

**ENVIROCYCLE
HANDBOOK**

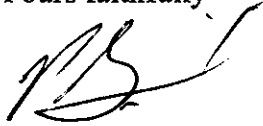
INTRODUCTION

This manual has been prepared to broadly detail the attributes of the Envirocycle system, and to help you appreciate the Envirocycle concept and its contribution to environmental health and safety throughout the world.

If you have any queries, please contact our office on (03) 6273 0755.

Please read on for more information regarding Australia's original award winning domestic waste water treatment plant.

Yours faithfully

A handwritten signature in black ink, appearing to be 'P. Bottomley', written in a cursive style.

Paul Bottomley

PROFESSIONAL WASTE WATER MANAGEMENT

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THE ENVIROCYCLE CONCEPT

The concept was developed to overcome the shortcomings of septic systems in a modern thinking Australia. The odd well-established septic systems are often unable to cope with increased water usage brought about by use of modern appliances.

Diversion of sullage by spraying onto gardens or allowing it to run into street gutters does not contribute to a clean and healthy environment for future generations.

Envirocycle was developed to put an end to this.

The Envirocycle concept utilizes five stages of treatment:

- Primary settlement for anaerobic digestion and breakdown of solids.
- Secondary treatment of aerobic means.
- Settling, where aerated waters are clarified.
- Disinfection by means of mild chlorination.
- A nutrient removal process by distribution of water over landscaped areas for plant transpiration and evaporation.

GENERAL DESCRIPTIONS OF FUNCTION OF THE PLANT

PRIMARY TREATMENT

The first stage of treatment is to separate the solids from the liquids. The solids, mainly toilet wastes, remain in the first compartment where a digestion process takes place. The digestion is accelerated by the presence of anaerobic micro-organisms which multiply rapidly under ideal conditions and which will ensure that the offensive faecal solids are turned into an inert waste. Hence, the microbial action in the first tank should not be hindered by the discharge of chemicals through household drainage fittings e.g. chemical toilet cleaners.

SECONDARY TREATMENT

The subsequent treatment stages are mainly concerned with the aeration of the liquid wastes. Once more, microbes present in these liquids are used to assist in the aeration process. The micro-organisms are called aerobes and will thrive and multiply in the presence of oxygen. It is important that a constant air supply is being maintained at all times. The air is supplied from a small blower located near the system.

SETTLING

Following aeration the liquid wastes are allowed to settle under quiescent conditions. Any solid particles, which are suspended in the aerated effluent, will settle out and are returned automatically to the first or second treatment stage. The clarified water, although it looks reasonably clean, may still contain some bacteria which will have to be removed.

TERTIARY TREATMENT

The bacteria are removed by a chlorination process, which is the only chemical treatment that takes place in your Envirocycle. While the clarified effluent flows into the garden irrigation pump chamber, it comes into contact with calcium hypochlorite tablets. The contact will ensure the disinfection of the final effluent, to criteria set by regulating bodies, prior to irrigation onto your garden.

NUTRIENT REMOVAL

The aerated, clarified and disinfected water contains natural nutrients such as phosphates and nitrates which are a bonus for the garden. Plants will readily take up these nutrients and thrive, thus completing the cycle.

OPERATION

Once all your household drainage fittings have been connected correctly to the unit, it can be used for its intended purpose immediately; provided your garden area has been landscaped to the satisfaction of your local Council.

The landscaping requirements are very essential, because you cannot irrigate on barren dirt.

The entire operation of the Envirocycle is automatic, therefore no adjustments should be made to the air supply or pumping equipment by the purchaser. Should you require further information of the operation of the system, please contact Professional Plumbing on (03) 6273 0755. Professional Plumbing Pty Ltd offer a 24 hours a day, 7 days a week service.

GENERAL

1. Electricity Consumption - Our electrical consultants advise that the annual usage of electricity for the total system is similar to an average household refrigerator.
2. Septic Tank - Dependant on individual household usage, it will be necessary to remove the contents once every two to five years, or more. This is the home owners responsibility, however, our company will assist where reasonably required, with costs for customer's account.

This service may be carried out by any person or organisation approved by the Department of Health and Human Services.

HELPFUL HINTS

To assist in keeping your treatment system operating at its best and within standards set by regulating bodies we provide the following hints.

