STATEMENT OF DESIGN - PS1

Issued by: Dean Hoyle
To: Pou Oranga Whai Ora Charitable Trust
Copy to be supplied to: Opotiki District Council
In Respect of: Econotreat Domestic Onsite Wastewater and Sewage System Design
At: 19a Baird Road, Opotiki
Legal Description: Lot 2 DP 8225

Waterflow NZ Ltd has been engaged by Pou Oranga Whai Ora Charitable Trust to provide the technical design services and details in respect of the requirements of G13/VM4 and B2 Durability of the Building Code 2004, for an Onsite Wastewater and Sewage System for their building at the above location.

The Design has been carried out in accordance with AS/NZS 1547/2012 and Clause B2, G13 and G14 of the Building Regulations 2004.

The proposed building work covered by this producer statement is described on the drawings titled: Pou Oranga Whai Ora Charitable Trust Onsite Wastewater Design Report, and numbered 1-42 together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions: correct installation of the system and drainage fields
(ii) All proprietary products meeting their performance specification requirements;

As an independent design professional covered by a current policy for Professional Indemnity Insurance, no less than $200,000*, I **believe on reasonable grounds** the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code.

Signed by: Dean Hoyle - PS Author '3037' Auckland Council, NZQA Onsite Wastewater Training/Opus, BOINZ OWM, HBRC & FNDC Approved Designer

Date: 08/04/2024

Signature: 

Waterflow NZ Ltd
1160 State Highway 12
Maungaturoto 0520

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

Date: 09.05.2024

Client: Pou Oranga Whai Ora Charitable Trust

Project: New onsite wastewater management

Address: 19a Baird Road, Opotiki

Waterflow NZ Ltd were engaged to assess the environmental and soil conditions for a suitable onsite wastewater management system for this property. The existing dwelling on the property has seven bedrooms and there is also a two bedroom cabin. We that the property will be used as a drug and alcohol rehabilitation facility and will accommodate up to 14 patients who will stay for periods of up to two weeks. The existing wastewater management system needs to be upgraded. Potable water supply to the property is from the Opotiki town supply.

Is the site suitable for an on-site effluent treatment and disposal system?
Yes, the site is suitable for the discharge of the wastewater production as per Auckland Council TP-58 Guidelines, Australia New Zealand Standard 1547:2012 and Rule 14 of the Bay of Plenty Regional Council's On-Site Effluent Treatment Regional Plan.

The project will consist of a seven bedroom main dwelling and a two bedroom separate cabin feeding into a 5200 Litre dual chamber pumped septic tank and an EconoTreat VBB-C-3000 Wastewater Treatment System and land application system.

Discharge calculations are based on the below:

- 7 bedroom dwelling = 11 personal @ 165L per person per day; 1815 Litres per day
- 2 bedroom cabin = 4 people @ 165L per person per day; 660 Litres per day
- Total Wastewater production across the site is 2475L/p/d

What are the disposal field requirements?
We recommend a 5200L dual chamber pumped septic tank and an EconoTreat VBB-C-2200 Treatment System in series. The system will apply advanced secondary quality effluent to land via a pressure compensating dripline system at a conservative design loading rate of 3L/m^2/day for the Category 3 sandy loam soils. The land disposal area 825m^2 and will consist of 10 x 82.5m laterals installed along the natural ground contour. The disposal area will be installed more than 20m from any surface water and more than 5m from any open drains/overland flow paths. A reserve disposal field 50% of the size of the main disposal area (413m2) has been allocated immediately north of the main disposal area.

Is Discharge Consent required?
Yes, the design flow is in excess of 2000L/day and therefore required a Discharge Consent from Bay of Plenty Regional Council in accordance with Discretionary Activity Rule 14 OSET Plan.

Other requirements:
Council will require a Producer Statement – Construction Review (PS4) to satisfy Council requirements therefore the system / disposal field will need to be inspected by the Wastewater Designer to ensure compliance with Wastewater Design.

Recommendation:
A meeting on site before installation with the installer and owner to confirm exact positioning of the system and disposal field in accordance with the design.

APPENDIX 1

Schedule 5 - On-site Wastewater Disposal

Site and Soil Evaluation Checklist

PART A: Contact Details

1. Applicant Details:

Applicant Name	Pou Oranga Whai Ora Charitable Trust
Company Name	

	First Name(s)	Surname
Property Owner Name(s)	Pou Oranga Whai Ora Charitable	Trust
Nature of Applicant*	Owner	

(*i.e. Owner, Lessee, Prospective Purchaser, Developer)

2. Consultant/Site Evaluation Details:

Consultant/Agent Name	Matt Riddell			
Site Evaluator Name	Taylor Hanrahan			
Postal Address	1160 State Highway 12			
	Maungaturoto 0520			
Phone Number	Business	09 4310042	Private	
	Mobile		Fax	
Name of Contact Person	Matt Riddell			
E-mail Address	matt@waterflow.co.nz			

3. Are there any previous existing discharge consents relating to this proposal or other waste discharge/disposal on the site?

Yes	x	No		(Please tick)

If yes, give Reference Number(s) on Description

0

4. List any other consents in relation to this proposal site and indicate whether or not they have been applied for or granted. If so, specify Application Details and Consent No.): (e.g. Land Use, Water Take, Subdivision, Earthworks Stormwater Consents)

This OSET Schedule 5 design is to accompany all necessary building consent documentation.

PART B: Property Details

1. Property for which this application relates:

Physical address of property	19a Baird Road		
	Opotiki		
Territorial Local Authority	Opotiki District		
Regional Council	Bay of Plenty Regional Council		
Legal Status of Activity	Permitted:	Controlled:	Discretionary: x
Relevant Regional Rule(s) [Note 1]	Rule 14		
Map Grid Reference of Property [Note 2]			
1. On-Site Effluent Treatment Regional Plan 2. NZMS 260 series, scale 1:50,000			

2. Legal description of land (as shown on Certificate of Title):

Lot No.	2	DP No.	8225	Ct No.	GS5C/1375
Other (specify)	Lot 2 DP 8225				

Please ensure copy of Certificate of Title is attached.

PART C: Site Assessment – Surface Evaluation

1. Has a <u>Desk Study</u> been undertaken for this property?

Yes	x	No		(Please tick one)

If yes, please specify the findings of the Desk Study, and if not please specify why this was not considered necessary.

As per documentation attached

2. Has a <u>Slope Stability</u> Assessment been carried out on the property?

Yes		No	x	(Please tick one)

If No, why not?

No signs of instability

If Yes, please give details of report (and if possible, please attach report):

Author:	
Company/Agency	
Date of Report	
Brief Description of Report Findings	

3. Site Characteristics – Provide descriptive details below:

Performance of Adjacent Systems:
Exsiting systems that have been designed and installed correctly, to our knowledge, are performing well.
Estimated Rainfall and Seasonal Variation:
1250 - 1500
Refer to Map 3
Vegetation Cover:
Pasture grass
Slope Shape:
Flat
Slope Angle:
<3
Surface Water Drainage Characteristics:
Broad overland Broad overland flow across site
Flooding Potential: YES/NO
NO
If yes, specify relevant flood levels on appended site plan, i.e. one in 5 year and/or 20 year and/or 100 year return period flood level, relative to disposal area.
Surface Water Separation:
> 20m from any surface water bodies
Site Clearances (Provide general description here and specific dimensions in Part 6 below an in Site Plan):
>1.5m from all boundaries and >3.0m from dwellings
There are no walls or bores
Site Characteristics:
19a Bairds Rd, Opotiki is an irregular shaped property of 33,484m2. Property is generally flat and covered with grass, trees and orchards. Property boundaries are on State Highway 2 to the East and similar large rural resdiential properties to the south, north and west.

4. Site Geology of the subject property

Geological Map Reference Number	

5. What Aspect(s) does the proposed disposal system face (please tick)?

North		West	
North-West		South-West	
North-East		South-East	
East		South	x

6. Site clearances, which should also be shown on the site plan:

Separation Distance from	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries	**>1.5**	**>1.5**
Surface water	**>20**	**>20**
Groundwater	**>1.2**	**>1.2**
Stands of Trees/Shrubs	**n/a**	**n/a**
Wells, water bores	**n/a**	**n/a**
Embankments/retaining walls	**n/a**	**n/a**
Buildings	**>3**	**>3**
Other (specify):		

PART D: Site Assessment – Subsoil Investigation

1. Please identify the soil profile determination method:

Test Pit		(Depth_____m)		No. of Test Pits	
Bore Hole	x	(Depth_1.2_m)		No. of Bore Holes	2
Other (specify)					
Soil Report Attached?	Yes		No	x	(Please tick)

2. Was fill material intercepted during the subsoil investigation?:

Yes		No	x	(Please tick one)

If yes, please specify the effect of the fill on wastewater disposal.

3. Has percolation testing been carried out?

Yes		No	x	(Please tick one)

If yes, please specify the method

Test Report Attached? (Please tick)	Yes		No	

4. Are surface water interception/diversion drains required?

Yes		No	x	(Please tick one)

If yes, please show on site plan

5. Please state the depth of the seasonal water table:

Winter	>1.2
Summer	>1.2

Please indicate whether measured		or estimated	x	(Please tick)

6. Are there any potential <u>short circuit paths</u>?

Yes		No	x	(Please tick one)

If the answer is yes, please explain how these have been addressed

7. Based on results of subsoil investigation above please indicate the disposal field soil category :

Is Topsoil Present?	x	If so, Topsoil Depth?	250mm

Soil Category	Classification	Properties
1	Sand	Very little to no coherence; cannot be moulded; single grains stick to fingers
2	Loamy sand	Slight coherence; forms a fragile cast that just bears handling; gives a very short (5mm) ribbon that breaks easily; discolours the fingers
	Sandy loam	Forms a cast but will not roll into a coherent ball; individual sand grains can be seen and felt; gives a ribbon 15-25 mm long
3	Fine sandy loam	As for sandy loams, except that individual sand grains are not visible, althoughthey can be heard and felt; gives a ribbon 15-25 mm long
	Loam	As for sandy loams but cast feels spongy, with no obvious sandiness or silkiness; may feel greasy if much organic matter is present; forms a thick ribbon about 25 mm long
	Silty Loam	As for loams but not spongy; very smooth and silky; will form a very thin ribbon 25mm long and dries out rapidly

4	Sandy clay loam	Can be rolled into a ball in which sand grains can be felt; forms a ribbon 25-40 mm long
	Fine sandy clay	As for sandy clay loam, except that individual sand grains are not visible although they can be heard and felt; forms a ribbon 40-50 mm long
	Clay loam	Can be rolled into a ball with a rather spongy feel;slightly plastic; smooth to manipulate; will form a ribbon 40-50 mm long
	Silty clay loam	As for clay loams but not spongy; very smooth and silky; will form a ribbon 40-50 mm long; dries out rapidly
5	Sandy clay	Forms a plastic ball in which sand grains can be seen, felt or heard; forms a ribbon 50-75 mm long
	Light clay	Smooth plastic ball that can be rolled into a rod; slight resistance to shearing between thumb and forefinger; forms a ribbon 50-75 mm long
	Silty clay	As for light clay but very smooth and silky; will form a ribbon about 50-75 mm but very fragmentary; dries out rapidly
6	Medium clay	Smooth plastic ball, handles like plasticine and can be moulded into rods without fracture; some resistance to ribboning, forms a ribbon 75 mm or more long
	Heavy clay	Smooth plastic ball that handles like stiff plasticine; can be moulded into rods without fracture; firm resistance to ribboning; forms a ribbon 75 mm or more in length

Reasons for placing in stated category

Class 3: 250mm topsoil over sandy loam
As per bore hole findings
Images attached

PART E: Discharge Details

1. Water supply source for the property (please tick):

Rainwater (roof collection)	
Bore/well	
Public supply	x

2. Calculate the maximum daily volume of wastewater to be discharged, unless accurate water meter readings are available *(Refer Schedule 6 and NZS1547:2012 Table H3).*

Number of Bedrooms	7 2 Cabins	
Design Occupancy	15	(Number of people)
Per capita Wastewater Production	165 0	(Litres per person per day)
Other – Specify		
Total Daily Wastewater Production	2475	(Litres per day)

3. Do you propose to install:

a) Full Water Conservation Devices?	Yes	x	No		(Please tick)
b) Water Recycling – what %?	%		No	x	(Please tick)

If you have answered Yes, please provide additional information including the estimated reduction in water usage:

As per design report attached D:2

4. Is Daily Wastewater Discharge Volume more than 2,000 litres:

Yes	x	No		(Please tick one)

Note if the answer to the above is yes, a Bay of Plenty Regional Council wastewater discharge resource consent will be required

Bay of Plenty REGIONAL COUNCIL

PART F: Primary Treatment *(Refer NZS 1547:2012 Appendix J)*

1. **Please indicate below the no. and capacity (litres) of all septic tanks including type (single/dual chamber grease traps) to be installed or currently existing:**

Number of Tanks	Type of Tank	Capacity of Tank (Litres)
	Total Capacity	

4. Is a Septic Tank Outlet Filter to be installed?

Yes		No		(Please tick one)

If yes, please state the type, manufacturer and serial number.

