IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	applications by Central Plains Water Trust to: Canterbury Regional Council for resource consents to take and use water from the Waimakariri and Rakaia Rivers and for all associated consents required for the construction and operation of the Central Plains Water Enhancement Scheme Selwyn District Council for resource consents to construct and operate the Central Plains Water Enhancement Scheme
AND	
IN THE MATTER OF	a notice of requirement by Central Plains Water Limited to: Selwyn District Council for the designation of land for works associated with the construction and operation of the Central Plains Water Enhancement Scheme

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RESPONSE TO S42A OFFICERS' REPORT OF PHILIP THOMAS DONNELLY

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1. I have read the report by Mr Nick Boyes with the comments by Dr Brown and Mr Butcher. I wish to respond to those reports as follows:

Response to Dr Brown

2. Dr Brown provides an economic definition of efficiency which I consider is of little usefulness to the Hearing Committee.[1] In addition, Dr Brown provides alternatives statements[2] in terms of assessing efficiency, which has three components.[3] In fact I consider his latter suggestions are misleading and/or unhelpful as they are concerned with productive efficiency (also referred to as technical efficiency) rather than allocative efficiency, the concept relevant to this hearing.[4]

3. The strict definition of efficiency, also known as Pareto Efficient Allocation, is:

> *"An allocation of resources in which no one individual can be made better off without making someone else worse off."*[5]

4. However, this theoretical requirement has little practical usefulness and the Kaldor Hick's compensation test is applied in practice (e.g. CBA) to make decision making more definitive. This test states that a project is to be judged socially beneficial or efficient if the gainers secure sufficient by way of benefits such that they can compensate the losers and still have some net gain left over.

5. Compensation does not actually have to take place to satisfy this test. In my opinion this is consistent with the RMA assessments which require consideration of efficiency (i.e. in respect to section 7(b) and section 32 (3b), where relevant) but does not necessarily require compensation (i.e. section 85 – compensation not payable in respect to control of land).

6. Dr Brown claims that a district viewpoint is the appropriate focus for determining whether the proposed irrigation scheme is efficient as a designation is being sought for Selwyn District Council.[6] Consents are also

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1 Para 20.
2 Para 21.
3 The three components of efficiency are productive, allocative and dynamic efficiency.
4 The problem with focusing on productive efficiency is that society can be productively efficient at producing the wrong mix of goods (e.g. producing just size 8 left foot shoes may be a technically efficient use of society's resources, but it will not be economically efficient if it does not satisfy society's preferences). Thus the Kaldor Hicks definition is more useful and the basis of all CBA and, therefore, in my opinion should be used in the assessment of the subject irrigation scheme while it is the underlying basis of all cost benefit analysis.
5 Page 877, Walter Nicholson, Microeconomic Theory Basic Principles and Extensions, Sixth Edition.
6 Para 23.

being sought from Environment Canterbury while the economic effects are very important nationally. Thus, I consider a national perspective is far more relevant to an assessment of the scheme's economic efficiency. Especially, as the district's economic well-being is totally entwined and dependent on the wider regional and national economies. It is noteworthy that Selwyn District Council's request for further information specifically required the CBA assessment from a national rather than a district perspective[7].

7. Dr Brown critically discusses the Macfarlane Rural Business (MRB) analysis of the scheme and notes that a July 2007 revision increases dairy product prices by over 30 percent compared to April 2007 figures.[8] Mr MacFarlane addressed this criticism. However, I would like to add that I considered the revision was essential. In my view the MRB analysis was excessively conservative on its revenue assumptions. Not only because of a substantial structural movement in demand for some applicable farm gate prices, but also because there was no allowance in the long-term price forecasts for the foreseeable downward movement of the New Zealand dollar exchange rate. That exchange rate is at long-term unsustainable levels, while foreseeable devaluation has positive implications for New Zealand farm gate returns. The unsustainability of the current high New Zealand exchange rate is highlighted by New Zealand's balance of payment deficit which is around nine percent of Gross Domestic Product.[9]

8. Dr Brown asserts that the only way to determine whether the economic impacts and benefits I have assessed will be realised is by addressing a number of questions he poses in respect to the scheme profitability to individual farmers.[10] However, if key MRB assumptions (e.g. affordability, productivity) are not broadly realisable in practice, then the scheme will not go ahead as farmers will not buy into it. Therefore, Br Brown is incorrect in stating: "The applicant takes the view that " the downstream benefits to the community of (the) increased earnings will be present regardless of the initial profitability for the individual farmer"[11]

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7 Refer quote at paragraph 78 of Dr Brown's evidence
8 Para 38.
9 Above five percent of GDP is generally considered unsustainable.
10 Para 53.
11 Para 56.

