



RECEIVED
13 APR 2007
MARLBOROUGH
DISTRICT COUNCIL

12/4/07

Jenny Keene,

Leinster Trust
General Reports

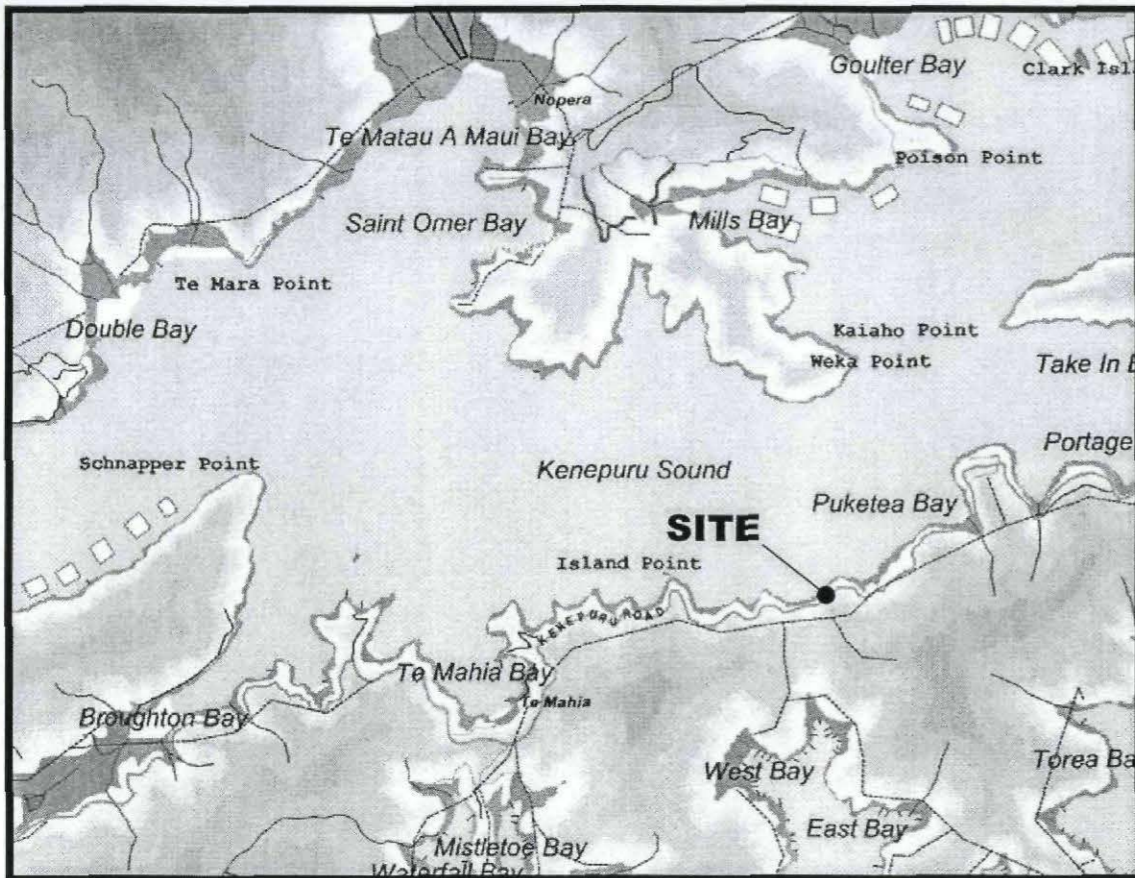
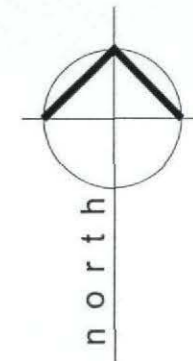
Discharge Consent
as discussed.

Regards
Jan Dimmendaal

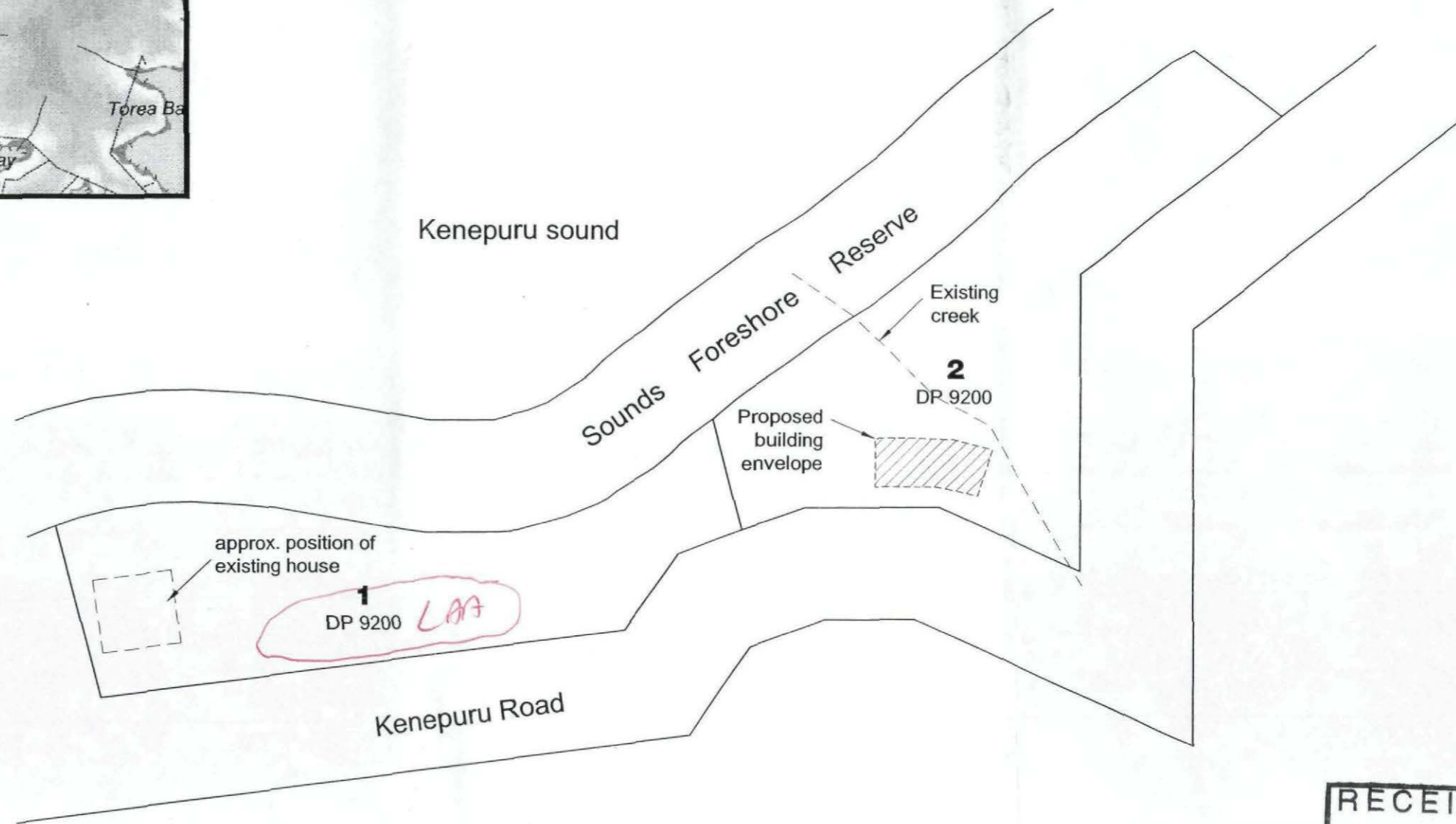
SmartAlliances Ltd T: 03 579 6211
PO Box 546 F: 03 579 6233
Blenheim, 7240 E: info@smartalliances.co.nz

