

Tabled at Hearing 13/03/2013

**IN THE MATTER OF** the Resource Management Act 1991

**AND**

**IN THE MATTER OF** The Proposed Canterbury Land and  
Water Regional Plan

Evidence of Dr Anthony Davoren for HydroTrader Ltd &  
ADAM Environmental Ltd

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## **Background and Qualifications**

1. My full name is Anthony Davoren. I hold the qualifications of Bachelor and Master (First Class) of Science in Earth Sciences from University of Waikato and Doctor of Philosophy in Engineering Science from Washington State University. I am a self-employed consultant, and owner and director of HydroServices Ltd.
2. I have 30 years' experience in soil moisture, irrigation management, groundwater and surface water research and other related consulting. After graduating from University of Waikato, I spent two years surveying the peat resources of New Zealand, followed by three years studying for a PhD on a National Advisory Council Fellowship. Water and Soil Division (Ministry of Works and Development) then employed me as a research scientist in the Hydrology Centre in Christchurch (now part of NIWA).
3. Since 1987, I have been involved as a specialist in soil moisture measurement and irrigation management. HydroServices now provides irrigation management advice to more than 350 clients in Canterbury. I have had a large involvement in preparing or supervising the preparation of technical assessments for resource consent applications irrigation.
4. In 2007 I founded HydroTrader Ltd with two other persons, Warwick Pascoe and Gus Walkden. In the five years trading and transferring water permits we have gained invaluable experience and expertise with regard to the transfer, transferee, their reasons to or for transfer, the volume of water transferred and where it is transferred.
5. With respect to irrigation and groundwater, I have specialised in crop water requirements for irrigation, irrigation efficiency and irrigation design.
6. I have been instrumental in developing Adaptive Management for applicants' at the Rakaia-Selwyn, Selwyn-Waimakariri and Valetta-Ashburton River Groundwater Zone Hearings.
7. I am a past board member of Irrigation New Zealand and managed a Sustainable Farming Fund project Irrigation System Design Standards and Code of Practice for INZ (Irrigation New Zealand).
8. Although this is a Council hearing I have read the Environment Court's consolidated practice note that came into effect on 1 November 2011. I have complied with it when preparing my written statement of evidence and agree to comply with it when giving oral evidence.

## **Information Sources Relied Upon**

9. In preparing my evidence, I have drawn on the following relevant information sources:
  - The Proposed Canterbury Land and Water Regional Plan (pLWRP);
  - The Proposed Canterbury Land and Water Regional Plan Section 42A Report - Volume 1;

- The expertise and experience of, and knowledge gathered by HydroServices Ltd with regard to Canterbury soils, irrigation systems and management, and Canterbury groundwater since 1982; and
- The experience and knowledge gathered by HydroTrader Ltd with regard to transfer and trading of water permits since 2007.

### **Key Issues Addressed in this Evidence**

10. I have prepared this evidence in consultation with other directors of HydroTrader, Warwick Pascoe and Gus Walkden.
11. I am also speaking on behalf of the submission lodged by ADAM Environmental Ltd as the director of that company (Warwick Pascoe) is not available to attend the hearing.
12. The fundamental issues addressed in this evidence are:
  - a) The interpretation around the meaning of “changed”;
  - b) The requirement to surrender a proportion of any allocated water upon transfer;
  - c) Setting of limits for allocation blocks based on 100% of all annual volumes; and
  - d) The fixing of interim allocation limits for groundwater zones as “final” limits, and the resultant classification of applications to take and use additional water from these zones as prohibited activities.

### **Overall Summary**

13. In relation to the key issues outlined in Paragraph 12 of this submission, the pLWRP and the S42a report from Environment Canterbury (ECan) Officers, we have concluded:
  - a) The definition of “changed” is flawed;
  - b) Requirement to surrender a proportion of any allocated water upon transfer not only lacks analysis of transferred volumes with respect to the total allocation, but may also be ultra vires;
  - c) Setting limits for allocation blocks based on 100% of all annual volumes is conservative, unrealistic and lacking any technical substantiation; and
  - d) Classifying applications to take additional water from supposedly fully allocated groundwater zones as prohibited activities (Rule 5.104) fails to recognise their dynamic nature (affected by irrigation and surface water recharge, as well as by changing patterns of abstraction), and the importance of not creating unreasonably high barriers to the testing of legitimate applications based on the best available science.
14. HydroTrader does not agree with the reasoning for b), c) and d), and the ever changing definition of “changed” from ECan Officers clearly shows the definition is flawed and needs to be amended.

