

**2019**

**Waterflow NZ Ltd**  
Certified Designer

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 4 of 22 - 03-10-19 - RBS

**George Suenson**  
**44C Cabbage Tree Bay Rd**  
**Opononi**  
**Lot 3 DP 346802**  
**06.06.2019**

**[ ONSITE WASTEWATER DESIGN REPORT ]**

Onsite Wastewater Design Report by Waterflow NZ Ltd – Copyright 2014





**TABLE OF CONTENTS**

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 5 of 22 - 03-10-19 - RBS

<b>PART A: CONTACT AND PROPERTY DETAILS .....</b>	<b>2</b>
<b>PART B: SITE ASSESSMENT - SURFACE EVALUATION .....</b>	<b>4</b>
<b>PART C: SITE ASSESSMENT - SOIL INVESTIGATION .....</b>	<b>6</b>
<b>PART D: DISCHARGE DETAILS - SEE HYDRAULIC LOADING TABLES .....</b>	<b>8</b>
<b>PART E: LAND DISPOSAL METHOD .....</b>	<b>9</b>
<b>PART F: PROPOSED WASTEWATER TREATMENT SYSTEM .....</b>	<b>9</b>
<b>PART G: OPERATION AND MAINTENANCE OF SYSTEM .....</b>	<b>10</b>
<b>PART H: SOIL LOG PROFILE .....</b>	<b>11</b>
<b>PART I: SITE IMAGES .....</b>	<b>12</b>
<b>DECLARATION .....</b>	<b>13</b>
<b>SITE LAYOUT PLAN: .....</b>	<b>14</b>
<b>Attachments</b>	
– PS1	
– Certificate of Title	
– Land Application System Schematics	
– Assessment of Environmental Effects	
– System & Installation Specifications	
– Home Owners Care Guide	



**PART A: CONTACT AND PROPERTY DETAILS**

**A 1. Consultant / Evaluator**

Name:	Dean Hoyle
Company/Agency:	Waterflow New Zealand Ltd
Address:	1160 SH 12 Maungaturoto
Phone:	09 431 0042
Fax:	09 431 8845
Email Address:	<a href="mailto:dean@waterflow.co.nz">dean@waterflow.co.nz</a>

**A 2: Applicant Details**

Applicant Name:	George Suenson
Company Name:	
Property Owner:	George Suenson
Owner Address:	44C Cabbage Tree Bay Rd, Opononi
Phone:	
Mobile:	020 407 92406
Email Address:	19bgas79@gmail.com

**A 3: Site Information**

Site Visited by:	Edward Foster	Date:	Tuesday, 7 May 2019
Physical Address:	44C Cabbage Tree Bay Rd, Opononi		
Territorial Authority:	Far North District Council		
Regional Council:	Northland Regional Council		
Regional Rule	15.1.3		
Legal Status of Activity:	Permitted:	<input checked="" type="checkbox"/>	Controlled:
Total Property Area (m <sup>2</sup> ):	18612m <sup>2</sup>		
Map Grid Reference:			
Legal Description of Land (as on Certificate of Title):			
Lot No:	3		
DP No:	346802		
CT No:			

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 6 of 22 - 03-10-19 - RBS



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

Yes:	<input type="checkbox"/>	No:	<input checked="" type="checkbox"/>
------	--------------------------	-----	-------------------------------------

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:	<input checked="" type="checkbox"/>	Existing:	<input type="checkbox"/>	Multiple:	<input type="checkbox"/>
How many dwellings on the property?	1					
Capacity of dwellings:	Dwelling 1	2				
(or number of bedrooms)	Dwelling 2					
	Dwelling 3					
	Other:					

Notes:	
--------	--

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 7 of 22 - 03-10-19 - RBS



**PART B: SITE ASSESSMENT - SURFACE EVALUATION**

**B 1: Site Characteristics**

ENDC - Approved Building Consent Document - EBC-2020-11226 - Pg 8 of 22 - 03-10-19 - RBS	Performance of adjacent systems:	(Unknown)		
	Estimated annual rainfall (mm):	1250 - 1500 (as per NIWA statistics)		
	Seasonal variation (mm):	300-400mm		
	Vegetation cover:	Native scrub		
	Slope shape:	Linear Divergent		
	Slope angle:	8 - 10 °		
	Surface water drainage characteristics:	Broad overland to distant natural waterway		
	Flooding potential?	Yes:	No:	x
	If Yes, specify relevant flood levels relative to disposal area:			
	Site characteristics:	large irregular shaped lifestyle block accessed via a long driveway off Cabbage Tree Bay Rd. Property is across a large knoll feature and is generally covered in native bush and regrowth. The building platform is at the top of the knoll and the property then slopes down towards the north, east and west. Property is surrounded by other like lifestyle Lots and reserve towards the north.		