21/04/07 10:05 AM
MARLBOROUGH DISTRICT COUNCIL

Geotech.rpt



LOCALITY PLAN
NTS



1 SITE PLAN
Scale 1:1000

RECEIVED
13 APR 2007
MARLBOROUGH
DISTRICT COUNCIL

SMART ASSOCIATES Ltd.
CONSULTING ENGINEERS
31 George Street Tel: ++64 3 577 7487
P.O.Box 57 Fax: ++64 3 577 7485
Blenheim, N.Z. design@smartassociates.co.nz



PROPOSED SITE LAYOUT
KENEPURU ROAD, KENEPURU SOUND
for LEINSTER TRUST
PROJECT No. **P05-1381**

NOTES
Do not scale from this drawing. Only figured dimensions are to be taken from this drawing. The contractor must verify all dimensions on site before commencing any ordering of materials, work or shop drawings. The contractor must report any discrepancies to the Engineer before commencing work. If this drawing exceeds the quantities taken in any way, the Engineer is to be informed before the work is started. This drawing is Copyright and must not be reproduced without the consent of Smart Associates Ltd. The Engineer is to be given at least 2 weeks notice of the beginning of construction works, and at least 48 hours notice of critical items (eg concrete pours, prelining etc). The Engineer reserves the right to alter the design in light of site circumstances including previously unforeseen design issues.

| | | | |
|---------------------------|------------|------------------------|---------------|
| SITE LOCATION PLAN | | DRAWING No. 001 | |
| DRAWN mp | CHECKED jd | SCALE (A3) As Shown | DATE 22-06-05 |
| COMPUTER FILE: drawings\ | | | REVISION / |

PO Box 57

Blenheim, New Zealand

Tel +64 (3) 577 7487

Fax +64 (3) 577 7485

Email design@smartassociates.co.nz

www.smartassociates.co.nz

4 April 2007

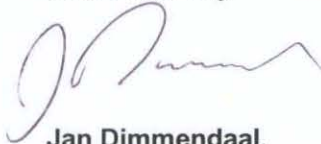
Jenny Keene
Resource Management Officer
Marlborough District Council
PO Box 443
Blenheim

Dear Jenny

Professional Opinion: U070324 – Leinster Trust
2379 Kenepuru Road, Kenepuru
Our File No: P05-1381

Please find attached a Professional Opinion in relation to the proposed onsite wastewater system for the property.

Yours sincerely



Jan Dimmendaal,
Senior Engineer, Smart Associates



Date 4 April 2007

Email design@smartassociates.co.nz

www.smartassociates.co.nz

Opinion As To Land Stability

Description: Lot 1 DP 9200, BC 051553 and U070324

For: Leinster Trust

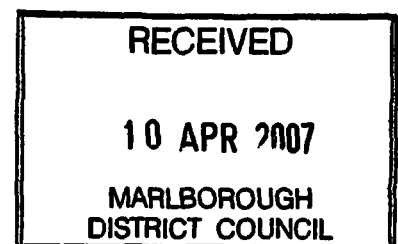
I, **Jan Dimmendaal** of Smart Associates Ltd, PO Box 57, Blenheim,

hereby confirm that:

1. I am experienced in the field of soils engineering and more particularly land and foundation stability and am formally recognised by the Marlborough District Council. I am familiar with and understand the purpose of the Marlborough District Council's geotechnical reporting standards. This professional opinion is furnished to the Marlborough District Council alone, on the express condition that it will not be communicated to or be relied upon by any other person. It is based on conditions presently found on site and is consistent with standards currently being applied.
2. I have carried out site investigations and the results are described in the site investigation report dated 23 May 2006 that has been submitted with the Resource Consent Application. The following professional opinion relates to the land application of treated effluent and is based on the assumption that the data obtained from the above referred to site investigation and that from investigations carried out at proximal locations within the property. In my professional opinion, it is reasonable for Council to assume that the data referred to above is representative of the whole area under consideration.
3. In my professional opinion, not to be construed as a guarantee, and having regard to the specifics of the site which I have had investigated to the extent that acceptable engineering practices require, giving due regard to acceptable engineering principles and practices for land and foundation stability, then the area shown on the plans is suitable for effluent land application, providing that the dripper irrigation system is installed in accordance with the design described in the Engineering Report referred to above and the following is adhered to:
 - a) the land application area is to be confined to the area shown on the drawings unless further Engineering and Geotechnical investigations are carried out
4. This professional opinion shall remain current for a maximum of two years.



