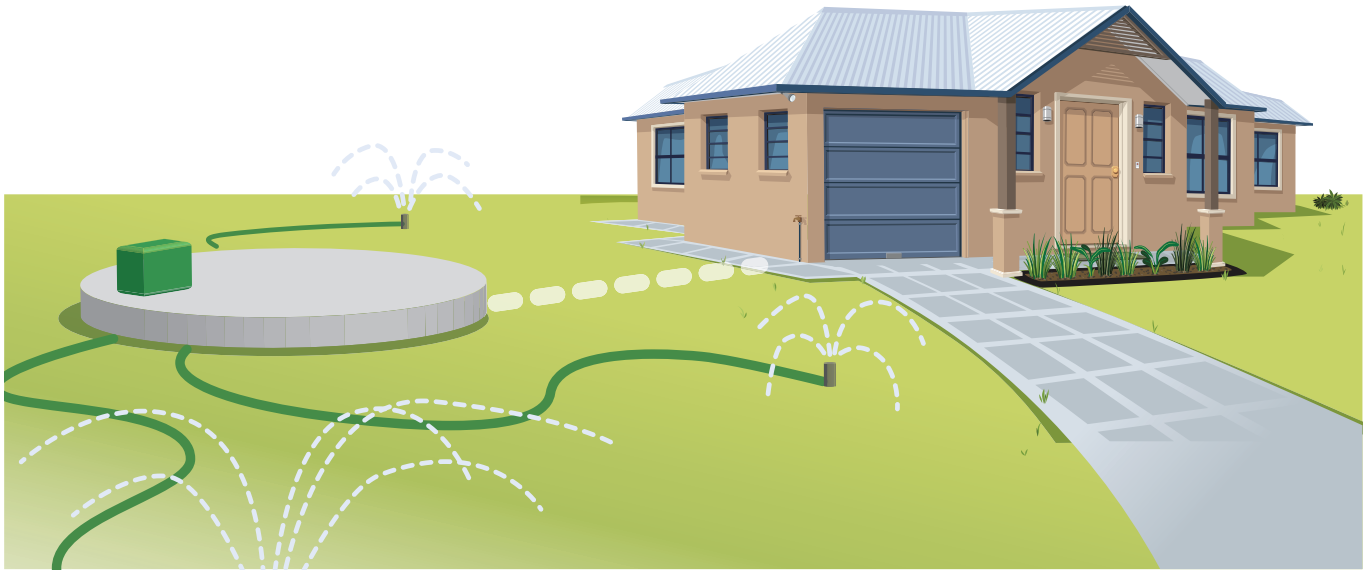

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Pre-Installation Information

The Water Cycle

(a) The water cycle is the term used to describe the naturally occurring processes of rainfall, evaporation, absorption, storage and use of water in the environment. The cycle starts with cloud formation and when rain falls, it is collected on the ground and runs into existing bodies of water such as streams, lakes and rivers. Some of this water finds its way back into the environment through evaporation back into the atmosphere and some finds its way back into the soil through percolation for use by plants and trees.

(b) The system is dynamic and constantly changing. Weather conditions such as humidity and temperature effect the amount of water drawn back into the air by evaporation or transpiration. The amount of rainfall (or lack of it) affects percolation of water into the soil in the proceeding days and months.

(c) Human use of water affects the water cycle in a variety of ways. Specifically water is drawn from its normal course of function within the water cycle and applied to domestic, agricultural and industrial uses. This diverted water, once used must be returned to the water cycle somewhere further downstream. The quality of water within a catchment has a significant impact on environmental and public health. The specific purpose of your Garden Master AWTS is to ensure that all waste water is correctly treated before it is returned to the water cycle.

Domestic Waste Water

By statutory requirement all water used in a domestic situation is required to be collected and treated before it is returned to the water cycle. With houses that are not connected to a centralised sewage system this treatment must be carried out in a fully approved on-site wastewater treatment system. This is to protect our environment and public health from waterborne pollutants. This responsibility ultimately lies with the householder and for this reason your should become sufficiently familiar with the operation of your Garden Master AWTS.

A typical domestic dwelling generates wastewater from the kitchen, bathroom, laundry and toilets. Wastewater can be divided into two categories depending on the degree of human waste it contains. Grey water is the largest proportion of wastewater and flows from all the non-effluent sources such as drains, sinks, baths and showers. Black water is from your toilet. Your Garden Master is designed to treat both black and grey water and, after processing, return it to the environment through a suitable irrigation system to the designated land application area.

