BEFORE INDEPENDENT HEARING COMMISSIONERS

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Proposed Variation 1 (Selwyn-Waihora) to the Proposed Canterbury Land and Water Regional Plan

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STATEMENT OF EVIDENCE OF ANDREW ROBERT CURTIS ON BEHALF OF IRRIGATION NEW ZEALAND INCORPORATED

Dated: 29th August 2014

INTRODUCTION

Qualfications and Experience

1. My name is Andrew Curtis. I am the Chief Executive of Irrigation New Zealand Incorporated (**INZ**). I hold an upper second class BSc (Hons) degree (Physical Geography and Environmental Biology) from Oxford Brookes University and a PGDip (Environmental Management) from the University of Surrey. I also hold a New Zealand National Certificate in Irrigation Evaluation, and Massey University Certificates of Completion in Sustainable Nutrient Management in New Zealand Agriculture for both Intermediate and Advanced courses.

2. My experience and knowledge of irrigation in New Zealand (**NZ**) is considerable, in terms of both land uses (pastoral through horticulture and viticulture) and irrigation systems (drip-micro and spray). Whilst at INZ I have co-authored the irrigation industry code of practices and standards for design, installation and evaluation, and the irrigation manager and development training resources. I have also published a number of papers on the history, current extent and future development of irrigation in NZ. I was also the owner operator of a vineyard whilst in Hawke’s Bay and successfully managed both a frost protection and drip irrigation system for eight years.

3. I have much recent experience in the area of water policy development. For example, as a representative of INZ I was actively involved in the Land and Water Forum process - plenary, small group and water quality management infrastructure and water allocation working groups since 2009. The multi-stakeholder water allocation working group explored a number of topics including, the nature of rights, allocation methods, over-allocation and water accounting.

4. My previous New Zealand work experience includes six years employment with Hawke’s Bay Regional Council, initially as an extension officer with a focus on irrigation and then as Strategic Advisor – Water. In this role I helped lead the development of the Hawke’s Bay regional water strategy. This had a strong non-regulatory focus (including water storage, water user groups, water metering) to complement and better enable traditional regulatory pathways.

5. Prior to my employment with Hawke’s Bay Regional Council I was employed in a variety of horticultural (in NZ), mixed cropping/sheep and beef (United Kingdom), orchard and farm management roles.

Code of Conduct for Expert Witnesses

6. As part of my role with INZ, I am an advocate for the irrigation industry. However, I have a good deal of technical knowledge and experience in respect of irrigation matters generally, and the Selwyn Waihora zone specifically.

7. To this end, I cannot provide this evidence as an independent expert but I confirm that the evidence I set out below addresses matters that I have a level of expertise in given my qualifications and background.

8. I confirm that I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

SCOPE OF EVIDENCE

9. Evidence with regard to the water quantity component of Variation 1 Canterbury LWRP has also been presented by Ian McIndoe from Aqualinc Research Ltd. I have seen that evidence and understand its conclusions and Mr McIndoe's opinions. My evidence seeks to complement that evidence on water quantity.

10. My evidence also contains an overview of the INZ SMART Irrigation framework – developed to better enable the implementation of Good Management Practice for irrigation. Lastly it contains an overview of the Nutrient Management framework that was developed collaboratively with the zone committee and led by INZ.

11. My evidence will cover the following matters:

    a) *Transfer of Water Permits (Policy 11.4.22 and associated rules)*

    b) *Importance of Water Supply Reliability for Irrigation (Policy 11.4.23, 11.4.26 and associated rules)*

    c) *Allocation Methodology (Schedule 10)*

    d) *SMART Irrigation – The INZ framework for Irrigation Good Management Practice (Schedule 24)*

    e) *The development of the Nutrient Management framework for the Selwyn-Waihora zone committee (Policy 11.4.13 & 11.4.14)*

TRANSFER OF WATER PERMITS

12. Water permit transfer within the current regulatory regime in Canterbury is limited. Data received from Environment Canterbury shows that during the 2013-14 financial year there were 341 full transfers and 19 part transfers for water permits over the entire region. At the

time of writing this evidence point of take transfers (water transferred from one property to another) were unable to be separated from a change of ownership only (a property sale or change in business name). However it is likely the latter scenario makes up a significant proportion of these.