Packed Bed Reactor
Must comply with NZS 1546.1:2008 Appendix D

PART G: Secondary and Tertiary Treatment

1. Please indicate the type of additional treatment, if any, proposed to be installed in the system (please tick):

Secondary Treatment	✓		
Home aeration plant			
Commercial aeration plant			
Intermediate sand filter			
Recirculating sand filter			
Clarification tank			
Tertiary Treatment			
Ultraviolet disinfection			
Chlorination			
Other		Specify	Econotreat VBB-C-3000

PART H: Land Application Method

1. Please indicate the proposed loading method (please tick):

Gravity	
Dosing Flout	
Pump	Davy D42A-B

2. Is a high water level alarm being installed in pump chambers?

Yes	x	No		(Please tick one)

3. If a pump is being used, please provide the following information:

Total Design Head	17.1	(m)
Pump Chamber Volume	1600	(Litres)
Emergency storage volume	3250	(Litres)

4. **Please identify the type(s) of land disposal method proposed for this site (please tick)** (Refer NZS 1547:2012 Appendices K to N):

Surface Dripper Irrigation	
Sub-surface Dripper Irrigation	x
Standard Trench	
Deep Trench	
Mound	
Evapo-transpiration Beds	
Other (Please Specify)	

5. Please identify the loading rate you propose for the option selected in Part H, Section 4 above stating the reasons for selecting this loading rate: (Refer NZS 1547:2012 Tables L1 and L2)

Loading rate		3	(mm/day)
Loading rate	Basal		(m2)
	Areal	825	(m2)

Explanation (Refer NZS 1547:2012 Appendix L and Appendix M)

As per AS/NZS 1547:2012 Table L1/M1 According to soil category established in part D:7

6. What is the available reserve wastewater disposal area (Refer NZS 1547:2012 5.5.3.4):

Reserve Disposal Area (m2)	413
Percentage of Primary Disposal Area (%)	50%

7. Please provide a detailed description of the design and dimensions of the disposal field and attach a detailed plan of the field relative to the property site:

Description and Dimensions of Disposal Field:

As per design report attahed
All vertical and horizontal setback distances to comply to AS/NZS 1547:2012
Refer to NZS 1547:2012 Appendix R

Plan Attached?	Yes	x		No		(Please tick)

If not, explain why not.

PART I: Maintenance and Management *(Refer NZS 1547:2012 section 6.3 and Appendix U)*

1. Has a maintenance agreement been made with the treatment and disposal system suppliers?

Yes		No	x	(Please tick one)

PART J: Risk Management

1. Is a Risk Reduction Report included with application? (Refer NZS 1547:2012Appendix A. Ensure all issues concerning potential effects addressed)

Yes	x	No		(Please tick one)

2. Are there any specific environmental constraints?

Yes		No	x	(Please tick one)

If Yes, please explain

PART K: Is Your Application Complete?

1. In order to provide a complete application you have remembered to:

Fully Complete this Assessment Form	x
Include a Location Plan and Site Plan (with Scale Bars)	x
Include a Property Title (Certificate of Title)	x
Attach a Risk Reduction Report	x

2. Declaration

I hereby certify that, to the best of my knowledge and belief, the information given in this application is true and complete

Name	Matt Riddell	**Signature**	
Position	Designer	**Date**	08/04/2024

WaterFlow
Bringing Clarity to Wastewater

2024

Waterflow NZ Ltd
Certified Designer

Pou Oranga Whai Ora
19a Baird Road
Opotiki
Lot 2 DP 8225

Reference Number:

Issued 08/04/2024

ONSITE WASTEWATER DESIGN REPORT

WaterFlow
Bringing Clarity to Wastewater

TABLE OF CONTENTS

Attachments

- PS1
- Land Application System Schematics
- Pump Specification
- Electrical Diagram
- Assessment of Environmental Effects
- System & Installation Specifications
- Home Owners Care Guide

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PART A: CONTACT AND PROPERTY DETAILS

A 1. Consultant / Evaluator

Name:	Matt Riddell
Company/Agency:	Waterflow New Zealand Ltd
Address:	4/525 Great South Road, Penrose, Auckland 1061
Phone:	09 431 0042
Fax:	
Email Address:	matt@waterflow.co.nz

A 2: Applicant Details

Applicant Name:	Pou Oranga Whai Ora Charitable Trust
Company Name:	
Property Owner:	Pou Oranga Whai Ora Charitable Trust
Owner Address:	19a Baird Road, Opotiki
Phone:	
Mobile:	
Email Address:	

A 3: Site Information

Sited Visited by:	Taylor Hanrahan	**Date:**	Thursday, 7 March 2024			
Physical Address:	19a Baird Road, Opotiki					
Territorial Authority:	Opotiki District Council					
Regional Council:	Bay of Plenty Regional Council					
Regional Rule	Rule 14					
Legal Status of Activity:	**Permitted:**		**Controlled:**		**Discretionary:**	x
Total Property Area (m^2):	33484m^2					
Map Grid Reference:						
Legal Description of Land (as on Certificate of Title):						
Lot No:	2					
DP No:	8225					
CT No:	GS5C/1375					

A 4: Are there any previous existing discharge consents relating to this proposal or other waste discharge/disposal on the site?

Yes:	x	**No:**	

If yes, give reference No's and description:

A 5: Dwelling(s) for which on-site wastewater service is to be provided

Status of dwelling(s) to be serviced:		**New**		**Existing**	x	**Multiple**	
How many dwellings on the property?		One main dwelling (7 bedrooms) and two self contained cabins.					
Capacity of dwellings:	**Dwelling 1**	7					
(or number of bedrooms)	**Dwelling 2**	2 Cabins					
	Dwelling 3						
	Other:						
Notes:	Intention is for the building to be used as a drug & alcohol rehabilitation facility with up to 14 patients staying for up to two weeks at a time. Meals will be prepared off site.						

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PART B: SITE ASSESSMENT - SURFACE EVALUATION

B 1: Site Characteristics

Performance of adjacent systems:	**(Unknown)**			
Estimated annual rainfall (mm):	1250 - 1500 **(as per NIWA statistics)**			
Seasonal variation (mm):	300-400mm			
Vegetation cover:	Pasture grass			
Slope shape:	Flat			
Slope angle:	<3 °			
Surface water drainage characteristics:	Broad overland flow across site			
Flooding potential?	**Yes:**		**No:**	**x**
If Yes, specify relevant flood levels relative to disposal area:	Site is relatively low lying. Land disposal area is to be installed outside the estimated 1 in 20 year flood level. See attached maps from BOPRC.			
Site characteristics:	19a Bairds Rd, Opotiki is an irregular shaped property of 33,484m2. Property is generally flat and covered with grass, trees and orchards. Property boundaries are on State Highway 2 to the East and similar large rural resdiential properties to the south, north and west.			

B 2: Slope Stability

Has a slope stability assessment been carried out on the site?

Yes:		**No:**	**x**

If no, why not?

Low slope:	**x**	**No signs of instability:**	**x**	**Other:**

If yes, give brief details of report:

Details:	
Author:	
Company/Agency:	
Date of report:	

B 3: Site Geology

B 4: Slope Direction

What aspect does the proposed disposal system face?

North		West	
North-West		South-West	
North-East		South-East	
East		South	x

B 5: Site Clearances if applicable (also on site plan)

	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries:	>1.5	>1.5
Surface Water:	>20	>20
Ground Water:	>1.2	>1.2
Stands of Trees / Shrubs:	n/a	n/a
Wells/Water Bores:	>20	>20
Embankments / Retaining Walls:	>3	>3
Buildings:	>3	>3
Other:		

B 6: Please identify any site constraints applicable for this property, and indicate how the design process is to deal with these.

Constraints	Explain how constraints are being dealt with
1 Site constraints:	n/a

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PART C: SITE ASSESSMENT - SOIL INVESTIGATION

C 1: Soil Profile Determination Method

Test pit:		Depth (mm):		No. of Test pits:	
Bore hole:	x	Depth (mm):	1200	No. of Bore holes	2
Other:					

C 2: Fill Material

Was fill material intercepted during the subsoil investigation?

Yes:		No:	x

If yes, please specify the effect of the fill on wastewater disposal:

C 3: Permeability Testing

Has constant head Permeability Testing (Ksat) been carried out?

Yes:		No:	x

If yes, please indicate the details (test procedure, number of tests):

Test report attached?

Yes:		No:	x

C 4: SURFACE WATER CUT OFF DRAINS

Are surface water interception/diversion drains required?

Yes:		No:	x

C 5: DEPTH OF SEASONAL WATER TABLE:

Winter (m):	>1.2
Summer (m):	>1.2

Was this:

Measured:	✓ no sign of ground water or mottling in bore holes
Estimated:	

C 6: SHORT CIRCUITS

Are there any potential short circuit paths?

Yes:		No:	x

If yes, how have these been addressed?

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C 7: SOIL CATEGORY

Is topsoil present?

Yes:	x	**No:**	

If yes, what is the topsoil depth & soil description?

250mm topsoil over sandy loam

Indicate the disposal field soil category (as per AS/NZS 1547:2012 Table E1)

Category	Description	Drainage	(x)
1	Gravel, coarse sand	Rapid draining	
2	Loamy sand, sandy loam	Free draining	
3	Medium-fine sandy loam, loam & silt loam	Good draining	x
4	Sandy clay-loam, clay loam & silty clay-loam	Moderate draining	
5	Sandy clay, light clay, silty clay	Moderate to slow draining	
6	Medium to Heavy Clays	Slow draining	

Reason for placing in stated category:

Result of bore hole/test pit sample	x
Profile from excavation	
Geotech report	
Other:	

C 8: SOIL STRUCTURE

Based on results of the in-situ soil profile investigation above (C7) please indicate the disposal (land application) field soil structure:

Massive	
Single grained	
Weak	x
Moderate	
Strong	

C 9: As necessary, provide qualifying notes on the relationship of Soil Category (C7) to Soil Structure (C8) and the effect this relationship will have on design loading rate selection:

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PART D: DISCHARGE DETAILS

D 1: Water supply source for the property:

Rain water (roof collection)	
Bore/well	
Public supply	x

D 2: Are water reduction fixtures being used?

