



*Engineering the future of wastewater*

# Aerated Wastewater Treatment Systems

ABS 2000 / 2500 / 3000

**OWNER / OPERATOR MANUAL**



### **Important**

We recommend you keep this Manual with other important household manuals for future reference. If you have questions regarding the safety and operation of your Austin Bluewater ABS Treatment System contact your Local Authorised Service Technician.

- Do not attempt to service components of the system yourself, call your Accredited Service Technician.
- Only Authorised Service Personnel are to remove covers on the Treatment System.

Problems with advanced treatment systems can be difficult to analyse.

Whenever your system is not functioning correctly, it is best to contact a trained professional, such as the manufacturer or trained technician to recommend the best procedure.



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# About Us

Austin Bluewater Environmental Concepts Ltd is a proven leader with over 30 years hands-on experience designing and manufacturing wastewater treatment systems, in New Zealand, for New Zealand.

Austin Bluewater Environmental Concepts is a leading manufacturer of specialised wastewater products including treatment systems, septic tanks, water storage tanks, pump stations, grease traps and oil & grit interceptors. Our company's founder and director Lew Austin, is the innovator of Aerobic Wastewater Treatment Systems in New Zealand and still plays an active role in the direction and supervision of the business.

As a business, we actively seek to develop, improve and refine all aspects of our products and our manufacturing processes. Our respect and care for the environment is our motivation to continue to develop and enhance the treatment of wastewater.

All of our products are designed, manufactured and assembled at our own manufacturing facility to ensure consistent quality and durability.



# The Treatment System

## The Nature of Household Sewage

Household sewage is a combination of wastewater from several sources including sinks, toilets, showers, washing machines and dishwashers. The largest source of household sewage may vary depending upon the number of residents and water-using appliances within the home. Organic matter comes mostly from toilets, while sinks, showers, and washing machines contribute large amounts of wastewater containing only small amounts of soap and dirt (including grease, detergents, lint and vegetable matter).

## Treatment System Process

### First Stages – Primary Treatment

All wastewater from the home flows by gravity into multi-stage primary settling chambers.

The heavier, solid particles in the sewage settle to the bottom of these chambers forming a layer of sludge. Lighter materials, including fat and grease, float to the surface, forming a scum layer.

Anaerobic (no oxygen) bacteria establish themselves in these chambers and partially digest organic matter.

Sludge and scum are stored in these chambers rather than being allowed to flow into the next chambers.

### Second Stages – Secondary Treatment

Our system is unique as it comprises multiple aeration chambers for higher quality treatment. Within these chambers a filter medium product called Bio-Blok is used to provide vast surface area, allowing a biological film to grow on its surface. This film is made up of healthy active aerobic bacteria, fed by diffused oxygen (by way of air) which is pumped through the enriched effluent multiplying the bacterial content. This process breaks down the effluent and assists with the denitrification process plus the removal of suspended solids.

### Third Stage – Clarification

The purpose built clarifier acts as a final settling chamber, removing settled sludge back to the primary area, to assist in de-nitrification of the system.

### Final Stage – Irrigation

This chamber contains an automatic irrigation pump or Flout which sends the highly treated effluent to the disposal field for irrigation and final treatment within the soil.

## Septic Tank Effluent Filters

Austin Bluewater ABS Systems are fitted with Polylok Effluent Filters, recognised as the most efficient filters available. These have an automatic shut-off ball installed with every filter.

When the filter is removed for cleaning, the ball will float up and temporarily shut off the system so solids won't leave the chamber.

While effluent filters are partially self-cleaning, they must be cleaned as part of routine maintenance, your service agent will perform this task during scheduled servicing.

## Pumped Systems

Site conditions, engineers and local Councils will determine the type of pump to be installed.

Pumped systems also allow for even pressure dosing of dispersal fields resulting in a longer life to the field than under gravity conditions. Effluent levels in the pump chamber are controlled by internal switches that turn the pump on and off at preset levels, sending effluent to the disposal field.





# Introducing Products To Your System

## Maintaining A Healthy Balance

The greatest cause of problems with your treatment plant **are cleaning products and the washing machine.**

## Cleaning Products

Certain cleaning products may harm your treatment system by poisoning the natural bacteria that treat the wastewater. We recommend using environmentally friendly products.

Your treatment system relies on bacteria for your system to work effectively. Any product that kills bacteria is harmful to your system. If you wish to use some of the harsher cleaning products, it is suggested that you use a bucket and discard the contents in an alternative manner. This also applies to disinfectant, surface spays and wipes.