**B 2: Slope Stability**

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

Yes:	<input type="checkbox"/>	No:	<input checked="" type="checkbox"/>
------	--------------------------	-----	-------------------------------------

If no, why not?

Low slope:	<input checked="" type="checkbox"/>	No signs of instability:	<input checked="" type="checkbox"/>	Other:	<input type="checkbox"/>
------------	-------------------------------------	--------------------------	-------------------------------------	--------	--------------------------

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	X
North-West		South-West	
North-East		South-East	
East		South	

**B 5: Site Clearances (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:	n/a	n/a
Embankments / Retaining Walls:	n/a	n/a
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

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 9 of 22 - 03-10-19 - RBS



**PART C: SITE ASSESSMENT - SOIL INVESTIGATION**

**C1: Soil Profile Determination Method**

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

**C2: Fill Material**

Was fill material intercepted during the subsoil investigation?

Yes:  No:

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

**C3: Permeability Testing**

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

Yes:  No:

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

Test report attached?

Yes:  No:

**C4: SURFACE WATER CUT OFF DRAINS**

Are surface water interception/diversion drains required?

Yes:  No:

**C5: DEPTH OF SEASONAL WATER TABLE:**

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

Was this:

Measured:	<input checked="" type="checkbox"/> no sign of ground water or mottling in bore holes
Estimated:	

**C6: SHORT CIRCUITS**

Are there any potential short circuit paths?

Yes:  No:

If yes, how have these been addressed?

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 10 of 22 - 03-10-19 - RBS



**C 7: SOIL CATEGORY**

Is topsoil present?

Yes:  No:

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

250mm Loamy Topsoil over Sandy Clay Loam

Indicate the disposal field soil category (as per AC TP-58, Table 5.1)

Category	Description	Drainage	(x)
1	Gravel, coarse sand	Rapid draining	
2	Coarse to medium sand	Free draining	
3	Medium-fine & loamy sand	Good draining	
4	Sandy loam, loam & silt loam	Moderate draining	
5	Sandy clay-loam, clay loam & silty clay-loam	Moderate to slow draining	x
6	Sandy clay, non-swelling clay & silty clay	Slow draining	
7	Swelling clay, grey clay & hardpan	Poorly or non-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	
Moderate	x
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:

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 11 of 22 - 03-10-19



**PART D: DISCHARGE DETAILS - SEE HYDRAULIC LOADING TABLES**

**D 1: Water supply source for the property:**

Rain water (roof collection)	<input checked="" type="checkbox"/>
Bore/well	<input type="checkbox"/>
Public supply	<input type="checkbox"/>

**D 2: Are water reduction fixtures being used?**

Yes:  No:

If 'yes' Please state:

Standard water reduction fixtures such as 6/3 dual flush toilets, shower-flow restrictors 8L/p/m, aerator faucets and water-conserving automatic washing machine with a 4.5 WELS or better star rating

**D 3: Daily volume of wastewater to be discharged:**

No. of bedrooms:	Dwelling 1:	2
	Dwelling 2:	
	Dwelling 3:	
Design occupancy (people): (as per AC TP-58, Table 6.1)		4
Per capita wastewater production (litres/person/day): (as per ARC TP-58, Table 6.2)		160
Total daily wastewater production (litres per day):		640
		Black / Grey water

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

Yes:  No:

**D 5: Gross lot area to discharge ratio:**

Gross lot area:	18612 m <sup>2</sup>
Total daily wastewater production (litres/day):	640
Lot area to discharge ratio:	29.08

**D 6: Net Lot Area**

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

Net lot area (m <sup>2</sup> ):	17612 m <sup>2</sup>
Reserve area (m <sup>2</sup> ):	100%

