

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of the Proposed Plan Change 10 to the Bay of Plenty Land and Water Plan

SUMMARY OF EVIDENCE OF RICHARD ALLEN FOR DAIRYNZ AND FONTERRA

1. INTRODUCTION

- 1.1 My full name is Richard Grant Allen.
- 1.2 I have been employed by Fonterra Co-operative Group Limited (Fonterra) since 2008. In my time with Fonterra I have been involved in the development and implementation of the on- farm environment programmes – namely the Effluent Programme, the Stock Exclusion (“Waterways”) Programme and the Nitrogen Programme. I was seconded to DairyNZ in 2011 to design and pilot an ‘Audited Nitrogen Management System’ – this system is now the basis for the Fonterra Nitrogen Programme and the nitrogen management commitments in the Sustainable Dairying Water Accord are based on that system.
- 1.3 My qualifications and experience are set out in my evidence document dated 3 March 2017.
- 1.4 I have read the document: *code of conduct for expert witnesses* and agree to comply with it.

2. SCOPE OF EVIDENCE

- 2.1 My evidence looked to outline some of the practical issues associated with the use of Farm Plans, OVERSEER and the reference file approach to managing OVERSEER version changes. It also touched on existing Industry systems that might be adapted to help support farmers meet new regulatory requirements.

3. THE RELATIONSHIP BETWEEN OVERSEER AND THE 'NITROGEN MANAGEMENT PLAN' IN PC 10

- 3.1 It is well understood that managing phosphorus (P) loss, and the sediment that carries P, from a farm requires a focus on specific risk areas (critical source areas or 'hotspots') and the linkage between those areas and water. The risk of P entering water is highly spatially variable, generally localised and the risk source area is often visible.
- 3.2 In contrast, nitrogen (N) loss is more likely to be a whole farm (or at least management block level) loss risk. Multiple factors and complex processes and pathways determine the amount of surplus N that will pass beyond the root zone and become available to be lost to water. The losses are occurring at a block or farm scale and are not visible.
- 3.3 Because of the above it is appropriate to apply different approaches to managing and regulating P and N.
- 3.4 Actions to target P / sediment loss hotspots and risk factors can be identified in a farm plan with time bound good management practice actions as a compliance point. It is generally possible to assess if actions have been implemented through an inspection of the risk area.
- 3.5 The multi factor N loss risk is better managed in an over allocated situation through an output based regulatory approach, rather than locking in practices and inputs as actions in the farm plan that become compliance points. The actions that would be described in a Plan to manage N loss can generally not be assessed through a visual assessment. Where there is a robust and recognised model that can be used to provide a quantitative assessment of N loss risk at management block or farm scale, the regulation of N loss can be made more efficient. As long as the system being described can remain within the nitrogen loss limits as modelled by Overseer, farm management practice and inputs should be enabled to vary. Allowing flexibility of inputs will ensure efficient farm system responses can be made to often

uncontrollable variables such as rainfall, temperature, feed supply, availability of supplements, availability of off farm grazing, product price etc.

- 3.6 While scenario modelling using Overseer to model the impacts of various management and input decisions on N loss, will assist farmers to understand and plan for changes they may need to make in the future, locking the actions in a scenario modelling exercise in to a consent condition is unrealistic and inefficient. Predicting and committing to a single set of management and input decisions 5 years ahead (let alone 15 years ahead) will mean a need for regular changes to consents, uncertainty for farmers and unnecessary additional costs as farmers respond to all the factors outside of their immediate control. Where the section 42A report identifies (in Appendix 1 table on p69, bottom row) that “...*Overseer input parameters...*” are one of the “*key compliance elements*” it may not be immediately clear to non-Overseer users just how many parameters this is referring to. It is also unclear if all the inputs must match the actions in the NMP or if only a couple of key ones must match while all the others can vary.
- 3.7 I have listened to the council evidence and read the relevant sections of the section 42A report and it is still not at all clear to me how the council intends to apply in parallel the two systems it is describing for the management of nitrogen – firstly the actions described in an NMP reviewable five yearly, and secondly the Overseer output from the annual reporting requirement. If the actions are locked in as described in the Plan what is the point of the annual Overseer exercise when the inputs - and therefore the outputs - will have to be the same for compliance?
- 3.8 As written the Controlled Activity land use rules appear to anticipate that the farmer would provide an annual Overseer file that demonstrates that the actions described in the NMP were carried out. (E.g. LR R8 matters of control (ii)). Clearly farmers will have to make some changes to practice year on year in response to factors they cannot control and council officers appear to appreciate this reality. It is not however clear at what point a change to consent might be required to allow for this year on year variability. A submitted actual Overseer file will always show some variance in inputs to those that were anticipated in the Farm Plan and council staff seem to appreciate that. However there is no clarity as to when the council would consider enforcement action appropriate for an Overseer file that was not the same as the farm plan actions.
- 3.9 Policy 11 sets out how controlled activity consent applications should demonstrate actions that would enable compliance with the Managed Reduction Target (MRT) and Nitrogen Discharge Allowance (NDA). I agree that this is an appropriate part of

the consent application and will make the applicant aware of the need to carefully monitor how farming decisions might impact on the ability to achieve the targets as they come up. I do not agree that it is then necessary for the actions in the scenarios to become compliance standards.