- DO**
- * Use bio-degradable detergents that do not contain disinfectants (ie.chlorine, bleach) benzine or phosphates. Benzine converts to carbolic acid which is a strong disinfectant.
 - * Spread your washing loads over a week (where possible) eg. 1 or 2 loads per day.
- DON'T**
- * Use dyes and colourings (ie. hair and clothes). These are very damaging to Envirocycle system where possible dye or colour in bucket and dispose of in garden.
 - * Use strong caustic, alkalis, oils, bleaches, disinfectants or chemical detergents. These items kill the purifying bacteria cause bad odours and damage your system (see attached list).
 - * Exceed maximum design load or subject the system to hydraulic shock loads (use of washing machines, shower/emptying of baths at same time).

FAULT FINDING

Careful attention should be paid to the points mentioned on page 7 of this handbook, for efficient plant operation.

However, on rare occasions, some minor mishaps do occur, which can easily be rectified. Please do not panic (we are a few short hours away) as the plant is designed to give sufficient leeway with normal household usage, before untreated waste water is discharged.

FAULT

The Alarm Operates

CAUSE

1. Tripping of a circuit breaker at the switchboard.
2. Irrigation Pump failure.
3. Blocked irrigation filter.
4. Kink in irrigation line.
5. Blockage in irrigation for line.
6. Blower failure.
7. Power failure.

ACTION

Turn alarm to mute.

Listen at the control box to hear if the blower is running.

If blower is running check irrigation system

- A) Blocked filter.
- B) Kink in hose.
- C) Blockage in hose.

<u>FAULT</u>	<u>CAUSE</u>	<u>ACTION</u>
Irrigation Does Not Work.	1. Pump failure.	Reset circuit breaker in meter box.
	2. Blocked filter or blocked irrigation line.	Clear filter or lines.
	3. Kink in hose.	Straighten hose.
Excessive Foaming	1. Too much detergent being used in laundry.	Use recommended products and quantities.
	2. Too many washes.	Do one or two washes per day.
Persistent Odours	1. The first tank in the system has not matured yet.	Refer the local office for advice.
	2. Too much water is being discharged through your household fittings at the same time.	Avoid using the shower and automatic washing machine at the same time.
	3. Excessive chemicals and or disinfectants are being used in your residence.	Please avoid and the system will recover.
	4. E-duct vent of S-Bends are not suitably constructed.	Refer your Plumber or the Local office for advice.
	5. Exposed areas in tanks, seal degradation.	Apply a light mix of sand/ cement or similar.
	6. The System is required to do more than it is designed for.	Refrain from overloading Refer the Local office for advice.

IF PROBLEM PERSISTS PLEASE CALL (03) 6273 0755.

MAINTENANCE JOB SHEET

On the following page is a “sample” maintenance job sheet. When your Envirocycle installation is serviced, this sheet will be completed and the original left on site for your information.

Please note that is a condition of our contract to report on condition of irrigation area.

A copy is sent to council and the remaining copy is retained on file in our office. If any of your contact details change, please contact the office on 6273 0755 so that we may update our records.

Envirocycle Maintenance Job Sheet

OWNER:

Ph

Address:

Commissioned:

Last Pumpout:

Agreement Type

Model No:

Pump No:

Pump Make:

Blower Make:

Occupier:

Blower No:

Occupier Phone:

Irrigation Area:

Sq m

Date: _____ / _____ / _____

Technician: _____

Time of Service: _____ : _____

RCI: _____ **PPM**

Clarity 1: _____ cm

Ph 1: _____ **Ph 2:** _____

Clarity 2: _____ cm

S/S: ON / OFF **S/R:** ON / OFF

Sed Scum: YES / NO

Filter Cleaned:

Scum Removed YES / NO

N/A YES / NO

Sed Sludge: _____ cm

Done YES / NO

Aeration Sludge: _____ cm

DO1: _____ mg/L **DO2:** _____ mg/L

Septic Sludge At Outlet: Tested: YES / NO

Odour: _____

_____ cm

Pump Operating: YES / NO

Chlorine Replaced: _____ %

Blower Operating: YES / NO

Does the irrigation area appear to be as per the approved plan (area and location)? YES / NO / NA

Does the irrigation area appear to be sufficient (e.g. no pooling or run-off)? YES / NO / NA

All the effluent is being retained within the property boundaries? YES / NO / NA

The effluent distribution system is in good condition? YES / NO / NA

The irrigation area is being satisfactory maintained (ie weeded, sufficient mulch, health and sufficient plants)? YES / NO / NA

Comments

Professional Plumbing Pty. Ltd.