9. Dr Brown quotes figures[12] from a 2007 report that I prepared.[13] I wish to draw the Hearing Committee's attention to the fact that the report's figures have been amended and, therefore, the figures quoted by Dr Brown are not necessarily correct.

10. He indicates that I have given the impression that the key variables assessed in the economic impact analysis (i.e. output, GDP and jobs) is additive.[14] I disagree as I indicated in my evidence that added value (i.e. GDP) is a component of output and that the added value measure avoids double counting of economic activity by excluding some items that make up output.[15] For that reason it is a superior measure of change in activity.

11. Dr Brown discusses and rejects the argument that economic impacts analysis can have a role to play in helping to determine whether use and development of resources can promote social and economic well-being.[16] I agree with Dr Brown's assertion that an assessment of the scheme's efficiency is the best means of determining the impact on (enabling) economic well-being. However, society also places value on jobs (which are a cost from an efficiency perspective). In addition, GDP, a principal focus of economic impact analysis, is the internationally accepted measure of economic activity. Growth in GDP is considered important as Government spending on areas such as health, education, social welfare and law and order are vitally dependent on it. The New Zealand Treasury and other Government departments, Reserve Bank, the private sector, IMF, World Bank, Organisation for Economic Development (i.e. OECD) and so forth, monitor GDP statistics.

12. Thus economic impact analysis is highly relevant to consideration of the socio-economic impact on society's wellbeing and, therefore, I disagree that an efficiency assessment is the only test that is relevant to consideration of the proposed irrigation schemes socio-economic impact. It is noteworthy that Mr Butcher states in his evidence that: "With respect to irrigation matters I have undertaken economic impact assessments on numerous schemes including several in Central Otago, Downlands, Rangitata, Hunter Downs and a generic assessment of the economic impacts of the Central Plains scheme in 2000 for Central Plains Water". Thus, Selwyn District Council's two economic experts

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12 Para 65
13 Economic Impact and Cost Benefit Assessment, Central Plains Irrigation Scheme.
14 Para 67.
15 Par 7.2.
16 Para 69.

would appear to disagree on the value of economic impact analysis, as Mr Butcher's statement implies he also considers this type of assessment is highly relevant to section 5(2), assessments on economic and social well-being.

13. I agree with Dr Brown's assertion that economic impact analyses do not reflect any consideration of the resource costs of achieving output, added value or employment and by itself does not demonstrate a contribution to social and economic wellbeing.[17] Used in combination with CBA, which I have done, it is a valuable tool, especially as it concentrates on highly relevant regional effects. Economic impact analysis is a widely accepted economic evaluation technique while, as previously stated, GDP (and jobs), is a universally accepted and widely used indicators of economic performance.

14. Dr Brown states in respect to Economic Impact Analysis that: "…it is particularly important to clearly identify what is likely to occur over the project area in the absence of the proposed project – the 'Without – Project' scenario.[18] I disagree, as economic impact analysis is "before" and "after" assessment as explained in paragraph 5.3 of my evidence. This is a fundamental distinction between this evaluation tool and CBA, which applies "with" and "without" analysis. While the analyses are complementary, they adopt different perspectives as they measure different things.

15. Dr Brown states that my Economic Impact Analysis amalgamates the assessed construction impacts with the irrigation and processing impacts. Further he argues that construction impacts can be quite negative, particularly on smaller communities as construction workforces are typically quite transient. He argues this can be quite disruptive, as businesses in smaller communities invest capital to cope with additional demand, and then suffer from excess capacity post construction. [19]

16. While the combined effects are shown, I also show the irrigation and processing impacts (refer Tables 3 and 4) separate from the construction impacts (Table 5). The construction impacts are only a small amount of the 35-year total impact, namely, 11 percent of direct and indirect output, nine percent of direct and indirect GDP and six percent of direct and indirect jobs. Further, while no examples are quoted to support Dr Brown's assertion, it is unlikely that

[17] Para 70
[18] Para 73.
[19] Para 76.

over investment by local business will apply to the proposed scheme because of its close proximity to Christchurch's urban area. Most of the schemes construction workers are likely to travel from and reside in Christchurch urban areas and, therefore, it is unlikely that scheme construction workers will need temporary accommodation or make excessive demands on smaller communities for goods and services.