- 3.10 The assertion that this is necessary (Evidence of Park and MacCormick) because Overseer outputs cannot be enforced is difficult to understand. There are Operative Plans where the use of Overseer output numbers as standards (and for defining activity status thresholds) have been considered and approved as appropriate by the Environment Court. (Horizons, Otago). It seems unlikely that it was not intended that these standards would be enforceable. Further, in this Plan Change 10 there is an intention to establish an N trading platform presumably using Overseer as the tool to enable that trading to occur and to be monitored. If the tool is suitable to be used in this way in the Plan then in my opinion it should be suited to be used to show compliance with a clear standard.
- 3.11 Where a consent establishes a standard to be met based on a clearly described measurement system (in this case Overseer), the council does not need to prove the effects of a breach of that standard. The failure to comply with a clear consent condition requiring achievement of a measured standard is an enforceable breach of itself. The question has been raised as to what is the compliance point (in time) if an Overseer output number on a rolling 3 output basis is applied as a performance standard. I think the answer is very simple – after 3 years (rolling 3 year output average as per DairyNZ ./ Fonterra submission) if the annual data set, submitted as an Overseer file, shows that the average N loss is above the relevant MRT that is a breach of the consent condition. The scale of that breach, history of previously breaching and the willingness of the consent holder to manage the next season N loss down so as to bring the rolling average back to compliance would be factors for the council to consider in determining any action. What is far less clear to me is how the council would enforce a series of actions written in to plan that (in theory) will achieve compliance with the next MRT. (Noting that the MRT that the scenarios must comply with, is a binding future standard and doesn't appear to be a retrospective threshold).
- 3.12 Mr Park at 52(d) of his evidence describes compliance as “focussed on the actions in the NMP in the first instance” but then immediately goes on to explain that “If there is a non-compliance with one or more specified NMP parameters (e.g. stock numbers), then council staff may require an Overseer assessment to check compliance against the relevant quantitative N limit.” (my emphasis) However at 47 Mr Park says “PC 10 largely addresses the Overseer compliance challenges by making the primary point of compliance the NMP...”. It is not at all clear in this evidence if

the compliance point is the failure to follow the action described in the NMP or the breach of the N limit (if the Overseer check finds this to have occurred). In my opinion, for the reasons set out earlier, it should be the breach of the N limit that is the compliance point.

- 3.13 It is generally accepted that good practice use of Overseer in regulation would allow for compliance with any numeric output limit to be assessed on a rolling output average basis. This is in recognition of the Overseer reliance on long term average climate data and therefore farmer responses to real climate variability should be allowed for (even in a limited way as would be the case with a 3 year rolling average approach). In PC 10 Schedule 5 “Use of Overseer” there is the statement that (at end of introduction section), *“Annual Overseer files submitted as part of consent or permitted activity conditions will be monitored on a three year rolling basis but may also be assessed on an annual basis”*. This flexibility in how the council intends to consider Overseer outputs adds to uncertainty about how compliance is intended to be assessed for nitrogen. The Schedule appears to identify good practice for Overseer use - assessment on a rolling output average basis – but that is immediately followed by allowing for a different approach with no guidance on when or why that would happen.
- 3.14 Overseer, used in the recommended way, would allow BOPRC to apply the most efficient regulatory approach to managing N, meaning locking in farm practices and inputs as compliance points in a farm plan is not necessary. Using a 3 year rolling output average, as is proposed in the DairyNZ / Fonterra submission, to identify compliance with a discharge allowance is good practice for the use of Overseer in regulation.

5. THE USE OF A REFERENCE FILE TO RECALIBRATE A NDA

- 5.1 While the reference file approach to Overseer version changes is relatively simple for the council to administer, and avoids the uncertainty in Plan processes where a clear version control method has not been spelt out, the issues that occurred following notification cannot be overlooked and there are alternatives available that do not appear to have been fully considered by the council. Also while administration may be simplified by applying a reference file average to a group of farms that in fact are dissimilar in many ways, the basis for the recalibration will possibly not be well understood by anyone beyond the council experts who developed the approach. I accept that Mr Mattheson, Mr MacCormick and Mr Park have developed the reference file approach with a genuine intention to streamline

processes however I continue to have concerns about transparency and within sector equity, as well as writing in to regulation such an untested approach with no alternative approach allowed for if anomalies do occur.