Most cleaning products should generally cause no issue when used as per the manufactures instructions and used in moderation. Always try to use the minimum amount of product required to perform the cleaning task.

Look for products labelled "safe for use in septic systems".

## Washing Machines

Try to evenly spread your washing over a period of a week. Avoid, where possible, washing everything in one day. It puts too much pressure on the system and your unit will struggle to cope. Liquid soaps breakdown easier than granulate styles do. Try not to be heavy handed with the amount of soaps you use.

When working properly, your treatment system will work efficiently with no odours or problems.

**It needs a happy balance.**



# How To Look After Your ABS Treatment System

## Acceptable Solutions

Substances that are considered to be typical domestic wastewater are human waste, bath and dish water and edible food waste.

The following substances may be used regularly without harming your Austin Bluewater ABS Treatment System:

- Laundry detergents without bleach
- Dishwashing detergents without bleach
- Toilet paper
- Household cleaners containing sodium bicarbonate, sodium carbonate and sodium borate.

## Caution Substances

Caution substances in large concentration will reduce or stop the treatment process.

These same substances in smaller concentrations can be safe to use in moderation without affecting the treatment process. You may use the following substances with your Austin Bluewater ABS Treatment System if you use the substance according to the manufacturer's directions, use the substances sparingly, and do not introduce concentrated doses to the system:

- Bio-degradable laundry powders
- Household cleaners containing sodium bactericides such as
  - Pine oil (disinfectant used in the general purpose liquid cleaners)
  - N-alkyl dichlorobenzyl ammonium chloride (disinfectant used in detergents and spray cleaners)
  - Sodium hydroxide (lye chemical used in drain openers and cleaners)
  - Sodium dichlor-s-triazinetrione (powdered bleach used in scouring powders and automatic dishwasher detergents)
  - Ortho-phenylphenol (bactericide used in tub and toilet bowl cleaners)

**We recommend to cease using the above substances if you experience issues with your treatment system, anything containing bleach should be used with caution.**

## Waste Food

Some food waste, whether or not it is run through a waste grinder will not be treated by the system, but will remain in solid form and fall to the bottom of the septic tank.

Therefore, you should not use a waste grinder system, or dispose of these food items through the Austin Bluewater ABS Treatment System:

- Animal bones
- Melon rinds
- Corn cobs
- Pips and seeds
- Eggshells
- Any other non-edible food waste

## Never Dispose Of Any Of The Following Items Into The System

- Automotive Oil or petroleum based products
- Bleaches, disinfectants, whiteners
- Nappy liners, wet wipes, condoms, sanitary napkins

Automotive oil is not treatable by the bacteria; the disinfectants will take away all the bacteria's oxygen; the sanitary items are impregnated with anti-bacterial matter, so they will never break down. The results will be – bacteria will die. The tank will almost certainly need to be pumped out to remove the gross pollutants and the tank refilled and re-started.

Whatever the product, always ensure that it is marked as Bio-degradable and Safe to Use in Septic/Onsite Systems.

If you experience issues with system performance that you think may be caused by a certain product, cease use or replace with a different product and see if the problem persists. Talk to your service agent if you have concerns about the health of your system.

**Please note:** Although often unavoidable, chemotherapy, radiation treatments and antibiotics can upset the system. Certain enzyme products on the market can help improve system performance. We recommend speaking to your service agent in this instance.

# Products For Septic Tank or AWTs System

## Suitable Products

Plant Based Cleaners are great as they are Phosphate, Chlorine and Ammonia free, here are some of the brands available in New Zealand.

- EcoStore
- Earthwise
- Able
- Sigrids
- Greenearth
- Biozyme Cleaner

## Avoidable Products

Please avoid these products from being discharged into a septic system

- Ajax
- Antibiotics , Anti Depressants and Blood Pressure Medication being flushed.
- Alcohol
- Bubble Bath
- Coffee Grinds
- Dettol
- Domestos
- Diesel and Petrol
- Draino
- Dog and Cat Flea and Tick Wash
- Exit Mould
- Finish Dishwasher Powder or Tablets
- Excess Milk
- Paint Oil, Water and even Kids paint
- Handy Andy
- Harpic Toilet Cleaners
- Napisan
- Persil
- Kerosene
- Shower and Glass Cleaning products
- Campervan & Caravan Toilet Tablets
- Excessive Salt
- Left over Spa and Swimming Pool Tablets

***Most product's that have a poison helpline on the back of the product is a clear indication that they are not septic safe.***

Please note this list is not intended to promote or discredit any company or product, but to provide aid in keeping your septic tank or treatment plant alive and operating costs down.