7 Hornby Road, Goodwood TAS 7010

Ph. 03 6273 0755 Fax. 03 6273 0981

If any of the above customer details are incorrect, please notify our office.
Thank you.

MAINTENANCE

To ensure that sewerage treatment plants perform to the high standards set by the regulating bodies, a maintenance programme is stipulated by these bodies in the interest of environmental health and safety. Failure to have the stipulated service carried out could result in a breach of public health legislation and subsequent legal proceedings.

The following information covering the requirements and maintenance for the first, second and ensuing years of operation is provided for your guidance.

The maintenance is more of a preventive type than a curative one. It consists of -

Quarterly inspections during which the following is undertaken:

- a) Adjustment to air intake where necessary.
- b) Cleansing of the system if necessary.
- c) Monitoring and maintaining the balance of the purifiers.
- d) Replenishing supply of disinfecting agent.
- e) Tests on water quality - on site or in the laboratory.
- f) Visually checking the irrigation discharge lines and points.
- g) Reports to the Council Health Department as directed.
- h) Complete servicing and maintenance check of the blower, irrigation pump and electrical system, quarterly.
- i) Replacement of any faulty components found to be faulty through normal wear and tear.

Maintenance fees are payable to your local Council or directly to an accredited service provider ie. Professional Plumbing. In the case of need the Company provides a 24 hour back up service. **Cleaning of filters and sprinkler heads is the responsibility of the property owner.**

RESPONSIBILITY AND LEGAL REQUIREMENTS

In the interest of the home owner and the public, certain requirements are imposed by the regulating bodies with regard to the installation of sewerage treatment plants; be they Envirocycle, septic or other systems.

The following are provided as a guide only (please check with the local regulating body).

1. The Envirocycle is to be constructed in the approximate position indicated in the plan.
2. The system may not be used until the site has been inspected and Council considers that effluent and sullage can be completely disposed of on the site without nuisance or likely danger to health.
3. No fruit or salad vegetable growing on the property shall be spray irrigated with effluent from the system.
4. There shall be no irrigated water run-off from the allotment to adjoining properties, public places or reserves.
5. An operator's manual is to be provided with the unit.
6. The service contractor shall make adjustments to each unit, its ventilation and irrigation system, when directed to do so by the Department of Health and Human Services, or the local Council.
7. The yard or garden areas of the allotment are turfed and/or landscaped to the satisfaction of Council and the Department of Health and Human Services, before the system is used for irrigation purposes.

Detailed conditions of installation are stated on the approval given to you by the regulating body. Please read them carefully and ask for advice should it be necessary.

RESPONSIBILITY

The owner of the plant is entirely responsible for the operation and maintenance of the plant.

The existence of a service contract does not transfer the responsibility from the owner to the supplier or its' agents.

GARDEN IRRIGATION

The treated waste water from your Envirocycle is rich in nutrients and therefore a bonus to your garden. Please do not waste this water.

You should be aware of the Health Authority's requirements that: "There shall be no irrigated water run-off from your allotment to adjoining properties, public places or reserves".

Generally speaking you are not permitted to water the Council's footpath and care should be taken not to allow any run-off onto your neighbour's land.

ENVIROCYCLE AND PLANTS

The Envirocycle system has met with a tremendous amount of favourable comment from Architects, Geotechnical Engineers, Environmentalists and our customers.

Within the Envirocycle system the only chemical used is chlorine as calcium hypochlorite, similar to the chlorine used in your pool. The chlorine acts as a final disinfecting process.

Chlorine is a very reactive substance and does not accumulate in soils. It does react with organic chemicals in the soil to a slight degree, however the majority dissipates as a gas into the atmosphere.