13. The figures provided in the s32 Report for Variation 1 support the view that only a small amount of allocated water is transferred within the Selwyn Waihora catchment.

14. From my discussions with irrigation consultants and irrigators it seems clear that the majority of water permit transfers are -

- *From* previously irrigated properties that have been subdivided and thus the water is no longer required, or from properties that have modernised their irrigation installing a more efficient system, for example moving from a rotorainer to a centre pivot where the efficiency gain creates a small amount of surplus water.

- *To* an existing allocation for the purposes of either ‘topping-up’ due to a land use change or increasing reliability. For example an existing irrigated cropping farm converting to dairy that has been allocated a volume less than the 9 in 10 years irrigation demand for pasture and thus requires more water to ‘top-up’ their allocation, or alternatively an existing cropping or dairy farm that is looking for greater reliability.

15. From this it appears evident that using the proposed transfer provisions as a means of providing a solution to over-allocation will achieve little benefit to the zone. This is also reflected in the s42A that states that CPW water is the key solution for over allocation in the zone.

16. For the 2012-13 year actual water use for the 58% of takes measured in the zone was 55%[1]. In the 2011-12 year actual water use for the 45% of takes measured in the zone was 45%[2]. Typically it is estimated that between 40-60% of the allocated water will be used for irrigation in the Selwyn-Waihora zone, this is due to; climatic variations, crop rotations, the pasture based allocation granted to existing consent holders through the Rakaia-Selwyn consent review process, consent double-ups, adaptive management consents and irrigation system breakdowns.

17. In my opinion, the reasons for the limited numbers of water permit transfers despite a typical actual water usage of 40-60% in the zone are –

[1] Canterbury Region Water Use Report for the 2012/13 water year. Environment Canterbury Report No. R14/4
[2] Canterbury Region Water Use Report for the 2011/12 water year. Environment Canterbury Report No. R12/105

(a) Reliability – Irrigation in NZ's maritime climate is subject to large climatic variation from year to year. An allocation is provided to irrigators on the basis of enabling them to successfully operate their business in a 9 in 10 year drought scenario. This means in 8 out of 10 years they will have more water than they need, in 1 out of 10 years they will have just the right amount of water and in 1 out of 10 years they will not have enough. Typically irrigators will not on-sell this reliability as they realise it is key to their business long-term success. In fact it is common for irrigators to invest in greater reliability than a 9 in 10 year drought scenario. Further comment is made on the investment that irrigators are currently making in reliability in the 'Importance of Reliability' section of this evidence.

(b) Permit Double-ups – For reasons of reliability and cost of water supply it is common for irrigators, where multiple sources of water are available, to have both a surface water and groundwater consent for their property. These would cover the same area and have the same seasonal volume applied to them. In the Selwyn zone surface water takes without storage are typically unreliable. Irrigators therefore frequently have a groundwater supply as a back-up for seasons with low river flows. The reduced cost of pumping means surface water consents are preferable, they are therefore used until minimum flows are reached and then a swap to groundwater pumping is made. Typically irrigators will not on-sell this reliability as they realise it is key to their business long-term success. As a result the groundwater allocation that relates to such consents will seldom be used in full.

(c) Adaptive Management Consents – Within the zone there are a number of consents that have adaptive management conditions placed upon them. This is implemented in the form of a minimum water level for the aquifer past which abstraction is not permitted (bore water levels are monitored). Therefore in years of low groundwater levels (low winter recharge) the seasonal volume allocated is not able to be utilised.

(d) Pasture Based Allocation – During the Rakaia-Selwyn consent review hearings all existing consents were granted a pasture based allocation. This decision was made as it allowed for flexibility of future land use, particularly for cropping farmers in the lower part of the zone. The decision was also made because it prevented adverse impacts on land value given the value of water is presently incorporated into land in NZ and a reduction in water availability would likely impact this. Irrigators leverage against their land value to provide security when debt financing business investment. Whilst there are no direct examples of this, as decisions to date have landed in favour of the pasture allocation, there is an exemplar for this. Land is currently valued based on the amount of water available and the reliability of this, as well as an assessment of whether this restricts the land use potential. An existing irrigator's investment can therefore be affected by significant decisions post the granting of the permit.

