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GEOTECHNICAL AND CIVIL ENGINEERING

SITE AND SOIL EVALUATION REPORT

RAI VALLEY TAVERN,

RAI VALLEY

Prepared for:

Rai Valley Tavern Ltd

Prepared by:

Swanney Geotechnical and Civil Engineering

July 2008

1. INTRODUCTION

The Rai Valley Taverns' resource consent to discharge to land is due for renewal, being ten years since last renewed. Since the last consent was issued, the Council rules relating to wastewater disposal have been updated, and each consent application for disposal to land now requires a site and soil evaluation report to accompany the application.

Swanney Geotechnical and Civil Engineering have been engaged by Rai Valley Tavern Ltd to prepare the site and soil report for this site. The report has been based on Council information on the currently operating system and a site investigation.

2. BACKGROUND INFORMATION ON EXISTING SYSTEM

The original wastewater disposal system installed to treat the wastewater from the tavern and the proprietors flat was a package system manufactured by Wallace Ltd of Auckland. The system was a small commercial secondary treatment system. After treatment the effluent passes into a distribution chamber, at which stage the greywater is introduced, and then out to the drainage field located in a fenced off area to the south of the tavern. The Council records note that details of the system and effluent disposal field were approved by the Catchment Board Engineer. No details of the disposal field are held in the Council resource of building files. This system was operated as an aerated system until approximately 1989, at which stage a roof was constructed above the tanks and distribution chamber, the aeration pumps were stopped and the system was run simply as a large multi-tank anaerobic system ie similar to a dual septic tank.

Resource consents for the system running as an anaerobic system were granted in 1993 and 1998, with one of the consent conditions being that monitoring of water wells in the vicinity of the site be undertaken by the MDC.

2. SITE DESCRIPTION

The Rai Valley Tavern is located on the west side of SH 6 near the centre of the small community of Rai Valley. The wastewater disposal system for the tavern is located on the south side of the tavern buildings and proprietor flat with the tanks fenced off separately within a larger fenced off area containing the disposal field. The area has residential properties on the east of the disposal field, the tavern buildings on then north, and flat pasture land on the south and west sides. The site is flat, with no watercourses or surface drainage channels crossing or immediately adjacent to the site. There are no obvious drainage patterns for surface water at the site. The site is exposed to wind and sun, with some sheltering by low trees present adjacent to the proprietors flat and a 1.8m high timber paling fence around the perimeter.

A shallow depression approximately 750mm below natural ground level has been excavated to accommodate the tanks. The lowering of the tanks would have been to enable gravity flow from the tavern and proprietors flat to the system. See Photo 1.

The geology of the site is described in the 1:250,000 Nelson Geological Map (Map 9 of the QMap series) as clay-bound gravels and minor fan deposits. This is consistent with the information in the Councils files and the site investigation findings as noted below.

3. INVESTIGATION

A site investigation was carried out on 2nd and 7th of July 2008. This involved an inspection of the site and surroundings, inspection of the existing tanks and hand augered boreholes across the disposal field.

The main tank is set below the natural ground level in a locally excavated-out depression. The top of the tank is approximately 100mm above the adjacent ground. Surface water which collects within this depression would fall to around the tank and infiltrate down into the tank backfill. The roof of the main tank was in good conditions and would adequately keep out all rainwater. The roof over the distribution chamber has rusted out in places. The integrity of the main tanks was not able to be determined during the inspection due to the system being in operation. Council records note that prior to the 1993 resource consent application the tanks had been leaking and were repaired.

The distribution chamber is a 2m diameter concrete riser with three inflow from the tanks, one inflow for greywater and four outflows to the disposal field. The depth to invert of the outflow pipes was approximately 1.5m below the top lip of the chamber, which in turn was slightly below the surrounding natural ground level. This indicates the tile drainage system to be a minimum of 1.5m depth.

The disposal area is approximately 1450m² in size. A site plan showing the tanks and disposal field is appended.