Jan Dimmendaal, Senior Engineer, Smart Associates
BE (Hons), CP Eng, MIPENZ



PO Box 57

Blenheim, New Zealand

Tel +64 (3) 577 7487

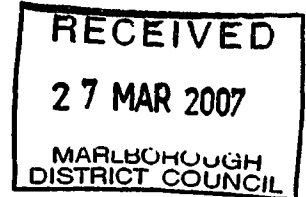
Fax +64 (3) 577 7485

Email design@smartassociates.co.nz

www.smartassociates.co.nz

27 March 2007

Administration
Resource Management
Marlborough District Council
PO Box 443
Blenheim



Dear Sir/Madam


**Application for Discharge Consent
Charles Powell, Kenepuru Road
Our Ref P05-1381**

Please find attached a Resource Consent Application and accompanying Wastewater Report relating to a proposed wastewater system up grade at Lot 1 DP 9200, 2379 Kenepuru Road Kenepuru. The associated Building Consent number is BC051553.

I confirm that an adequate stable area suitable for the land application of wastewater is available to service the dwelling on the property.

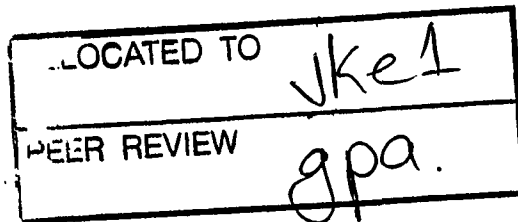
Please do not hesitate to contact me should you require any further information.

Yours sincerely



Jan Dimmendaal
Chartered Engineer

c/c Charles Powell



PO Box 57

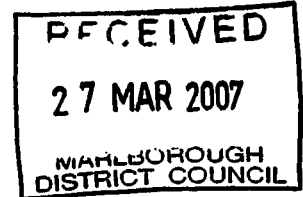
Blenheim, New Zealand

Tel +64 (3) 577 7487

Fax +64 (3) 577 7485

Email design@smartassociates.co.nz

www.smartassociates.co.nz



Engineering Report

Proposed Wastewater System

**2379 Kenepuru Road
Kenepuru**

for

Leinster Trust (Charles Powell)

Jan Dimmendaal
Chartered Engineer
Smart Associates Ltd
23 May 2006

Project P05-1381

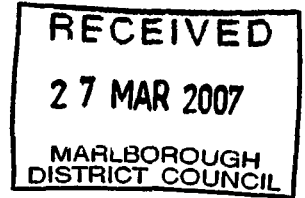


Table of Contents

1. ***Introduction***

2. ***Design - Wastewater Treatment and Disposal***

3. ***Assessment of Environmental Effects***

4. ***Recommendation***

5. ***Limitations***

6. ***References***

Appendices

- A Site Plan
- B Wastewater Design Sheets
- C Biolytix System Specification
- D Site Photo

1. Introduction

- 1.1 Leinster Trust is proposing to install a new wastewater treatment and disposal system to replace an existing septic tank and disposal system that no longer meets Marlborough District Council requirements. The proposed new system will service an existing dwelling that has recently been altered to provide four bedrooms (previously two bedrooms).
- 1.2 The property is largely covered in regenerating native bush with a dominance of Mahoe. Ground cover is sparse within the proposed effluent disposal area. An existing access track leads from the dwelling to the foreshore.
- 1.3 The property legal description is Lot 1 DP 9200.

2. Design - Wastewater Treatment and Disposal

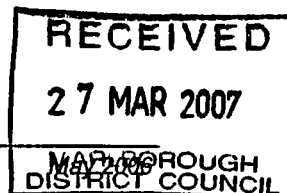
- 2.1 The site investigation identified that a suitable wastewater disposal area exists on proximal slopes to the south of the dwelling. The proposed disposal area is constrained by the southern boundary (Kenepuru Road) and the foreshore access track. Based on the soil assessment carried out, an average drainage category of 4 has been adopted.
- 2.2 Three test pits were dug at the site in the proposed effluent disposal area and their locations are shown on the site plan. The representative soil properties are:

W 1

| (m) | Horizon or Layer and boundary | Genesis | Description | | | | | | | Drainage Category |
|------|-------------------------------|-----------|-------------------|-------------------|-------------------|-------------|-------------|-----------|--------------------|-------------------|
| | | | Colour | Field Texture | % + 2mm Fragments | Compactness | Consistency | Structure | Moisture condition | |
| 0.05 | 1 | Colluvial | Dark brown | Humus | 20% coarse gravel | Very Loose | V.Soft | Strong | Dry | 1 |
| 0.25 | 2 | Colluvial | Pale brown | Gravelly loam | 20% fine gravel | Very Loose | Soft | Moderate | Dry | 2 |
| 0.45 | 3 | Colluvial | Pale brown | Clay loam | none | Med. Dense | Firm | Weak | Dry | 4 |
| 0.50 | 4 | Residual | Pale creamy brown | Weathered bedrock | none | Dense | Firm | Weak | Dry | 6 |