From reviewing the CRC s32 and s42A Reports, there seems to be a perception that there is a risk of cropping enterprises either transferring their excess water to an unirrigated property or undertaking land use change to a pasture based enterprises and thus more fully utilising their allocations. As far as I am aware, this has not occurred to date or at least not to any noticeable extent. I consider the new nutrient management regime that Variation 1 introduces now provide considerable additional barriers to this. Whilst it could be argued this unproductively "locks up" water, the reality is preserving this allocation gives a continued ability for cropping irrigators to leverage off their existing land value. This underpins the considerable financial investment that is currently being made in irrigation modernisation in the lower plains so has a direct environmental and economic output.

18. Based on the evidence above it is my opinion that it is extremely unlikely that the current total allocated volume in the Selwyn-Waihora zone would ever be fully used, even in a drought year of high abstraction (high evapotranspiration and low rainfall). However I also do not believe there is much "surplus" water in the zone so I consider the risk of converting "dry" allocation to "wet" allocation or "surplus" water being transferred to be minimal because:

(a) Irrigators are not going to transfer the water they have not been using if they know they would need it in a 1 in 10 year dry event. Such water cannot truly be considered "dry" allocation as it is not meant to be used except in the more extreme events. I am not aware of any situations where an irrigator has transferred water and taken a reduction in reliability in order to do so – for example, I consider it is extremely unlikely that a farmer with enough water for 9 in 10 years reliability is going to transfer water and accept a drop in reliability to 7 in 10 years;

(b) The most usual situation of transfer I am aware of is where an irrigator has made efficiency gains so that they need less than their allocated volume to achieve 9 out of 10 year reliability. In such a case the water has in fact been used in the past, so it is "wet" allocation. The reward and incentive to the irrigator making efficiency gains is in being able to sell that water. The relatively small amount offered tends to be bought by farmers wishing to increase their own security rather than establishing new operations.

19. Although transfers are always going to be limited in number for the reasons set out above, there are some significant benefits to enabling – rather than deterring – a transfer system to grow. Improved dynamic efficiency (transfer) is key to growing the socio-economic benefit the community receives over time from its water resource. In particular the growth of a temporary transfer market is of much value.

20. Temporary transfers (movement of an allocation from one point of take to another for a limited number of seasons) are of particular value to as they allow the inevitable swings in commodity prices to be better accommodated. This is of major benefit for cropping enterprises particularly where a range of crops are grown with differing water use requirements - both total seasonal water requirement and the seasonal distribution of this. It also better allows for site to site transfers for market access reasons, quarantine periods for example, or disease control. The flow-on benefits of improved transfer include;

(a) Increased allocative efficiency – the limited amount of surplus water will be provided a mechanism to move to its highest value use (particularly on a temporary transfer basis). This will optimise the overall community socio-economic benefit that could potentially be created from its available water resource. For every $1 of private gain from irrigation it has been well proven there is in excess of $3 of public benefit;

(b) Increased technical efficiency – the ability to on-sell potential efficiency gains provides an incentive for irrigators to continuously improve upon their existing practice to further reduce drainage losses and thus nutrient loads. Improved transfer will therefore ultimately add to the more timely reduction of nutrient loads in the catchment.

THE IMPORTANCE OF RELIABILITY

21. Over the last 20 years reliability has become one of the key drivers to enable good irrigation performance. It is now widely recognised that >95% reliability is required for this and is therefore being actively sought by irrigators[3].

22. It should also be noted one of the main drivers behind the Canterbury Water Management Strategy (CWMS) was to improve irrigation water supply reliability. This then creates the foundations for numerous other, socio-economic, environmental, recreational and cultural benefits to occur – the targets contained within the CWMS[4].

