LETS Go!
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19th April 2004

Proposed Wastewater Management System for the Richards and Barnett Residence, Okiwi Bay

1 Introduction

The proposed Onsite Wastewater Management System (WMS) is to be situated on Lot 11 DP 20444 at Okiwi Bay, Marlborough Sounds.

The property is located on Kaimiko Place at Okiwi Bay and the section size is approx 1,550 square metres.

This report reviews the effluent loadings, proposed effluent treatment and land application systems.

2 Report Overview

This report covers the estimated wastewater volumes generated; suggested wastewater management system and land application method and area required.

3 Flow Calculations

Inflow Source

- Domestic washing machine
- Standard electric hot water cylinder
- Dual flush toilet
- Standard shower

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Based on AS/NZS 1547:2000 the calculated flow rate is as follows

Occupants:	3 Persons
Flow Allowance:	170 litres/person/day (lpd) *1
	510 litres per day
Contingency:	170 litres per day *2
Total Flow Allowance:	**680 litres per day**

Footnote

*1 Adjusted by 10 lpd as an allowance for a dual flush toilet

*2 Balance for population equivalent for # of bedrooms: 1 @ 170 lpd – AS/NZS 1547:2000

4 Design Guidelines

4.1 Design Criteria

The proposed Land Application Area will handle up to 4 full time residents.

Have the ability to process the wastewater flows from the holiday home that will vary between full and nothing for periods of time. The discharged effluent should meet the standards as set by the MDC and comply with AS/NZS 1547:2000.

4.2 Requirements

- Minimal operator input
- Reliable, odour free operation
- Environmentally safe
- Sufficient storage to cover for power outages
- Low maintenance
- Minimal sludge pump outs
- Adjustable to meet the varying loads throughout the year
- Cost effective
- Proven technology
- Efficient and timely backup service

5 Land Application System (Equivalent to Secondary Treated Effluent)

5.1 Area

A suitable land application area of 190 m^2 is identified on the southern side of the property for the safe environmental re-entry of highly filtered wastewater. This area is no less than:

- 30m from any recognised watercourse and/or water body
- 1.5m off and property boundary

The area si vegetated in regenerating scrub and slopes to the southeast at approximately 10 degrees, has moderate to good exposure to the sun and wind currents for most of the day and has good potential for evapotranspiration.

The site and soil assessment indicate that soil is predominantly moderately structured silty clay loam base with some broken rock in places. This soil falls into category 4 as defined in the AS/NZS 1547:2000 standard and is consistent with other properties assessed in the area.

5.2 Design

5.2.1 General Description

A Network of covered dripper lines in the area identified on the attached site plan will form the Land Application System (irrigation system).

The Land Application System will use the "Dose Loading" method for application on the soil.

5.2.2 Area Required

Recommended Design Irrigation Rate (DIR) for irrigation systems and Category 4 soils is: 25 mm/week.

Note: 1mm is equivalent to 1 litre of water covering 1 square metre per day

Area required for the Land Application Area (irrigation area)

Max Loading	4,760 L/week
DIR	25 mm/week
Area required	**190 m^2**

All irrigation dripper line laid on the surface should be pegged and covered with the decomposing layer of organic material, bark or soil.

The dripper line will be RAAM 17D 2.3LPH 0.6M (similar to a garden hose with built in emitters) and connected to a low density alkathene supply line from the irrigation pump via an inline ARAAG screen filter.

5.2.3 *Design Irrigation Rate per dose*

Total estimated daily flow	680	litres / day
Number of Doses	3	doses / day
Discharge per dose	200	litres / dose - approx
Estimated Duration	10	min/dose
Design Flow	700	litres/hour
Irrigation Rate (RAAM 17D)	3.5	litres/hour/metre
Total RAAM Required	200	metres
Number of Zones required	1	zones
Land Application Area	190	square metres/zone
DIR per dose	1.05	mm / dose

5.2.4 *Materials Schedule*

Discharge Pump	Wallace JX250 (or similar)
Inline Filter	Short Body Araag, 25mm
Supply Line	25mm LDPE
Main	25mm LDPE
Submain	16mm Lateral
Laterals	NETAFIM RAAM 17D, 2.3 LPH, 0.6M
Lateral Spacing	0.6 – 1.0m
Sampling Point	15mm takeoff with isolating valve

6 Proposed Wastewater Management System

6.1 *Effluent Quality*

The Wastewater Management Plant will be capable of exceeding the recommended minimum effluent quality standard set for subsurface dripper line irrigation in AS/NZS 1547:2000;

BOD5	< 20 milligrams per litre
Suspended Solids	< 30 milligrams per litre
Faecal Coliform	< 10,000 cfu per 100 millilitres

6.2 *System*

Recommended System:

The *Stemphlow NM1 advanced Wastewater Management Plant* (by Wastewater Treatment Services Ltd, Nelson, ph 547 8408). This system is capable of meeting the required standards.

6.3 *Quality Management*

As per the manufacturers policy, this WMS is to be covered by a Maintenance Contract that the property owner will enter into to maintain the system warranty. In accordance with this, **Wastewater Treatment Services Ltd** undertakes to service the system on a twelve monthly Programmed Maintenance basis – following which a copy of the service report will be sent to the Marlborough District Council, and the owner if requested. The Maintenance Contract remains in force until the system is decommissioned or removed.