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Installation of your AERATED TREATMENT SYSTEM

Site Access

Ensure the site of the proposed excavation is clear and free of any obstacles so as to ensure good access for both the excavator and the Crane Truck. The crane truck requires clear access to reverse up to the excavation.

Excavation

Mark out and excavate the hole as per the excavation details on the following page.

Ensure the Excavation is solid and level. Screed a 50mm base of crusher dust or sand.

Place the Garden Master 7100 into the excavation, lifting only using the 4 x swift lift lugs located in the bottom of the tank.

All personnel should keep well clear of the excavation.

Installation

Backfill the excavation with clean fill, no rocks. This would generally be the spoil removed during the initial excavation of the hole.

Immediately fill the system with water. The system will take approximately 7,000 litres to fill to operational level. Failure to fill the system could result in the tank floating out of the ground if heavy rain is experienced.

Connect the sewer line to the inlet of the tank. All plumbing connections are to be carried out by a licensed Plumber only.

Electrical

All electrical connection must be carried out by a licensed electrician. Connect the Garden Master as per the Electrical specifications below. Leave the power to the Garden Master switched off until the system is commissioned by an authorised agent.

Commissioning

This will be carried out by an authorised Garden Master Agent. Connect the outlet of the system to the approved disposal area only. The disposal area must be constructed in accordance with the approval. The system will start automatically when the power is switched on.

Bio-Logic Elite 7100 Specifications

Tank Dimensions		Chamber Capacity
Diameter	= 2540mm	A 7100 Lt Tank – AS 1546
Height	= 2050mm	B 3050 Lt Septic Chamber
Bottom of tank to bottom of inlet	= 1600mm	C 3300 Lt Aeration Chamber
3m x 3m x 2050mm deep from high side		D 350 Lt Clarifier
		E 350 Lt Chlorination Chamber
		F Biological Media

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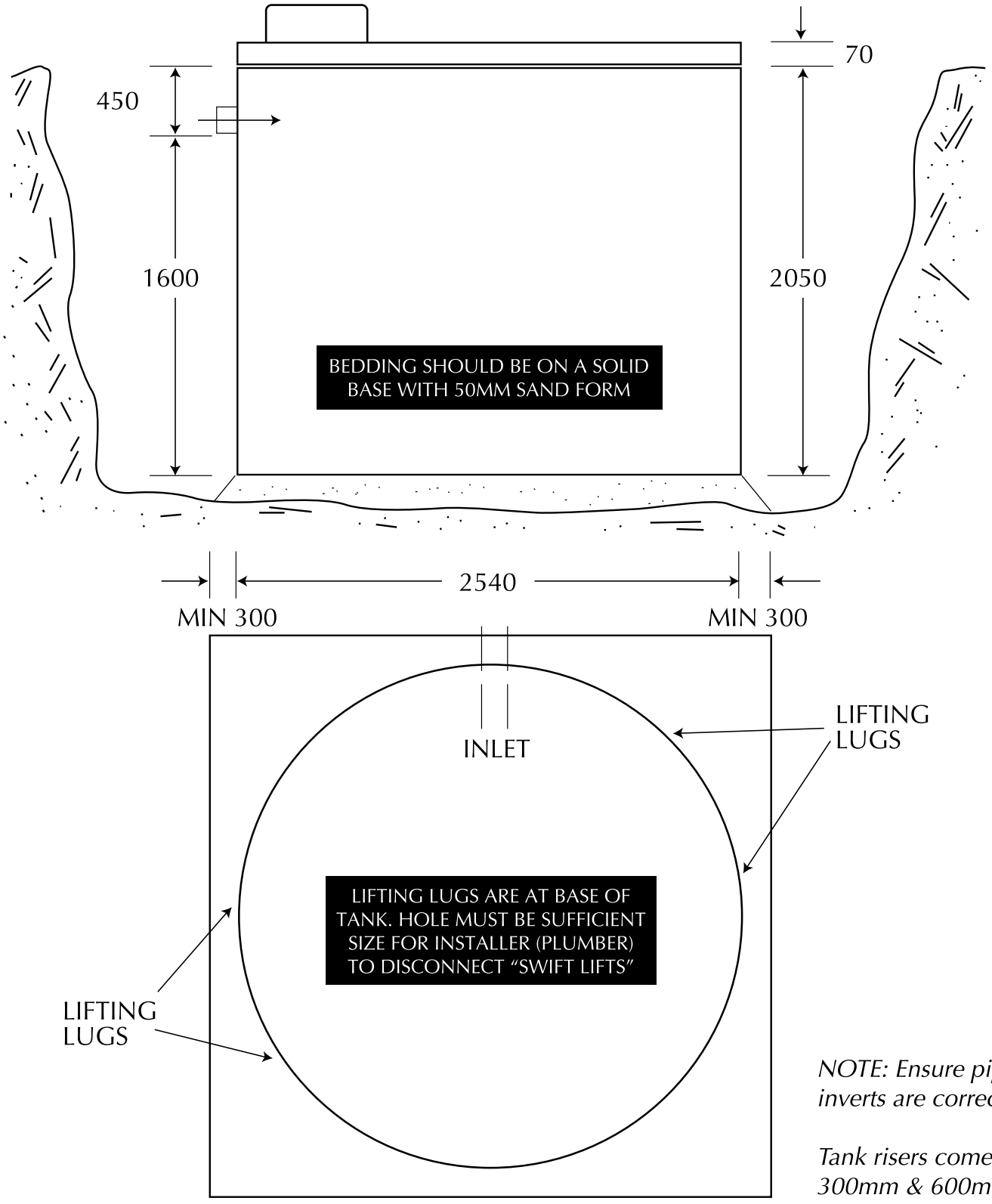
Excavation Detail for your AERATED TREATMENT SYSTEM