W 2

| (m) | Horizon or Layer and boundary | Genesis | Description | | | | | | | Drainage Category |
|------|-------------------------------|-----------|-------------------|-------------------|-------------------|-------------|-------------|-----------|--------------------|-------------------|
| | | | Colour | Field Texture | % + 2mm Fragments | Compactness | Consistency | Structure | Moisture condition | |
| 0.10 | 1 | Colluvial | Dark brown | Humus | 20% coarse gravel | Very Loose | V.Soft | Strong | Dry | 1 |
| 0.15 | 2 | Colluvial | Pale brown | Gravelly loam | 20% fine gravel | Very Loose | Soft | Moderate | Dry | 2 |
| 0.30 | 3 | Colluvial | Pale brown | Clay loam | none | Med. Dense | Firm | Weak | Dry | 4 |
| 0.35 | 4 | Residual | Pale creamy brown | Weathered bedrock | none | Dense | Firm | Weak | Dry | 6 |



W 3

| (m) | Horizon or Layer and boundary | Genesis | Description | | | | | | | Drainage Category |
|--------|-------------------------------|-----------|-------------|---------------|-------------------|-------------|-------------|-----------|--------------------|-------------------|
| | | | Colour | Field Texture | % + 2mm Fragments | Compactness | Consistency | Structure | Moisture condition | |
| 0.10 | 1 | Colluvial | Dark brown | Humus | 20% coarse gravel | Very Loose | V.Soft | Strong | Dry | 1 |
| 0.50 | 2 | Colluvial | Pale brown | Gravelly loam | 40% coarse gravel | Very Loose | Soft | Moderate | Dry | 2 |
| 0.60 + | 3 | Colluvial | Pale brown | Clay loam | none | Med. Dense | Firm | Weak | Dry | 4 |

- 2.3 The proposed land application is on northerly aspect slopes of 30° to 40°. The landform element is linear planar.
- 2.4 At the closest point the proposed land application area is less than 30m from the foreshore. An assessment of effects on the environment is presented in section 3 below.
- 2.5 Secondary treatment and drip irrigation effluent disposal are considered the only suitable options for this property when the average slope and soil drainage characteristics are taken into account.
- 2.6 A secondary treatment system involves aerobic biological processing and settling or filtering of effluent received from a primary unit. The following system is considered suitable:

Biolytix BF6 2500 PAT treatment system coupled with a drip irrigation system. System performance details are:

BOD after 5 days (average) < 8.8 g/m³
 Suspended solids (average) < 5.4 g/m³

A Biolytix system specification is attached (Appendix C).

Based on information provided by the system supplier the Biolytix system is suitable for a holiday home situation where the house is unoccupied for extended periods and as a consequence there is no flow of effluent going into the system.

The design irrigation rate for Category 4 soil is 25mm/week (i.e. 3.6mm/day).

- 2.7 The recommended location of the proposed irrigation disposal field is indicated on the site plan (Appendix A).
- 2.8 The length of dripline required is 420m (refer wastewater design sheets Appendix B). The irrigation system design requires 1.6 litre/hr emitters with lines laid at 1.0m spacing and following contours (when possible), at 100mm below ground level. The installation of the irrigation system is to be in accordance with the product installer guide supplied by the manufacturer.
- 2.9 The Marlborough District Council Guidelines for new on-site wastewater management systems, requires that a system to service a four bedroom dwelling be designed for a permanent occupancy of 8 people. A minimum wastewater storage capacity of 4500 litres is required.
- 2.10 The wastewater flow design allowance of 180 litres/person/day has been used in the design of the system. This allowance is in accordance with Appendix 4.2D of AS/NZS 1547:2000 and is based on a stream supply water source for the dwelling.

- 2.11 Prior to the proposed system becoming operational the system designer must inspect and certify that the system has been installed according to the design. This certification must then be forwarded to Council.
- 2.12 The Marlborough District Council requires that the owner of any advanced wastewater treatment system enters into and retains a maintenance contract with the supplier of the system, or a recognised maintenance contractor, for maintenance to be carried out at yearly intervals. Records of the maintenance should be forwarded to the Council as soon as practicable following the completion of the inspection or, in the case of remedial works being required, on completion of those remedial works.
- 2.13 Vehicle access to the system for maintenance will be available via the house access.

3. Assessment of Environmental Effects: Activity - Install Effluent Disposal Field Within 30 Metres of the Foreshore

3.1 Effects

It is proposed to install a Biolytix BF6 2500 PAT secondary treatment system and drip irrigation effluent disposal system with the effluent disposal system being less than 30 metres from the foreshore.

A possible environmental effect resulting from this proposed activity is the contamination of the foreshore through the vertical movement of secondary-treated effluent that is not treated or consumed in the soil.

The proposed irrigation system will be located amongst established native bush.

3.2 Mitigation Measures

Treatment

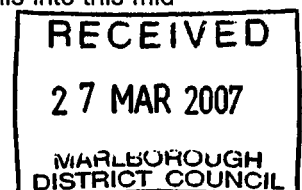
The treatment system proposed is a Biolytix BF6 2500 PAT secondary treatment system, that produces a high quality effluent (refer 2.6 above), and therefore has a minimum impact on the environment.

Vegetation on the property will assist with the breakdown of the effluent entering the soil.

Coliform numbers, the indicators used to measure the various pathogens present in sewage effluent, are initially very low in the secondary-treated effluent. These will not be a concern for it is well established that bacterial, (and viral etc), numbers are reduced exponentially with passage of effluent, whether primary-treated or secondary-treated, through mid-range textured soils.

This is evidenced by Note 1 in Table 4.2B1 of NZS 1547:2000 where it is noted that a "path length of 0.3 – 0.4 metres would be sufficient to reduce (bacterial) numbers to insignificant levels in normal soils i.e. soils that are of a mid-range texture, not too sandy or too clayey, and not saturated all the time".

We are of the opinion that the soil on the property (refer 2.2 above) falls into this mid-range soil category.



4. Recommendation

The Biolytix BF6 2500 PAT Secondary Treatment System combined with drip irrigation effluent disposal is recommended for this site. Installation is to be in accordance with requirements and recommendations of NZS1547:2000.