## Definition of Changed

15. Section 2.10 defines “changed” as:

*“a change in land use, calculated on a per property basis that arises from either:*

- 1. a resource consent to use, or increase the volume of, water for irrigation on a property; or*
- an increase of more than 10% in the loss of nitrogen from land used for farming activity above the average nitrogen loss from the same land for the period between 1 July 2011 and 30 June 2013. The amount of nitrogen loss shall be calculated using the Overseer<sup>TM</sup> nutrient model for 12 months preceding 1 July in any year and expressed as kilograms per hectare per year.”*

16. Evidence presented by HydroServices Ltd with regard to “changed” is accepted in full by HydroTrader. (Paragraph 15(f)).
17. HydroTrader is concerned that the interpretation(s) (and there are now several iterations) by ECan Consents and Planning will require a land use consent for every transfer of water permits. This despite the fact that land use is not changing. The main consequence of this approach and interpretation means permit holders who have “an old annual volume calculated according to land use and the now superseded Schedule WQN9v2” who propose to top up the annual volume to meet demand in the 90-percentile demand season (9/10 year demand season) will trigger the requirement for a land use consent.
18. On the other hand, those consent holders who do not have an annual volume as a consent condition and vary their consent will receive an NRRP compliant annual volume – larger and often significantly larger than the Schedule WQN9v2 annual volume recorded on the GIS data base for allocation limit calculations. The variation will not trigger the requirement for land use consent.
19. There is also no distinction concerning the size of the transfer. We do not consider it reasonable for a small land holder (life-style block) proposing to transfer a few hundred cubic metres (or few L/s) to avoid purchasing supplementary feed, to trigger the requirement for a land use consent.
20. HydroTrader considers land use consent should ONLY be required when the land use actually changes and following thresholds be established to exempt the requirement for land use consent. For example:
  - a) The transfer is to a land parcel greater than 10 - 20ha;
  - b) The take is greater than 4-5.5L/s (345-475m<sup>3</sup>/day); and
  - c) The annual volume is greater than about 70,000m<sup>3</sup>/year.
21. HydroTrader considers precedent for such threshold(s) for small scale farming activities exists in the NRRP and pLWRP; i.e.
  - Rule WQN9, Chapter 5 of NRRP where the take and use is a permitted activity up to 10m<sup>3</sup>/day at a maximum rate of take of 5L/s (subject to various conditions, including that the bore must be greater than 50m from any bore on a neighbouring property); and

- Rule 5.86 of the pLWRP where the take and use is a permitted activity up to 10m<sup>3</sup>/day at a maximum rate of take of 5L/s, provided the bore is greater than 20m from property boundary or any surface water body; and
- Rule 5.87 of the pLWRP where the take and use is a permitted activity up to 100m<sup>3</sup>/day at a maximum rate of take of 5L/s for sites of more than 20ha, and provided bore is greater than 20m from property boundary or any surface water body.

### **Transfer requiring surrender of a proportion of allocated water**

22. HydroTrader submitted Policy 4.73 and Rule 5.107 requiring a proportion of any allocated water to be surrendered upon transfer in over-allocated catchments or groundwater zones is unnecessary, inappropriate and inconsistent with the Canterbury Water Management Strategy goals to facilitate additional (sustainable) irrigation because transfers have and are likely to comprise an insignificant proportion of the total allocation.
23. This would have been apparent to planning staff had they analysed the combined annual volume of site-to-site transfers that have occurred over the last few years. The cursory s32 discussion of transfers is completely lacking in such analysis.
24. To put the significance of transfers into perspective, the following analysis of the HydroTrader transfers is provided:
- Since March 2007 approximately 7.8million m<sup>3</sup> has been transferred.
  - All the transfers have been in “red” zones.
  - The volume is a very small proportion of the water allocated in the “red” zones - 7.8 million m<sup>3</sup> of 741.4 million m<sup>3</sup> allocated or about 1% of the total allocation.
  - In the Selwyn – Waimakariri Groundwater Zone 2,782,715m<sup>3</sup> has been transferred/traded, approximately 2.3% of the zone limit of 121.3Mm<sup>3</sup>. This zone is considered to be 135% allocated.
  - In the Rakaia - Selwyn Groundwater Zone 2,898,929m<sup>3</sup> has been transferred/traded, approximately 1.3% of the zone limit of 215Mm<sup>3</sup>. This zone is considered to be 145% allocated.
25. While transfers have also been carried out between individual permit holders, and facilitated by other consultancies, anecdotal evidence gathered from other consultants would suggest that HydroTrader has been involved with the majority of transfers since its launch in 2007.
26. “Clawing” back water from transfers is the only measure in the pLWRP proposed to address the issue of “over-allocation”, if and when over allocation exists. Nowhere is there reference to or discussion of moving from an “arm-chair” approach to groundwater management to a more dynamic management approach. Over allocation only exists when there is insufficient water stored in the groundwater system to meet the environment requirement and demand of permit holders. On three occasions since