Source: Water New Zealand

## Our Additional Recommendations

In addition, Austin Bluewater have performed some limited trials with customers and found the following **products less likely to cause problems** within the system.

Use products sparingly and as directed.

### **Dishwasher:**

- Active dishwashing powder (Do not use power balls or dishwashing tablets)
- Ecostore products
- Earthwise products

### **Washing Machine:**

- Cold Water Surf
- Cold Power
- Fab2
- Ecostore products
- Earthwise products

(Do not use any type of fabric softener as this can cause sludge buildup within the system)

### **Cleaning Products:**

- Spray and Wipe
- Ecostore products
- Earthwise products
- Biozyme products

### **Toilet:**

- Ecostore toilet cleaner - use sparingly

Again, this list is not intended to promote or discredit any company or product, but to provide aid in keeping your septic tank or treatment plant alive and operating costs down.



# High and Low Loadings

The treatment plant is designed to handle a maximum daily flow as per the following:

- ABS2000 - 1600L per day, up to 2000L intermittent use.
- ABS2500 - 2000L per day, up to 2500L intermittent use.
- ABS3000 - 2400L per day, up to 3000L intermittent use.

There may be times where the flows are higher or lower than 'average' use.

## Low or No Flows

At times of low or no occupancy there will be less 'food' for the aerobic bacteria to consume. Do not turn the power off to the system. There is some recirculation occurring within the system as part of the treatment process and this helps to keep the contents moving to provide a food source to the aerobic chambers. The amount of beneficial bacteria will be somewhat regulated by the available organic content of the waste stream. If there are prolonged periods of no flow the bacteria will die back. When normal flow resumes the bacteria will colonise accordingly, however during this period there may be some slight odours while the system recovers. Any odours should be temporary and the system should recover within a couple of weeks. If odours persist you should contact your service person for advise or possibly a tank inspection.

If the system will not be used for months or more we recommend discussing this with your service person, power to the system can be switched off but upon restarting a service callout may be required to check correct operation and there may be temporary odours as the system recovers.

## High Flows

As with low flows, there may also be times where occupancy or water use is higher than average. It is important not to hydraulically overload the system as this can result in the contents becoming unsettled and cause premature filter blockages, it can also have a negative effect on effluent quality.

The system is capable of treating the volumes listed above however the size of the effluent field can be a limiting factor. Most designs account for the number of bedrooms and base the design off maximum occupancy, this makes the system suitable for when guests or additional occupants will be using it providing maximum treatment flows are not exceeded.





# System Maintenance, Monitoring and Servicing

It is the owners responsibility to:

- Monitor the alarm panel and contact the appropriate contractor in the event of a fault.
- Control the substances entering the system (remember anything that goes down the drain will end up in the system).
- Have the system pumped out as and when required (this is usually determined by the service provider).

To maintain the Limited Warranty your Austin Bluewater ABS Treatment System should be furnished with a 6 monthly service policy to ensure proper operation of the system.

## Primary and Secondary Chambers

Periodically, waste will need to be removed from both primary chambers using normal pump-out procedures. These intervals will vary depending on usage and solids accumulation, your service person will advise when a pump out is required. As a guide, on average systems will require a pump out of the primary chambers every 4-6 years.

## Polylok Effluent Filter

The system is complete with a Polylok effluent filter which heavily reduces the amount of solids that reach the end of the system resulting in lower BOD (organic content) and suspended solids in the treated effluent. This filter requires cleaning as part of routine maintenance.

## Dosed Pumping System

A dosed pumping system is used to give a proportioned controlled flow to the engineer designed disposal field, to allow for even distribution over the entire field. Submersible effluent pumps operate in harsh acidic conditions and should be checked on a 6 monthly basis for satisfactory operation.

## System Capacity

The system is rated for a maximum of:

- 8 – 10 persons or 1,600 litres/day continuous flow - ABS2000
- 10 – 12 persons or 2,000 litres/day continuous flow - ABS2500
- 12 – 14 persons or 2,400 litres/day continuous flow - ABS3000

As with any system it is important the system is not hydraulically overloaded as this will interfere with the treatment process. Continuous use above site specific design may also result in flooding of the disposal area.