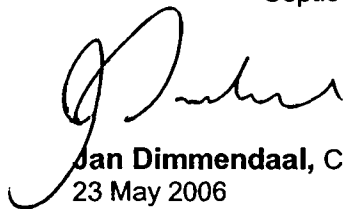
5. Limitations

This report is valid for two years from the date of issue and covers the design of a wastewater treatment and disposal system for Leinster Trust at 2379 Kenepuru Road, Kenepuru Sound. Any other areas are outside the scope of this report.

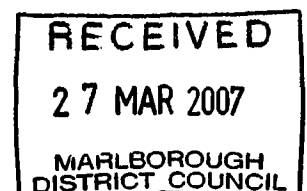
The reliance by other parties on the information or opinions in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

6. References

1. NZS 1547:2000 On-site Domestic Wastewater Management
2. NZS 1546.3:1998 On-site Domestic wastewater Treatment Units (Part1: Septic Tanks).



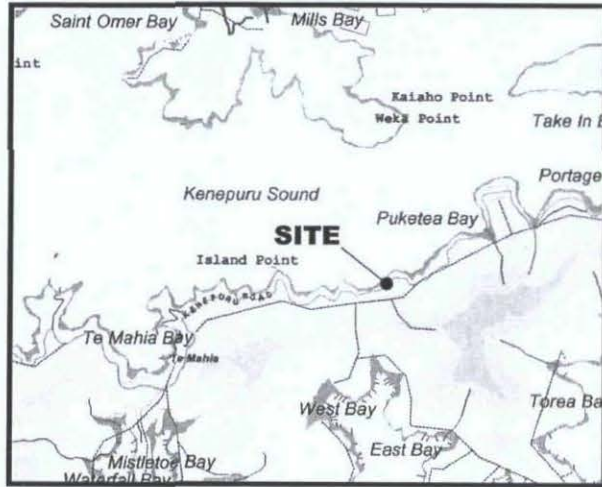
Jan Dimmendaal, Chartered Engineer
23 May 2006



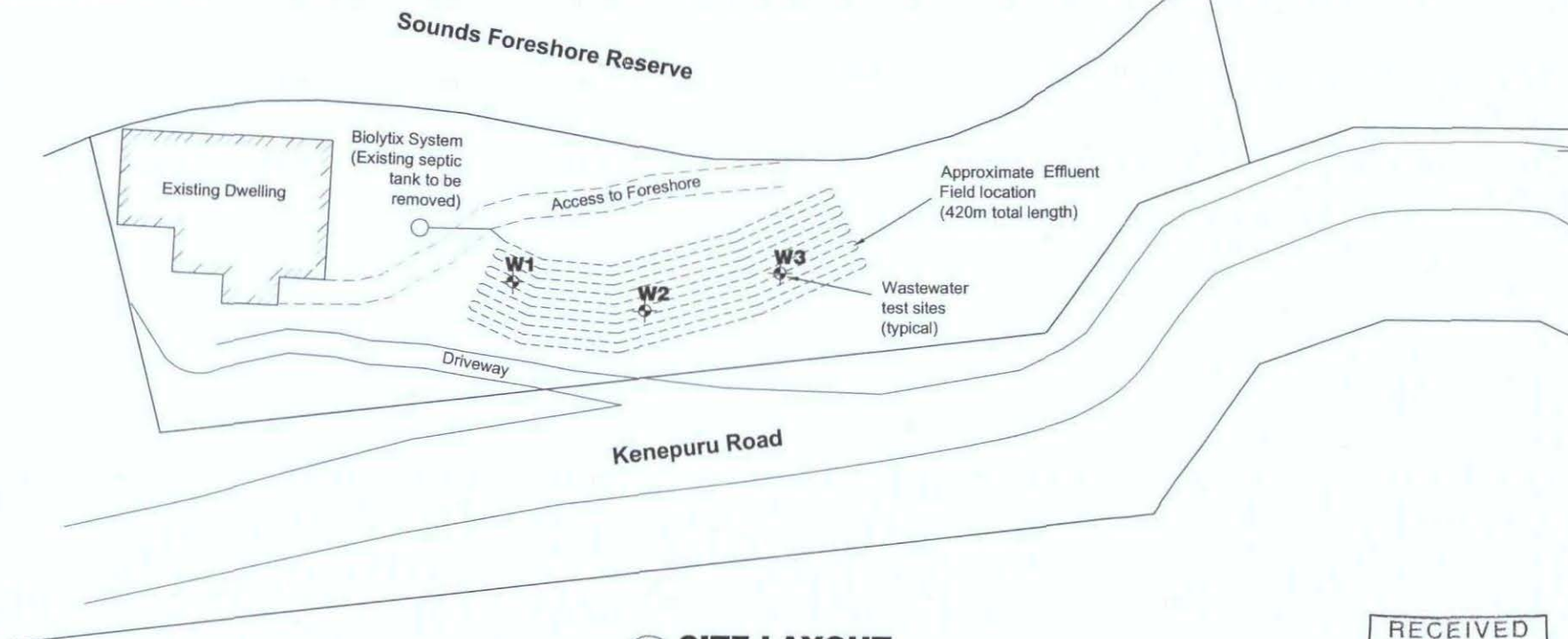
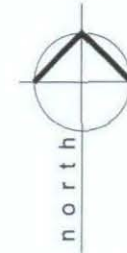
Appendix A

Locality and Site Plan

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL



LOCALITY PLAN
NTS



1 **SITE LAYOUT**
Scale 1:500

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL

| | | | |
|--------------------------|------------|-----------------------------|-------------|
| SITE/ LOCALITY PLAN | | DRAWING No. APP A | |
| DRAWN jd | CHECKED mp | SCALE (A3) As Shown | DATE May 06 |
| COMPUTER FILE: COMP_FILE | | | REVISION / |

Appendix B

Wastewater Design Sheets

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL



ASSOCIATES Ltd.
 ENGINEERS & ARCHITECTS
 31 George Street Tel: (03) 577 7487
 P.O.Box 57 Fax: (03) 577 7485
 Blenheim, N.Z. design@smartassociates.co.nz