Yes:		No:	x	(according to our knowledge at time of design report)

If 'yes' Please state:

Standard Fixtures include dual flush 11/5.5 or 6.3 litre toilet cisterns, and includes standard automatic washing machine, but a low water use dishwasher, no garbage grinder.

D 3: Daily volume of wastewater to be discharged:

No. of bedrooms/people:	1:	7 Bedroom
	2:	2 Bedroom Cabins
	3:	
Design occupance (people):	1:	11 People
(as per AS/NZS 1547:2012 Table J1)	2:	4 People
	3:	
		Black / Grey water
Per capita wastewater production (litres/person/day):	1:	165 L/day
(as per AS/NZS 1547:2012 Table H3, Note 2)	2:	165 L/day
	3:	
Total daily wastewater production (litres per day):		2475 L/day

D 4: Is daily wastewater discharge volume more than 2000 litres?

Yes:	x	No:	

D 5: Gross lot area to discharge ratio:

Gross lot area:	33484 m²
Total daily wastewater production (litres/day):	2475 L
Lot area to discharge ratio:	13.53

D 6: Net Lot Area

Area of lot available for installation of the disposal (land application) field and reserve area:

Net lot area (m²):	32484 m²
Reserve area (m²):	30%

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PART E: LAND DISPOSAL METHOD

E 1: Indicate the proposed loading method:

	Black / Grey Water
Gravity Dose:	
Dosing Siphon:	
Pump:	Davy D42A-B

E 2: If a pump is being used please provide following information:

Total Design Head (m):	17.1
Pump Chamber Volume (litres):	1600
Emergency Storage Volume (litres):	3250

Is a high water level alarm being installed in pump chambers?

Yes:	**x**	**No:**	

E 3: Identify the type(s) of Land Disposal method proposed for this site:

	Black / Grey Water
P.C.D.I. Dripper Irrigation:	PCDI sub-surface laid
L.P.E.D. System:	
Evapo-Transpiration Beds:	
Other:	
	(as per Schematics attached)

E 4: Identify the Loading Rate proposed for option selected in E3:

as per AS/NZS 1547:2012 Table L1 & M1	**Black / Grey Water**
Loading Rate (litres/m²/day):	3
Disposal Area Basal (m²):	
Areal (m²):	825

E 6: Details and dimensions of the disposal (land application) field:

Length (m):	82.5	**No. Lines:**	10	**Hole Size:**	N/A
Width (m):	10.0	**Spacing (m):**	1.0	**Hole Spacing:**	N/A

Notes:	**825sqm of Sub-Surface laid PCDI dripline buried at 1m centers and covered with a minimum covering of 100mm topsoil. See schematic drawing attached.**

PART F: PROPOSED WASTEWATER TREATMENT SYSTEM

A Econotreat EconoTreat VBB-C-3000 System, fed through sub-surface laid PCDI dripline is suitable for this site. The EconoTreat VBB-C-3000 System has enough capacity to accommodate 3000ltr per day, so will be well within its capacity. The land application system is designed to discharge a maximum volume of 2475ltrs per day and if this is exceeded it could cause failure resulting in environmental and public harm.

PART G: OPERATION AND MAINTENANCE OF SYSTEM

The operation of this complete system will be explained verbally to the owner by the Installer or Agent on Completion of Installation; also provided with Waterflow's Home Owner's Manual.

Waterflow NZ Ltd encourages the Home Owner to monitor and care for your Econotreat system yourself, with our backing and support, and by doing so you will learn how your system works and operates and how to keep it in top working order.

It is also recommended that a Maintenance Program contract is in place at all times to ensure this system is maintained at top performance at all times.

All on site wastewater systems require regular maintenance; in this case once annually is suffice and may be specified within the consent process by the Building Department of Opotiki District Council. This Maintenance will be recorded on hard copy and supplied to both the Owner and Opotiki District Council Compliance Officer if requested.

NOTE TO OWNER: All written records pertaining to the wastewater system should be retained in a safe place. When a change of ownership occurs, a full and complete history is able to be passed to the new owners.

Animals are to be physically excluded from the installed effluent field to avoid damage, and to reduce the risk of soil compaction in the vicinity of the bed.

Planting within this area is encouraged to assist with evapotranspiration by plants.

PART H: SOIL LOG PROFILE

Class 5, (as per AC TP-58, Table 5.1)

DECLARATION

I, hereby certify that, to the best of my knowledge and belief, the information given in this application is true and complete.

Prepared By:	
Name:	**Matt Riddell - Approved Designer**
Signature:	
Date:	8/04/2024

Reviewed By:	
Name:	**Dean Hoyle - PS Author '3037' Auckland Council, NZQA Onsite Wastewater Training/Opus, BOINZ OWM, HBRC & FNDC Approved Designer**
Signature:	
Date:	8/04/2024

NOTE: The Waterflow Systems are to be installed by a registered drainlayer to the designs supplied by Waterflow NZ Ltd. All work to comply with Regional Council Water and Soil Plans.

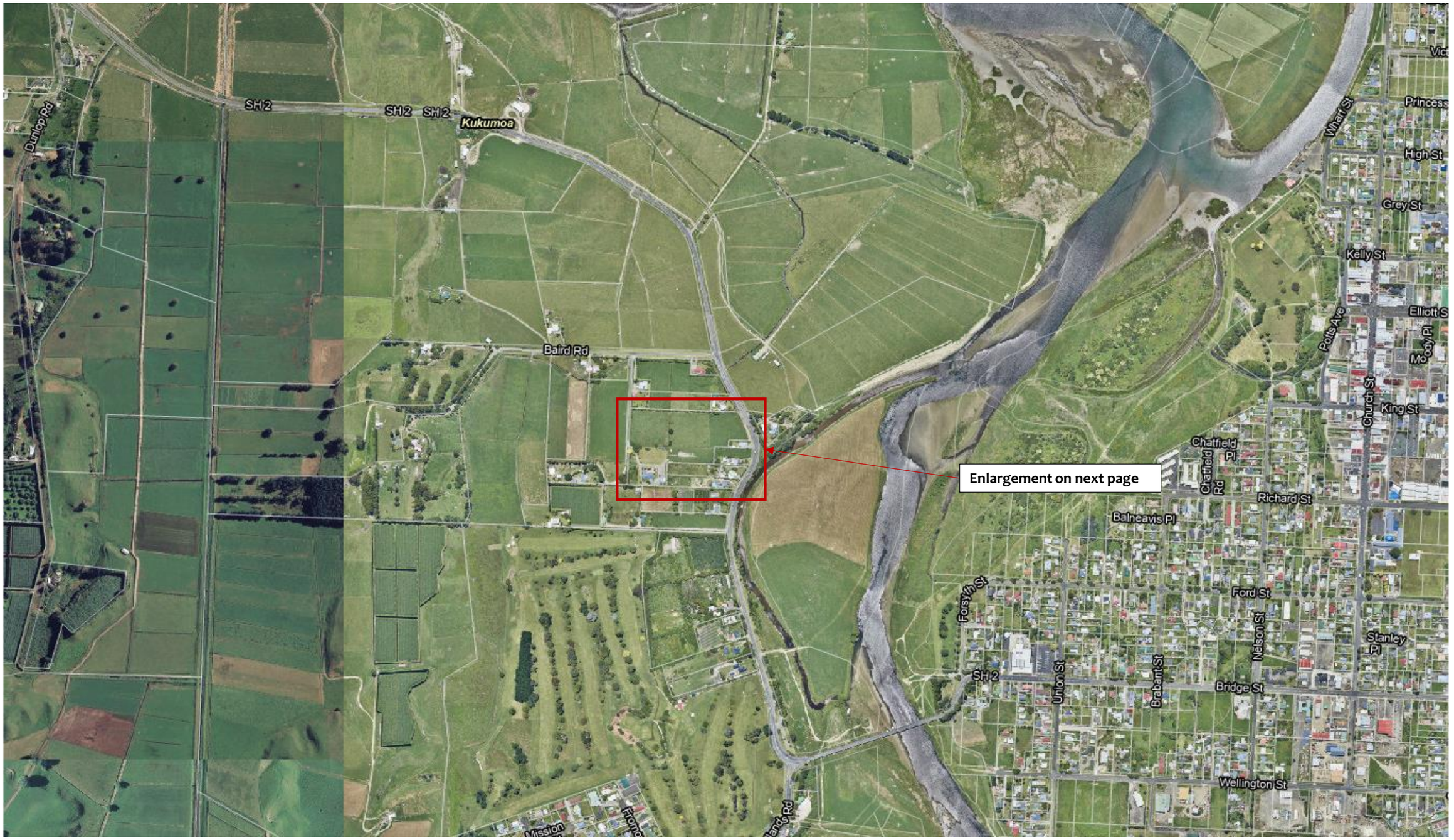
Comments/Summary:

The disposal field will need to be protected from traffic and animal grazing. Planting this area is recommended to increase Evapotranspiration.

Suitable plants for the disposal field can be found on our website www.naturalflow.co.nz

Waterflow Treatment systems to be installed by accredited installer unless other arrangements have been made by Waterflow NZ Ltd

For more information do not hesitate to contact the team at Waterflow NZ Ltd on 0800 628 356



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WaterFlow
Bringing Clarity to Wastewater

SITE LOCATION PLAN:

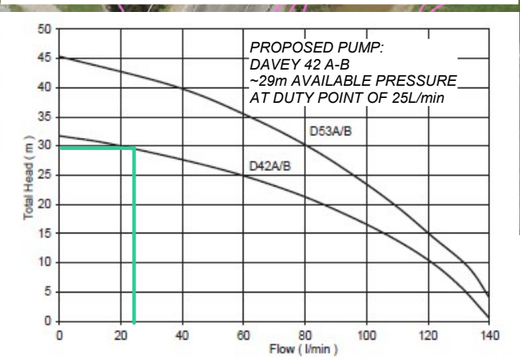
Pou Oranga Whai Ora Charitable Trust
19a Baird Road
Opotiki
Lot 2DP 8225
3.3484HA

SCALE:

1 : 907

@ A3

Process	Value	Units	Notes
Design Flow	2475	L/day	
Design Loading Rate	3	mm/day	
Disposal Area	825	m2	Total Area Required
Dripline Spacing	1	m	Distance between laterals
Dripline Qty	825	m	Amount of dripline required
Zones	2	zone	If using multi port sequencing valve enter number of ports
Zone Qty	413	m	Amount of dripline per zone
Enter Emitter Spacing	0.6	m	Default Metzerplas ADI 16mm, 2.2L/hour, 0.6m spacing
Emitter #	688	emitters	Emitters per zone
Emitter Flowrate	2.2	L/hour	Default Metzerplas ADI 16mm, 2.2L/hour, 0.6m spacing
Zone Flowrate	25	L/min	Flowrate per zone
Length of manifold pipeline	120	m	Distance from treatment plant to disposal field
Diameter of manifold pipeline	28	mm	ID of 32mm MDPE PN9
Type of pipeline	MDPE		i.e. LDPE, MDPE, HDPE
Pipeline friction loss	2.5	m	
Emitter pressure	8	m	Minimum pressure at start of dripline
Estimated headlosses through misc fittings & filter	2	m	
Tank Depth	2	m	Vertical distance between pump intake and top of tank
Elevation difference	1	m	Estimated difference in height between tank and field
Safety Factor	1.6	m	10% safety factor
Total Pressure	17.1	m	Total Pressure required at zone flowrate



DESIGN FLOW = 2475 LITRES PER DAY

CATEGORY 3 SOILS:
DLR = 3mm/DAY
MINIMUM DISPOSAL AREA = 825m2.
MINIMUM RESERVE DISPOSAL AREA = 413m2 (50%)

MINIMUM 1.5m FROM PROPERTY BOUNDARIES
MINIMUM 3.0m FROM HABITABLE BUILDINGS
MINIMUM 5m FROM OPEN DRAINS
MINIMUM 20m FROM OTHER SURFACE WATER
INSTALL OUTSIDE 1 IN 20 YEAR FLOOD ZONE

PROPOSED LAND DISPOSAL AREA:
2 x 412.5m2 DISPOSAL AREAS EACH CONSISTING OF
412.5 LINEAL METRES OF PRESSURE COMPENSATING DRIPLINE.
TO BE INSTALLED SUBSURFACE (50 ~150mm INTO THE TOPSOIL)
DRIPLINE TO BE INSTALLED AT AN AVERAGE OF NO LESS THAN
1.0m ROW SPACING. THE RECOMMENDED SPEC FOR THE
DELIVERY PIPELINE IS 32mm DIAMETER MEDIUM DENSITY PE
NO MORE THAN 120m & ID > 28mm
DRIPLINE LATERALS TO BRANCH OFF DELIVERY PIPELINE.
EACH DISPOSAL AREA 5 x 82.5m DRIPLINE LATERALS.
EACH LATERAL TO TERMINATE IN A NORMALLY CLOSED FLUSH VALVE.
FINAL LOCATIONS OF TREATMENT PLANT AND
LAND DISPOSAL AREAS MAY BE ALTERED BY
INSTALLING DRAINLAYER TO SUIT SITE/INSTALLATION
CONDITIONS AND PROPERTY OWNER PREFERENCES.
CHANGES TO BE RECORDED ON THE 'AS-BUILT' PLAN.