Three hand-augered boreholes were located in the outside corners of the disposal area with one adjacent to the tank area. Notes in the Council records from the 1993 resource consent note that test holes showed a soil profile to be 10 feet of clay bound gravels above the first water bearing gravels. The details of the system and disposal field are noted as having been approved by the Catchment Board Engineer. These details were not in the Council files. The augering met with limited success, with testing limited to identifying the soils overlying the gravels and the depth to the top of the gravel stratum, as the auger could not penetrate the gravels. The top level of the gravel layer ranged in depth in the boreholes from 280mm bgl to 1250mm bgl. The overlying soils were typically silts with low plasticity and minor fine gravels. Slight mottling of the silts indicate imperfect drainage. Full borelogs of the boreholes are appended.

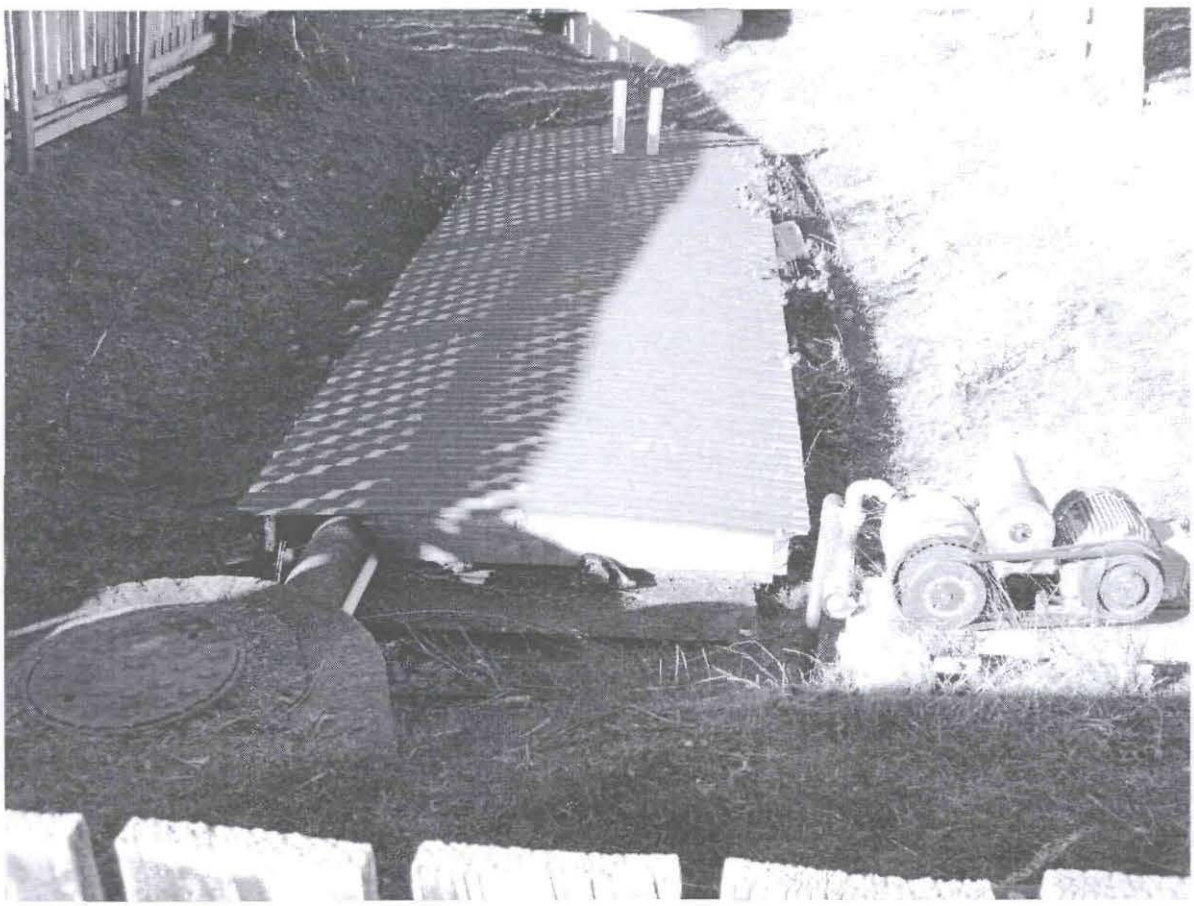

Photo 1 The main tank, with the inflow manhole at the lower LH corner, the disused aeration pump in the lower RH corner and the distribution chamber top centre.