WASTEWATER SYSTEM DESIGN SHEET
 To AS/NZS 1547:2000

| | |
|---|---|
| Charles Powell | File No: P05-1381 |
| Intended water Supply: <i>Public Supply Rain-water (roof collection) Bore/Well/Dam</i> | |
| Local experience with existing on-site systems: | |
| Septic Tank or similar (Primary treatment): <i>OK when installed properly with a correctly sized level drainage area and maintained.</i> | Secondary treatment: <i>Produce high quality effluent suitable for irrigation.</i> |
| Recommendation for this site: <i>Secondary treatment system utilising irrigation system effluent disposal (Biolytix System)</i> | |
| DRAINAGE CONTROLS: Need for surface water collector / cut-off drains? | |
| AVAILABILITY OR RESERVE / SETBACK AREAS | |
| Reserve area available for extensions, % of design area: | <i>100%</i> |
| Setback distance? (between development and disposal system): | <i>Min. as required by Resource Management Act</i> |
| Ksat, (m/day): | ESTIMATED SOIL CATEGORY: <i>Category 4 - Imperfectly drained loam</i> |
| Design | |
| RECOMMENDED D.I.R. | <i>25</i> mm/week |
| (NOTE: Where DIR is 10mm/week or less, ETA/ETS trenches to Fig 4.5A7 NZS1547:2000 should be specified to enable the utilisation of such soils) | |
| 8 Permanent People At 180L/person/day: | <i>1440</i> L/day from Appendix 4.2D AS/NZS 1547:2000 |
| DESIGN WEEKLY FLOW: | <i>10080</i> L/week |
| Septic tank size (min): | <i>4500</i> (Table 4.3A1) |
| AREA REQUIRED: | <i>403.2</i> m ² |
| LENGTH REQUIRED: | <i>420.0</i> m. (Refer Irrigation System Calculation sheet) |
| RESERVE AREA REQUIRED: | <i>100%</i> of specified drainage area |
| RECOMMENDATION : | |
| <i>Biolytix Secondary treatment with dripper line irrigation. Min 4500 litre capacity treatment and irrigation lines to be a minimum total length of 420m using 1.6 l/hr emitters Lines to be laid at 1.0m spacing to follow contours (when possible), at 100mm below ground level . Installation of the irrigation system to be in accordance with the product Installer Guide. Detailed design of the irrigation system is to be responsibility of the installer.</i> | |

RECEIVED
27 MAR 2007
 MARLBOROUGH
 DISTRICT COUNCIL

Irrigation System Calculation

Project Title: Charles Powell

Date: Monday, 22 May 2006

File Ref: P05-1381

Operator:

| | |
|--|---------|
| Acceptable daily loading rate (mm/day) | 3.6 |
| Daily influent (l/day) | 1440 |
| Emitter type | Raam 17 |
| Emitter flow rate (l/h) | 1.6 |
| Emitter Spacing (m) | 1 |
| Dripline Spacing (m) | 1 |
| Distance from Treatment system to Irrigation Field (m) | 5 |
| | |
| Field Size (m ²) | 400 |
| Field length assuming square area | 20 |
| Number of lines | 21 |
| Total Dripline Length (m) | 420 |
| | |
| Total flow Rate Required (l/h) | 672 |

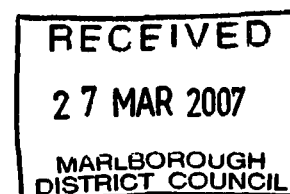
Pump Duty

| | |
|------------|-----|
| Flow (l/h) | 672 |
| Head (m) | 18 |

| Head-Loss Table | | |
|-----------------|---------------|---|
| Item | Head loss (m) | Comments |
| Emitter | 5 | Minimum pressure required |
| Lateral | 0 | Head loss insignificant |
| Submain | 1 | Using Netafim Raam 17 as a submain |
| Main | 0.06 | Using 25mm LDPE x main length |
| Water meter | 0 | For a 15mm Multijet Turbine Water Meter |
| Filter | 3 | For a Semi blocked filter |
| Tank Depth | 2 | |
| Elevation | 5 | |
| Sub Total | 16.06 | |
| Total | 18 | including 10% |

NOTE:

This design is indicative only and detailed design is the responsibility of the installer.



Appendix C

Biolytix System Specification

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL

6 Fairmont Place
Hornby
Christchurch
9428901
021 1346438
24 October 2005

Mr Jan Dimmendaal
Smart Associates Ltd
P.O.Box 57
Blenheim

Dear Jan

BIOLYTIX WASTE TREATMENT SYSTEM

Our system is the result of 11 years research in a joint venture between Australian and South African Waste Water Engineers. This system produces a high grade of secondary treated effluent, which is then suitable for sub-surface irrigation or for use in conjunction with existing drains as a pre-treatment. The workings are simple in principle and it has a number of unique features which are listed on attached pamphlet. It will be seen that our system is a single tank of only 2500 litres, yet still achieves a capacity treat 1600 litres of waste a day. It has a peak capacity of 2150 for 5 days running, yet is also able to be left 9-12 months without use. Our tank boasts many other unique features, it is silent, odourless, economical to run (\$12-20/year), has telemetry back up, and never needs to be pumped out. With our service fee comes a twenty year guarantee on a componentry.

Our product complies with all the New Zealand regulations regarding secondary treatment filters both 1546:3, 1547 and also complies to electrical and plumbing standard as required by Australian and New Zealand standards. It will be seen on the figures quoted in some of the attached documentation that we would easily comply to the 20/20 standard. The tank is unique in that it achieves all three treatment stages in one chamber, and therefore installation is straight-forward, as excavation for only one tank per property is required.

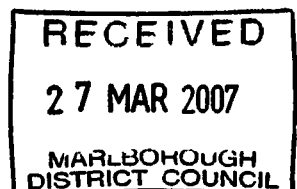
Enclosed you will find a copy of our SAI Global audit which is the body that governs Australian / New Zealand standards. We were winners of the global Eco-Tech Award during June this year in recognition of the achievement of this system both in cost competitiveness and the ability of our machine. I believe no other machine on the New Zealand market has this distinction.