0m — 100m

WaterFlow
Bringing Clarity to Wastewater

PO Box 24
Maungaturoto
www.waterflow.co.nz

CLIENT
POU ORANGA WHAI ORA
CHARITABLE TRUST
C/O PIPETECH OPOTIKI

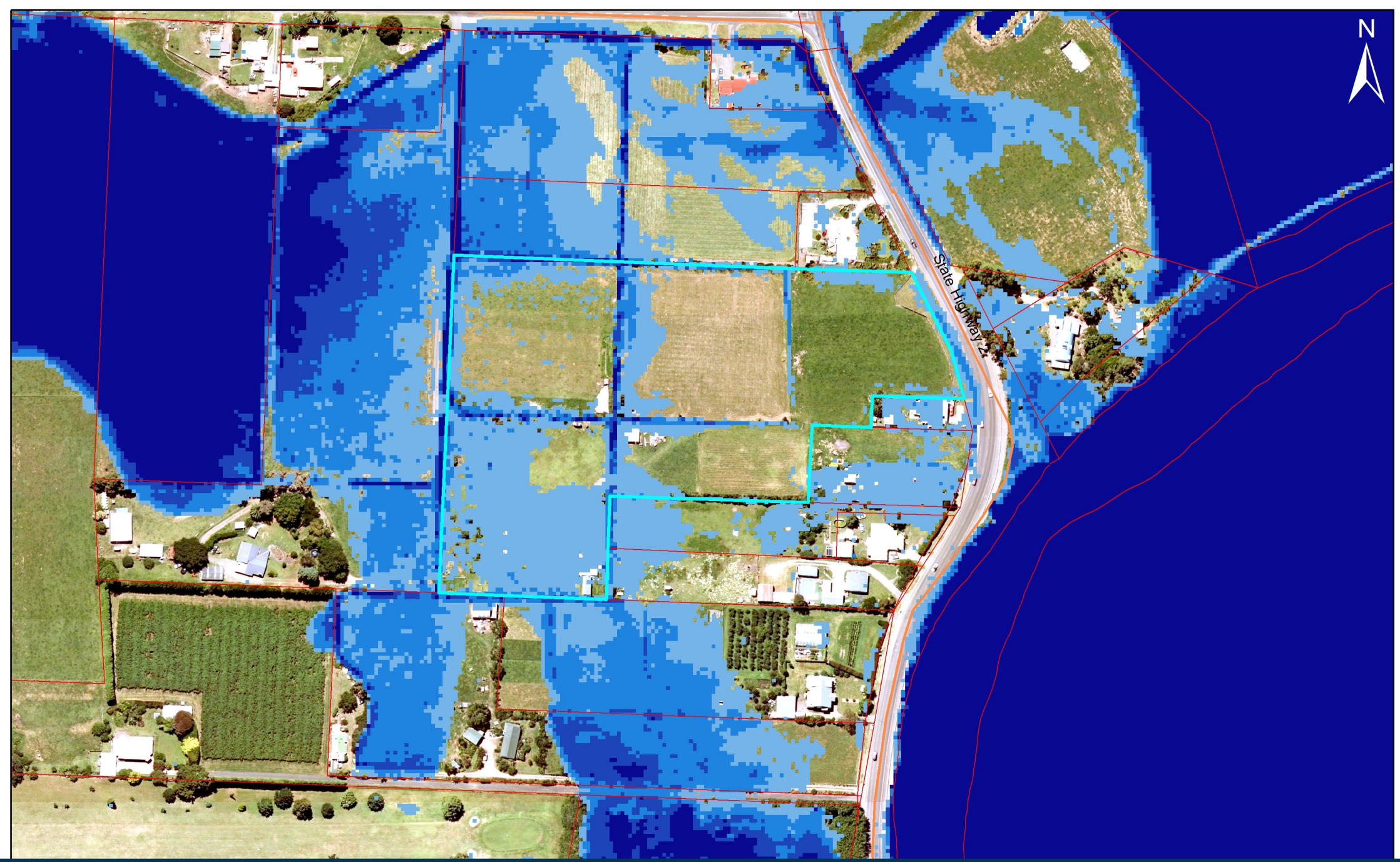
PROJECT
19 A BAIRD ROAD, OPOTIKI
ON-SITE WASTEWATER
TREATMENT AND DISPOSAL

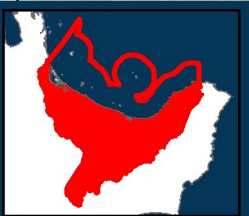
TITLE
PROPOSED ONSITE
WASTEWATER LAYOUT

DATE	08/05/24	
DRAWN	MR	
DESIGN	MR	
CHECKED	CP	

JOB No.	SCALE.
WF10001	1:500@A3

DWG No.	REV.
WF10001-01	B





Legend

Primary Parcels

Road

20yr_wQ020_oQ...

m

0 - 0.1

0.100000001 - 0.3

0.3 - 0.5

0.5 - 0.7

0.7 - 0.9

0 50 100 200 Meters

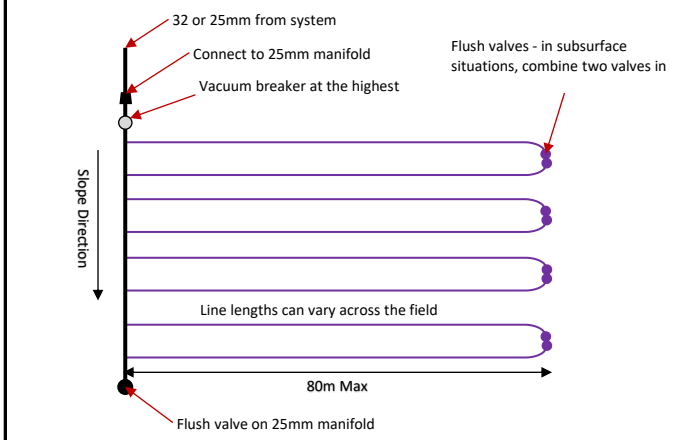
19A Baird Road Flood Depth
20yr flood 2030

Bay of Plenty REGIONAL COUNCIL

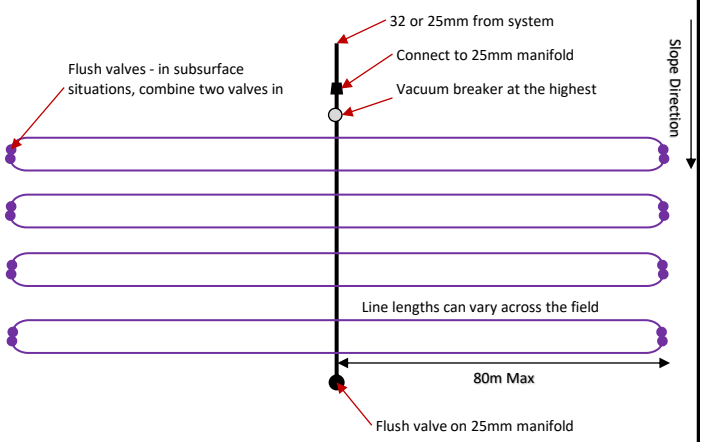
Boundaries indicated are approximate and reflect the area of investigation.
North indicated is Grid North. True north and magnetic north may differ.
Map created by MF on 9/04/2024.

Common PCDI Layouts

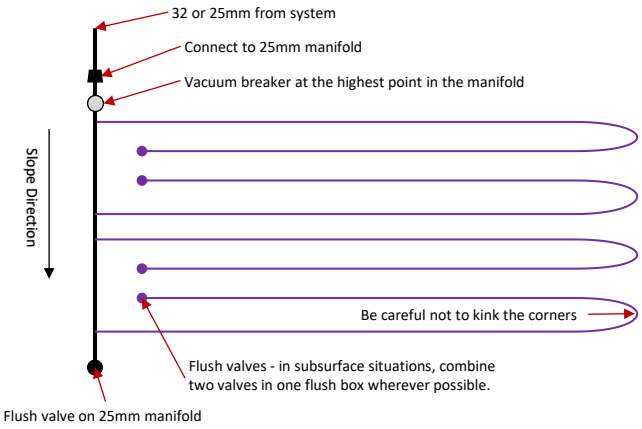
Single Side Manifold - straight



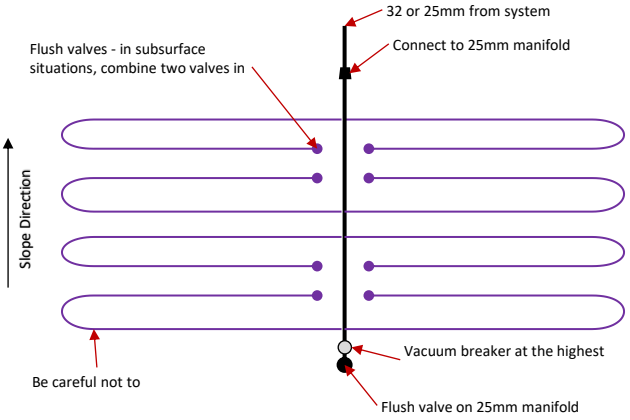
Single Center Manifold - straight



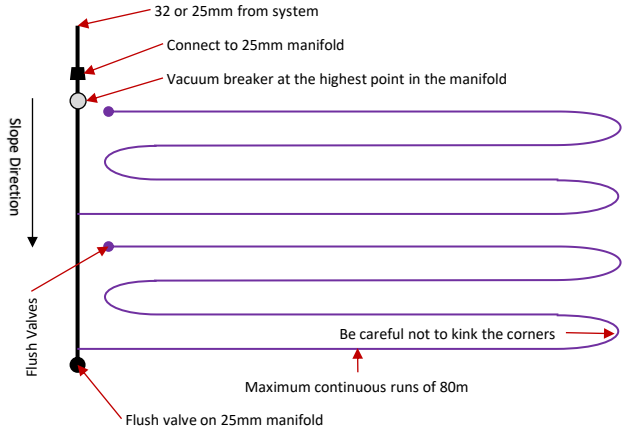
Single Side Manifold - curled



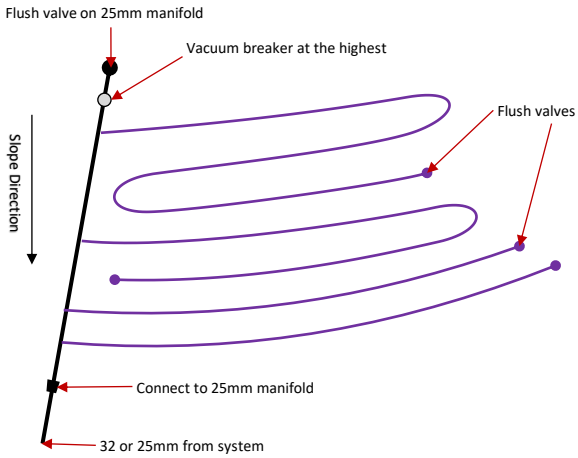
Single Center Manifold - curled



Long Single Runs



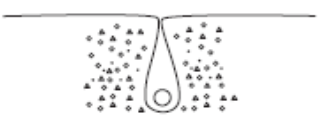
Custom Layout



Cross Sections of PCDi installation

150mm Mulch or Leaf Litter

Subsoil Buried @ 100-150mm

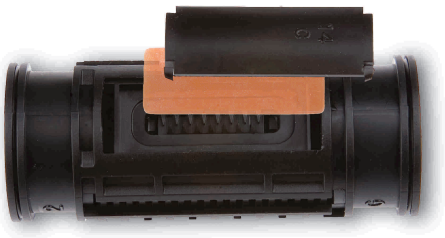


METZERPLAS

ADI

Cylindrical PC (Pressure Compensated) dripper.

