GW 98

# DavidsonPartners Ltd

Structural Engineering
Civil Engineering
Building Design
Project Management

Practising in association with Ayson and Partners, Registered Surveyors

**Our Ref: 22779**

28 July 2003

RECEIVED
31 JUL 2003
MARLBOROUGH
DISTRICT COUNCIL

Marlborough District Council
P O Box 443
**BLENHEIM**

**ATTENTION:** Mr G Boddington

**re:** **W L & R A O'DONNELL, HINEPANGO DRIVE, RARANGI** (41.2m)

As you are aware, Mr and Mrs O'Donnell hold a bore permit under U030087 for a deep aquifer well (number 4192) on Lot 2 DP 1130. We are writing to you having been engaged by the O'Donnell's to provide the necessary information in support of their application to take up to 30 $m^3$/day of irrigation water for the purposes of landscape irrigation. The irrigation system will include tank storage such that the abstraction from the well will be spread out over time at a rate of approximately 3.0 $m^3$/hour.

## 1. Pump Test

The well was pumped by Simpson Bros Blenheim Ltd under our direction for a period of 53 hours. (Note that Driscoll (1986) suggests that 24 hours is usually a sufficient test period for a confined aquifer well.) The test was conducted at a constant rate of 3.5 $m^3$/hour, i.e. 84 $m^3$/day, almost three times the daily take being applied for.

The drawdown and recovery results are attached, together with the chemical analysis of the water sample taken during the test. Assistance given by Council in the way of access to and information from the nearby deep aquifer sentinel well was very much appreciated.

The initial readings of the test from the pumped well show 20-30 mm of drawdown was all that was necessary to sustain 3.5 $m^3$/hour. There was immediate recovery of this drawdown at the end of the test. Given that the proposed abstraction will average only 1.25 $m^3$/hour, the actual drawdown in the pumped well will be in the order of 10 mm.

With regard to potential effects on neighbouring deep wells, the closest private wells on Lots 5 and 6 DP 11430 are 275 and 360 m away respectively, and their owners have given their green form approval as per the attached.

Davidson Ayson House, 4 Nelson Street,
P.O. Box 256, Blenheim, New Zealand
Telephone 03 578 7029 Fax 03 578 7028
Email: service@DavidsonPartners.co.nz

Principals Stephen Sheat, BE, M.IPENZ
Leigh McGlynn, BE, M.IPENZ
Ross Davis, BE, M.IPENZ

Of most significance is the potential effect on the Council sentinel well 86 m to the southeast. Based on assumed aquifer properties (transmissivity T = 6,000 $m^2$/dam, storativity S = 0.0001) the predicted effect on the Council well after 100 days pumping using the Theis equation is 6.0 mm. This amount of drawdown is of the same order as the accuracy of measurement, and will also be difficult (if not impossible) to detect due to the tidal influence on coastal aquifer levels of 300-400 mm.

In summary, we consider that the taking of up to 30 $m^3$/day from the Wairau Aquifer at this location will not have a measurable effect on neighbouring wells nor impact upon future applications for the taking of water by adjacent landowners. The role of the sentinel well will also not be jeopardised.

**2. Water Test**

The water analysis results are very similar to a previous sample we have the results for from Flaxmill Drive, with the water being of generally excellent quality other than high in iron. This is common in groundwater and of no concern – the iron may well be removed in the tank storage by aeration and settlement prior to irrigation.

Please do not hesitate to contact us if you have any queries, or require any additional information.