5.2 Due to an Overseer bug, the reference file output change with an Overseer version change (post notification) did not represent the output change that occurred on the real farms. Bugs in this model have been a common occurrence and while that is normal in a complex computer model, regulatory use of the model needs to allow for this occurring again in the future.

5.3 Table of 5 real farms and reference file recalibration:

	Property File 6.2.1	Property File 6.2.2	NDA Overseer Version 6.2.1				NDA Overseer Version 6.2.2			
			2017-2022	2022-2027	2027-2032	2032-	2017-2022	2022-2027	2027-2032	2032-
1	74	72	99.7	87	73.1	59.2	120.4	105	88.2	71.4
2	83	83	87.7	77.5	66.4	55.3	104.4	92.3	79.1	66.0
3	82	80	93.8	83.0	71.1	59.3	113.2	100.2	85.9	71.6
4	73	71	74.6	67.5	59.7	51.9	89.9	81.2	71.8	62.4
5	84	84	89.0	80.3	70.8	61.3	108	97.5	85.9	74.3

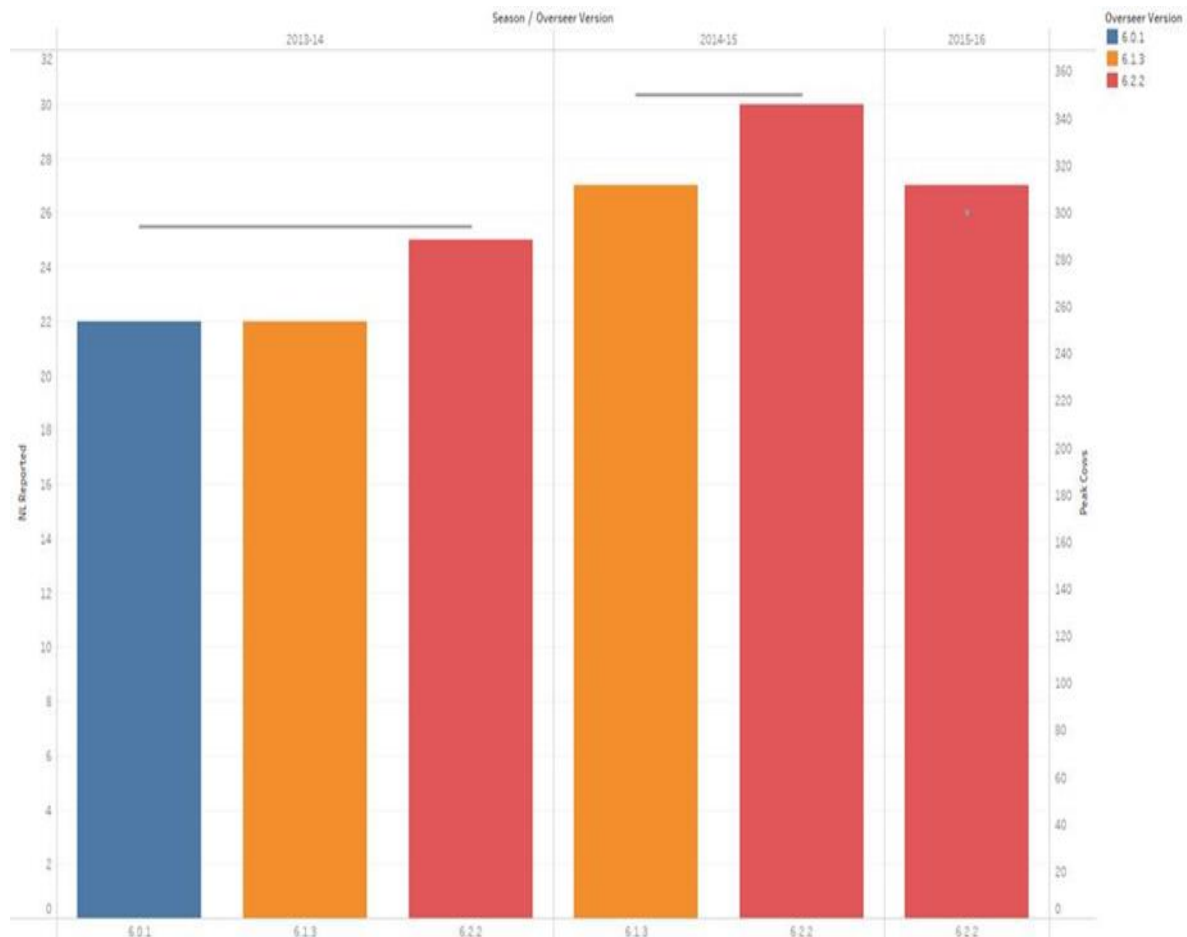
5.4 Evidence from Mr Park, in support of the continued reliance on reference files despite the issues that occurred post notification, (though he does note the method has been revised since notification), sets out the alternatives (to reference file approach) considered by the council at 34. The list of alternatives, surprisingly, does not include the recalibration of individual NDAs (and MRTs) to reflect the actual impact of an Overseer version change on the original dataset for a particular farm. Mr Park focuses on the between sector proportionality but does not address the possible within sector inequities that arise from the reference file method.