4. ASSESSMENT OF THE EXISTING SYSTEM

The flows to the system have not been assessed as part of this report. The maximum flow of 4.5m³/day as per previous resource consents is assumed to be appropriate. The tank is 7.1m x 1.75m x approx. 1.0 m deep, giving a capacity of ~12m³. At maximum flow, this gives approximately 2.5 days retention. A minimum retention time for septic tanks of 24 hours is recommended. The integrity of the tanks were not assessed during the investigation due to the tanks being full and operational at the time of inspection. An inspection of the tanks should be carried out next time the tanks are cleaned out.

A limited soil profile was viewed during the site investigation due to difficulties penetrating the gravels with the hand-auger. A full soil profile could be obtained by excavating test pits across the site. In the interim, based on information in the council files and the soils encountered within the hand-augered boreholes to maximum depth of 1250mm, the soil category has been conservatively assumed to be Category 5 for assessment of disposal area calculations. The silt soils overlying the clay-bound gravels are considered to be Category 4, as defined in AS/NZS 1547:2000.

Taking the conservative rate for primary treated effluent of 5mm/day from Table 4.2A1 in AS/NZS 1547:2000 for a Category 5 soil, the area required for a maximum flow of 4.5m³/day is 900m². The total disposal field area available is 1450m² (excluding setbacks from boundaries). Details of the extent of the field tile drainage system are is not known, although these would be contained in the original application to the Catchment Board. Enquiries at the Council did not find any staff members that knew the location of this information. It has been presumed that the drainage field covers the fenced off section.

While the Council has carried out monitoring of nearby wells, the water levels of the bores were not taken during sampling, presumably due to the samples being taken from taps at the household as opposed to directly from the well. The groundwater levels in the district were discussed with Peter Davidson of MDC, who noted that there is very little information within Council aside from some drill logs of larger bores.

While our information on the existing system is incomplete, the system does appear to be operating adequately for the flow demands that are being placed on it. The location of the tanks and the depth of the tile drains in the disposal field make the risk of contamination of surface water from this system negligible. There are unknowns relating to the depth to groundwater in this location and the depth at which water is taken in water bores near the site. The condition of monitoring the nearest water bores that the Council imposed on previous resource consents will give the best indication of the adequacy of the system. If the Council requires additional soils information, and the ensuing test pits excavated in the corners of the disposal field site encounter groundwater, standpipes could be installed to allow Council monitoring of groundwater directly adjacent to the site.

5. CONCLUSION

We consider the existing tile drainage system is adequate to spread the current loads imposed on it across the disposal area. The existing system is very unlikely to cause any surface water contamination due to the location of the tanks and the depth of the tile drainage system. With the unknowns regarding the depth to groundwater at the site and the details of abstraction depths for the nearby water bores, the best approach to monitoring the adequacy of the system is continued monitoring of the water from the nearby bores – a condition that the Council has included in the previous two resource consents for this site.

The size of the tanks will give approximately 2.5 days retention, which is above the minimum recommended of 24 hours. It is recommended that the integrity of the tanks be confirmed during the next desludging and that the iron roof over the distribution chamber be repaired.

6. REFERENCES

Institute of Geological and Nuclear Sciences (2000) *1:250,000 Geological Map 9 – Nelson*

Marlborough District Council (2005) *Guidelines for new on-site wastewater management systems* and *Plan Change 7: On-site discharges of Domestic Wastewater*

Standards New Zealand AS/NZS 1547:2000 *On-site domestic wastewater management*

Prepared by
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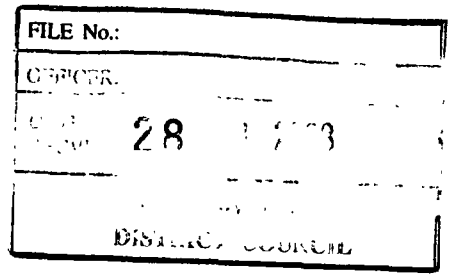
Appended: Site Plan
Borelogs