17. Dr Brown is correct in asserting that the region I have adopted for analysis purposes is the Canterbury region.[20] I also agree that the direct operation impacts will mainly accrue within Selwyn District. Those impacts are about half of the total output and GDP impacts, but 36 percent of total jobs. I also agree that the indirect impacts are more likely to be largely concentrated in or around Christchurch City. However, that does not mean that Selwyn District residents will not benefit from that activity as a large percentage of residents earn their living working in the city as the district is an important dormitory centre to Christchurch.

18. Dr Brown notes that I have assumed a continuation of existing farming operations in my CBA, i.e. a no change situation. He states that this is an unlikely situation as land use change and expansion of groundwater irrigation seems to be ongoing.[21] There are two issues to be considered in this respect, namely, change in farming output generated by technology and change specific to irrigation. Technological change is likely to affect the proposed scheme as much as existing farming operations. That is existing farming and the scheme scenarios are both likely to be higher than estimated over time because of technology driven increased output. Thus this type of change is unlikely to cause an overstatement of CBA results as it will apply to both scenarios.

19. In respect to change driven by irrigation, my understanding is that groundwater has been fully allocated in the irrigation scheme area and, therefore, there is likely to be little if any "net" expansion of irrigation based on "additional" allocations of the area's present groundwater resource. Irrigation by individual farmers from scheme areas close to the subject rivers is possible but small scale. The main potential for change generated by irrigation is from competing schemes. I address this issue in my evidence where I state it has not been possible to test the proposed irrigation scheme against any competing projects

[20] Para 77.
[21] Para 82 and 83.

that may also wish to use the water for irrigation and/or other purposes (e.g. hydro electricity generation). However, I state the relevant points that suggest that the proposed scheme is the best use of society's resources, including the water to be abstracted.[22]

20. In his criticisms Dr Brown's report appears to lose sight of the purpose of CBA. He mentions in several places that I may have overstated the assessed improvement to economic well-being and implies the end result is principally to determine an absolute sum by which society's wellbeing is enhanced (e.g. $XM). In fact the principal objective is twofold, namely, to identify whether a project is efficient (i.e. whether it produces a positive NPV at the chosen discount rate) and to select the best project or projects where there are several alternative projects competing for the same resources. In respect to the first point, it is not particularly important whether the NPV is $1000M, $100M or $1M. All results meet the efficiency test (i.e. a positive NPV), but the higher figures obviously have more scope for variation in assumptions without changing the conclusion that a project is efficient. Therefore, all things being equal, more confidence can be placed on an NPV that substantially exceeds zero. I have shown the proposed irrigation scheme is efficient and, through sensitivity testing, considerable confidence can be placed on my analysis as it is not overly sensitive to reasonable change in assumptions.

21. By ranking competing mutually exclusive projects and selecting the best the second objective of CBA is achieved.[23] I have shown that the proposed irrigation scheme is efficient, but I cannot rank it as there are no known competing projects. Therefore, I cannot say with absolute certainty that the proposed project is the best possible use of the subject water resource from society's perspective. But, as noted in my evidence, the RMA adopts a first-in first-served approach to resource consent applications to use water, while transferability of water permits is the best means of encouraging best use of the resource.[24] In my opinion, both those provisions are designed to discourage regulators from trying to pick best use of water resources as only markets can achieve this.

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[22] Para 9.33.

[23] This is the approach historically adopted in evaluating roading projects funded by road taxes and fuel levies. Projects are subject to CBA and ranked in order of social desirability and the best are chosen within budget constraints.