2005 independent commissioners at consent hearings have determined dynamic or adaptive management of the groundwater is a better solution to “over allocation”.

27. Other measures that should be considered and we consider more likely to address the supposed “over allocation” include:

- Progressively review existing water permits and apply a “reasonable use test” (e.g. Schedule 10) to ensure that water has been efficiently allocated; and
- Carry out a thorough quality assurance check of the Consents database to remove errors and double-counting of allocations. The latter error is found on a regular basis when carrying out WQN10 interference assessments.

28. This would suggest that the motivation for this policy has less to do with implementing the National Policy Statement for Freshwater Management 2011 (NPS 2011) to address over-allocation, but more to do with a philosophical objection to the free-market trading of water permit allocations and/or cementing the simplistic ECan management approach to groundwater management.

29. While the NPS 2011 requires over-allocation to be phased out (e.g. Objective B2, Policies B5 and B6), nowhere does it state that this should or will be achieved by penalising transfers. Quite the contrary, the NPS 2011 makes specific provision for transfers as one means of promoting the efficient allocation of water (e.g. Policy B3). HydroTrader and many other practitioners in the field agree that the ability to transfer will increase efficient allocation of water, as does the broad-based membership of the Land & Water Forum in their recommendations to Central Government<sup>1</sup>.

30. The pLWRP provisions with regard to transfers appears contradictory to the newly operative Regional Policy Statement (RPS) which does not appear to have any “anti-trading or transfer provisions”. For example, the proposed RPS had the following policy:

*Policy 7.3.4(2): Where the quantum of water allocated for abstraction from a water body is at or exceeds the maximum amount provided for in an environmental flow and water allocation regime:*

- a) prevent any additional allocation of water for abstraction or the site to site transfer of allocated but unused water, from that water body; and*
- b) identify the actions to be taken within an appropriate timeframe, to address any adverse effects of over-allocation.*

31. This policy now reads:

*(2): Where the quantum of water allocated for abstraction from a water body is at or exceeds the maximum amount provided for in an environmental flow and water allocation regime:*

*avoid any additional allocation of water for abstraction or any other action which would result in further over-allocation; and*

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<sup>1</sup> <http://www.landandwater.org.nz/includes/download.aspx?ID=124767>

*(b) set a timeframe for identifying and undertaking actions to effectively phase out over-allocation; and*

*(c) Effectively addresses any adverse effects of over allocation in the interim.*

32. Further, Method (1)(g) of Policy 7.3.8, and Method (3)(a) of Policy 7.3.13 make specific reference to transfers in a neutral or positive manner as follows:

**Method (1)(g)**

*Set the conditions and circumstances for the transfer of water permits to take or divert water within a water body and avoiding any transfers that would be inconsistent with Policy 7.3.4; and*

**Method (3)(a)**

*Provide procedures and mechanisms to facilitate stewardship and self-management of water resources within the conditions set by a regional plan or resource consent, including:*

- a) localised transfer of water allocations between consent holders, subject to safeguards to prevent unintended consequences for the environment or other users.*

33. HydroTrader considers the pLWRP to be at odds with the NPS and the RPS, further reinforcing the view expressed above in Paragraph 28 regarding the motivation for the policy.
34. Furthermore, HydroTrader considers Environment Canterbury has exceeded its powers by effectively requiring a portion of allocated water to be surrendered under this Policy. Consequently, HydroTrader considered the policy and Rule 5.108 were *ultra vires* and sought legal opinion. A legal opinion was provided by Mr Hans van der Wal of DuncanCotterill, and the hearing panel will hear from Hans on behalf of HydroTrader on 14 March.