## Visual

Wastewater backup is characterised by wastewater flowing back into the house or slow movement of the wastewater in the drains. This may indicate a problem with your wastewater treatment system. Identify where the backup is occurring within your home's plumbing system. If no material is blocking the drain, contact your Service Technician or local supplier. Check for an alarm at the controller, if alarming refer to Section Five.

Within the greater Canterbury area, Austin Bluewater Environmental Concepts offer a six monthly service and maintenance contract to ensure your system functions correctly. This also forms part of our two year Limited Warranty Validation.

### Service procedure includes the following:

1. Visual inspection of system to ensure correct biological function of system.
2. Septic and secondary chamber checked and biological breakdown of sewage analysed for correct operation of system. Client notified of correct timing for septic pump-out.
3. Polylok bacteriological filter cleaned and repositioned.
4. Inspection and/or adjustment of sludge return and aeration balance.
5. Air blower filter checked and cleaned or replaced if needed.
6. If pump fitted, unit removed, impeller checked and unit fully cleaned of debris/build-up.
7. Inspection/cleaning of biogrowth in pump chamber.
8. Flushing of irrigation field
9. Disassembly, cleaning and reassembly of micron filter (if fitted).
10. Field Service Report presented to owner and Council verifying work carried out.

# Troubleshooting, Faults & Alarms

In the event of a fault, an audible alarm will sound and an alarm strobe light will flash on the system controller. The alarm can be muted by pressing the mute button, the strobe will continue to flash. The mute function will reset after 24 hours.

The following information will assist with establishing the fault, please contact Austin Bluewater or your local service agent for help or further advice in the event of a fault.

The tables below refer to the possible alarms shown on the main controller at the wastewater tank. The tables are broken down to show the respective alarms, their likely cause and their likely solution.

ALARM: AIR FAULT	
POSSIBLE CAUSE	SOLUTION
The blower has failed	Repair or replace blower
The air hose has come off the pressure switch at base of controller	Remove the top of the turret attachment and secure hose onto pressure switch
The air hose has come off the air piping inside the turret	Remove top of turret and secure hose onto air pipe

ALARM: HIGH WATER FAULT	
The fluid level in the irrigation tank is high	Check irrigation filter is clean Check that the pump is running and pumping freely
The float is caught in the high level position	Check float position and move to stop it being caught

ALARM: CHECK FILTER	
The irrigation pump has been running in excess of 30 minutes continuously	Check and clean the irrigation filter

See more information under 'Equipment or Power Failure' – Page 18

PROBLEM: WASTEWATER IS BACKING UP INTO THE HOME SEWER PIPING	
There is an obstruction in the home sewer piping	Check the pipes leading to the system visually or with drain cleaning equipment for an obstruction and correct
There is an obstruction in the discharge line from the system	Check the effluent piping and lateral field piping visually or with drain cleaning equipment for an obstruction and correct
The lateral field pump has failed	Check the operation of the lateral field pump per the manufacturer's specifications
The flow rate to the system is too high	Check the maximum flow rate to the system to see that it is within normal limits
The tank requires cleaning and/or a pump out is required	Check the sludge depth in both chambers of the tank to see if it is below required levels
Polylok filter is blocked	Remove Polylok filter from system and clean as necessary
There is a blockage at the inlet of the system	Remove 100mm PVC cap to inspect inlet. Remove or clear blockage if required

# Equipment or Power Failure

In the event of equipment or power failure please follow these guidelines.

## Power Failure or Outage

The system needs power to treat the wastewater and to pump to the irrigation field. In the event of a power failure or outage minimise water usage as much as possible. There is enough emergency storage in the tank for about a days worth of flow. The system should restart when the power has resumed, a high level alarm may be experienced at this stage if water has continued to flow into the system during the outage. Let the system pump down, this will be automatic. The alarm can be silenced by pressing the mute button on the controller. The alarm should clear within a couple of hours when the internal levels have returned to normal.

If an alarm persists contact your local service agent.

## Irrigation Pump Failure

This will often be indicated by a high level alarm, if a pump failure is diagnosed limit water usage as much as possible. A replacement pump should be installed as soon as possible. There is emergency storage in the system and this should be enough to cover minimal water usage before the pump is replaced. Avoid using washing machines, dishwashers, showers etc. during this time.

## Blower Failure

This will often be indicated by an air alarm. A blower failure will stop air being pumped through the aerobic treatment chambers and stop the recirculation within the tank. This will heavily affect the treatment and the biomass will start to die back. The system will still pump to the field but the effluent will not be as clean as usual and may cause filter blockage and odours if left unrepaired. The blower should be repaired or replaced as soon as possible. Water usage should be reduced where possible until the blower is reinstated.