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 12 of 22 - 03-10-19 - RBS



**PART E: LAND DISPOSAL METHOD**

**E 1: Indicate the proposed loading method:**

	Black / Grey Water
Gravity Dose:	
Dosing Siphon:	NaturalFlow Dose Float
Pump:	

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

Total Design Head (m):	
Pump Chamber Volume (litres):	
Emergency Storage Volume (litres):	
Is a high water level alarm being installed in pump chambers?	
Yes: <input type="checkbox"/>	No: <input checked="" type="checkbox"/>

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

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

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

as per ARC TP-58, Table 9.2 & Table 10.3	Black / Grey Water
Loading Rate (litres/m <sup>2</sup> /day):	3
Disposal Area Basal (m <sup>2</sup> ):	
Areal (m <sup>2</sup> ):	213

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

Length(m):	28.4	No. Lines:	5	Hole Size:	4.0
Width (m):	7.5	Spacing (m):	1.5	Hole Spacing:	1.0

Notes: surface laid LPED drip lines laid 1.5m apart on a level contour, squirt holes overlaid with 300mm squirt guards and a minimum covering of 150mm landscape mulch. See schematic drawing attached.

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pa 13 of 22 - 03-10-19 - RBS



## **PART F: PROPOSED WASTEWATER TREATMENT SYSTEM**

A Naturalflow NF8000S Treatment System, gravity fed through surface laid LPED dripline is suitable for this site. The NF8000S Treatment System has enough capacity to accommodate 2000ltr per day, so will be well within its capacity. The land application system is designed to discharge a maximum volume of 640ltrs 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 Naturalflow 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 Far North District Council. This Maintenance will be recorded on hard copy and supplied to both the Owner and Far North 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.