5.5 It is not difficult, with the right systems, to run an Overseer version control method whereby the data entered in to the version that was used to create the original Nitrogen Discharge Allowance for each farm, is automatically rerun in each subsequent version so as to recalibrate the N loss number farm by farm. I.e. the recalibration is not 'representative' of the average farm – it is instead specific to the real farm that is being regulated. This approach protects the proportionality of effort through the life of the Plan farm by farm. The reference file approach will create winners and losers as the real farms files diverge in different ways to the reference file which is used to recalibrate the allowable loss numbers. I do accept that the divergence should not be large if the revised but untested reference file approach proves to be sound.

5.6 The issues that Mr Park and Mr MacCormick raise re the problems that arise if a property changes in area (through lease, sale or purchase) seem relatively simple to address in a regulatory system that has applied a nitrogen loss allowance to each land parcel and anticipates N trading. It would not seem difficult to apply the recalibrated NDA for any area of land in the catchment that was later joined or removed from a farming property regulated under PC 10 and then recalculate the property level NDA accordingly.

5.7 The Fonterra Nitrogen Programme database, which links directly to the Overseer engine, allows for easy tracking of each annual dataset being run in each new version of the model. For example the data that was entered in 2016 to produce an Overseer file and the nitrogen loss output estimate, can be automatically rerun in the 2017 version of Overseer and the changed output values for the same data can be tracked and reported.

5.8



5.9 The graph above shows 3 seasons of data for one farm run in each updated version of Overseer as reported out of the Fonterra Nitrogen Programme database. The system allows for easy tracking and reporting of the recalibrated 'basefile' output

numbers. It also allows for easy calculation of the 3 year rolling output average. E.g. the recalibrated baseline in the above table (where the 2013 data established that baseline) would be 25 (red bar showing the original data run in the most recent version). The rolling 3 year average would be the sum of the red bars for the 3 year period divided by 3. In this example the 3 year rolling average is 27 while the recalibrated baseline is 25. The grey line, representing peak cows in a given year, is displayed as a basic indicator that the farm system being described is reasonably constant.

- 5.10 The recalibration approach described above is able to be reported at scale with minimal manual input. Current systems can run several thousand Overseer files in a new version and produce updated version control reports in a matter of hours when a new Overseer version goes live.
- 5.11 If the reference file approach does carry through to the Operative Plan it would be sensible to allow for an alternative in the Plan, e.g. allow for individual farm recalibration using the original file input data run in the most recent Overseer version where the reference file change does not represent the individual farm file change. In my opinion all dairy farms in the catchment could easily be managed through the farm specific recalibration.

6. INDUSTRY ENVIRONMENT MANAGEMENT PROGRAMME

- 6.1 Schedule LR 6 – Nitrogen Management Plan requirements at 2A anticipates that an industry environment management programme might provide support in the preparation and updating of NMPs.
- 6.2 The dairy industry has established systems and capability to manage the very large number of Overseer files required to meet our nutrient management commitments under the Sustainable Dairying Water Accord.
- 6.3 Fonterra has developed a ‘Nitrogen Programme’, based on the DairyNZ developed ‘Audited Nitrogen Management System’ that receives individual farm data for each completed dairy season. That data is used to complete an annual actual Overseer file for each farm. Fonterra reports back to the farmers and provides information on efficiency opportunities and environmental risk.
- 6.4 This programme has rapidly evolved and improved and the system now manages over 9000 Overseer files per year. The system can be ‘regionalised’ where there are specific process requirements for farmers operating under a Plan that requires the

use of the Overseer model. For dairy farms operating under PC 10 the programme could be readily adapted to allow for any variance to the Best Practice Data Input Standards required by BOPRC.

- 6.5 In response to upcoming regulation in other regions DairyNZ and Fonterra have also developed capability, supporting resources and systems for the development of tailored farm environment plans.
- 6.6 Fonterra and DairyNZ can provide useful input in to development of an implementation programme for PC 10 and there may be scope for Industry programmes to be adapted and recognised in an industry environment management programme context.

RICHARD GRANT ALLEN

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