23. Reliability is key to maximising the value the community receives from irrigation. It allows a wide range of high value agricultural and horticultural production systems to be put in place. The increased capital investment and seasonal inputs associated with high value horticultural crops require a reliable water supply – without this there is a significant financial risk to production. This is very evident in Canterbury where low reliability run-of-river takes have pasture dominated land use. Feed can be brought in or livestock moved in times of low reliability (flow restrictions for example). It is not possible to move a crop and as a result, particularly for 'quality' driven crop production systems, significant crop loss or failure will

[3] Macfarlane presentation to MAF seminar "*Financing Pathways for Rural Water Infrastructure*" MRB study for Environment Canterbury, and the Canterbury Water Management Strategy study "*On-farm Impact of Variation in Reliability*".
[4] http://ecan.govt.nz/get-involved/canterburywater/targets/Pages/targets-summary.aspx

occur. The financial risk is therefore too great for investment in high value horticulture or cropping (seed crops for example) where there is low water supply reliability. Whilst it is difficult to put an exact number on the level of reliability required for cropping and horticultural enterprises, as the actual number is crop and growth stage specific, it is regarded that less than 90% reliability during the critical growth stages of each crop is prohibitive.

24. High reliability is one of the main enablers for water and energy efficiency. A reliable water supply enables irrigators to invest in modern irrigation infrastructure and technologies (gives relative investment certainty). It also enables optimal irrigation, a move to 'as and when' and 'just in time' scheduling practice instead of a precautionary 'just in case' approach. If irrigators are uncertain about their reliability of irrigation water supply then a precautionary 'keep the soil moisture topped up' strategy is common. Also with reliability the full water storage potential of the soil (its water holding capacity) is used to take better advantage of rainfall, particularly on the shoulders of the irrigation season where deficit irrigation practice is practiced. The availability of a reliable water supply to allow irrigators to 'catch-up' is fundamental to this.

25. Obviously a number of other factors need to be apparent for efficient water and energy use to occur, the irrigation system needs to be designed, installed, operated and maintained well and this requires a trained and knowledgeable irrigation service industry, as well as irrigators and their staff. The INZ SMART Irrigation framework, as discussed later in this evidence, provides the pathway for this. However a reliable water supply is the key enabler for allowing the full efficiency potential to be realised.

26. For example, irrigators on the RDR schemes (Mayfield Hinds, Valetta, and Ashburton Lyndhurst Irrigation Schemes) have demonstrated clearly that there are water efficiency, productivity, and environmental gains from improving reliability above the 90% reliability inherent in their 'run-of-river' take. They have voluntarily invested in 'in-scheme' (Mayfield Hinds Carew storage ponds for example) and 'on-farm' storage in order to increase reliability to in excess of 95%. As a result, water use per hectare has reduced, pasture and crop productivity has increased, electricity consumption has reduced, and nutrient leaching has declined. Typically, best practice farm output of wheat, milk and meat per millimetre of applied water, has tripled over the past decade[5].

27. The Slee's Melrose Dairy farm on Mayfield Hinds, winners of the Supreme Ballance Farm Environment Award 2014, is a prime example of this. Between 1992 and 2014, 5 water storage ponds were built to increase reliability and allow investment in modern centre pivot

[5] Taken from the evidence of Mr Andy McFarlane for HBRIC as part of the EPA hearings for PC6 & RWSS

technology. As a result water use reduced from 800mm/ha to 383mm/ha and Milk Solids produced per mm of irrigation applied increase from 0.439kg/mm to 1.666kg/mm[6].

28. Efficient irrigation practice drives improved environmental performance. It is well documented that significantly less drainage and run-off occurs through improving irrigation efficiency. For example by moving from 60% to 80% irrigation application efficiency, for an average season and for a light (40mm WHC) and heavy (100mm) soil type, there is a drainage reduction of 241mm and 246mm respectively (746mm to 543mm and 722mm to 461mm)[7]. This would equate to a significant reduction in N-loss for an intensive farming system. While the LWRP seasonal allocation methodology is based upon an 80% application efficiency it does not require an irrigator to achieve this level in practice. In my experience, the shift toward efficiency and related environmental improvement will occur once all the building blocks and related incentives are in place. Reliable water is the fundamental building block.

29. It should be noted that the current OVERSEER model is not able to account for nutrient gains through improvements in irrigation application efficiency due to the inadequacies of its irrigation module. It is expected this will be rectified with a new version release within the next 12-18 months. A recent peer reviewed technical report has confirmed with a few changes, that have now been tested in a beta version[8], OVESEER will be able to better account for a range of irrigation practices.