Work has been done on the use of chlorinated swimming pool water, (which usually contains a greater amount of chlorine than Envirocycle irrigated water) by the Department of Agriculture's Biological and Chemical Research Institute of Rydalmere. They found that chlorine concentrations of up to 1.5 ppm - 3 TIMES GREATER THAN THE AMOUNTS FOUND IN AN ENVIROCYCLE SYSTEM - had no long term effects on grasses or native species of plants and there was no chlorine accumulation.

It is interesting to note that many town water supplies are chlorinated with residual concentrations of up to .06* ppm (Envirocycle irrigated water ranges from 0.5 ppm (minimum standard) to 0.8 ppm).

* dependant on sampling point.

Our Company has tested the effects of the Envirocycle treated water on three individual installations where it had been sprayed directly onto native plants over a period of 2 years. The results are thriving and healthy plants with a measured faster growth rate than areas of the gardens not irrigated by Envirocycle water (care should be taken when spraying onto very young plants).

For your perusal listed below is a list of native and exotic species of plants suggested for over-wet soils.

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>
Acacia Retinodes	Wirilda
Acacia Reciana	Rices Wattle
Acacia Rubida	Red Stemmed Wattle
Alnus Glutmosa	Common Alder
Alnus Jorullensis	Semi Evergreen Alder
Atherosperma Moschatum	Sassafrass
Banksia Marginata	Silver Banksia
Banksia Ericfolia	Heath
Banksia Robur	Swamp Banksia
Betula Pendula	Silver Birch
Betula Rubigides	Wiry Bauere
Callistemen Citrinus	Crimson Bottle Brush
Callistemen Macropunctatus	Scarlet Bottle Brush
Callistemen Pallidus	Lemon Bottle Brush
Callistemen Paludosus	River Bottle Brush
Choisya Ternata	Mexican Orange Blossom
Correa Alba	White Correa
Correa Dusky Bells	Native Fushia
Correa Mannii	Native Fushia
Correa Pulchella	Native Fushia
Eucalyptus Crenulata	Silver Gum
Eucalyptus Gunnii	Cider Gum
Eucalyptus Kitsonia	Bog Gum
Eucalyptus Risdonii	Risdon Peppermint
Eucalyptus Tenuirmais	Silver Peppermint
Eucalyptus Urnigera	Um Gum
Grevillia Robusta	Silky Oak
Grevillia Poorinda	
Royal Mantle	
Leptospermum Lacvigatum	Coastal Tea Tree
Leptospermum Nitidum 'Copper Sheen'	Copper Tea Tree
Leptospermum	
Junipernium	
Horizontalis	
Lonicera Nitida	Chinese Honeysuckle

BOTANICAL NAME

COMMON NAME

Malaleuca Ericifolia
Malaleuca Gibbosa
Malaleuca Linariifolia
Malaleuca Sgicarrosa
Malaleuca Thymifolia
Phorium Tenax
Populus Simoni
Tamarix Gallica
Telopea Truncata
Viburnum Tinus
Westringia Fruiticosa 'Aurea'

Swamp Paperback
Silver Honey Myrtle
Flax Leaf Paperback
Scented Paperback
Feather Honey Myrtle
New Zealand Flax
Simons Popar
French Tamarisk
Tasmanian Waratah
Laurustinas
Golden Coast Rosemary

RECOMMENDED PRODUCTS

For your consideration, we provide the following list of products that should and should not be used.

These recommendations are made to the best of our knowledge and are not intended to promote or discredit the product of any company.

WASHING POWDERS, LIQUIDS & SOFTENERS

Add soft	Embassy	Purlite
Blue Gum	Fab	Rinso
Blue Sno	Hurricane	Softly
Care	H.L.D	Spree
Cold Power	Launda	Sunlight
Cuddly	Love & Care	Surf
Castle	Lux	Somthin Else
Drive	More	Top wash
Dynamo	Omo	Woolmix
Ease	Parry's	

DISHWASHING LIQUIDS

Finishing-powder for dishwashers	Greenapple	Palmolive
Adds	Kit	Sunlight
Bushland	Morning Fresh	Trix

SURFACE CLEANERS

Jiff cream cleanser	Nifty
Spray and Wipe (in limited quantities)	Shower Power (in limited quantities)
Swipe	