# ABS Controller Installation Guide

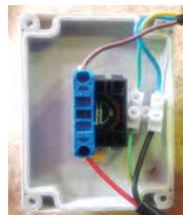
All electrical work must be carried out as per NZS 3000:2007 and NZECP2:1993. The controller is to be earthed at the distribution board and the supply to the controller should be protected by a 16A MCB.

This controller is rated to 10A at 230V and has been designed for the ABS tank only.

1. Run the power supply cable through a cable gland (or similar water tight method) to the junction box mounted on the blower box. Ensure this connection is high as practical above ground level to ensure the chance of water entering is as low as possible.
2. Once the power supply cable is inside the junction box, wire the supply Phase to the isolation switch. Wire the Supply Earth and Neutral to the terminal block with the corresponding Earth (green/yellow) and Neutral (black) cables.
3. The inside of the blower box will show two cables with plugs attached to them, and a cable for the high level alarm. The plugs supply power to the Pump and Blower respectively.
4. The pump and blower plugs each have a label identifying what is the plug for the pump and blower. Connect the pump and blower to their respective plugs
5. Wire the high level alarm float to the cable supplied. The wires of the float used are the Black and Brown wire. The Blue wire is not used and can be cut but ensure it is sealed well so no moisture can track down the float cable. The float is to be wired Normally Open (NO). The level float circuit is extra low voltage. NB: This is typically done at the factory.



6. Once finished wiring, secure the blower box's lid back on.
7. Once installed commission by:
  - Supply power to controller once safe to do so. The Green Power LED light should illuminate on front of controller.
  - The Blower should run continuously
  - Test pump by lifting the float attached to the pump.
  - Test high level alarm by lifting high level alarm float. The red High Water Fault LED should illuminate, the buzzer sound and alarm light flash.
  - Press the mute button and the buzzer should stop. The mute will disengage after 24 hours.



# Installation Information

## Site Requirements

- The tank(s) should be installed clear of any buildings so as not to affect any structure and with regard for section boundaries relating to local regulations and bylaws.
- The location of the treatment system is subject to approval by local councils/ authorities.
- The tank(s) should be sited so that access can be gained for desludging purposes.
- The tank(s) should be installed on a suitable foundation in stable soils.
- The tank(s) should be installed in a location and manner that diverts surface water away from the system.
- Installation should account for cases of high ground water or flood prone areas.
- The sanitary drainage system should comply with the New Zealand Building Code. All drainage levels should be considered to ensure that there are appropriate gradients leading into the system.
- A 16 amp circuit is required at the tank.

## Installation Instructions

- The system components are to be installed in accordance with the approved design plans and taking into account required setback distances and consented land application system envelope areas.
- The system comes complete with an alarm panel mounted on the top. Consideration should be given to placement so any alarm will be seen and can be dealt with in a timely manner. Remote alarm panels are available for installations where the on tank alarm panel is in a hidden location. These are purchased and installed separately.
- As standard, Austin Bluewater ABS systems are non-trafficable and should be located away from trafficked areas or protected by fencing, bollards or barriers etc. Recommended maximum loose soil cover depth is 400mm for standard lid thickness.
- Any excavation must comply with all relevant legal acts, codes and standards including Department of Labour approved code of practice for safety.
- Following excavation dimensions of hole to suit both tank and soil types, cover the base of the hole with 100mm of 5-7 drainage gravel ensuring the base is finished perfectly level. DO NOT leave exposed rocks as these may damage the tank and void the warranty. DO NOT use sand.