- Cylindrical PC dripper, with unique regulating labyrinth with self-flushing operation at the beginning and the end of each irrigation cycle.
- Triple inlet filter with filtering area 10 times larger than any other dripper.
- High clog resistance.
- Suitable for poor quality and effluent water.
- Large pressure compensation range up to 4.3 bars.
- Dripline diameter: 16, 18 and 20 mm.
- Dripper flow rate: 1.6, 2.2 and 3.5 l/h.
- *Rootguard*® configuration available for extra root protection in SDI (Subsurface Drip Irrigation).



ADI Dripline Technical Data:

Model	Inside Diameter (mm)	Wall Thickness (mm)	Min. Working Pressure (bars)	Max. Working Pressure (bars)	KD
ADI 16	13.8	0.9	0.8	3.5	1.12
		1.15	0.8	4.3	0.95
ADI 18	15.8	1.2	0.8	4.3	0.95
ADI 20	17.4	1.0	0.8	3.5	0.85
		1.25	0.8	4.3	0.6

METZERPLAS IRRIGATION SYSTEMS

Kibbutz Metzer M.P. Heffer 38820 ISRAEL Tel: 972-4-6387001 Fax: 972-4-6385385
info@metzerplas.com • www.metzerplas.com

METZERPLAS

ADI

Cylindrical PC (Pressure Compensated) dripper.

ADI 16 mm. Maximum lateral length (I.D. 13.8 mm, W.T 0.9 mm, Inlet pressure 2.5 bars):

Nom. Flow Rate (l/h)	Spacing Between Drippers (m)						
	0.20	0.30	0.40	0.50	0.60	0.75	1.00
1.6	86	122	156	188	218	260	324
2.2	72	103	131	157	182	216	269
3.5	51	73	94	113	131	156	195

ADI 18 mm. Maximum lateral length (I.D. 15.8 mm, W.T 1.2 mm, Inlet pressure 2.5 bars):

Nom. Flow Rate (l/h)	Spacing Between Drippers (m)						
	0.20	0.30	0.40	0.50	0.60	0.75	1.00
2.0	93	134	171	205	238	284	355
3.5	65	92	118	142	166	198	247

ADI 20 mm. Maximum Lateral length (I.D. 17.4 mm, W.T 1.0 mm, Inlet pressure 2.5 bars):

Nom. Flow Rate (l/h)	Spacing Between Drippers (m)						
	0.20	0.30	0.40	0.50	0.60	0.75	1.00
1.6	128	182	234	281	325	388	484
2.2	113	159	202	242	279	331	409
3.5	76	109	140	168	196	233	291

For additional tables and data please contact Metzerplas Technical Department or visit our website: www.metzerplas.com

Packaging Data

Model	Roll Length (m)	Quantity Per Container (Rolls)		
		20	40	40 h
ADI 16	400	150	300	350
ADI 18	300	150	300	333
ADI 20	300	133	266	300

METZERPLAS IRRIGATION SYSTEMS

Kibbutz Metzer M.P. Heffer 38820 ISRAEL Tel: 972-4-6387001 Fax: 972-4-6385385
info@metzerplas.com • www.metzerplas.com

Assessment of Environmental Effects

Pou Oranga Whai Ora Charitable Trust of 19a Baird Road, Opotiki
Lot 2 DP 8225

1.1 Description of Proposal

The property owners propose a new onsite wastewater management system to treat the wastewater from an existing seven bedroom dwelling and two bedroom cabin to a secondary standard and then dispose to land via a network of subsurface pressure compensating dripline.

1.2 Site Description

19a Bairds Rd, Opotiki is an irregular shaped property of 33,484m2. Property is generally flat and covered with grass, trees and orchards. Property boundaries are on State Highway 2 to the East and similar large rural resdiential properties to the south, north and west.

1.3 Wastewater Volume

In calculating the wastewater flows we have allowed for a maximum total occupancy of 15 persons, based on the proposed 7 bedroom and 2 bedroom dwellings (as per AS/NZS 1547:2012 Table J1). Total wastewater production is based on an allowance of 165 litres per person per day (as per AS/NZS 1547:2012 Table H3, Note 2), which is conservative given that water is public supply and standard water fixtures will be used throughout the house.

1.4 Wastewater Volume

The EconoTreat VBB-C-3000 system that is proposed will treat the wastewater to a high standard prior to dispersal using a PCDI drip line, into a purpose-designed disposal field, where the removal of nutrient will continue, both in the receiving soils and by plant uptake.

The system will be capable of producing reductions in Biochemical Oxygen Demand, Total Suspended Solids, Nitrogen, and Coliforms to a standard that meets the requirements (see details below). The system will cater for the wastewater requirements of the private dwellings (domestic wastewater) and will not service any commercial or trade waste sources. Risk Minor to Nil.

1.5 Proposed Treatment System

The objective of the treatment system is to reduce and remove much of the contaminants from the wastewater prior to discharge into the receiving soil. This will improve the long-term performance of the disposal field as well as reducing the risk to the receiving environment. The system will consist of:

- 5200L pumped septic tank
- EconoTreat VBB-C-3000
- Land Application System

The system is constructed using concrete tanks. The system produces treated effluent with BOD <20mg/l, Suspended solids <20mg/l.

1.6 Land Application System

The proposed irrigation system uses pressure-compensating dripper lines ensuring an even delivery of moisture over the entire irrigation field and a conservative DLR of 3mm. We propose the use of Metzerplas unibioline ADI16/2.2 @ 0.6m/c with the Dripline laid out at 1m centres. This Dripline will then be covered by 100mm topsoil. Densely planting this area will greatly enhance evapo-transpiration and be very beneficial especially in the wetter months of the year. This irrigation can be installed in conjunction with existing or proposed landscaping.

1.7 Surface & Ground Water

It is proposed to treat the water to a high standard prior to discharge and the proposed irrigation system will introduce the water into the topsoil horizon using PCDI irrigation. A low application rate of treated effluent into the topsoil will significantly reduce the likelihood of, any breakout or runoff or any risk of surface water contamination. With the ground water levels being >1.2m this conservative DLR also means the risk of ground water contamination is virtually nil. A majority of the undeveloped areas of this site are suitable for a PCDI disposal field when the necessary setbacks are observed. Risk Minor to Nil.

1.8 Air Quality

The proposed EconoTreat VBB-C-3000 system will produce no noticeable odour when functioning correctly. Any odour will be contained within the tanks. The PCDI irrigation system will load the soil at a rate that should not cause ponding, spraying or aerosol of the effluent that could potentially cause odours. Risk Minor to Nil.

1.9 Visual Impact

The tanks are installed wholly below ground level with only the lids being visible. The lids will protrude approximately 100mm to prevent egress of storm water into the system. The disposal field will be located in a purpose designed mulched and intensively planted disposal area. Warning signs may be installed to indicate the presence of the disposal area, although probably not necessary in a domestic situation, also the area may be fenced to restrict access.

1.10 Environmental Risks

Risks are associated with this proposal are minor. The treatment system will be automated, and the Home Owner will be given a 'Home Owners Care Guide' which explains the necessary visual checks to ensure no issues arise with the system, specifically – solids build-up - high water level – discharge failure – filter blockage.

Peak flow into the system are not expected to be significant and the system includes a large emergency storage volume.

1.11 Maintenance Requirements

The maintenance requirement of this system is minimal, with the system fully automated. The system requires little input from the operator apart from the regular cleaning of the outlet filter between the treatment system and the Dripline field. All other maintenance interventions must be carried out by service persons familiar with the operation of the system and approved by the manufacturer. Maintenance may include checking of the dissolved oxygen levels, cleaning of effluent outlet filter, removal of excess sludge volume, checking of control panel function, etc.…

The disposal field is quite possibly the most important and sensitive part of the treatment system and requires a reasonable amount of maintenance to keep it functioning well. Any leaking or damaged Dripline must be fixed quickly using the appropriate materials, the planting must be maintained, weeds removed and grass kept cut. The Dripline should be kept covered with a suitable bark, mulch, or topsoil.

Warning signs such as ponding, odours, and signs of excessive growth act as an indicator to possible problems. A disk filter s fitted to help prevent blockage of the drippers and to protect the Dripline. This filter will require cleaning during servicing of the system.The owners will be verbally informed at the commissioning of this system of all maintenance requirements and strongly advised to have a service contract in place prior to final sign off of the system installation.

econo-treat

Econotreat VBB-C-3000 Treatment System

System Specifications & Installation Instructions

Compliance Requirements

All Econotreat Treatment Systems meet the requirements of the NZ Building Code G13-VM4.

Section 9 of AS/NZS 1546.1:2008 state that tanks constructed to these Standards will meet the requirements of the Code for Clauses B1 and B2, structure and durability.

Compliance with Section 9 of AS/NZS 1546.1:2008 and also Clauses G13.3.4 relating to on-site treatment and disposal systems and G14.3.1 and 14.3.2 relating to the control of foul water as an industrial waste.

The Treatment Process

Primary Chamber / Tank

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 primary tank will also act as a storage chamber for sludge returned from the Clarification Chamber.

Aeration Chamber

Water enters from 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 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 the Primary chambers via a sludge return which aids in further biological reduction, denitrification and providing a constant food supply rich in microbes supporting the system through periods of limited flows.

Performance	
BOD (g/m^3)	<10
TSS (g/m^3)	<10
Total Nitrogen TN (g/m^3)	<15
Ammonia Nitrogen NH4-N (g/m^3)	<5
Total Phosphorous (g/m^3)	<5

ECONOTREAT VBB-C-3000

System Specification & Installation Instructions

New Zealand's Leaders in Advanced Secondary Treatment Systems

Tank Specifications

Tanks are made of 50mpa Fiber Reinforced Concrete, which is suitable material for wastewater treatment containment meeting all the requirements of Section 4.3.3 of AS/NZS 1547:2012. These tanks have an expected lifespan of 50 years.

Dual Chamber Septic Tank
6000L Nominal Capacity
2200mm Diamter
1960mm High
~4,120kg

Aeration Tank
6000L Nominal Capacity
2200mm Diamter
1960mm High

Installation Location and Certification

These tanks are not designed for vehicle loads and shall be located no closer than 2m to a driveway, road frontage or a building. If for any reason the tank is located where vehicle traffic may drive over the tank or approach closer than 2m, or where it may be trampled on by farm stock then the tank should be protected by a concrete slab designed to support these loads. Surface water must also be diverted from flowing into the installation.