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 14 of 22 - 03-10-19 - RBS



**PART H: SOIL LOG PROFILE**

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 15 of 22 - 03-10-19 - RBS



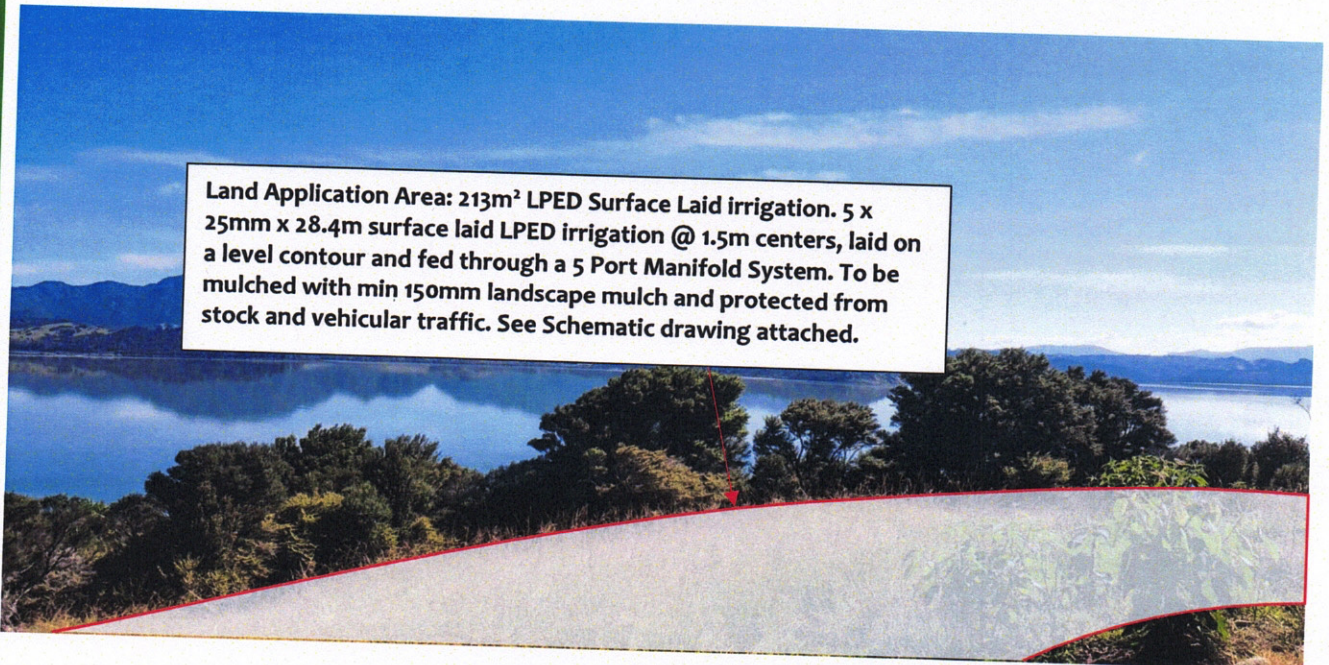
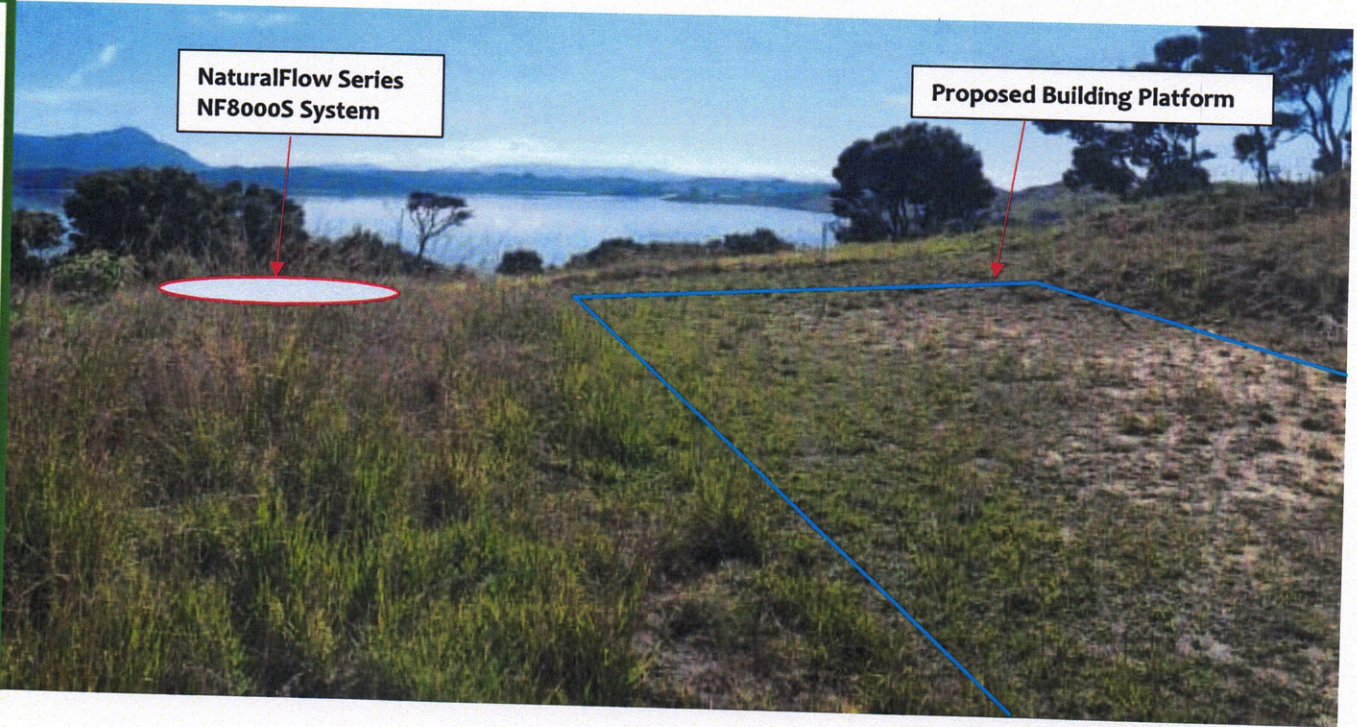
**Soil Profile: 250mm Loamy Topsoil over Sandy Clay Loam  
Class 5, (as per AC TP-58, Table 5.1)**





**PART I: SITE IMAGES**

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 16 of 22 - 03-10-19 - RBS

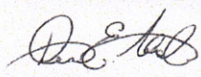




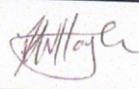
**DECLARATION**

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

**Prepared By:**

<b>Name:</b>	Dean Hoyle – PS Author '3037' Auckland Council, NZQA Onsite Wastewater Training/Opus, BOINZ OWM, HBRC Approved Designer
<b>Signature:</b>	
<b>Date:</b>	06.06.19