Swanney

Geotechnical and Civil Engineering

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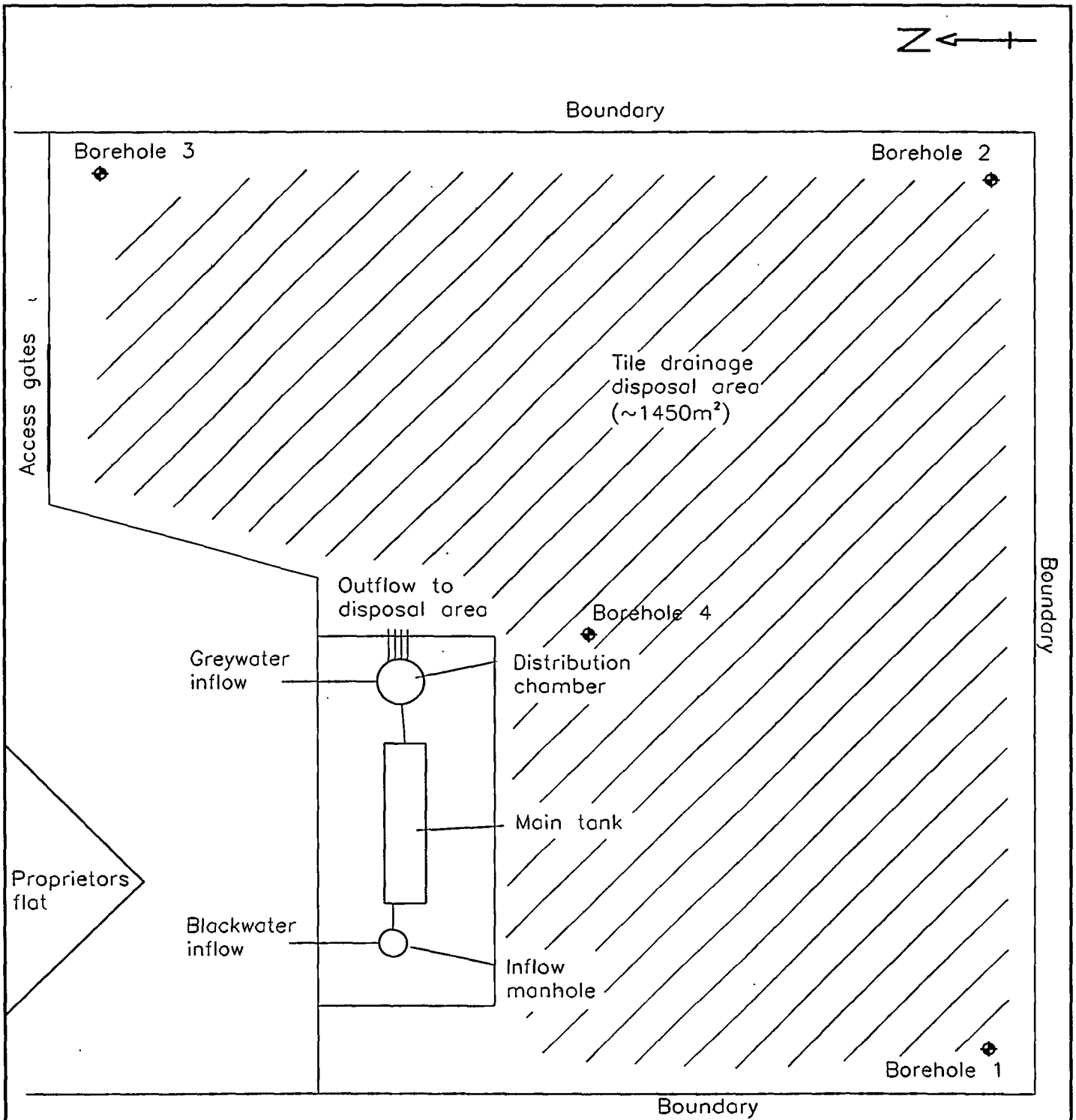
T: 03 5489870 M: 021 882011 E: jeff@swanney.co.nz