The Economic Cost of an 85 Percentile Reliability

30. The financial cost of a reduction in reliability from 9 years in 10 to 8.5 years in 10 is calculated between $120-240/ha for a dairy enterprise and between $70-140/ha for a feed barley arable crop in a drought year.

31. This is calculated based upon the loss of between 20-40mm for the majority of seasonal allocations, which typically equates to the reduction of 2-3 irrigation rounds off an irrigation season for a centre pivot irrigator[9]. A pasture response of 15kg/DM per mm applied (15kg/DM equating to 1kg/MS @ $6/MS) and a yield loss of 0.1% per mm of drought stress for an arable feed barley crop (8 tonne/ha yield @ $440 tonne) were applied in deriving these figures.

32. However it should be noted that as per the evidence provided above in 'The Importance of Reliability' section that a >90 percentile reliability is required for the full range of crop scenarios to be viable options. Also it is my experience that a >90 percentile level is

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[6] Taken from the Canterbury Ballance Farm Environment Awards field day hand-out
[7] Numbers generated by the IRRICALC water allocation model and based on a Te Pirita climate scenario
[8] Comparison of OVERSERR and IRRICALC predicted irrigation and drainage depths, Agresearch RE500/2014/070
[9] Modelled irrigation demand changes – 90th percentile vs 85th percentile, Aqualinc Memorandum, July 2014

necessary to ensure irrigators are not deterred from making on-going efficiency investments and improvements,

ALLOCATION METHODOLOGY

33. A robust allocation methodology must be able to account for:

(a) the irrigated production system(s);

(b) the irrigation system(s) type;

(c) the soil type(s);

(d) the climate and it's variation over time;

(e) a given reliability; and

(f) a given technical efficiency.

In my experience it is complex to do this from records of past use. For example how is this practically performed for a cropping enterprise that grows multiple crops in a rotation over a farm with multiple soil types?

34. The concepts of water allocation and actual use should not be confused. This is of particular importance for NZ where irrigation season rainfall and the diverse range of crops grown upon different soil types significantly impact upon actual use from one season to another. Basing an allocation on past use creates issues such as -

(a) It does not easily account for NZ's cyclical climatic variations

NZ has irregular 3-10 year climate cycles. It is challenging and therefore costly to put each season's reliability versus its actual use in the context of a 9 in 10 year reliability.

(b) It does not easily account for rotational cropping farming systems

Cropping farmers typically run a 4 – 8 year rotation to avoid issues such as increased disease resistance or incidence, and to meet market entry requirements, seed crop quarantine needs for example. Crops vary significantly in their water needs based on rooting depth, leaf area, length of growing season and the soil they are grown in. Using actual use for establishing an allocation therefore has a high probability of unfairly reducing the reliability of supply for a cropping irrigator – either allocating them less water than their farming system actually requires or alternatively becoming unnecessarily complex to determine.

35. In my opinion limiting the allocation methodology in schedule 10 to method 1 will be problematic. It is widely accepted internationally[10] that the best mechanism for setting a fair and equitable allocation volume is through using a water balance model as is allowed for in method 2.

SMART IRRIGATION – GOOD MANAGEMENT PRACTICE IRRIGATION

36. Regional Councils often state they apply seasonal volumes to surface takes on the grounds that they will achieve efficiency of water use. In my experience, seasonal or annual volumes do not drive efficiency as for most years (depending on the reliability chosen) an irrigator has more water available to them than they need. Rather, seasonal volumes are derived to give certainty (a defined reliability of supply) to an irrigator usually based upon a particular drought scenario and to relate an individual allocation to the total allocation available.

37. In my view, a better method to drive efficiency is the application of the INZ SMART Irrigation (Irrigation Good Management Practice) framework. It should be noted that the Irrigation Farm Practices (consistency with industry design standards, annual calibration of equipment, use of site specific monitoring and providing proof of the these) contained in Schedule 24 reflect the requirements of the INZ SMART Irrigation framework.

38. The expectations of the SMART Irrigation framework are complementary to improved production (both quality and quantity – through uniformity of application and appropriate application depths and timing), minimised operating costs – through hydraulic design and scheduling, and thus profitability.