NOTE: Ensure pipe inverts are correct

Tank risers come in 300mm & 600mm

PLEASE NOTE: Please ensure that a minimum of 50mm of tank plus lids is above ground.

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Electrical CIRCUIT SPECIFICATIONS

Important: This sheet and the alarm plate must be handed to your electrical contractor.

Caution: this specification changes from time to time – always check.

The conduit must be run to the junction box mounted in the side of the control box on the treatment tank. **Ensure you glue all joints in your conduit run** to prevent water from entering your conduit and the control box and causing damage. Water ingress is not covered under warranty.

A dedicated single phase plus earth circuit, protected by a 16 amp MINIMUM circuit breaker of 8Ka type suitable for motor start, such as Weber/Martec AS168 type, Quicklag, Terasaki Safe "T" or Clipsal "U" type.

Minimum cable size is 2.5mm, this is Connected to, and run from, an EXTERNAL building switchboard (to allow for maintenance when the house is unattended), to the Garden Master terminal box. Alarm wiring run can be two-core switch wire.

Circuits should be labeled "Garden Master System"

The above circuits must be connected to the terminals as labeled in the Garden Master terminal box. Note: Electrical work must be carried out in accordance with A.S/N.Z. 3000 and Supply Authority Rules. A "Notification of electrical work" certificate must be lodged with the Supply Authority for your wiring.

Continuous running current is 0.6amp with maximum intermittent current up to 3.1 amps (dependant on submersible pump size).

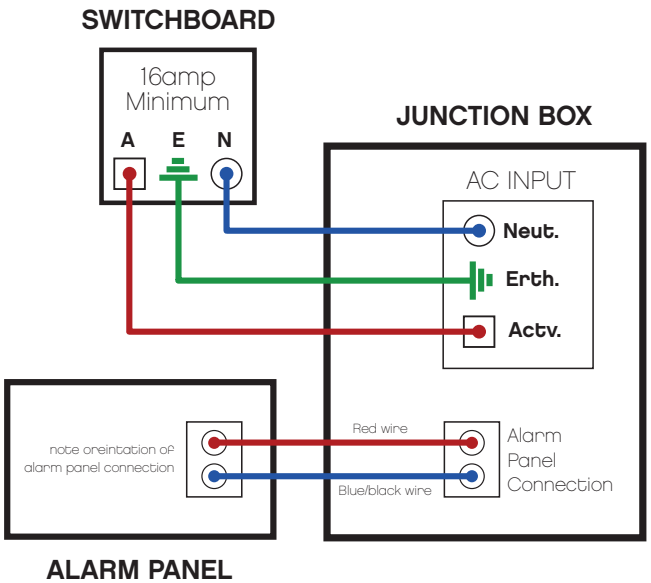
Upon initial energizing of the circuit to the system, the alarm may sound. This may be caused by high water level, and is no cause for concern. If the power is left on, the level will return to normal within 30 minutes and the alarm will automatically reset.

Be sure to return the alarm to "NORMAL" after the alarm has reset.

Alarm Panel: If the alarm panel is more than 30 metres away from the Garden Master control box use shielded cable for **SW to alarm panel** to avoid any induced voltage from active cable.