Should you require any information regarding design layout, or anything further, please do not hesitate to contact me.

I am enclosing a few additional pamphlets for your convenience.

Kind regards


Antony Willemse





SAI Global

Assurance Services

Head Office
286 Sussex Street
Sydney NSW 2000 Australia
Postal Address
GPO Box 5420
Sydney NSW 2001 Australia
Phone (61-2) 8206 6060
Fax (61-2) 8206 6061
Email assurance@sai-global.com
training@sai-global.com
Web www.sai-global.com

Report on Testing of AWTS Units

Biolytix Model BF 6

Several waste water treatment systems designed by Biolytix were tested at the Maleny Sewerage Treatment Plant (STP), under the provisions of the NSW Health Department Aerated Wastewater Treatment Systems (AWTS) Accreditation Guideline (Part 3, Clause 95B Local Government (Approvals) Regulation, 1993) and AS/NZS 1546.3:2001. The guideline was issued in September 1998 and is read in conjunction with the explanatory memo of 3 September 1998 and the Interpretation Document of 2 December 1998.

The performance evaluation was conducted at the Maleny STP using sewage diverted from the STP inflow.

The units under test were commissioned on 27th December 2002. Testing in accordance with the guideline was conducted in the following weeks:

4th March to 7th March 2003,
29th April to 2nd May 2003; and
8th July to 11th July 2003

The first test period was delayed due to periods of heavy rain, which diluted the influent to an unacceptable level. The testing period was delayed, but subsequent test periods were at the correct interval from the first test period (If first test period is regarded as week 8, second test period in week 16 and third test period in week 26).

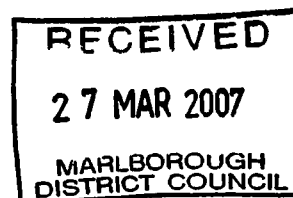
As the units under test are of non-conventional design, three test periods were required.

Following are the test results for the three test periods (consolidated):



A division of SAI Global Limited
ABN 67 050 611 642

Offices throughout Australia and in New Zealand, North America, Indonesia and India



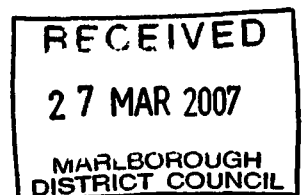
Influent Characteristics:

| | | DO mg/L | Temp c | BOD mg/L | SS mg/L | TN | TP |
|-----------------|------------|------------|-----------|-------------|------------|-------|------|
| 1 st | 4/03/2003 | 1.35 | 23.3 | 86 | 126 | 11.1 | 2.4 |
| Test | 5/03/2003 | 1.4 | 23.2 | 66 | 107 | 19 | 2.3 |
| Period | 6/03/2003 | 3.2 | 22.9 | 95 | 135 | 18 | 1.8 |
| | 7/03/2003 | 1.7 | 22.5 | 147 | 135 | 20.1 | 2.8 |
| | 8/03/2003 | 2.36 | 21.9 | 198 | 117 | 28.5 | 4.6 |
| 2 nd | 29/04/2003 | 1.4 | 21.4 | 138 | 187 | 43.4 | 4.1 |
| Test | 30/04/2003 | 1 | 21 | >350 | 335 | 58.6 | 6.7 |
| Period | 1/05/2003 | 2.9 | 20.2 | 328 | 398 | 50 | 7.9 |
| | 2/05/2003 | 1.5 | 21.5 | 118 | 167 | 35.3 | 4.9 |
| 3 rd | 3/05/2003 | 1.5 | 20.6 | 230 | 165 | 38.5 | 6.6 |
| Test | 8/07/2003 | 0 | 15.9 | 230 | 149 | 62.8 | 9.3 |
| Period | 9/07/2003 | 2.16 | 17.3 | 193 | 151 | 54.1 | 8.3 |
| | 10/07/2003 | 1.35 | 18.3 | 112 | 124 | 50.4 | 8.3 |
| | 11/07/2003 | 1.29 | 17.9 | 245 | 204 | 56.7 | 10 |
| | Average | 1.65 | 20.56 | 168.15 | 178.57 | 39.04 | 5.71 |
| | Std Dev. | 0.80 | 2.35 | 76.47 | 84.92 | 17.24 | 2.80 |
| | Max | 3.2 | 23.3 | 328 | 398 | 62.8 | 10 |
| | Min | 0 | 15.9 | 66 | 107 | 11.1 | 1.8 |

A magnetic flow meter on the influent lines was used to keep a record of the daily hydraulic loading on the units on test. Over the test period there was adequate loading to ensure that the units tested were loaded to the levels required by the standard and the guideline. These records are included in *BF6_AS1546 trial report.pdf* attachment to this report.

The BF6 Model tested met the effluent specifications. The following are the results obtained on the BF6.

Please note that a 40 watt UV disinfection unit was initially used on the effluent from this model. However the effluent failed the Thermotolerant Coliform specification in the first two test periods. The UV unit was modified by installing a 75 watt lamp and effluent sampled during the third test period met the Thermotolerant Coliform requirements of the standard and the NSW Health Department guideline. At this stage certification is recommended on condition that this model can only be used in conjunction with appropriate sub-surface disposal. Testing is continuing with the current UV disinfection configuration in order to establish whether this model can be used for surface irrigation.