Installation must be in accord with G13 of Building Code. Final producer statement certificate to be issued and held by the regulatory authority.

High Water Table Installations

All tanks have been engineered and designed for maximum strength, in accordance with the AS/NZS 1546.1:2008 and G13 Clauses B1 and B2 for structure and durability, to withstand any hydraulic pressures, both lateral and uplift, created by high water table conditions.

In high water table installations, it is important to fill the tanks with water. This removes the hydraulic uplift and simplifies the installation. In extremely high-water tables, a concrete foot can be added to the tank during manufacture. Waterflow must be made aware of this early on in view of supplying a tank that is fit for purpose.

Plumbing Pipes and Fittings

All internal plumbing is done with PVC pipes with appropriate connections according to AS/NZS 1260 and AS/NZS 4130.

Backfill and Bedding

Place and bed to NZBC G13/AS2, using compacted granular metal, in layers not exceeding 100mm.

Electrical

Where a pump is required on a flat site electrical connection must be installed according to AS/NZS 3000 and the control and alarm system must be in a weatherproof housing located in a readily visible position.

Warranty

WATERFLOW NZ LTD warrants that the Econotreat System will be free from defects in material and workmanship for the following periods of time from the date of installation as set out in the following conditions:

1. Concrete Tank 15yrs
2. Roto-Molded Tanks 15yrs
3. Nitto Blower 2yrs
4. Irrigation Pumps 2yrs
5. Warranty of Operation covers the performance of the Econotreat System as connected to the effluent inflow for which they are designed, and has been installed to the criteria as set out in the relative installation instructions and procedures, and has an assigned Service/Maintenance contract in place with Waterflow NZ Ltd or it's appointed agent/s.

Warranty excludes defects due to:

A) Failure to use the system in accordance with owner's manual.

B) A force majeure event outside the reasonable control of WATERFLOW NZ LTD such as (but not limited to) earthquake, fire, flood, soil subsidence, ground water table variations or plumbing fault.

C) Modifications to surrounding landscape contour after installation

D) The actions of a third party

E) The system required to bear loads (either hydraulic or biological) greater than that for which it was designed

F) Any modifications or repairs undertaken without the consent of WATERFLOW NZ LTD

G) Failure, where applicable, to fence and plant disposal field.

1st June 2014
Dean Hoyle
Managing Director

The Econotreat system is to be installed or signed off by a registered Drain layer to the design specified by Waterflow NZ Ltd.

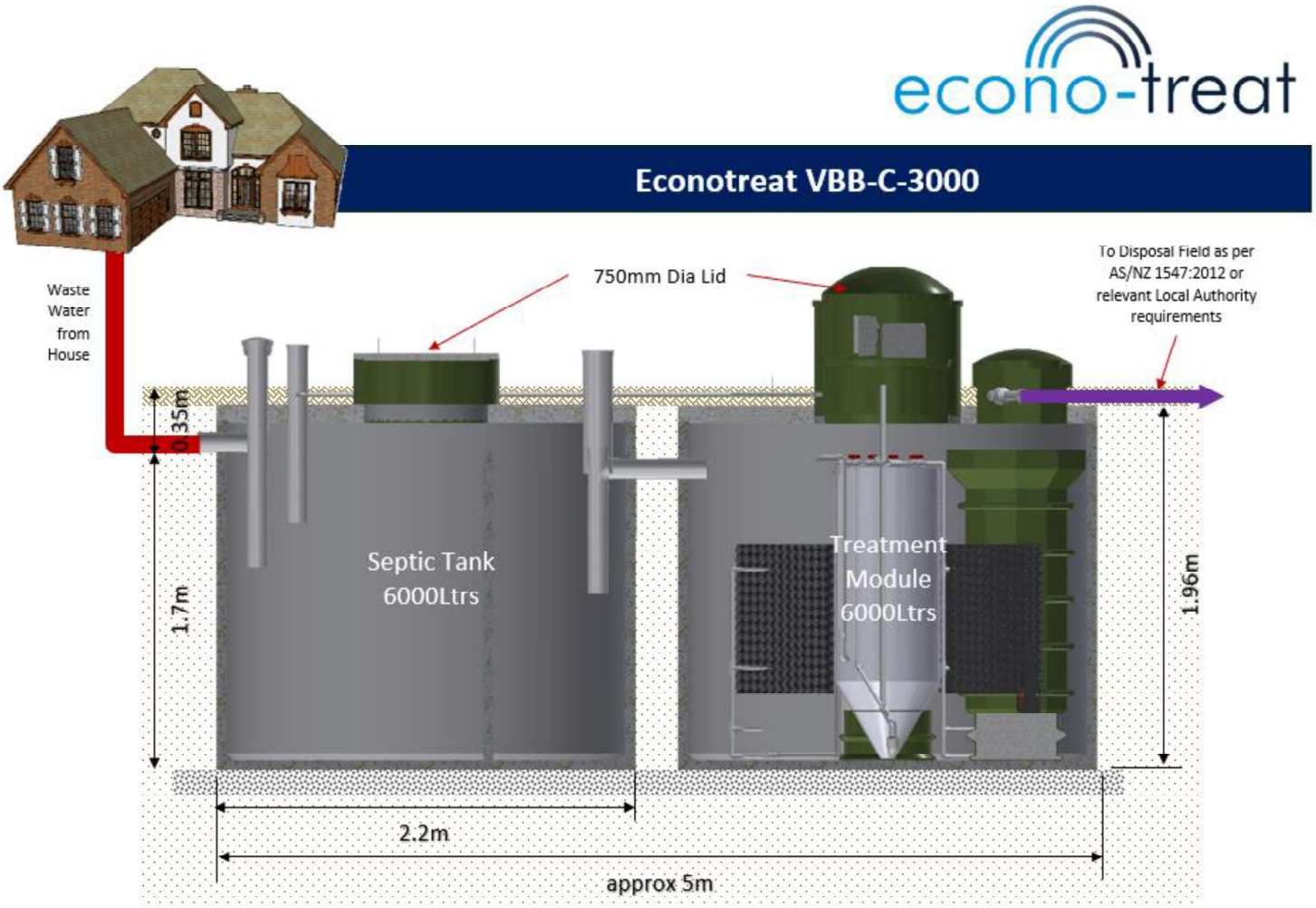
The following installation instructions and procedures followed correctly will ensure System performance is not compromised in any way.

1. Excavate two 2.5m x 2.5m level platforms at an appropriate depth to ensure adequate fall for inlet pipe from the source. This has to be installed on virgin ground. The two platforms are ideally on the same level and next to each other, either side-by-side or end-on-end.
2. Lay 100mm of bedding metal on platform and place the Septic and Aeration tanks next to each other. As close as practically possible to minimize the connection distance between the tanks.
3. Connect the two tanks with 100mm PVC. If the tanks are side-by-side the connection will need supporting. This is done by tying it back to the wire on the lids with a length of rope supplied. The rope can be found in the top of the treatment tank.

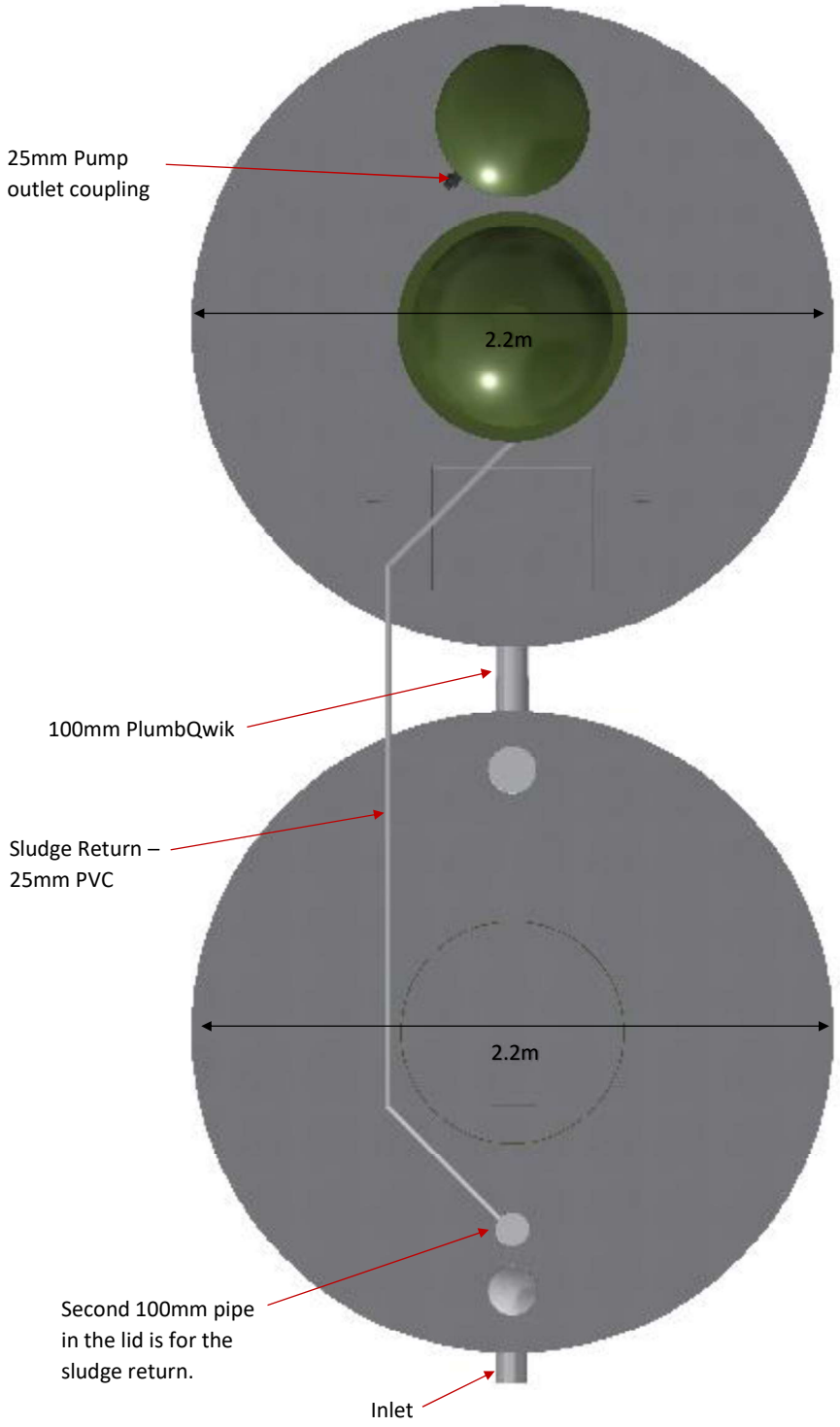
4. Next connect the sludge return. This is a 25mm PVC pipe that come out of the central riser on the treatment tank. This must be plumbed back to the second 100mm PVC at the start of the septic tank. It is important that this pipe is falling slightly or at minimum flat.
5. Trench from Dose Chamber outlet to disposal field and lay the 25mm alkathene feed line.
6. Take a minimum of 3 photos at this point to showing connections and back fill, to ensure correct installation for sign off.
7. Back fill around tanks. Using spoil from the excavation is fine, be aware that this will settle over time though.

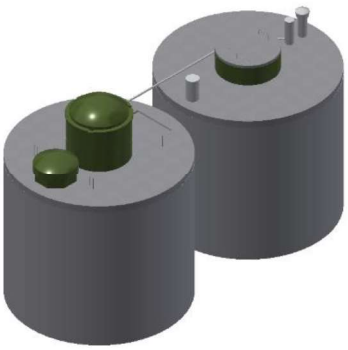
Caution: System must be protected from excessive super imposed loads both lateral and top loads. E.g. loads from vehicular traffic. There needs to be at least 2m of clearance maintained around system.