Fault Conditions

- Yellow light and buzzer low air pressure. Red light and buzzer high water,.
- When button is pushed alarm sound only will be muted for 24 hours, resetting after this time if the problem has not been resolved, please contact your service agent again to ensure a technician has been allocated, technicians have up to 48 hours to respond to faults, but commonly will always be quicker.



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System Operation of your AERATED TREATMENT SYSTEM

Primary Chamber

Influent enters the chamber via the source whereby scum and solids capable of settling are separated from the raw influent. Primary treated effluent flows through a transfer port to the aeration tank. This tank will also act as a storage chamber for sludge returned via the Clarification Chamber.

Aeration Chamber

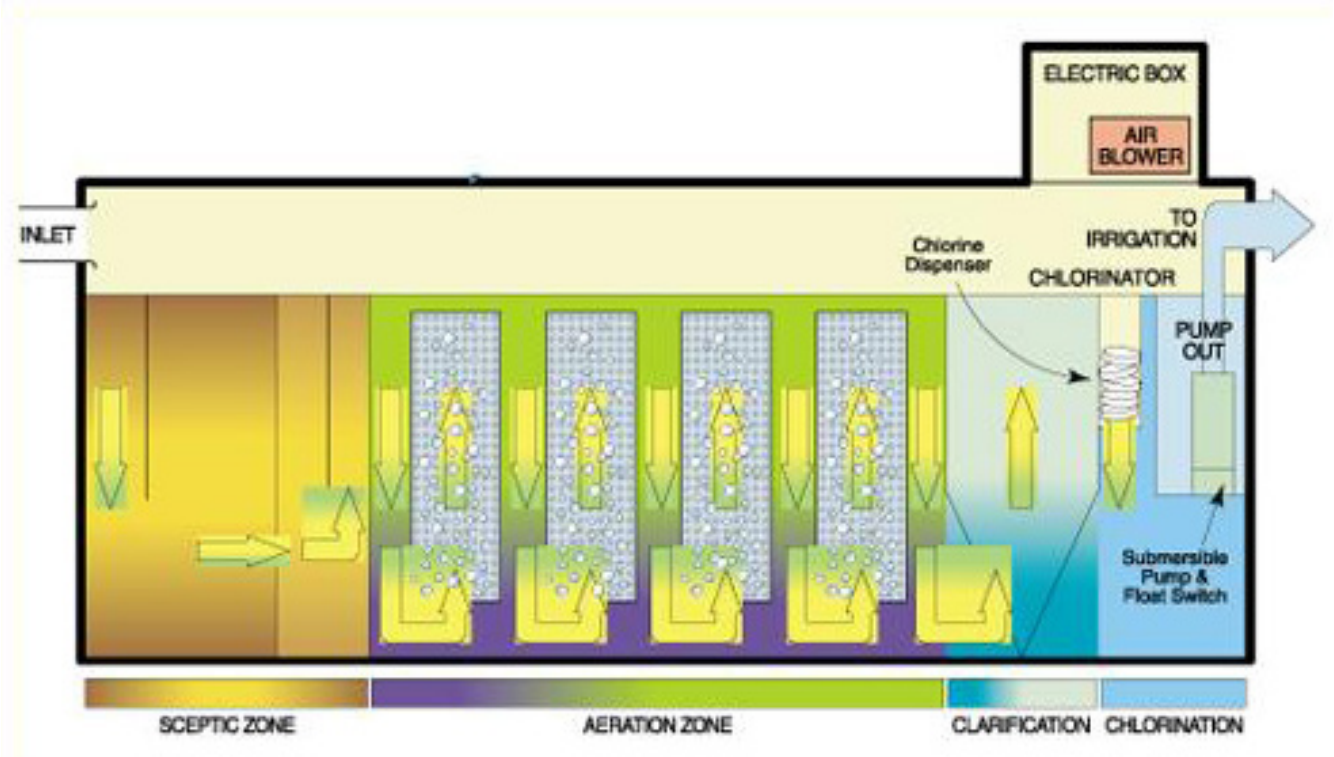
Water enters via the Primary Chamber. Air is introduced into this chamber via an air blower to create an environment for aerobic bacteria and other helpful organisms to consume the organic matter present. The aeration tank is designed in a manner to help prevent short circuiting of the wastewater to ensure extended aeration. Media is also present in the tank to support the growth of bacteria.