TOILET CLEANERS

Jiff or any cream cleanser

FLOOR CLEANER

Use hot water and detergent

PRODUCTS TO BE AVOIDED

ANTIBACTERIAL SOLUTIONS

Bio-Ad	Napisan	Preen Soaker
Bio Joy	Nappy Soft	Pineoclean
Milton Tablets	Nursil	Tri-zyme
Nappy Plus	Nappy Fresh	Toilet Duck

BLEACHES

Domestos	Lemon Budget	White King
Fiesta	Marvolinn	Zixo
Lemon Bleach		

OTHER CLEANERS

Ajax	Handy Andy	Down To Earth
Aussa	Draino	Pet, Flea & Tick Wash
Bubble Baths	ESP Herbal	Spirits/Alcohol
Caustic Oven Cleaners	Floor Cleaners	Swipol
Green Choice	Metho or Kero	Gow's
Amway		

IN GENERAL

The treatment system relies mainly on bacteria for treatment, therefore any product used that kills bacterial is harmful to your treatment system. If you wish to use some of the harsher cleaning products I suggest that this is done in a bucket, then after use the contents discarded in the garden (eg. Disinfectants-Wipe around surface then rinse sponge/cloth in a bucket of water then discard contents in garden. Same for floor and oven cleaner, wipe as much as possible then rinse sponge/cloth in bucket then discard in garden, never down any drains connected to your treatment system.

Pouring large quantities (1/2 litre or more) of beer, wine, milk or fruit juice into the system should be avoided.

If in doubt or you require any further information please contact our office or ask at time of quarterly maintenance service.

DIAGRAMS, WIRING ETC.

The following pages show schematics of the approved system for Tasmania and the electrics.

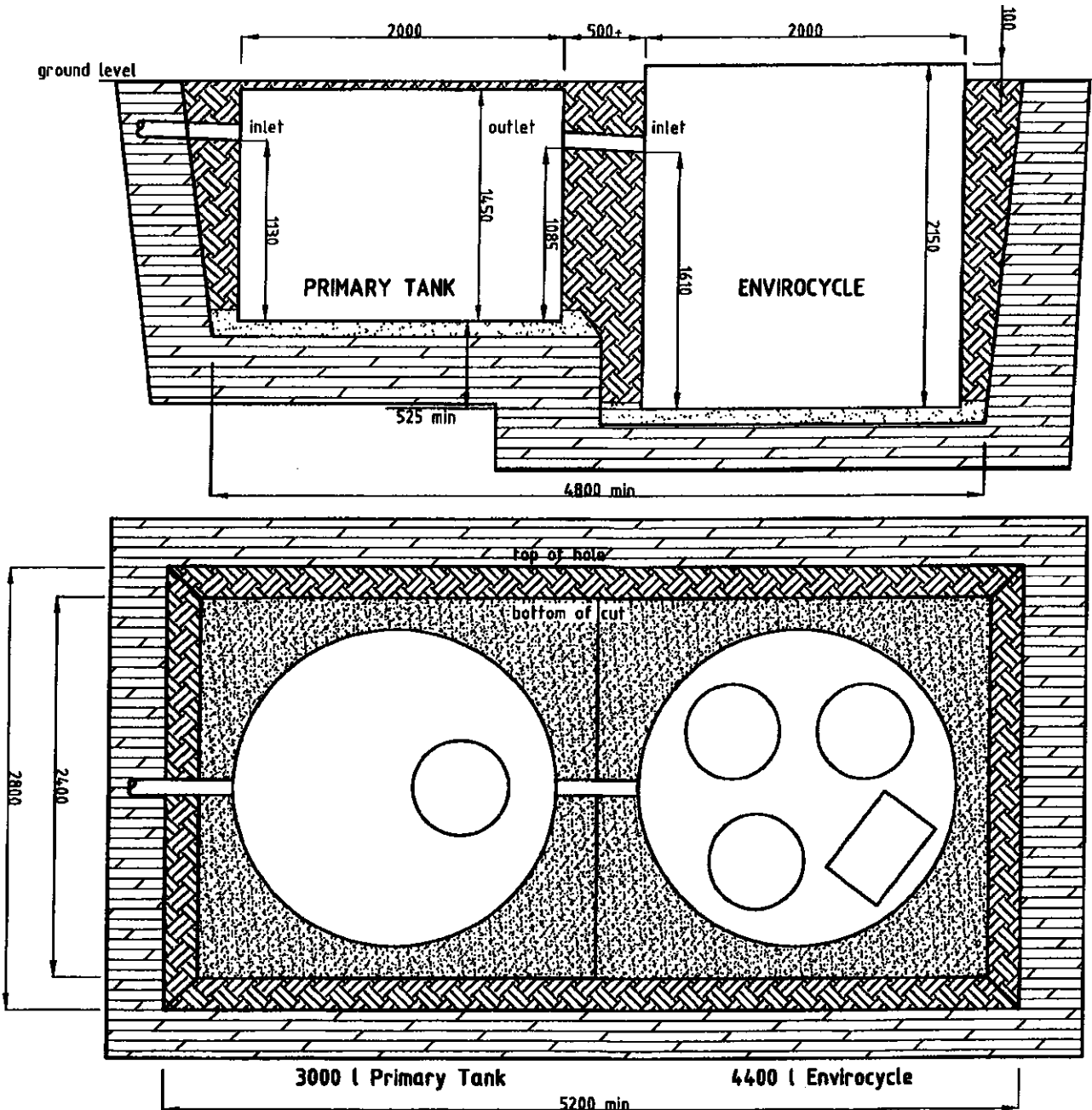
Systems are designed for varying conditions found in the market place.