Econotreat VBB-C-3000 Schematic Drawings



End on End Installation





Water Flow NZ LTD

Knowledge • Innovation • Care

"Making it Easy"

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0800 SEWAGE

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econo-treat

Advanced Secondary Treatment

Aerated Wastewater Treatment System

Commercial System Operation Manual

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ECONOTREAT AERATED WASTEWATER SYSTEMS

Commercial System Operation Manual

Knowledge • Care • Innovation

If in doubt contact the experts on 0800 628 356 or sales@waterflow.co.nz

To the Client

Thank you for choosing an Econotreat System to treat and care for your on-site sewage and wastewater.

Your Econotreat System 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.

We would encourage you to monitor and care for your Econotreat system with our backing and support and by doing so you will learn how your system works and operates and how to keep it in top working order. Waterflow promises consistent results year after year.

Kind regards,
The Waterflow Team

Warranty

WATERFLOW NZ LTD warrants that the Econotreat System will be free from defects in material and workmanship for the following periods of time from the date of installation as set out in the following conditions:

Concrete Tank 15yrs

Roto-Molded Tanks 15yrs

Nitto Blower 3yrs

Irrigation Pumps 2yrs

Warranty of Operation covers the performance of the Econotreat System as connected to the effluent inflow for which they are designed, and has been installed to the criteria as set out in the relative installation instructions and procedures, and has an assigned Service/Maintenance contract in place with Waterflow NZ Ltd or it's appointed agent/s.

Warranty excludes defects due to:

A) Failure to use the system in accordance with owner's manual.

B) A force majeure event outside the reasonable control of WATERFLOW NZ LTD such as (but not limited to) earthquake, fire, flood, soil subsidence, ground water table variations or plumbing fault.

C) Modifications to surrounding landscape contour after installation

D) The actions of a third party

E) The system required to bear loads (either hydraulic or biological) greater than that for which it was designed

F) Any modifications or repairs undertaken without the consent of WATERFLOW NZ LTD

G) Failure, where applicable, to fence and plant disposal field.

How it Works

Primary Chamber / Tank

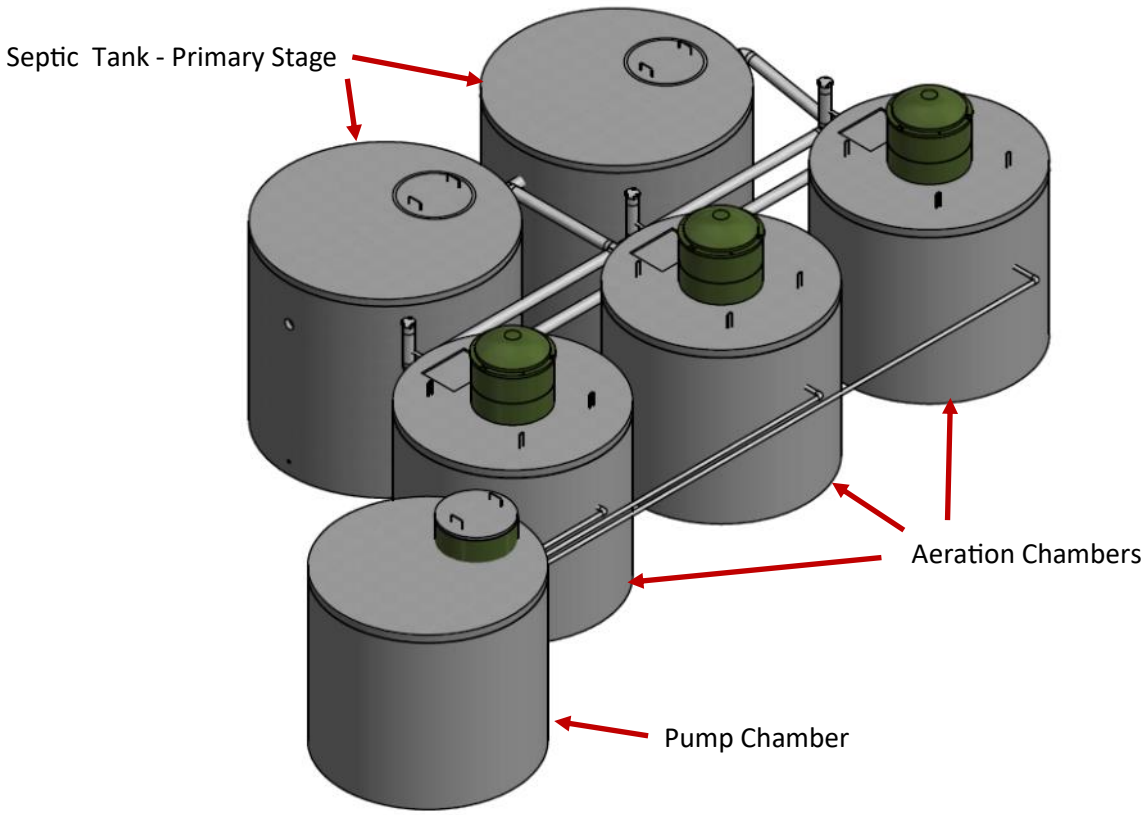
Influent enters the chamber via the source whereby scum and solids capable of settling are separated from the raw influent. Primary treated effluent flows through a transfer port to the aeration tank. This tank will also act as a storage chamber for sludge returned via the Clarification Chamber.

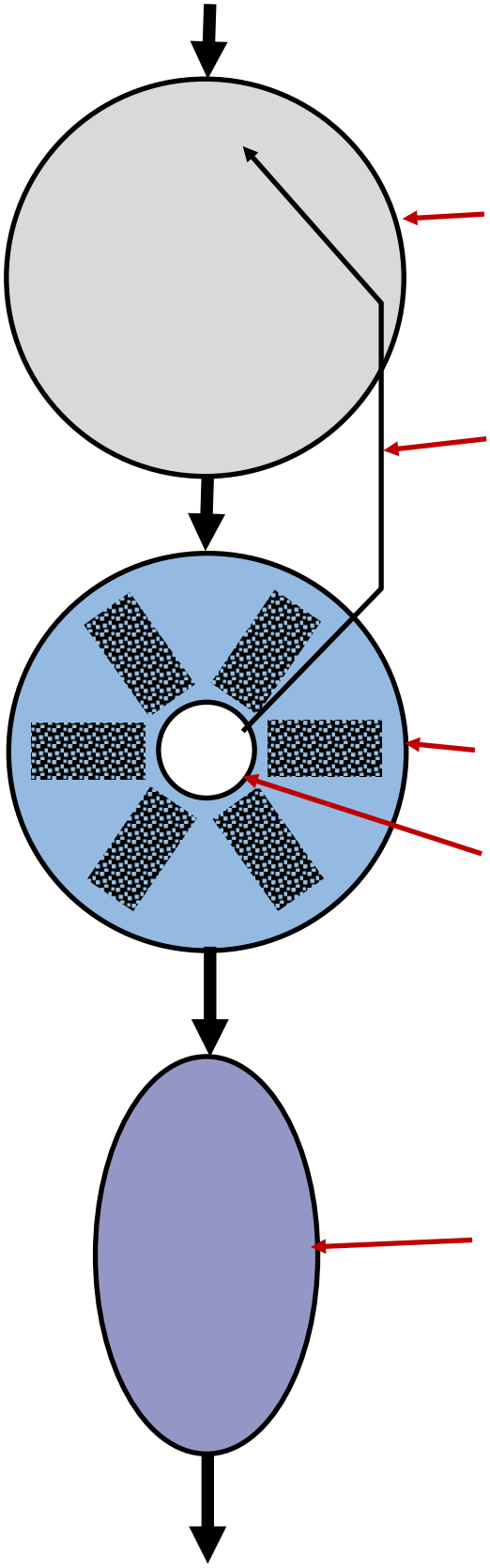
Aeration Chamber

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 the Primary chambers via a sludge return which aids in further biological reduction, denitrification and providing a constant food supply rich in microbes supporting the system through periods of limited flows.





Primary Stage

This will be sized to the flow, and can be made up of multiple tanks.

Sludge Return

There will be a sludge return from each clarifier. Where this returns to will vary depending on the setup. Refer to job specific system design for this information

Aeration Stage

Depending on the flow, there are a few different sized modules that could be used. There is likely to be two or more of these modules, fed from the Primary Tanks.

There will be a clarifier in each module.

Pump Chamber

This will be sized to handle up to 24hr emergency storage, in the unlikely event of a pump failure.

The inlets in this tank will be lower than the operating level in the aeration modules. This allows us to balance the flow coming through each aeration module.

Servicing

Your Econotreat System requires annual service and maintenance inspections. This will need to be done by our trained technicians. We will phone to arrange a suitable time to attend to your servicing needs.

A record sheet (in duplicate) will be completed by our technician at the time of service. One copy is for you the customer and available upon payment, the other copy will be retained for our records.

Please call our office on the number listed at the back of this manual for the cost of servicing after the initial 12-month period.

Servicing includes:

1. A general inspection of tank area, irrigation and drainage.
2. Inspection of electrical equipment including timer, Low powered Blower, irrigation pump, warning lights and connections.
3. Inspection of Pump-out Chamber and septic tank, checking air lines, adjusting air supply (if necessary), operating de-sludging unit, resetting air control, operating submersible switch, checking bio-mass growth, checking sludge level.
4. Inspection of irrigation including lines, jets and outlets. Between 4 - 9 years the tank will need to be de-sludged (pumped out) as with any septic tank. We will notify you of this requirement, as the service technicians will be monitoring sludge depth annually.

Holiday Precautions

There are no precautions to take. Your Econotreat can be left to function automatically for 6 to 12 months. However, if you are likely to be away from home for more than six months you may like to contact our office, so we can make a routine check.

Responsibility

As the Owner of the system you are responsible for the correct operation and maintenance and to conform to Councils requirements.

The Facility Owner needs to clean the outlet filter in the septic tank, and flush the irrigation lines every three months. It is also the home owners responsibility to ensure the taps on the irrigation are kept clear and accessible for servicing.