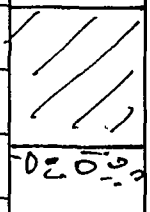
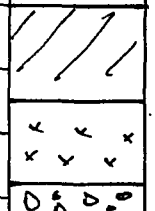
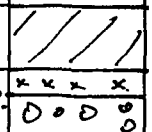
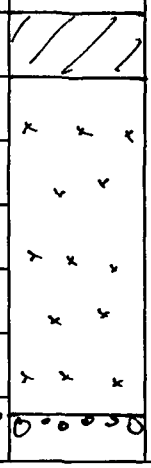
Project:	Rai Valley Tavern
Project No:	1240
Drawn:	J Swanney
Date:	8 July 2008
Drawing/Sketch No:	SITE PLAN



SITE PLAN

Rai Valley Tavern Effluent Disposal Area

Scale 1:250

Depth (m)	Graphic Log	In-situ Testing	Description
0 200 435		**BOREHOLE 1.**	TOPSOIL. GRAVEL.
0 200 300 400 550		**BOREHOLE 2.**	TOPSOIL LIGHT BROWN SILT. LOW PLASTICITY. MOIST. TRACE OF FINE GRAVEL. RIBBON LENGTH ~20mm GRAVEL.
0 200 280		**BOREHOLE 3.**	TOPSOIL. SILT AS ABOVE WITH MINOR MOTTLING. GRAVEL.
0 200 1400 600 800 1000 1200 1250		**BOREHOLE 4.**	TOPSOIL SILT AS ABOVE. RIBBON LENGTH ~ 30mm. MOIST TO WET. GRAVEL.

Notes

NO GROUNDWATER ENCOUNTERED IN ANY BOREHOLES.

FILE No.:

OFFICER:

DATE RECV'D 28 JUL 2008

MARLBOROUGH DISTRICT COUNCIL

RL Coords LOCATIONS SHOWN ON SITE PLAN.

Machine Operator HAND AUGER 50mm ϕ.

Swanney

Geotechnical and Civil Engineering

PO Box 828, Nelson

Phone: 03 548 9870

Mobile: 021 882011

Client:	Rai Valley Tavern Ltd	**Hand Auger Borehole Log**	
Location:	Rai Valley	**Date:**	7-Jul-08
Tester:	J Swanney	**Job No.**	1240

Annexure 2:

Certificate of Title

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**MB2D/600**
Land Registration District	**Marlborough**
Date Issued	25 July 1974

Prior References
MB2A/668

Estate	Fee Simple
Area	6045 square metres more or less
Legal Description	Lot 1 Deposited Plan 4148

Proprietors
Rai Tavern 2008 Limited

Interests

76565.4 Easement Certificate specifying the following easement - 25.7.1974 at 10.42 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way	Lot 1 Deposited Plan 4148 - herein	Yellow DP 4140	Part Deposited Plan 768 - CT MB2A/688	

The easement specified in Easement Certificate 76565.4 is subject when created to Section 37(1)(a) Counties Amendment Act, 1961

199480.3 Lease Term 21 years commencing on 28.7.1998 and expiring on 27.7.2019 CT 25248 issued - 27.8.1998 at 10:25 am

200627.1 Crossing Place notice pursuant to Section 91 Transit New Zealand Act 1989 - 27.10.1998 at 9.55 am

200608.1 Gazette Notice 1997 page 418 declaring State Highway 6 adjoining the within land to be a Limited Access Road - 27.10.1998 at 9.55 am