**DAVIDSON PARTNERS LTD**

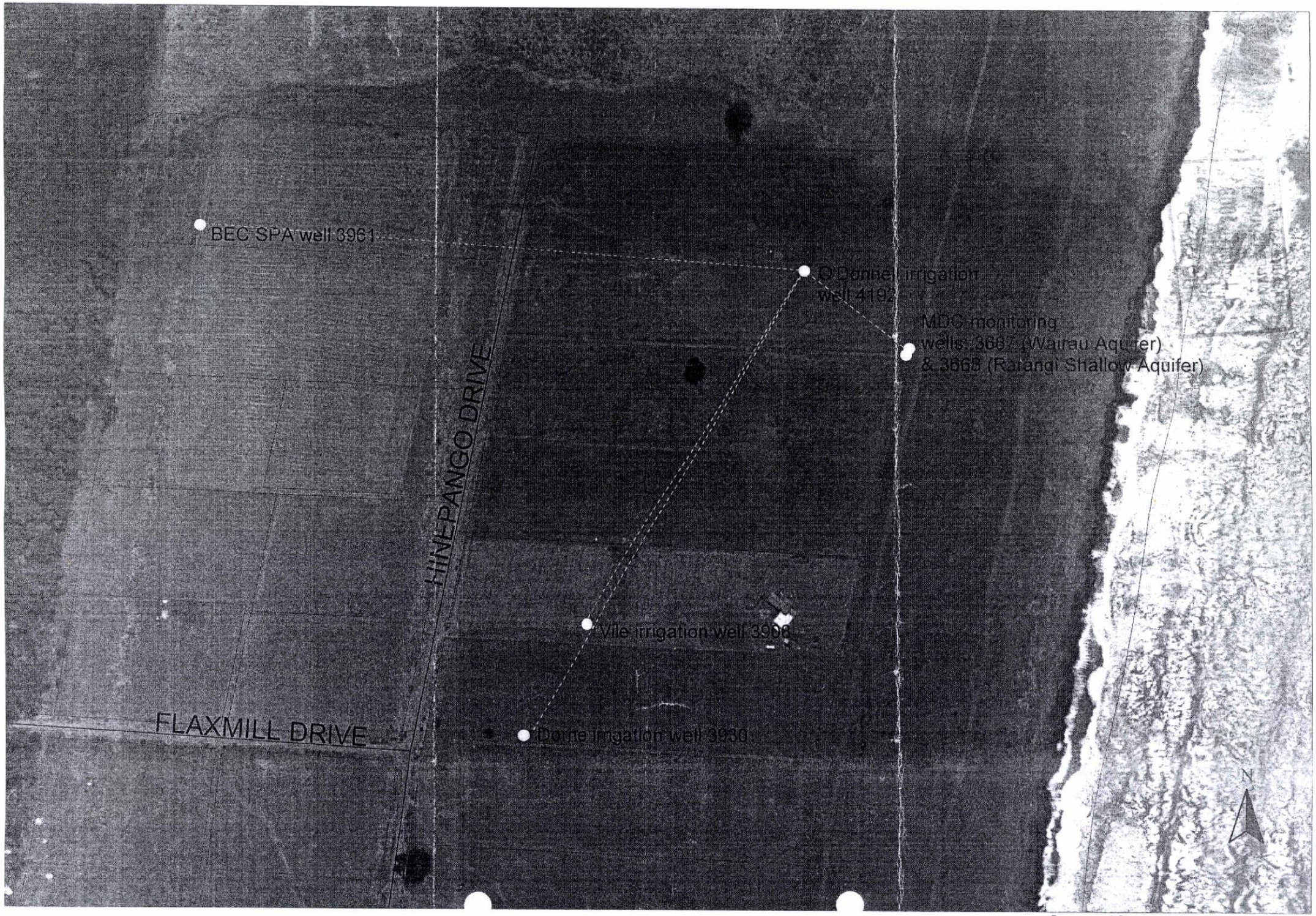
**R W Davis**

RWD:RLF

**COPY TO** Mr & Mrs O'Donnell
Belvue Bay
R D
**PICTON**

| AQUIFER TEST RESULTS: Drawdown / Recovery Measurements | | | | | | Job No. | 22779 |
|---|---|---|---|---|---|---|---|
| Site: | W&R O'Donnell | | Radius from | | Observer: | Simpson Bros. | |
| | Hinepango Dr, Rarangi | | pumped well: | 0m | | | |
| Ref. Point: | top of well | | Type of test: | Constant rate | Instrument: | | |
| RL Ref. Point: | | | | 3.5 $m^3$/hr | Date: | 26-May-03 | |
| NZ Std Time | Time Elapsed | Depth to WL | Drawdown | Corrections | Corrected | Remarks | |
| | Since Pumping | Below Ref Pt | (Recovery) | | Drawdown/ | | |
| | Started/Ceased | | | | Recovery | | |
| Time | Minutes | Metres | Metres | Metres | Metres | | |
| 09:15:00 | -1485 | 0.600 | | | | pre test Weds 21 May 2003 | |
| 11:00:00 | -1380 | 0.600 | | | | | |
| 13:00:00 | -1260 | 0.790 | | | | | |
| 15:00:00 | -1140 | 0.990 | | | | | |
| 17:00:00 | -1020 | 1.060 | | | | | |
| 19:00:00 | -900 | 0.850 | | | | | |
| 10:00:00 | 0 | 0.990 | 0.000 | | | start Monday 26 May 2003 | |
| 10:00:30 | 0.5 | 1.020 | 0.030 | | | | |
| 10:01:00 | 1.0 | 1.020 | 0.030 | | | | |
| 10:01:30 | 1.5 | 1.015 | 0.025 | | | | |
| 10:02:00 | 2.0 | 1.015 | 0.025 | | | | |
| 10:02:30 | 2.5 | 1.013 | 0.023 | | | | |
| 10:03:00 | 3.0 | 1.010 | 0.020 | | | | |
| 10:03:30 | 3.5 | 1.010 | 0.020 | | | | |
| 10:04:00 | 4.0 | 1.010 | 0.020 | | | | |
| 10:04:30 | 4.5 | 1.010 | 0.020 | | | | |
| 10:05:00 | 5.0 | 1.010 | 0.020 | | | | |
| 10:05:30 | 5.5 | 1.010 | 0.020 | | | | |
| 10:06:00 | 6.0 | 1.012 | 0.022 | | | | |
| 10:06:30 | 6.5 | 1.012 | 0.022 | | | | |
| 10:07:00 | 7.0 | 1.010 | 0.020 | | | | |
| 10:07:30 | 7.5 | 1.010 | 0.020 | | | | |
| 10:08:00 | 8.0 | 1.010 | 0.020 | | | | |
| 10:08:30 | 8.5 | 1.010 | 0.020 | | | | |
| 10:09:00 | 9.0 | 1.010 | 0.020 | | | | |
| 10:09:30 | 9.5 | 1.010 | 0.020 | | | | |
| 10:10:00 | 10.0 | 1.010 | 0.020 | | | | |
| 10:11:00 | 11 | 1.010 | 0.020 | | | | |
| 10:12:00 | 12 | 1.010 | 0.020 | | | | |
| 10:13:00 | 13 | 1.010 | 0.020 | | | | |
| 10:14:00 | 14 | 1.010 | 0.020 | | | | |
| 10:15:00 | 15 | 1.008 | 0.018 | | | | |
| 10:20:00 | 20 | 1.003 | 0.013 | | | | |
| 10:25:00 | 25 | 1.010 | 0.020 | | | | |
| 10:30:00 | 30 | 1.010 | 0.020 | | | | |
| 10:35:00 | 35 | 1.008 | 0.018 | | | | |
