

1. EXECUTIVE SUMMARY

- 1.1 Plan Change 6 (PC6) to the Hawke's Bay Regional Resource Management Plan became operative on the 1st of October 2015. It set groundwater allocation limits for the Ruataniwha Basin which is located within the Upper Tukituki River Catchment. Included within those limits was an allocation of deep groundwater that PC6 has labelled Tranche 2. In response to the Tranche 2 allocation, eight parties have applied for a groundwater take.
- 1.2 Each of these properties plan to abstract water for agricultural production purposes. The proposed take for agricultural purposes is 8.4 million m³/yr. In addition to this quantity, a significant part of their total take (4.5 million m³/yr) will be used for augmentation back into surface water bodies to support low flow periods. There is also 2.2 million m³/yr residual available for any necessary mitigation.
- 1.3 The eight applicants submitted individual applications to the council. In August 2021 a revised combined Assessment of Environmental Effects (AEE) was submitted to the council following council request to show the combined impact of the applications. To support this AgFirst Waikato Ltd (AgFirst) were engaged by the applicant group (in March 2022) to provide an overarching report that outlined the combined water take requirements, nitrogen discharges and other environmental impacts associated with the proposed irrigation and an assessment of the potential economic effect on the farms and community, which is the purpose of this report.
- 1.4 To prepare this report AgFirst reviewed all the of the existing information, particularly around water use requirements and associated IrriCalc and OverseerFM (Overseer) modelling. Where necessary, Overseer files were updated or reworked. It is noted AgFirst is reliant on the provision of accurate information by both the farmer applicant and the nutrient management consultant who prepared the Overseer files.
- 1.5 The analysis was based on the following understanding:

- (a) The eight applicants are applying for the irrigation water for agricultural purposes (8.4 million m³/yr) to:
 - (i) Increase security of water supply to continue existing farming operations (e.g. replacing leased water with their own consented water).
 - (ii) Move to higher value land uses.
- (b) Seven of the eight applicants will also require a land use consent. The conditions of the consent will require the landowner to ensure that there is no increase in nitrogen discharges as a result of the irrigation.
- (c) For the purpose of this report environmental impact is limited to the nitrogen, phosphorus, sediment, and *E.coli* discharges and greenhouse gases.

1.6 Assessment of likely environmental impacts of irrigation, along with mitigation of effects, is best undertaken using a combination of Overseer modelling in conjunction with industry accepted science and the Hawkes Bay Regional Council (HBRC) two-tiered risk matrix.

1.7 The key conclusions from the analysis are as follows:

- (a) Overseer modelling of the proposed irrigation with a combination of land use changes, livestock management changes, and farm management changes indicate that nitrogen losses will not increase as a result of the irrigation.
- (b) Overseer modelling scenarios have been assessed as potentially viable and the resulting outputs credible based on current science and understanding.
- (c) HBRC matrix assessment and found two farms drop a category, four remain in the same category and two increase a category. This increase in category is caused by increased imported nitrogen for both farms. With irrigation it is possible to increase imported nitrogen application to pastures and crops without increasing loss

of nitrogen as, with effective management, irrigation enables increase yield and improved utilisation efficiency.

- (d) GDP outputs as a result of the irrigation development equate to \$5.7 million per annum.
- (e) The aggregated net economic benefit for the eight properties was \$4.4 million per annum. This equates to a return of 12% before taxation on the approximately \$36 m of capital (irrigation) that will need to be invested.
- (f) An increase in horticultural area provides increased employment opportunities for the region. If 260 hectares of land is converted to horticulture, this could provide additional employment for up to 74 people.
- (g) There is approximately 1.3 million m³ per annum of potential irrigation water available for mitigation. This would be sufficient to irrigate 217 ha, add \$217,317 per year of net benefit, and provide additional employment for 10 people in the community.