Requirements of SMART Irrigation

39. The requirements of SMART Irrigation are simple -

(1) The Irrigation System Can Apply Water Efficiently

Industry codes of practice and standards provide minimum design performance levels

Once installed the performance is checked annually

(2) The Use of Water for Irrigation is Justified

There was a valid reason why I applied irrigation today

(3) Proof can be provided of the above

I am accountable for my actions

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[10] Crop evapotranspiration - Guidelines for computing crop water requirements - FAO Irrigation and drainage paper 56

The Irrigation System Can Apply Water Efficiently

40. This is achieved through –

(a) *Any new development, upgrade or redevelopment is consistent with the INZ Irrigation Design and Installation Codes of Practice and Standards*

INZ has developed Codes of Practice and Standards for Irrigation Design[11] and Installation[12]. Both of these were reviewed and updated between 2012 and 2014. They have been developed in collaboration with technical experts from the irrigation service industries and irrigators. INZ Accreditation Ltd was established in 2012 in part to introduce an accreditation programme for Irrigation Design Companies[13]. This first requires design companies to demonstrate they can achieve the Standard through the application process. Accredited companies then agree (through a legal agreement) to adhere to the INZ Design and Installation Codes of Practice and Standards and be audited biannually with regard to this. The programme has been developed to give irrigators confidence that an accredited company will deliver an irrigation system design that meets the Codes of Practice and Standards. This will ensure it can deliver the required amount of water at the right time to maximise the production potential and importantly minimise environmental impacts.

(b) *A new development, upgrade or redevelopment is commissioned to demonstrate that it has achieved the Irrigation Design Standards*

INZ produced a freely available standard installation contract in 2013 and alongside this a commissioning template was also produced in 2014[14]. Together they allow the irrigation systems design performance parameters to be incorporated into the contract. These can then be used in the commissioning process to hold the installer/designer to account.

(c) *The irrigation system is self-evaluated annually to demonstrate that it continues to perform efficiently*

INZ updated the Evaluation Code of Practice in 2014[15]. It is now called the Irrigation Performance Assessment Code of Practice. Within this, self-evaluation performance methods for all irrigation system types have been collated and documented. The outcomes from the self-audit should be compared to the design performance parameters in the commissioning report. If anomalies are observed they should be rectified, alternatively if there is uncertainty as to the issue a full independent evaluation should be

[11] http://irrigationnz.co.nz/industry/design/
[12] http://irrigationnz.co.nz/industry/installation/
[13] http://irrigationaccreditation.co.nz/
[14] http://irrigationnz.co.nz/news-resources/irrigation-resources/
[15] http://irrigationnz.co.nz/industry/performance-assessment/

undertaken. Such an approach makes economic sense, ensuring the irrigation system is working as it should is an essential risk management strategy for production.

The Use of Water is Justified

41. *Annual justification of irrigation applications to demonstrate responsible use*. Firstly it is important that consistency with any consent condition is demonstrated. These are a legal requirement and therefore must be adhered to. For the justification of use there are a number of ways this can be done. Soil moisture monitoring provides one easy pathway and is becoming more commonly used. A simple water budget (climate and soil data combined with irrigation applications) provides another. There are also crop models available, for example orchardists can use the Tree-Vine irrigation calculator (CropIRLog) and arable growers can use Aquatrac. For irrigation applications that are not triggered through plant induced soil water deficits, other evidence should be provided – for example for frost protection temperature records should be kept.

42. To support and enable all irrigators to perform SMART Irrigation, INZ has developed a comprehensive Irrigation Resource Kit - ‘Irrigation in a Box’[16]. This contains information books to assist in irrigation management and development, irrigation system pre-season checklists, evaluation materials and a range of other information – a one stop shop for irrigators. Alternatively INZ also has one day irrigation operator and manager training courses now widely available[17]. Five of these courses are planned for the Selwyn-Waihora zone during 2014-15 and will be attended by in excess of 120 irrigators. Attending the day allows irrigators to practically understand SMART Irrigation. They also receive a complimentary Irrigation Resource Kit.