| 10:40:00 | 40 | 0.995 | 0.005 | | | | |
| 10:45:00 | 45 | 0.987 | -0.003 | | | | |
| 10:50:00 | 50 | 0.975 | -0.015 | | | | |
| 10:55:00 | 55 | 0.970 | -0.020 | | | | |
| 11:00:00 | 60 | 0.962 | -0.028 | | | | |
| 11:30:00 | 90 | 0.917 | -0.073 | | | | |
| 12:00:00 | 120 | 0.882 | -0.108 | | | | |
| 12:30:00 | 150 | 0.851 | -0.139 | | | | |
| 13:00:00 | 180 | 0.810 | -0.180 | | | | |
| 13:30:00 | 210 | 0.780 | -0.210 | | | | |
| 14:00:00 | 240 | 0.770 | -0.220 | | | | |
| 14:30:00 | 270 | 0.766 | -0.224 | | | | |
| 15:00:00 | 300 | 0.765 | -0.225 | | | | |
| 16:00:00 | 360 | 0.806 | -0.184 | | | | |
| 17:00:00 | 420 | 0.837 | -0.153 | | | | |
| 18:00:00 | 480 | 0.935 | -0.055 | | | | |
| 19:00:00 | 540 | 0.995 | 0.005 | | | | |
| 20:00:00 | 600 | 1.053 | 0.063 | | | | |
| 21:00:00 | 660 | 1.090 | 0.100 | | | | |
| 22:00:00 | 720 | 1.040 | 0.050 | | | | |
| 02:00:00 | 960 | 0.800 | -0.190 | | | Tuesday 27 May 2003 | |
| 10:00:00 | 1440 | 1.110 | 0.120 | | | | |
| 14:00:00 | 1680 | 0.850 | -0.140 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18:00:00 | 1920 | 0.890 | -0.100 | | | | |
| 22:00:00 | 2160 | 1.105 | 0.115 | | | | |
| 06:00:00 | 2640 | 0.825 | -0.165 | | | Wednesday 28 May 2003 | |
| 14:15:00 | 3135 | 0.871 | -0.119 | | | | |
| 15:05:00 | 3185 | 0.845 | -0.145 | | | | |
| 15:05:30 | 3185.5 | 0.820 | -0.170 | | | | |
| 15:06:00 | 3186 | 0.820 | -0.170 | | | | |
| 15:06:30 | 3186.5 | 0.820 | -0.170 | | | | |
| 15:07:00 | 3187 | 0.820 | -0.170 | | | | |
| 15:07:30 | 3187.5 | 0.820 | -0.170 | | | | |
| 15:08:00 | 3188 | 0.820 | -0.170 | | | | |
| 15:08:30 | 3188.5 | 0.820 | -0.170 | | | | |
| 15:09:00 | 3189 | 0.820 | -0.170 | | | | |
| 15:09:30 | 3189.5 | 0.830 | -0.160 | | | | |
| 15:10:00 | 3190 | 0.830 | -0.160 | | | | |
| 15:10:30 | 3190.5 | 0.830 | -0.160 | | | | |
| 15:11:00 | 3191 | 0.830 | -0.160 | | | | |
| 15:11:30 | 3191.5 | 0.830 | -0.160 | | | | |
| 15:12:00 | 3192 | 0.830 | -0.160 | | | | |
| 15:12:30 | 3192.5 | 0.830 | -0.160 | | | | |
| 15:13:00 | 3193 | 0.830 | -0.160 | | | | |
| 15:13:30 | 3193.5 | 0.830 | -0.160 | | | | |
| 15:14:00 | 3194 | 0.830 | -0.160 | | | | |
| 15:14:30 | 3194.5 | 0.830 | -0.160 | | | | |
| 15:15:00 | 3195 | 0.830 | -0.160 | | | | |
| 15:30:00 | 3210.0 | 0.771 | -0.219 | | | | |




BLENHEIM LIFESTYLES WAIRAU AQUIFER WELL LOCATIONS