**Reviewed By:**

<b>Name:</b>	Ken Hoyle - NZQA Onsite Wastewater Training/Opus, HBRC Approved Designer
<b>Signature:</b>	
<b>Date:</b>	06.06.19

**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](http://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

FNDC - Approved Building Consent Document - EBC-2020-11226 - Pg 17 of 22 - 03-10-19 - RBS





Boundary - 1.5m min setback

10m Buffer Zone

Bore Holes

Land Application Area: 213m<sup>2</sup> LPED Surface Laid Irrigation. 5 x 25mm x 28.4m surface laid LPED irrigation @ 1.5m centers, laid on a level contour and fed through a 5 Port Manifold System. To be mulched with min 150mm landscape mulch and protected from stock and vehicular traffic. See Schematic drawing attached.

NaturalFlow Series NF8000S System

Proposed Building Platform

Surface water cut-off drains

Reserve Area 100%

30m

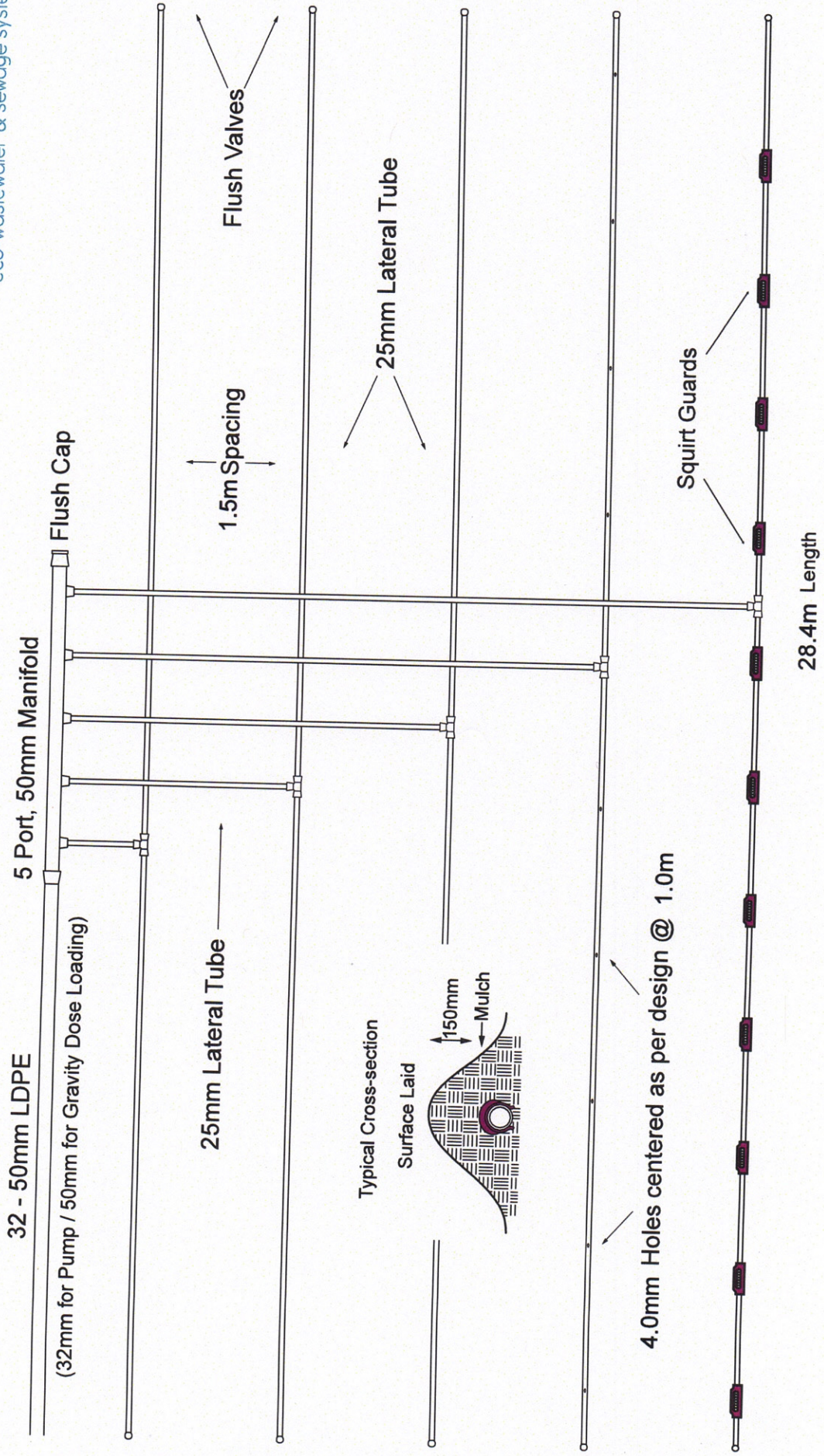
1,637,811.314 6,076,675.146 METERS



DATE DRAW: PREPARED BY: REVISED:	06.06.2019 Dean Hoyle Ken Hoyle	SITE LAYOUT PLAN: George Suenson 44C Cabbage Tree Bay Rd Opononi Lot 3, DP 346802 1.8612 HA	SCALE: 1 : 50 @A3
--	---------------------------------------	--	-------------------------



# Surface Laid Standard LPED Field Layout



**Note:** Each individual line must be laid level (even if you are following a contour)  
**Note:** With sub surface laid LPED lines the disposal field must be planted as per Waterflow NZ Ltd.'s recommendations, to maintain maximum performance.



## Assessment of Environmental Effects

George Suenson of 44C Cabbage Tree Bay Rd, Opononi  
Lot 3 DP 346802

### 1.1 Description of Proposal

The owners of this site propose the construction of a new 2 bedroom dwelling .

### 1.2 Site Description

This site, located at 44C Cabbage Tree Bay Rd, is a large irregular shaped lifestyle block accessed via a long driveway off Cabbage Tree Bay Rd. Property is across a large knoll feature and is generally covered in native bush and regrowth. The building platform is at the top of the knoll and the property then slopes down towards the north, east and west. Property is surrounded by other like lifestyle Lots and reserve towards the north.

### 1.3 Wastewater Volume

In calculating the wastewater flows we have allowed for a maximum occupancy of 4 persons, based on the proposed 2 bedroom dwelling (as per AC TP-58, Table 6.1). Total wastewater production is based on an allowance of 160 litres per person per day (as per ARC TP-58, Table 6.2), which is conservative given that water supply is roof collected rain water and standard water conserving fixtures will be used throughout the house.