2. INTRODUCTION

- 2.1 My full name is James Kenneth Allen. I am managing director of AgFirst Waikato (2016) Limited (**AgFirst Waikato**)
- 2.2 I have been working as an agricultural consultant since 1996, based in the Waikato region for all of that time. From 1996 to 2001 I was employed by the agricultural consultancy firm Agriculture New Zealand Limited. Since 2002 I have been self-employed with AgFirst Waikato.
- 2.3 I am also a director of AgFirst Manawatu-Whanganui, and AgFirst Taranaki.
- 2.4 I am a previous chairman (and director) of AgFirst Consultants New Zealand Ltd.
- 2.5 The core base of my experience relates to farm management consultancy, in its wider context.
- 2.6 I hold a Bachelor of Agricultural Commerce (farm management and rural valuation majors) from Lincoln University, New Zealand, and a Professional Masters in Agribusiness, also from Lincoln University. I am a Fellow and registered member of the New Zealand Institute of Primary Industry Management, where I was national president for two years. I am also a director on the Nutrient Management Advisers Certification Programme Limited.
- 2.7 My relevant qualifications include accreditation in Farmax, intermediate and advanced Sustainable Nutrient Management, NZIPIM Dairy Farm Systems Certified Consultant, and a certified nutrient management adviser.
- 2.8 I have been engaged by a collective of eight applicants to provide expert opinion in relation to providing a combined assessment of the environmental and economic effects of abstracting water from the Tukituki river. The eight applicants are: Te Awahohonu Forest Trust (TAFT), Papawai Partnership, Tukituki Awa, Plantation Road Dairies, Springhill Dairies, I & P Farming, Buchanan TrustNo. 2 and Purunui Trust.

- 2.9 The nature of my work leads me to work across a wide range of issues in the primary sector. This includes, but is not limited to: farm management system design, farm investment advice, preparation and review of farm environment plans, economic analysis, on-farm financial management, reviewing nutrient budgets, greenhouse gas emissions reductions plans and advice on land use optimisation.

Methodology

- 2.10 The consent application comprises a collaborative group of applicants that have come together for this application to more effectively address and manage the potential effects of the proposed taking on the surrounding environment and other nearby water users. This project was governed by a smaller committee consisting of the applicants and a resource management planning expert. Our methodology was as follows:

- (a) Desktop review of all of the relevant background material, i.e. applications, AEE, various correspondence.
- (b) Review existing OVERSEER files (these files were created for their land use applications and their baselines). This includes comparison with application volumes.
- (c) Compare the OVERSEER files with the individual applications
- (d) Review alignment of irrigation water take volumes requested against proposed water use requirements from the Overseer modelling. IrriCalc data sourced from Aqualinc was used to determine the irrigation volume requirements. To ensure that the Overseer files provided accurately represented the environmental impact of the full volume being applied for by each applicant, each proposed scenario was compared with IrriCalc to seek alignment between Overseer and IrriCalc. The 90th Percentile annual irrigation volume was taken to be the application volume. IrriCalc was calculated based on a given area (by the applicant and

optimised by Aqualinc modelling) and based on the use of irrigation for pastoral agriculture. IrriCalc also has the ability to output average annual irrigation volumes (m³/yr). This volume is what was compared to the irrigation volumes modelled in Overseer proposed scenarios as Overseer is an 'averaging' model. As the input data for the two models and the calculation methods are not identical, AgFirst agreed that the volume of irrigation applied in the Overseer scenario modelling needed to be ± 25% of the IrriCalc average annual irrigation volume

- (e) Engagement with the eight farmer applicants and their associated nutrient management experts who have pulled together the relevant consent applications and undertaken Overseer modelling.
- (f) Full irrigation application scenarios (or future opportunity scenarios) were requested and finalised.
- (g) A review of the environmental impact of each applicants current land use and proposed land use was conducted through comparison of Overseer files.
- (h) Using the Hawkes Bay Regional Council (HBRC) two-tiered matrix an assessment of each applicants current ranking verses their proposed system was undertaken.
- (i) Review of proposed farm system changes and associated economic costs and benefits.
- (j) Compilation of financial impacts at the farm level, and the associated impacts to the wider community.

2.11 There are several limitations to this report. In preparing this report, AgFirst were reliant on:

- (a) The quality of the data provided by the farming applicants.