Effluent Characteristics Model BF 6:

| Characteristic | Results | Maximum | Average | Comments |
|------------------------|-----------------------------------|---------------------|------------|----------|
| BOD ₅ | 100% < 20 mg/L 90% < 11.6 mg/L | 14 mg/L | 8.7 mg/L | Pass |
| Suspended Solids | All < 30mg/L 90% < 8.9 mg/L | 14 mg/L | 5.4 mg/L | Pass |
| Faecal Coliforms | Not Applicable No Disinfection | | | N/A |
| Dissolved Oxygen | 100 % > 2.0 mg/L * | Minimum 2.2 mg/L | 4.26 mg /L | Pass |
| Free Residual Chlorine | No Disinfection | | | N/A |

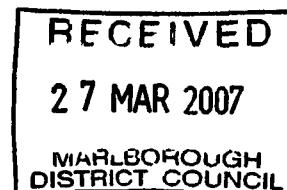
- * One reading at 7.15 am 8/7/03 of 0 was discarded from the analysis as the other three readings that day were 7.43 am, 5.56; 8.13 am, 5.55; 8.40 am, 6.43. Due to the nature of the aeration process used in the Biolytix BF6, it is impossible for such a dramatic change from zero dissolved oxygen to 5.6 mg/L in less than 30 minutes to occur. The oxygen level of 5 to 6 mg/L was confirmed in subsequent readings

As can be seen from the above tables the BF6 unit produces an effluent that meets the requirements of the Guideline and AS/NZS 1546.3.

Attached is the following supporting documentation:

1. *BF6_AS1546-3_trial_report.pdf*, this report includes the results and report obtained from Caboolture Water, who took the samples and analysed the samples in their NATA registered laboratory.
2. *BF6_Drawings.pdf* - Drawings of the BF6 model.
3. *BF6_Specifications.pdf*
4. *R032_Operational_Principles_BF6_R-0.pdf*
5. *SOP037_R-0_BF6G_Construction_Manual.pdf*
6. *SOP024_R-0_BF6_Construction_Manual.pdf*
7. *R030_R-1_BF6_Specifications.pdf*
8. *R040_R-0_BF6G_Specifications.pdf*
9. *SOP026_R-1_BF_Installation_Manual.pdf*
10. *SOP028_R-1_BF_Service_Manual.pdf*
11. *BF_Operators_Manual.pdf*

SAI-Global's Audit Reports for Standards Mark certification will be forwarded separately if requested.



This model (BF6) meets the requirements of AS/NZS 1546.3:2001 – On-site domestic-wastewater treatment units Part 3: Aerated wastewater treatment systems, and a recommendation will be made to SAI-Global's certification authority that a StandardsMark Product Certification licence be issued for the BF6.

- 4 -

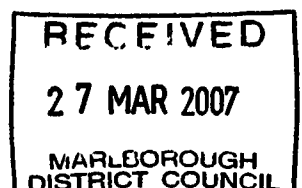
SAI Global is accredited as a testing agency by Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

Please contact me if you need any further explanation or information.

Yours faithfully

Garry Kimble
Project Coordinator
Health and Safety Products

(07/08/03)



BF6 Filter Effluent Quality

Introduction

This technical note provides a summary of final effluent performance data for the Biolytix Filter, BF6 Model:

The Biolytix Filter was tested for compliance to Australian Standard AS1546.3, On-site Wastewater Treatment Units - Aerated Wastewater Treatment Systems March to July 2003. A second compliance trial was completed from July 2003 to January 2004 to accredit the BF6 filter for use with an ultraviolet disinfection unit and an Insinkerator (garbage grinder unit). SAI Global Assurance Services (accredited JAS-ANZ testing agency) was the body overseeing and assessing the trial. Caboolture Water, a NATA registered laboratory, took and analysed samples from the trial BF6 filter.

Results from the Australian Standards testing is summarized in this technical note. Australian Standards compliance monitoring did not include nutrient removal monitoring. Biolytix Technologies sampled and analysed nutrient levels in the final effluent during the compliance trials and this data is also included.

Effluent Quality

Table 1 summarises performance monitoring test results (March-July 2003) and Table 2 performance monitoring (July 2003 to January 2004) for BF6 operating with UV disinfection and Insinkerator.

Table 1 BF6 Filter Effluent Characteristics

| Characteristic | Results | Maximum | Average |
|------------------|-----------------------------------|---------------------|-----------|
| BOD ₅ | 100% < 20 mg/L 90% < 11.6 mg/L | 14 mg/L | 8.8 mg/L |
| Suspended solids | All < 30 mg/L 90% < 8.9 mg/L | 14 mg/L | 5.4 mg/L |
| Dissolved Oxygen | 100% > 2.0 mg/L | Minimum 2.2 mg/L | 4.26 mg/L |

Source: SIA Global Assurance Services, Report on Testing of AWTS Unit, Biolytix Model BF6, 7 August 2003.

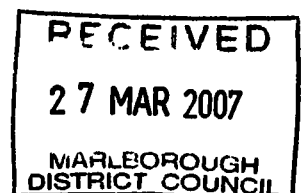
Table 2 BF6 Filter Effluent Characteristics – UV Disinfection & Insinkerator

| Characteristic | Results | Maximum | Average |
|--------------------------|-----------------------------------|---------------------|-----------|
| BOD ₅ | 100% < 25 mg/L 90% < 14.4 mg/L | 25 mg/L | 8.9 mg/L |
| Suspended solids | All ≤ 30 mg/L 90% < 8.9 mg/L | 30 mg/L | 5.6 mg/L |
| Thermotolerant Coliforms | 90% < 2.9 | 17 | 1.7 |
| Dissolved Oxygen | 100% > 1.6 mg/L | Minimum 1.6 mg/L | 4.26 mg/L |

Notes:

1. Filter operated with 75 watt UV lamp at flow of 12L/minute.
2. Insinkerator loaded at 2.4kg/day.
3. Test results from Australian Standards performance monitoring July 2003 to January 2004.

Nutrient levels in the final effluent were typically 8mg/l phosphorus and 28mg/l nitrogen during the test periods.



Appendix D

Site Photo

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL

Charles Powell
Kenepuru Road
P05-1381



Photo shows typical vegetation within the proposed effluent disposal area.

RECEIVED
27 MAR 2007
MARLBOROUGH
DISTRICT COUNCIL