Clarification Chamber

The Clarification chamber is essentially a quiescent zone where suspended particles/solids are settled out of the water. These particles are returned to either the septic or aeration chambers via a sludge return which aids in further biological reduction, de-nitrification and providing a constant food supply rich in microbes supporting the system through periods of limited flows.

Disinfection

Disinfection is achieved via low doses of chlorine to kill off any remaining harmful organisms. This process is achieved through an automatic chlorinator with sufficient doses to last between maintenance visits.



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Monitoring Process of your AERATED TREATMENT SYSTEM

Irrigation - Designated Land Application System

Your **Garden Master** AWTS has been designed to treat the effluent to achieve the best possible quality water before discharge back into the environment. The designated irrigation area is an integral part of your **Garden Master** system and is designed to accommodate the predicted flow rate of wastewater at the time of system approval.

Local Government approval of an AWTS is conditional upon regular maintenance being conducted by an approved service technician. With **Garden Master** this is done by means of a maintenance agreement which ensures that your system is serviced quarterly and the results of the inspections are supplied to the local council. **Garden Master** has an ongoing statistical audit program which collects designated samples and submits these to independent test laboratories for microbiological testing.

Quality of Waste Water after Treatment in an AWTS

Parameter	Acceptable Levels
Biological oxygen demand	<20mg/L
Suspended solids	<30mg/L
Thermo Tolerant Coliforms (after disinfection)	30 cfu/100mL
Dissolved Oxygen	2mg/L

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Service and Support of your AERATED TREATMENT SYSTEM

Garden Master Servicing

Garden Master are committed to servicing and supporting you long after your tank has been installed. For your system to maintain its high-level performance, NSW Health requires that it is serviced every three months. During this service, our team provides comprehensive checks and tests to ensure you get the most out of your system. These include:

- Sample water through the system for quality testing
- Measure residual chlorine & replenish chlorine supply
- Record water usage
- Inspect the septic tank
- Inspect the pump & blower operations
- Make any necessary adjustment; inspect the treatment tank including scum & sludge return, water & airflow
- Inspect operations and conditions if irrigation system
- Replenish the supply of disinfectant

Our qualified service technicians provide complete servicing solutions for all brands of both Commercial & Domestic systems. Annual service contracts are available for all systems. Always ring your service provider as soon as the alarm comes on.

Pump-Out

During your service, our qualified technician will advise you when a pump out will be required. Garden Master will be happy to advise and assist in this matter.

Depending on the individual usage of your septic system, a slow but gradual accumulation of Non-biodegradable matter will lead to the need for pump-out.

How often pump-outs are required will depend on how large the tank is and how many people use the system. However, it is recommended our systems are pumped out every 5 to 7 years.

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Maintenance of your AERATED TREATMENT SYSTEM

Because your **Garden Master** is fully automatic there is no need for the owner to be concerned. However there are some simple precautions to observe.

DO's

- Avoid using strong acids, alkalis, oils and chemicals in your toilet, bathroom, laundry and kitchen (too much can kill off the working "bugs").
- Limit the use of water in the dwelling.
- Use only bio-degradable detergents in the laundry and kitchen.
- Try to spread wash loads over different days.
- Try to avoid using the washing machine and shower at the same time.
- Front loader washing machines reduce water usage.
- Have your system serviced every 3 months.

DON'Ts

- Do not use harsh cleaners such as bleaches and anti-bacterial products. Do not pour left over solutions, acrylic paints etc directly down the drain.
- Do not dispose of condoms or sanitary products down the toilet or house drains.
- Do not put products such as hairdye, Napisan, Domestos, cooking oils, metho, turps or excess fats into the system.
- Never turn the system off, even when away on holidays.

Products to use

WASH POWDERS, LIQUIDS & SOFTENERS					
Add Soft Cuddly Gows Pree Woolmix	Blue Dynamo Embassy Launda Purelite	Blue Gum Fab Love & Care Lux Rinso Topwash	Snow Care Fluffy More Softly	Castle Ease Omo Surf	Cold Power Hurricane Parrys Sunlight
DISHWASHING					
Bushland	Finish	Greenaple	Kit Palmolive	Sunlight	Trix
SURFACE CLEANING			**TOILET CLEANING**		
Jif or similar cream cleansers / Spray & Wipe			Hot water is an effective disinfectant and can be used with a little cream cleanser like JIF.		

Bleaches and antibacterial products are a NO NO!

Avoid all products with bleach or ammonia.

NOTE: these are our recommendations and they are based on product knowledge at the time of writing. We do not intend to discredit any product or favour others, we are concerned primarily with the function of your unit.