- (b) The competency of the nutrient management consultants who prepared the Overseer files.
- (c) The assumptions provided by the applicants with regard to their proposed land use once irrigation is secured.
- (d) The assumption that farmers are achieving and will continue to achieve good farming practices at minimum and are operating efficient irrigation systems.
- (e) The assumption that the proposed farm systems are economically and practically viable.
- (f) The accuracy of Overseer and IrriCalc.
- (g) AgFirst has not undertaken site visits as the preparation of the Overseer files was done by the various nutrient management consultants. Information received from applicants was reviewed to ensure assumptions were reasonable.

Code of Conduct

- 2.12 Although this is a Council hearing, I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this statement of evidence are within my area of expertise.

Scope of Evidence

- 2.13 My evidence will address the following matters:
- (a) I was engaged by the applicant group (in March 2022) to provide an overarching report that outlined the combined water take requirements, nitrogen discharges and other environmental impacts associated with the proposed irrigation and an assessment of the potential economic effect on the farms and community

- 2.14 Where appropriate and relevant, my evidence will reference and rely on the evidence of Julian Weir, a principal engineer from Aqualinc Research Ltd, whose opinion I agree with.

3. SUBMISSION

- 3.1 The detail of my submission is shown in the report titled “Applications for take, use and discharge of Tranche 2 groundwater: combined assessment of environmental and economic impacts.” The executive summary of this report forms the basis of the executive summary for this evidence. The full report is attached to this submission.
- 3.2 The key conclusions from the analysis, which are outlined in the report, are as follows:
- (a) Overseer modelling of the proposed irrigation with a combination of land use changes, livestock management changes, and farm management changes indicate that nitrogen losses will not increase as a result of the irrigation.
 - (b) HBRC matrix assessment found two farms drop a category, four remain in the same category and two increase a category. This increase in category is caused by increased imported nitrogen for both farms. With irrigation it is possible to increase imported nitrogen application to pastures and crops without increasing loss of nitrogen as, with effective management, irrigation enables increase yield and improved utilisation efficiency.
 - (c) GDP outputs as a result of the irrigation development equate to \$5.6m per annum.
 - (d) The aggregated net economic benefit for the eight properties was \$5.7 million per annum. This equates to a return of 12% before taxation on the approximately \$36m (of capital (irrigation) that will need to be invested).

- (e) An increase in horticulture provides increased employment opportunities for the region. If there is 260 hectares of land converted to horticultural purpose this could provide additional employment for up to 72 people.
- (f) The payback period of the investment is approximately 8 years. The net present value becomes positive after 16 years assuming a discount rate of 20% which is reasonable due to the risk (consenting risk, infrastructure development risk, farm systems risk) associated with the T2 proposal.
- (g) It would be unrealistic to restrict the applicants to growing specific crops as is suggested in the Section 42a report. Crops need to be rotated based on climatic conditions, environmental conditions, profitability and market demands. The applicants are seeking a long-term consent, and there may be new crops available in the future that are not even considered at this stage. Placing such a restriction on the consent holders would potentially be disadvantageous to both the consent holder and the land and environment. It is suggested that the desired environmental outcomes are best controlled and determined by the Farm environment plans that the consent holders will be bound to. It is also suggested that the consented area is set as the total area of the land parcels that the applications have applied for as part of this consent.
- (h) There is approximately 1 million m³ per annum residual available for mitigation. This would be sufficient to irrigate 167 ha, add \$217,317 per year of net benefit, and provide additional employment in the community.

The following tables summarise these results

Table 1: Summary of evidence

	Application volume for irrigation (m ³ /yr.)	Total N loss (kg/yr.) current	Total N loss (kg/yr.) proposed	HBRC matrix category current	HBRC matrix category proposed
TAFT	2,841,220	37850	38976	M	L
Papawai	1,010,817	13267	13267	H	H
Tuki Tuki Awa	607,000	4788	4788	H	H
Plantation Rd Dairies	1,645,279	41526	32741	H	H
Springhill Dairies	497,652	11385	10233	M	H
I & P Farming	916,010	4870	4890	M	M
Buchanan Trust	550,960	8698	8852	L	M
Purunui	370,321		5250		M
Total	8,439,260	122384	118997		



James Allen

31 October 2022