### 1.4 Wastewater Volume

The Naturalflow Series NF8000 treatment system that is proposed will treat the wastewater to a high standard prior to dispersal using a LPED system, 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:



- Wormerator – Solids separation and breakdown unit
- Aeration discharge chamber
- Land Application System

The system is constructed using plastic roto-molded tanks. The system produces treated effluent with BOD <40mg/l, Suspended solids <40mg/l.

### 1.6 Land Application System

The proposed irrigation system uses a LPED irrigation and manifold system, ensuring an even delivery of moisture over the entire irrigation field and a conservative DLR of 3mm. We propose the use of 25mm lateral tube with 4mm perforations at 1mm centres and laid out at 1.5mtr apart. This LPED line will then be covered by 150mm landscape mulch. 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 LPED 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 LPED disposal field when the necessary setbacks are observed. Risk Minor to Nil.

### 1.8 Air Quality

The proposed NF8000 system will produce no noticeable odour when functioning correctly. Any odour will be contained within the tanks. The LPED 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 visual checks of the treatment system and land application system. 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 function well. Any leaking or damaged LPED irrigation must be fixed quickly using the appropriate materials, the planting must be maintained, weeds removed and grass kept cut.



## STATEMENT OF DESIGN - PS1

**Issued by:** Dean Hoyle

**To:** George Suenson

**Copy to be supplied to:** Far North District Council

**In Respect of:** NaturalFlow Domestic Onsite Wastewater and Sewage System Design

**At:** 44C Cabbage Tree Bay Rd, Opononi

**Legal Description:** Lot 3 DP 346802

Waterflow NZ Ltd has been engaged by George Suenson to provide the technical design services and details in respect of the requirements of G13/VM4 and B2 Durability of the Building Regulations 2004, for an Onsite Wastewater and Sewage System for their building at the above location.

The Design has been carried out in accordance with Auckland Council TP-58 Guidelines 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: George Suenson Onsite Wastewater Design Report, and numbered 1-39 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: 06/06/2019

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\*.*