The local Envirocycle office will be pleased to recommend the most suitable system for the situation presented.

ENVIROCYCLE AEROBIC TREATMENT PLANTS
MODEL 11/4 4400 LITRE CAPACITY

Used in conjunction with 3000 litre septic tank (or larger). System will treat 1920 litres inflow of domestic waste water i.e. shower, bath, laundry, washing machine, basin, WC, kitchen sink etc. to a government regulation or better of 10 faecal coli 20 biological oxygen demand, 20 non-filterable residue (10,20,30) standard. Daily hydraulic treatment can be increased by upsizing septic i.e 4400 litre gives 2820 litres per day treatment. Basic tank layout below.

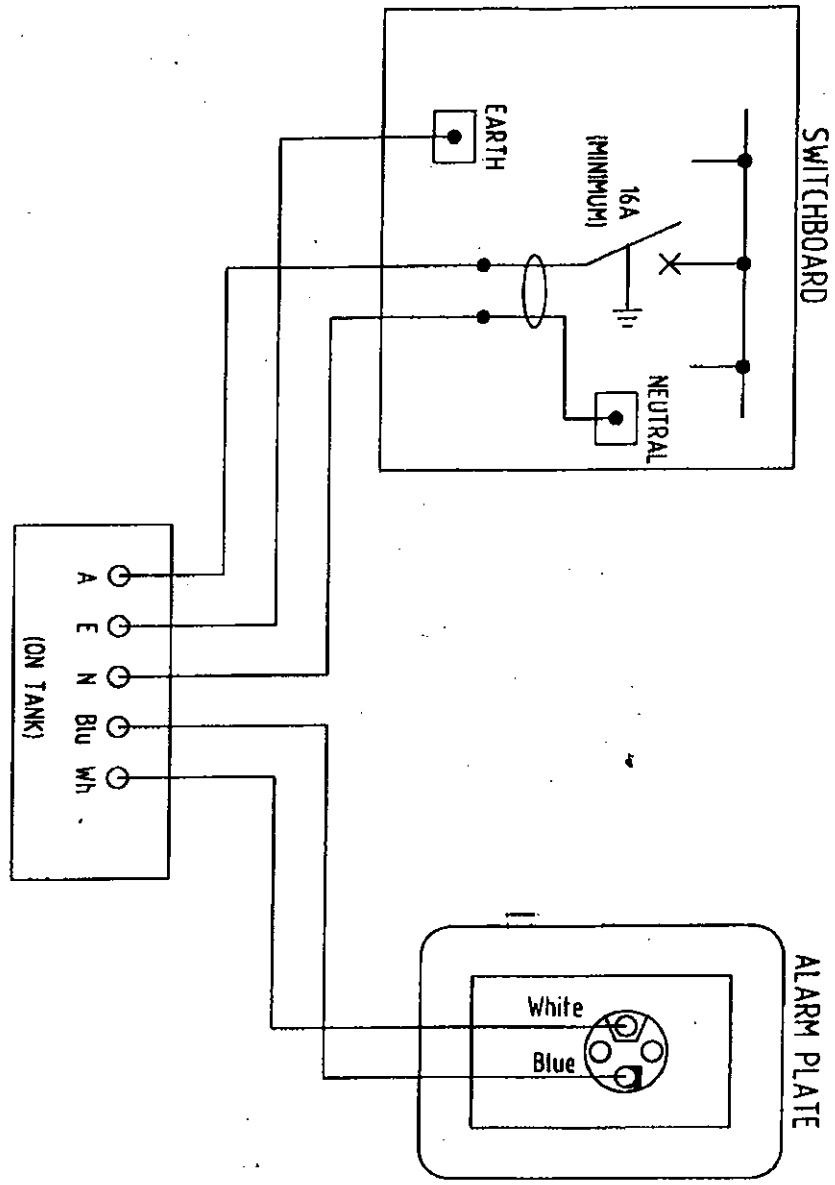
DETAILS OF ENVIROCYCLE DIMENSIONS



NOTE: If in any doubt ring Paul Bottomley 0418122066
'remember lost time costs money'

ELECTRICAL CIRCUIT SPECIFICATIONS: ENVIROCYCLE MODEL 10NR

1. CAUTION: THIS SPECIFICATION CHANGES FROM TIME TO TIME - ALWAYS CHECK THIS DOCUMENT BEFORE COMMENCING WIRING. (WARRANTY IS VOID IF NOT WIRED CORRECTLY)
2. THE ENVIROCYCLE SYSTEM REQUIRES A DEDICATED SINGLE PHASE CIRCUIT. ALL SOCKET OUTLETS MUST BE THROUGH A RESIDUAL CURRENT DEVICE (RCD) AS PER AS/NZ 3008:2000
3. INSTALL A DEDICATED SINGLE PHASE CIRCUIT, PROTECTED BY A MINIMUM 16A BVA CIRCUIT BREAKER SUITABLE FOR MOTOR START. MINIMUM CABLE SIZE 2.5mm², CONNECTED TO AND RUN FROM AN EXTERNAL BUILDING SWITCHBOARD (TO ALLOW FOR MAINTENANCE WHEN HOUSE IS UNATTENDED) TO ENVIROCYCLE TERMINAL/CONTROL BOX. TWO 2.5mm² CABLES SHOULD ALSO BE RUN FROM THE ENVIROCYCLE CONTROL BOX TO THE ALARM PANEL LOCATED INSIDE THE DWELLING.