Problem Solving

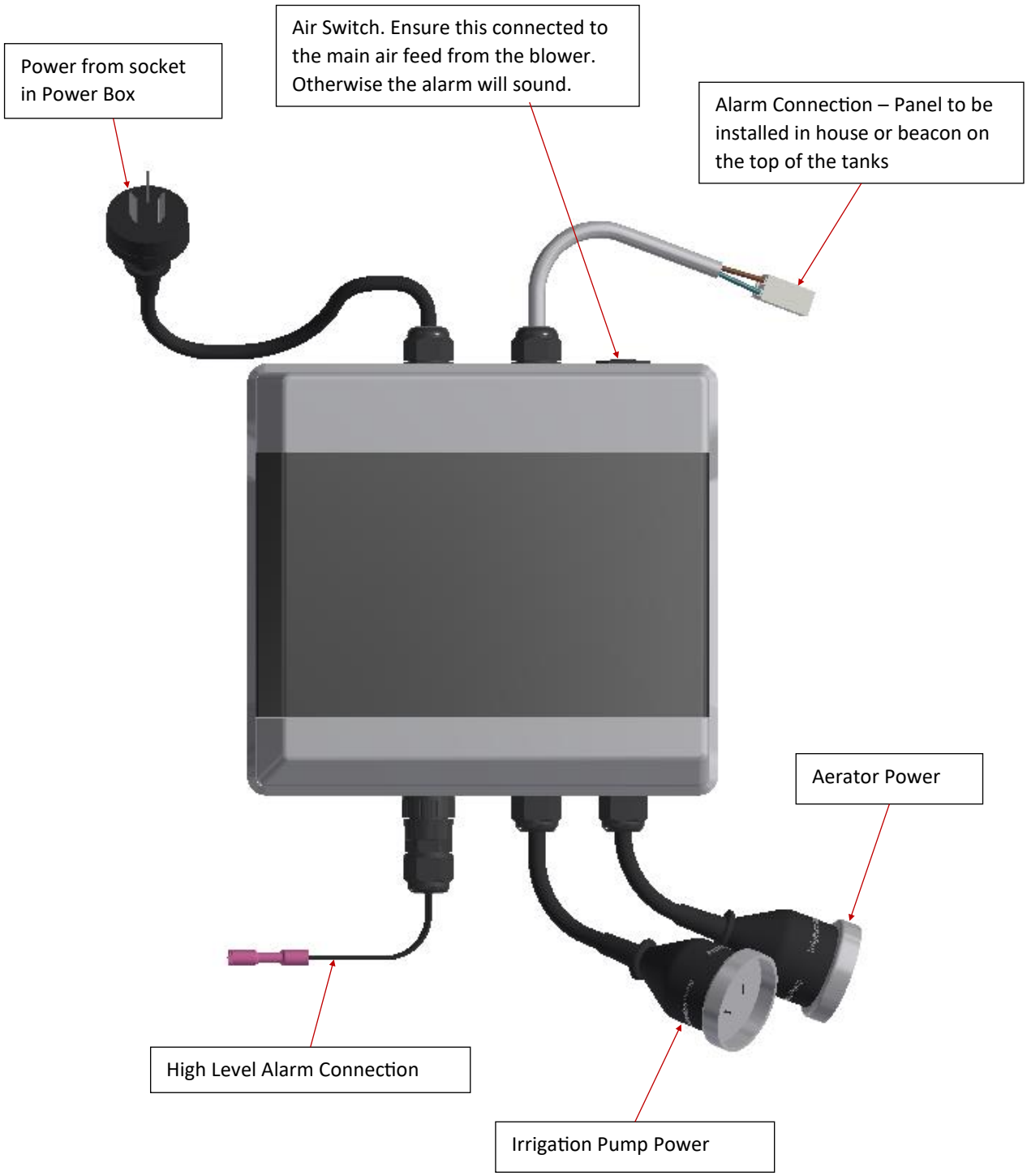
To ensure the most effective operation of your Econotreat System you should familiarize yourself with the contents of this manual. The Econotreat has been designed to include additional safety margins and minor mishaps and normal household usage will not usually affect the operation of the system.

However, if the alarm sounds or strong odors persist, please call your service agent.

Area of Concern	Potential Cause	Remedial Action
Alarm sounds (will indicate air or water alarm)	Irrigation pump not working Air supply not working No power at the tank Blocked Septic filter	Check power to pump and float switch operation. Check air connections to blower and switch Check power supply source Clean Septic filter
Water around tank	Irrigation pump not working Irrigation lines blocked or kinked	Check power supply Check irrigation lines and flush well
Excessive foaming	Too much laundry detergent Too many washes	Use recommended quantities Spread wash loads over different days
Persistent odors	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 power source and pump float Flush irrigation lines
Water ponding on irrigation field	Irrigation line blocked Excessive water use Broken irrigation pipe	Installation should comply with original approval Install water saving devices Repair irrigation pipe

‘Do not flush cleaning wipes down toilets’

Typical Controller



Caring for Your Wastewater System

Components of Your Complete Wastewater Septic System

A typical wastewater septic system has two main components: a Wastewater Treatment System and a Land Application System (or disposal field). This is simply treatment then discharge.

Efficient Water Use – 'it does make a difference'

Average indoor water use in the typical single-family home is approximately 180ltrs per person per day. The more water a household conserves, the less water enters the septic system. Efficient water use can improve the operation of the wastewater system and reduce any risk of disposal field overload.

High-efficiency toilets

Toilet use accounts for 25 to 30 percent of personal water use.

Do you know how many liters of water your toilet uses to flush? Most older homes have toilets with 11+ liter reservoirs, while newer high-efficiency dual flush toilets use 6.3/5.5ltrs or down to 4.5/3ltrs of water per flush. N.B. Did you know leaky toilets can waste as much as 700ltrs each day.

Consider reducing the volume of water in the toilet tank with a volume displacer (fancy name for a brick, stone etc!) if you don't have a high-efficiency model or replacing your existing toilets with high efficiency models.

Check to make sure your toilet's reservoir isn't leaking into the bowl. Add five drops of liquid food coloring to the reservoir before bed. If the dye is in the bowl the next morning, the reservoir is leaking, and repairs are needed.

Water fixtures

A small drip from a faucet may add many liters of unnecessary water to your system every day. To see how much a leak adds to your water usage, place a cup under the drip for 10 minutes. Multiply the amount of water in the cup by 144 (the number of minutes in 24 hours, divided by 10). This is the total amount of clean water travelling to your septic system each day from that little leak.

Faucet aerators and high efficiency showerheads

Faucet aerators help reduce water use and the volume of water entering your septic system. High-efficiency showerheads also reduce water use.

Washing machines

By selecting the proper load size, you'll reduce wastewater. Washing small loads of laundry on the large-load cycle wastes precious water and energy. If you can't select load size, run only full loads of laundry. N.B. A new Energy Star washing machine uses 35 percent less energy and 50 percent less water than a standard model.

Watch your drains!

What goes down the drain can have a major impact on how well your wastewater system works.

What shouldn't you flush down your toilet?

Dental floss, feminine hygiene products, diapers, cotton swabs, cigarette butts, cat litter, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can also stress or destroy the biological treatment taking place in the system or might contaminate surface or ground waters.

Educational & School Chemical Waste Streams

Any chemical wastes generated from school activities such as art and science lessons should **not** be discharged to the wastewater system and the school will need to develop **standard operating procedures** for their disposal, to ensure harmful chemicals are disposed of appropriately. Cleaning products containing strong acids, alkalis, quaternary ammonium compounds (QAC) and high sodium products also must be avoided. It is recommended that eco-friendly products are used where at all possible — Please See 'Cleaning Chemicals'

Care for your Land Application System

Your land application system is an important part of your wastewater system. Here are a few things you should do to maintain it:

- Flush driplines regularly – every 3 months recommended
- Plant only recommended wetland plants over and near your wastewater system. Roots from nearby trees or shrubs might clog and damage the drain field. Trees with very aggressive roots, such as willows, should be kept well away from the disposal system, see page 11 for list of recommended planting
- Don't drive or park vehicles on any part of your wastewater system, doing so can compact the soil
- in your drain field or damage the pipes, tank, or other septic system components
- Do not build any structures over it or seal it with concrete, asphalt etc.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drain field. Flooding the drain field with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back up
- A soggy drain field won't absorb and neutralize liquid waste. Plan landscaping, roof gutters and foundation drains so that excess water is diverted away from the Land Application System

Cleaning Chemicals

Effects on Wastewater and Disposal System Receiving Environments

Use of many cleaning chemicals in facilities served by on-site disposal systems, can result in high concentrations of the constituents in those cleaning agents being discharged into the receiving soils. These chemicals and constituents can have a massive impact on the quality and condition of the receiving soils over time.

Many of the chemicals can disrupt soil structure and decrease hydraulic conductivity while others can act as bactericides, destroying the essential micro-organisms required to achieve the high level of biodegradation in the treatment and disposal systems.

The following matters need to be considered when using cleaning agents in a domestic situation:

- Laundry powders are often extremely high in sodium which will destroy the salt balance in the soils. Check the labels for low sodium and phosphorous contents.
- Wastewater flow from dishwashing machines can have an impact on wastewater treatment systems, in terms of the strong cleaning chemicals used, so check labels for low sodium products
- Highly corrosive cleaners (such as toilet and drain cleaners) that have precautionary labels warning users to minimize direct contact, are an indication that they can adversely affect the wastewater treatment system. Up to 1 cup of bactericides such as bleach can be sufficient to impact on all the microorganisms/bugs in a septic system.

Recommended Cleaning Brands:

earthwise
caring for your world

eco
STORE

Cleaning Substitutes

Substitutes for Household Cleaning Chemicals (Ref TP58)

Use of the following readily biodegradable substitutes for common potentially harmful household cleaning chemicals will reduce the stress on any wastewater system, significantly enhance the performance of the whole system and increase the life of the land application system, while reducing the potential effects of the receiving soils.

General Cleaners

Use soft soap cleaners and bio-degradable cleaners and those low in chlorine levels.

Ammonia-Based Cleaners

Instead sprinkle baking soda on a damp sponge.

Disinfectants

In preference use Borax (sold in most Bin Inn stores): ½ cup in 4-litres of water.

Drain De-Cloggers

Avoid using de-clogging chemicals. Instead use a plunger or metal snake or remove and clean trap.

Scouring Cleaners and Powders

Instead sprinkle baking soda on a damp sponge or add 4-Tbs baking soda to 1-Litre warm water. It's cheaper and won't scratch.

Toilet Cleaners

Sprinkle on baking soda, then scrub with toilet brush.

Laundry Detergent

Choose one with a zero-phosphate content and low in alkaline salts (in particular, a low sodium level) and no chlorine.

Oven Cleaners

Sprinkle salt on drips, then scrub. Use baking soda and scouring pads on older spills.

In a Nutshell

Because your system is fully automatic there is no need for the owner to be concerned. However, there are some simple precautions to observe:

DO

- 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.
- 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.
- If your system requires power supply make sure this remains on continuously, unless system is being serviced.
- Check faucets and toilets for leaks; make repairs if necessary.
- Use low flush toilets where possible.
- Use a 'displacer' to reduce the amount of water needed to flush older toilets.
- Use aerators on faucets and flow reducer nozzles on showers to help lower water consumption.
- Reduce water levels for small loads of laundry.
- Wait until the dishwasher is full to run it.
- Densely plant your field to maximize transpiration.
- Perform regular monthly visual checks of your system and field.
- Grass should be mowed or trimmed regularly to optimize growth and prevent the grass from becoming rank.
- Use signs, fences and/or plantings to prevent any vehicle or stock access.
- Keep records of all maintenance undertaken on the wastewater systems.
- Monitor and care for your Wastewater System as per instructions in the home owner's manual.

DON'T

- Switch off power unless servicing
- Use chlorine-based disinfectant & cleaning products in the toilets or kitchen sink (Cleaners high in chlorine, phosphorous or ammonia must not be used)
- Over use heavy cleaners that kill beneficial bacteria in the septic system
- Pour any toxic/strong chemicals (paint, oil, grease, paint thinners or pesticides) down any drains
- Flush down your toilet – Dental floss, feminine hygiene products, diapers, cotton swabs, cigarette butts, cat litter, and other kitchen and bathroom items
- Discard any drugs down the sink or toilet
- Alter or add any part of your system without Waterflow NZ LTD's approval
- Never turn the system off, even when away on holidays.

Water Flow NZ LTD

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Call us today to discuss your needs

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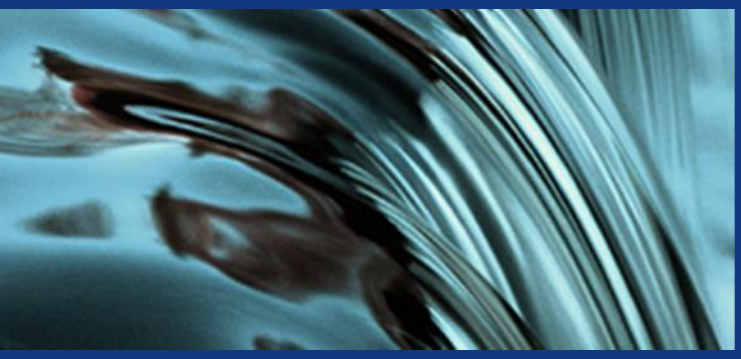

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