Proof can be provided of the above

43. The provision of auditable evidence is key to providing accountability and establishing trust. SMART Irrigation has become an integral part of Farm Environment Management Plans. For Canterbury, and particularly for the Selwyn-Waihora zone, it will therefore become an accountable, industry led pathway for the achievement of improved continuously improving environmental performance.

44. A summary of the INZ SMART Irrigation framework has been included to:

    (a) Demonstrate that the irrigation component of Schedule 24 is consistent with the INZ initiative to improve irrigation environmental performance. Schedule 24 will incentivise actual farm irrigation practices to change for the better – this is what matters if environmental outcomes are sought.

[16] http://irrigationnz.co.nz/news-resources/irrigation-resources/
[17] http://irrigationnz.co.nz/events/

(b) Demonstrate to the wider community that INZ is committed to starting irrigators along the environmental improvement pathway; importantly this will be whilst working on better informing the proposed nitrate percentage reductions contained in Variation 1. The next section of my evidence 'Development of the Nitrate Management Framework' provides the reasoning behind this.

DEVELOPMENT OF THE NITRATE MANAGEMENT FRAMEWORK

45. Water quality is dealt with in other evidence and submissions. I do not propose to provide any evidence on those matters except to outline my involvement in the development of the nitrate management framework in Variation 1. I do this because I have first-hand knowledge of the agreements made through this collaborative process in respect of nutrient management. The Section 42A Report suggests the primary section agreed to the percentage reductions proposed in Variation 1. This is not my recollection of the process.

46. In 2013 the Selwyn-Te Waihora zone committee requested that the primary sectors come up with a nitrate management framework for them to consider. INZ took the lead role in the delivery of this work stream. I was therefore heavily involved in it. The process involved considerable collaboration with primary sector industry bodies, farming enterprises and Ngai Tahu. Monthly updates were presented to the zone committee that included a robust discussion of any inconsistencies and issues as the process progressed. The end result was the nitrate management framework as outlined in the ZIP Addendum.

47. For the nitrate management framework it was agreed that -

(a) By 2017 all farmers should be at Good Management Practice (GMP). The intention being that GMP would be defined by the Matrix of Good Management (MGM) project to be completed in 2015. Evidence on the MGM has been provided by Dr Williams.

(b) A lower limit of 15kg/N/ha should be applied in the zone. Low leaching land uses would be allowed to change their land use within this limit as this would enable a degree of land use flexibility and thus better allow for long-term financial viability. However any land use change should be consistent with that land uses Good Management Practice expectations, as defined by the MGM project.

(c) By 2022 it was agreed there should be a further reduction in nitrate leaching that was consistent with the zone committee's target, an overall reduction of 14% *(check actual number)*. However as GMP had not yet been defined by the MGM project it was considered impossible to set the level of reduction to be achieved by each industry at this time. The reason for this being it was not possible to appropriately assess the achievability of each reduction as the start point, thus equity of this between industries and financial implications were an unknown.

(d) It was agreed that if a farming enterprise had not achieved GMP by 2017 or the further reductions by 2022 then a consent would be required to ensure there was a regulated pathway in place with which to achieve this. It was also agreed 2037 was an appropriate cut-off date to have all farming enterprises operating at the 2022 reduction level. A 15 year period was considered fair as this would better allow for reductions to be achieved through options that may require significant capital investments, allowing existing sunk infrastructure to be paid off and investment made in new.

48. Percentage reductions were not agreed to. The numbers contained in Variation 1 were instead generated by consultants engaged by Environment Canterbury from an Earnings Before Interest and Tax (EBIT) analysis of the patched Look-Up Tables (LUT) interpretation of GMP.

49. The primary sector expressed concern as to this approach and advised it would be better to wait until the outcomes from the MGM project were available. This would enable a robust and defensible analysis from which the percentage reductions could be generated with minimal disagreement. It would also allow the inclusion of an irrigation module that could better account for irrigation practices.

50. As an act of good faith the primary sectors instead put forward the Farm Practices as contained in Schedule 24. This was proposed as an interim measure to demonstrate the primary sector was serious about working towards the zone committee targets for nutrient management until such time the MGM and subsequent reductions upon this could be derived. As it is, we now have a proposal for both Schedule 24 and the percentage reductions.

Andrew Curtis

29 August 2014