4. THE ALARM PANEL IS MOUNTED ON EITHER A STANDARD MOUNTING BLOCK OR WALL PLATE IN THE VERTICAL POSITION INSIDE THE PREMISES (E.G. KITCHEN, LAUNDRY, GARAGE OR OTHER AS DIRECTED BY THE CLIENT).
5. CIRCUIT SHOULD BE LABELLED "ENVIROCYCLE SYSTEM".
6. NOTE: ELECTRICAL WORK MUST BE CARRIED OUT IN ACCORDANCE WITH AS/NZ 3008:2000 AND SUPPLY AUTHORITY RULES.



Terminal strip in the Envirocycle Control Box

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ENVIROCYCLE - VACANT PREMISES

Procedure Guidelines

EVENT	OWNER	COUNCIL	CONTRACTOR
Power "on". Premises vacant up to 12 weeks	No action.	No action.	No action
Power "on". Premises vacant over 12 weeks.	Notify council.	Notify contractor.	Turn down air flow, maintain regular service.
Power "off" – 4 days or more.	Notify Council.	Advise contractor. No service charge to owner for period.	No servicing for period of charge.
Premises re-occupied, power back on.	Notify Council.	Advise contractor. Recommend service charge period.	Full system pump out (septic & treatment tanks) within 2 days, at owners expense. Re-commence servicing & charge

NOTICE

The information in this handbook is provided as a guide only.

The contents are subject to change without notice.

Regulations may vary from Council to Council dependant on conditions prevailing in each State.

You are requested to check details with the relevant regulating bodies or contact the nearest Envirocycle Office.

All phone assistance given free of charge. If extra irrigation pipe / sprinklers are required, please contact service personnel and delivery can be arranged during next service.