If you accidentally put the wrong products in your system, don't hesitate to call us. We will advise on ways you can remedy the situation or suggest ways to recommence the bacterial activity.

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Conserving Water with your AERATED TREATMENT SYSTEM

Water conservation is very important for septic systems because continual saturation of the soil can affect the quality of the soil and its ability to naturally remove toxics, bacteria, viruses, and other pollutants from the wastewater. The most effective way to conserve water around the house is to first understand where it is being wasted. In a typical household, most of the water used indoors is used in the bathroom, kitchen and during laundry. There are several little things that can be done to conserve water here.

Bathrooms

- Try to avoid letting water run while washing hands and brushing teeth. This can save 6 litres of water per minute.
- Avoid taking long showers and install water saving features in faucets and shower heads. These devices can reduce water use by up to 50 percent.
- Install a dual-flush toilet. Low-flush toilets use far less water per flush compared to conventional toilets.
- It is also important to avoid overtaxing your system by using a lot of water in a short time period. Try to space out activities requiring heavy water use over several days.
- Immediately repair any leaking faucets or running toilets.

Kitchen and Laundry

- Put a plug in the sink if you're running the tap to wash dishes by hand or rinse fruit and vegetables.
- Only use the washing machine and the dishwasher when they are full. Otherwise, adjust the water level to match a partial load.
- Avoid doing laundry all in one day, as this may be harmful to your septic system. By doing several loads in succession, the septic system does not have time to adequately treat wastes.
- Newer energy-efficient clothes washers use 35 percent less energy and 50 percent less water than a standard model. Look for appliances that display high Energy star ratings.

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Fault Finding for your AERATED TREATMENT SYSTEM

To ensure the most effective operation of your Garden Master AWTS system you should familiarise yourself with the contents of this manual. The Garden Master AWTS has been designed to include additional safety margins and minor mishaps and normal household usage will not usually affect the operation of the system.

However if the alarm sounds or strong odours persist this checklist may assist in locating the fault.

Fault Observed	Potential Cause	Remedial Action
Alarm sounds	* Irrigation pump not working * Air supply not working * No power at the tank	* Check water levels * Listen for the air compressor * Check power supply source
Water around tank	* Irrigation pump not working * Irrigation lines blocked or kinked	* Check water levels * Check irrigation lines and clear sprinklers
Excessive foaming	* Too much laundry detergent * Too many washes	* Use recommended quantities * Spread wash loads over different days
Persistent odours	* Too much water usage * Excessive chemicals in use	* Add biologic starter pack * Install water saving devices * System will recover
Irrigation system not working	* Pump failure * Irrigation lines blocked	* Check water level * Clear lines and sprinklers
Water ponding on irrigation field	* Not enough sprinklers working * Excessive water use * Broken irrigation pipe	* Installation should comply with original approval * Install water saving devices * Repair irrigation pipe

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How the **House Alarm** Works

The alarm plate is usually placed in the laundry of the dwelling or in another suitable place that the homeowner will be able to hear if there is a problem with the system.

Alarm Light

The alarm light will only be displayed if a fault is located. In the unlikely event that this occurs, press the switch in the centre of the plate to mute the alarm buzzer. The light will continue to stay on until a **Garden Master** technician rectifies the problem.

Power

Warning light will come on for air or water. Please inform your technician which light is on - Air or Water.

Mute Switch

This switch is designed to mute the alarm from sounding until the fault is rectified. If Garden Master is not notified of the problem and the fault is not rectified, the alarm will sound again in 24 hours.

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Irrigation Area for your AERATED TREATMENT SYSTEM

Your irrigation / disposal area will operate more efficiently and have less wet areas if covered with vegetation.

The following is a list of some of the plants and shrubs that are suitable for planting in wet conditions. Consult your local nurseryman for the particular species that will suit your area and soil conditions.

PERENNIALS	SHRUBS
Agapanthas Canna Gazania Umbrella Grass Helleborus (Christmas rose) Hosta (plantain lilly) Shasta Daisy Marguerite Daisy Mazus viburnum	Aucuba Bauera Callistemon Bottlebrush Coprosma Cordyline flax Strelitzia Photinia
GROUND COVERS	**GRASSES & CLIMBERS**
Grevillea Bougainvillea	kikuyu Buffalo kennedya Hardenbergia

The treated effluent from domestic wastewater treatment systems should not be used for human consumption or to irrigate vegetables or fruit.

The irrigation area should not be used for recreational purposes.

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