- Tank Weight - including 80 mm lid = 8.2 tonne. Lifting - 4 x 2.5T eye anchors. When handling, an equalising beam must be used to ensure equal loading to all lifting anchors.
- Backfill excavation with soil/sand maximum particle size of 50mm DO NOT use rocks. Compact in layers of 300mm max.
- The ABS lid(s) should be a minimum of 200mm above finished ground level to prevent stormwater ingress.
- To prevent flotation, fill the tank to at least 70% of capacity. Austin Bluewater will not take responsibility for floating tanks.
- For ground level installations, the ground must be able to support the tank and water contents. Generally the foundation must have a safe bearing capacity of 100kPa typical for normal house foundations. Tanks must be placed on a bed of compacted sand or 5-7 drainage gravel 150mm thick. This base must extend an additional 1.0 metre further than the tank base all round. We recommend that the site is excavated a minimum of 150mm below existing ground level.
- Ensure the drain field is not in trafficked areas and do not allow stock to graze on this area.
- Austin Bluewater ABS systems leave our yard fully assembled, 2 tank systems (ABS 2500/3000) will require a standard 100mm drainage connection between the 2 tanks.
- Inlet/outlet heights should be positioned to allow for fall between tanks. There should be no need to remove access lids except for filling with water or if a riser kit is being installed for deeper than standard installs. Instructions for this are provided separately if required. Any lids removed should be reinstalled and screwed down to prevent accidental or unauthorised access.
- Only authorised personnel should access tank internals.
- All electrical connections to the system must comply with current codes and operate correctly.
- The controller is powered via a 230V power supply. This power supply should be protected by a 16A MCB or as deemed necessary from the electrician. The controller is rated to 10A at 230V.



# Commissioning and Startup Procedure

To ensure correct operation and effluent quality, the ABS system will need to be commissioned shortly after installation or after usage begins. Commissioning should only be performed by a trained staff member or agent of Austin Bluewater.

Contact Austin Bluewater or your local agent to arrange commissioning.

Commissioning can only be performed when the tank is full, we recommend leaving the power off until the aeration chambers are full, this will allow the correct back pressure for the blower to operate. If no water was added to the system during install, approximately 5500L will be required to fill the system to this point. As a guide, a typical flow allowance is 200L per person per day.

Among other things, commissioning should include:

- A general inspection of the installation
- An operational check of all components
- Testing of air and high water alarms
- Testing of alarm strobe and audible alarm
- Correctly adjust air diffusers
- Correct setting of sludge return
- Check correct seating of Polylok filter
- Check for leaks in discharge pipework
- Check field for leaks
- Check each flush point for flow and leaks





# Information For Effluent Field Planting

The following plants are suitable for the Canterbury area. Maximum heights and spreads are approximate only, and will differ in different situations, soils and aspects.

BOTANICAL NAME	COMMON NAME	MAX HEIGHT	MAX SPREAD
<i>Aristotelia serrata</i>	Wineberry	6	3
<i>Carex comans</i>	Ornamental Grass	0.5	1
<i>Carex secta</i>	Large Green Sedge	1.5	1.5
<i>Carex trifida</i>	Ornamental Sedge	1	1
<i>Carex virgata</i>	True Wetland Sedge	1	1
<i>Carpodetus serratus</i>	Marble Leaf	7	4
<i>Chionochloa conspicua</i>	Snow Grass	1	1.5
<i>Chionochloa rubra</i>	Red Tussock	1	1.5
<i>Coprosma propinqua</i>	Mingimingi	5	2.5
<i>Cordyline australis</i>	Cabbage Tree	10	2
<i>Cortaderia richardii</i>	Toe Toe	2	2
<i>Cyperus ustulatus</i>	Giant Umbrella Sedge	1	0.6
<i>Griselinia littoralis</i>	Broadleaf	5	2.5
<i>Hebe</i> spp			
<i>Hoheria populnea</i>	Lacebark	8	3
<i>Leptospermum scoparium</i>	Manuka	4	3
<i>Melicytus ramiflorus</i>	Whiteywood	8	2.5
<i>Pennantia corymbosa</i>	Bellbird Tree	8	3
<i>Phormium</i> spp	Flax		
<i>Pittosporum colensoi</i>	Black Mapou	5	3
<i>Pittosporum tenuifolium</i>	Kohuhu	6	3
<i>Plagianthus regius</i>	Ribbonwood	12	3
<i>Pseudopanax arboreus</i>	Fivefinger	6	3.5
<i>Sophora microphylla</i>	Kowhai	8	3
<i>Uncinia uncinata</i> 'Rubra'	Red-leaved Grass	0.3	0.3

## General Notes On Planting

- Avoid planting willows, birches, pohutukawa and poplars near driplines.
- Conversely, avoid locating driplines near existing plantings of these trees. Their invasive root systems can crowd and damage the driplines.
- Do not plant or grow root vegetables in dripline areas, although the wastewater is treated to a high level, there are still pathogens in the waste stream that can cause illness.
- Fruit trees can be planted in dripline areas, we recommend staking as a ready supply of water near the surface can prevent the establishment of deep root systems.
- Any fruit that has fallen onto the ground should be thoroughly washed and dried before consumption.

## Limited Warranty

Please refer to our website for warranty terms and conditions.



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