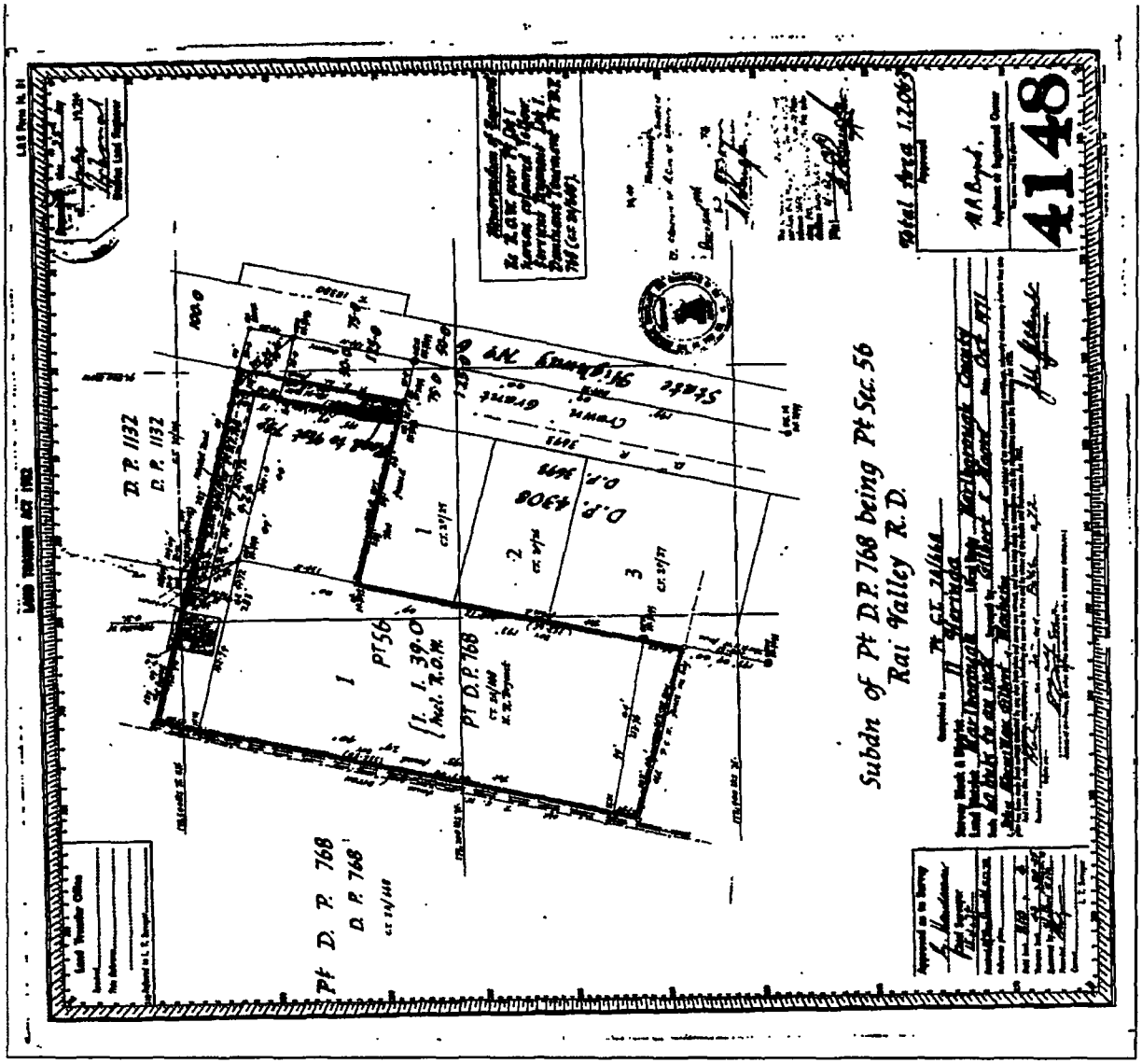
Subject to a right (in gross) to convey water over part marked B DP 399794 in favour of Rai Water Limited created by Easement Instrument 7835933.1 - 4.6.2008 at 9:00 am

Subject to a right to convey telecommunications and computer media over part marked B DP 399794 created by Easement Instrument 7835933.1 - 4.6.2008 at 9:00 am

Subject to a right (in gross) to convey electricity over part marked B DP 399794 in favour of Marlborough Lines Limited created by Easement Instrument 7835933.2 - 4.6.2008 at 9:00 am

7825802.3 Mortgage to ANZ National Bank Limited - 23.6.2008 at 3:37 pm

Identifier **MB2D/600**



FILE No.
OFFICER:
DATE 28

COMPUTER INTEREST REGISTER UNDER LAND TRANSFER ACT 1952

Search Copy

R. W. Muir
Registrar-General
of Land

Identifier **25248**
Land Registration District **Marlborough**
Date Registered 18 January 2002 09:00 am

Prior References
MB2D/600

Estate	Leasehold	**Instrument**	L 199480.3
Area	6045 square metres more or less	**Term**	21 years commencing on 28.7.1998 and expiring on 27.7.2019