6.3.1 *Monthly Maintenance*

Check/clean the discharge filter from the system — Responsibility: Owners

6.3.2 *Routine Service*

This service occurs on average once a year — Responsibility: WTS technician

Typical maintenance service includes (but is not limited to):

- Pump testing
- Clean all filters
- Test alarm and alarm trigger
- Check Land Application System for correct operation
- Assess system health
- Sludge assessment
- Check in with resident owners
- Complete and file a written report

6.3.3 *Warranty*

The AS/NZS 1547:2000 standard require tank and components (excluding electrical) to be free of defects for 15 years and electrical for 2 years back to base full cover warrantee against defects.

All other components will be covered by there respective warranties from the manufacturers.

6.3.4 *Desludging*

The primary treatment tank may require desludging in approx 5 years from commissioning. This is consistent with other domestic systems operating in the area.

However the frequency is dependant on factors such as:

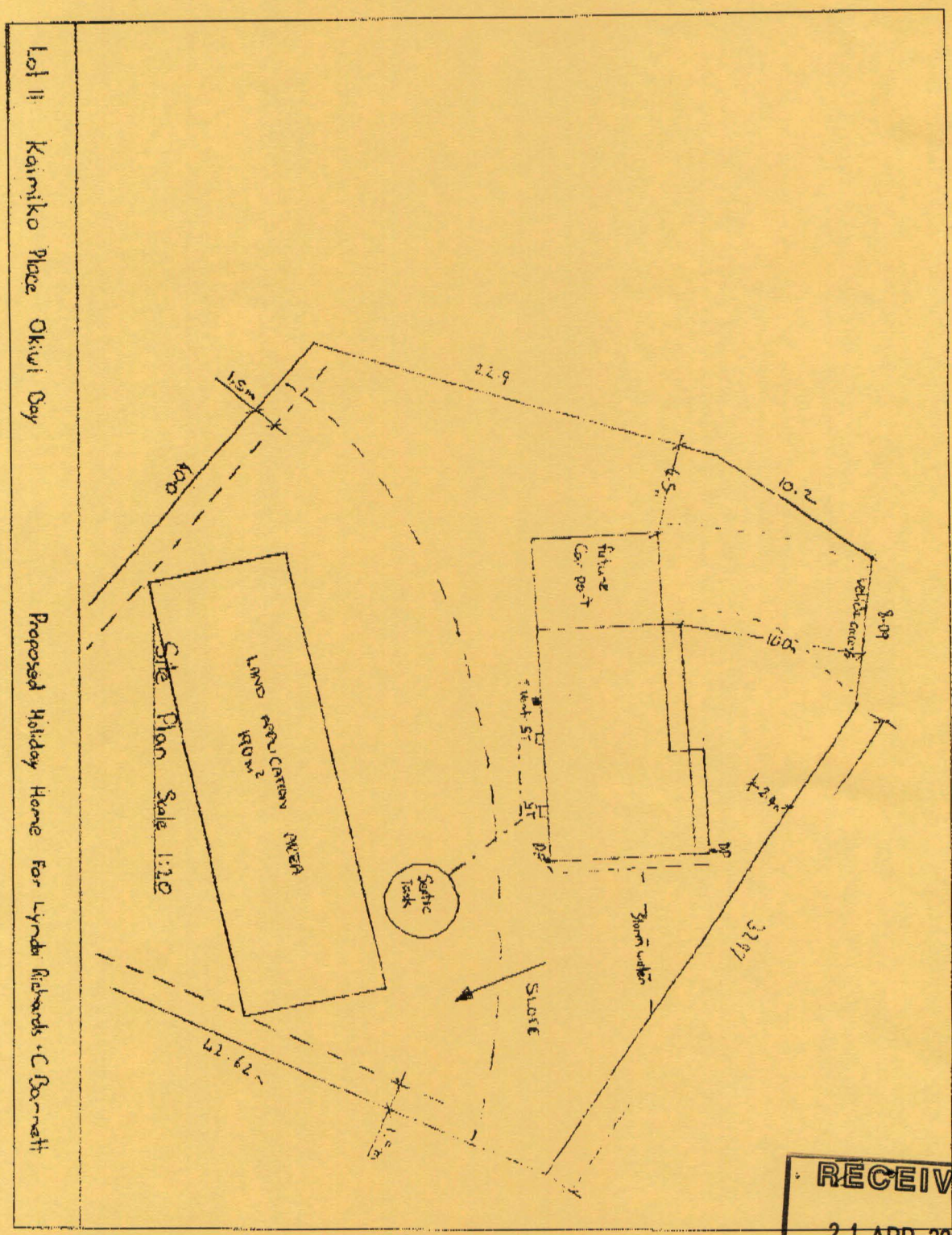
- Amount of use
- Bacteria die off rate and
- Inflow strength

Mardy Audier

Wastewater Treatment Specialist

General Site Plan

for Lynda Richards and Chris Barnett



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