[24] para 9.33

22. Dr Brown is critical of the fact that my CBA does not subscribe a price to water as the Council has noted that take and use consents are limited and that there is intense competition amongst potential users for these consents. Because of this he concludes that consents would trade above zero price if there were a market and, therefore, there is an opportunity cost to use of the subject water. He argues that I should have shadow priced the water.[25] As I did not do that he asserts the net benefits are overstated.[26] I refute this for several reasons:

- water is indisputably a free good although at times in specific locations it will have scarcity value. This is a reflection of the opportunity cost of capital rather than water being a scarce environmental commodity per se. Irrigators and other users may at times pay for the right to use water as it avoids storing it or the sometimes prohibitive cost of transporting water from locations where it is abundant (e.g. the West Coast to Canterbury)

- there are rules restricting the maximum take for the Rakaia to 70 cubic metres per second while there is no maximum cap on the Waimakariri. However, from an economic perspective those regulated constraints are without supporting economic rationale, i.e. they are not determined as a consequence of CBA showing the social benefits are greater than social cost. The whole purpose of shadow pricing is to remove the distortions caused to the true value of resources caused by market imperfections and government intervention to pursue non-economic goals (e.g. environmental protection regardless of cost, social policy). Thus the fact that regulators have created a situation where consents may be traded above zero price is not evidence that there is a true opportunity cost to use of water

- the whole purpose of the proposed scheme is to harvest and store water when it is an abundant resource and to provide it to irrigators when natural flows are low.

23. Dr Brown queries the weight that can be placed on my analysis given that the applicant has stated that capital cost is almost certain to vary significantly from any estimate provided. He states that he cannot understand why the Applicant cannot provide capital cost estimates with appropriate levels of contingency

[25] By shadow pricing he means determining a price for water that represents its true value to society if real markets could be established for it in the subject rivers.
[26] Para 86.

allowances.[27] However, the hearing is in relation to a designation of land for works associated with the construction and operation of the Central Plains Water Enhancement Scheme, as well as a large number of resource consent applications. The aspect of the work with the largest potential for cost variation is in respect to works in the area covered by the designation. The application is based on and provides the required flexibility to accommodate the detailed design of the scheme, so as to avoid having to re-apply for consent to accommodate detailed design issues that may materialise. I have addressed the construction uncertainty created by this situation by applying sensitivity analysis to the estimated costs. This shows that the scheme's capital and operating cost could be much higher and still produce a strong welfare gain to society.

24. The water uptake assumptions used in the analysis are criticised by Dr Brown. Those assumptions were adopted on the advice of Mr MacFarlane who considers they are realistic. The scheme has a long lead-time to construction and, consequently, farmers have a lot of time to consider their participation in the scheme. Regardless, I tested the impact of extending the full uptake of the scheme from six to eight years and found the scheme is not particularly sensitive to the uptake assumption.[28] The rate of uptake could be much slower than assumed while still making a substantial contribution to society's well-being.

25. Dr Brown claims that using the MRB April 2006 budget, costs are greater than benefits at 10 percent discount rate.[29] I have not reworked my model to see if this is in fact the case. However, there are three points that should be considered:

    - the latest budget is the most relevant as the reason for the revision was that costs and benefits had changed. Further changes can be expected before the scheme is constructed, but the scheme will only get built if market conditions remain favourable overall

    - the 10 percent efficiency threshold adopted for analysis purposes is high. As stated in my evidence, debates in the economic literature generally relate to arguments supporting lower rather than higher social discount

[27] Para 90.
[28] Refer para 9.28 and 9.30 of my evidence
[29] Para 96

rates. Sensitivity analysis shows that at lower rates the welfare gains to society from the irrigation scheme increase significantly

- the scheme is more sensitive to revenue than cost movements. The revenue assumptions, however, are based on prices below current market returns and are based on a high exchange rate. The probability that the exchange rate will be lower on average over the analysis period provides substantial scope for a downward movement in international commodity prices without significantly adversely effecting revenues.

26. Dr Brown is critical of the lack of close assessment of the cost of alternative options to ensure that the least cost option is adopted and considers this is important to the efficiency assessment.[30] There is considerable commercial incentive on the applicant to ensure that least cost options within the consent envelope that has been applied for is constructed. The appropriate time for that analysis is at the detailed design stage. Regardless, lower cost options will merely improve the estimated net benefit to society.

Response to evidence of Geoffrey Butcher

27. Mr Butcher provides additional comments to Dr Brown's in respect to "capital cost estimates", "water as a free good" and lower product prices in old MRB budgets. However, I have no further comment to make as those comments are adequately addressed in this statement.

P T Donnelly

[30] Para 100 to 102