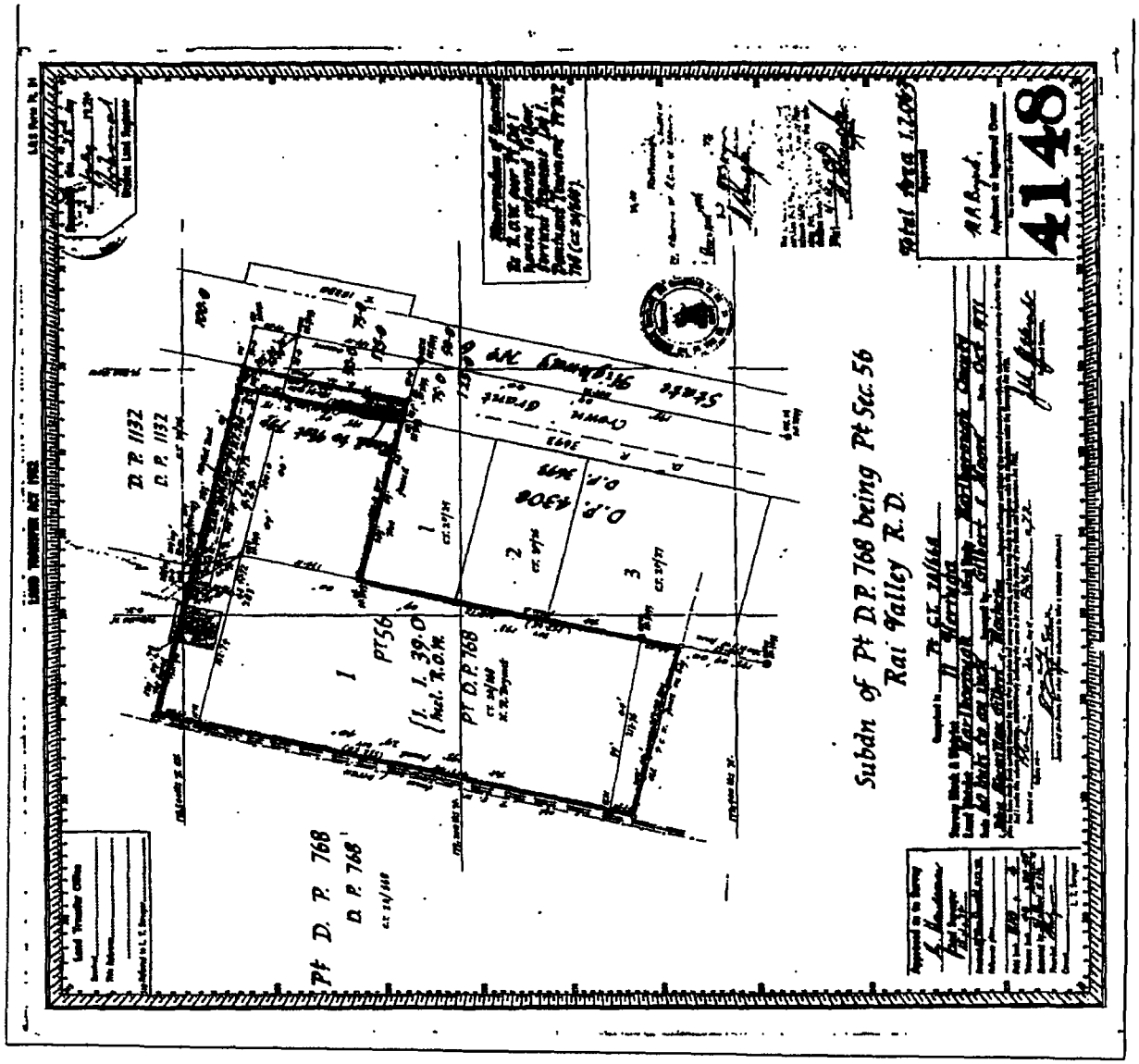
Legal Description Lot 1 Deposited Plan 4148

Proprietors
Manner Developments Limited

Interests

FILE No.:
OFFICER:
DATE RECVD 28 JUL 2008
MARLBO[illegible] DISTRICT COUNCIL

Identifier **25248**



FILE No.:	
OFFICER:	
DATE RECV'D	28 JUL 2008
MARLBOROUGH DISTRICT COUNCIL	