### **Setting Limits Based on 100% of Allocation**

35. HydroTrader submitted Schedule 13 was conservative and unrealistic.
36. HydroTrader considers it is overly conservative to set limits for allocation blocks to be 100% of all annual volumes of groundwater takes (Schedule 13, Groundwater allocation regimes, Point 1) or stored surface water (Schedule 13, Surface water allocation regimes, Point 3). There is no evidence presented or justification provided for the limit to be set at 100%. This is contrary to previous studies by ECan staff and limits; for example
- Aitchison-Earl et al<sup>2</sup> considered actual use to be 60% of the volume allocated for groundwater takes;
  - Russel Sanders<sup>3</sup> irrigation water use survey reports between 1997 and 2003 estimated actual use as between 15 and 51%; and

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<sup>2</sup> Phillippa Aitchison-Earl, David Scott and Russel Sanders, 2004. Groundwater Allocation Limits: Guidelines for the Canterbury Region. ECan Report Number U04/02.



- The NRRP (Schedule 16) considered actual use to be 85% of the annual volume “for estimating the effective allocation”.
37. There is also little evidence from water meter records to show that even the driest years **all water permit holders have used their entire allocation**. The emphasis on all is because it would require every permit holder to use 100% of their annual volumes for the 100% “rule” adopted in Schedule 13 to be fulfilled.

### **Classifying new takes from fully allocated groundwater zones as prohibited activities**

38. It is totally inappropriate to make applications to take additional water from a groundwater zone prohibited activities until such time as allocation limits have been set using a “3rd order” methodology. Currently the groundwater zone limits in Canterbury are all 1st or 2nd order ones, hence they have a low level of certainty.
39. This has been conclusively demonstrated at a number of major consent hearings where comprehensive evidence lodged in support of new applications was accepted by independent commissioners, despite strenuous opposition by ECan staff and management.
40. While it is important to avoid a situation where over-allocation is exacerbated by a string of new applications (the “death by a thousand cuts” argument), it is equally important to not effectively close the door to new irrigation development until such time as 3rd order allocation limits have been determined, when / if ECan has the resources to do so.
41. Forcing applicants for additional water to go through an expensive and time consuming plan change, when they have probably already spent a considerable sum of money determining that additional water is available, is obstructive, unreasonable and inconsistent with the principles and objectives of the RPS and CWMS.
42. A recent example serves to highlight this. The allocation limit for the Eyre Groundwater Allocation Zone in Schedule WQN4, Chapter 5, NRRP is 81.3Mm<sup>3</sup>/year, based on a “First Order” estimation (15% of average annual rainfall, the crudest of the three ECan proposed methods). This has now been increased to 99.07Mm<sup>3</sup>/year in Section 8, pLWRP, following a review by ECan of groundwater levels and recharge data between 2010 and 2012.
43. Had this review not been agreed to following advocacy by a group of consent applicants (who had access to my cursory analysis of recharge data which indicated more water was almost certainly available for allocation), this additional ~18Mm<sup>3</sup>/year of allocation would have been locked up, possibly for many years, until either a group of applicants attempted a plan change (at significant individual cost), or ECan’s own investigations lead it to propose a change (at significant cost to rate-payers). Clearly such a process runs contrary to the RPS and CWMS principles of making sustainable water allocation available for use.

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<sup>3</sup> Sanders, R.A. 1997 to 2003: Irrigation water use survey: report on the 1997-1998 (1998-1999 etc.) irrigation season. Canterbury Regional Council Unpublished Reports U97/39, U98/45, U99/27, U00/29, U01/50, U02/31 and U02/30.

## Summary

44. In accordance with the HydroTrader and ADAM Environmental Ltd submissions, we seek:

- Revision of the definition of “Changed” so that the requirement for a land use consent does not apply where the land use is **not** proposed to change;
- The establishment of a threshold to exempt very small scale farming activities from the requirement for a land use consent;
- Deletion of the reference to the surrender of any portion of the annual allocation when a permit is transferred;
- The adoption of more effective means to address the issue of “over allocation”;
- The setting of limits for groundwater allocation blocks as summation of 85 or 90% of the annual volumes of all groundwater permits;
- Similarly for dammed or stored surface water allow set the allocation block to be 85 or 90% of the combined annual volumes; and
- Classification of applications to take additional water from ‘fully allocated’ groundwater zones as non-complying activities, rather than prohibited activities.



**Dr Anthony Davoren**

**13 March 2013**