

BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

applications by Maree Horo filed under
CRC042022 and CRC042025 to take water from
Wairepo Creek for irrigation of 52 hectares of
crops and pasture at Ribbonwood Station,
Quailburn Road, Omārama.

FINAL REPORT AND DECISION OF HEARING COMMISSIONERS PAUL ROGERS,
DR JAMES COOKE AND EDWARD ELLISON

PART B - SITE SPECIFIC DECISION

1 INTRODUCTION

- 1.1 This is the final decision on applications CRC042022 and CRC042025 by Maree Horo (the applicant). This decision follows and should be read in combination with our Interim Decision on these applications dated 29 March 2012.

2 INTERIM DECISION

- 2.1 In our Interim Decision, we concluded that we required further information from the applicant before we could issue a final decision with conditions. In particular, we noted that the Nutrient Discharge Allowance (NDA) and Farm Environmental Management Plan (FEMP) were based on all applications by the applicant being granted. However several of the applications by the applicant were declined in separate decisions.
- 2.2 We therefore requested a new nominated NDA and OVERSEER output based on the effects of CRC042022 and CRC042025 alone (as well as any existing consents not affected by these applications). In other words we required an NDA that excludes the modelled effects of the declined applications, but which includes the effects of existing dryland farming on that area. We suggested that it should be the OVERSEER output for Ribbonwood Station based on irrigation of CRC042022 and CRC042025 plus 10%, but requested input from the applicant to provide us with this information. For completeness, we also requested a revised FEMP and irrigation plan relating to the consented area only.
- 2.3 Based on the above, we directed that the applicant provide the following additional information:
- (a) A recalculated NDA and revised FEMP for Ribbonwood Station, excluding irrigation on the areas proposed under CRC042011, CRC042015, CRC041017, CRC042018 and CRC04202 (all of which have been declined); and
 - (b) A revised plan for use in conditions showing only the irrigation area proposed under these consents (CRC042022 and CRC042025).

3 APPLICANT'S RESPONSE

- 3.1 In response to our Interim Decision, the applicant provided a recalculated NDA, a revised FEMP and a new plan of the irrigation area as requested. It also noted that the earlier NDA figure did not reflect current farm practices on Ribbonwood Station, as it did not provide for fertiliser application in the high country and only limited application on the flats.
- 3.2 Table 2 of the FEMP set out the following recalculated NDA based on Overseer modeling and correcting the error in the earlier NDA identified by the applicant:

	N Threshold (kg/farm)	P Threshold (kg/farm)
OVERSEER outputs April 2012	17,009	766
OVERSEER + 10%	18,710	843

- 3.3 The applicant told us that the revised NDA figures are sustainable, are in line with good practice, show only the discharge thresholds for resource consents CRC0420222 and CRC042025 and include the effects of other existing consents and existing dry land farming operations on Ribbonwood Station.
- 3.4 In addition to the changes to the NDA, the following further changes were made to the FEMP:
- (a) The farm topography was updated to show current farming practices;
 - (b) All plans / maps were updated to show only the irrigation areas proposed under these consents;
 - (c) The water quality study receiving environments was deleted;

- (d) The receiving environment for the effects of irrigation and the site specific environmental risks were updated to reflect and refer to only those irrigation areas proposed under these consents;
- (e) Additional photos were inserted to provide a better picture of the application site.

4 FURTHER DIRECTIONS AND RESPONSE

- 4.1 The applicant's response as outlined above gave us some concern. Whereas we were expecting a reduction in the NDA due to the removal of effects from the irrigation areas we declined, the applicant in fact managed to increase its NDA. In particular, we were concerned that the calculated revised thresholds were not transparent because the applicant did not provide the figures whereby the earlier NDA was deemed incorrect.
- 4.2 We were of the view that the setting of the Ribbonwood Station NDA had been characterised by a number of ad hoc decisions. We did not wish to perpetuate this and therefore directed via our 40th minute that:
 - (a) an audit be undertaken by Mr McNae of the OVERSEER inputs and assumptions associated with the three versions of the FEMP we had been presented with; and
 - (b) the FEMP be updated to include projected stock numbers carried by Ribbonwood once CRC042022 and CRC042025 are exercised.
- 4.3 The applicant subsequently provided a revised FEMP dated June 2012 that include projected stock numbers as directed. The NDA within the FEMP remained unchanged. We also received an audit report from Mr McNae, which confirmed that the inputs and assumptions were realistic and typical for the proposed type of farming system. Based on his review, Mr McNae concluded that Ribbonwood Station would be able to operate under the "OVERSEER + 10%" limits set for the farm.

5 OUR CONSIDERATION

- 5.1 Mr McNae expressed a number of concerns in his audit. These included:
 - (a) Some of materials he requested were not able to be supplied by the applicant. This included the OVERSEER file relating to the November 2010 FEMP. This meant that no direct comparison could be made to the assumptions within this file relating to the same FEMP ,
 - (b) The introductory statement in the June 2012 FEMP that "with irrigation all progeny bred on the property will be able to be finished if the irrigation system is installed as planned " was not borne out in the OVERSEER files.
- 5.2 With respect to these concerns Mr McNae's view appeared to be that:
 - (a) Whilst the lack of the November 2010 OVERSEER files prevented him from completing his brief, the June 2012 FEMP (and OVERSEER files) were the critical ones because they reflected the change in farm management,
 - (b) The fact that only lambs could be finished, and not cattle would be reflected in stock numbers (we assume in subsequent OVERSEER runs to ensure compliance).
 - (c) It would be deemed prudent from a forward planning perspective to have allowed for a best estimate of weaning and finishing in the OVERSEER predictions, rather than keeping the input files reflecting all stock sold at weaning.
- 5.3 In spite of these reservations Mr McNae concluded that Ribbonwood would be able to operate under the OVERSEER + 10% limits given in the June 2012 FEMP.
- 5.4 Therefore we need to be assured that the actual limits proposed in the June 2012 FEMP are environmentally acceptable.
- 5.5 The total stock numbers now proposed are less than those of the November 2010, and April 2012 versions of the FEMP, and the OVERSEER-predicted nitrogen and phosphorus loads are

correspondingly less than predicted in those earlier versions (though higher than the MWRL-imposed NDA for the November 2010 version). We accept that this NDA may have unfairly restrained the applicant's farming operations, particularly as fertilizer applications were apparently not included.

- 5.6 The difference in NDA between June 2012 (OVERSEER +10%) and the MWRL (November 2010) NDA is ~13% for nitrogen, and 92% for phosphorus. However the absolute difference in phosphorus load limit is not large (~400kg).
- 5.7 This exercise has emphasized to us that relying on OVERSEER as a compliance-monitoring tool is unwise. It is simply too easy for a farmer to 'fiddle' with the input numbers to achieve the desired result, and it is not easy to uncover such discrepancies in an audit.
- 5.8 However taking Mr McNae's advice into account, and the small area of irrigation proposed, our view is that the environmental risk associated with the difference in NDA is minor in this instance.
- 5.9 We record here that we place more reliance on periphyton monitoring to provide early warning of excessive nutrient loss and the consequent 'ratcheting' conditions than we do with OVERSEER reports.
- 5.10 On this basis and for the reasons set out in our Interim Decision, we conclude that the outcome which best achieves the purpose of the Act is to grant consent to the applications, subject to conditions.

6 DECISION

- 6.1 Pursuant to the powers delegated to us by the Canterbury Regional Council and pursuant to sections 104 and 104B of the Resource Management Act 1991, we GRANT applications CRC042022 and CRC042025 by Maree Horo for the following activity:

to take water from Wairepo Creek for irrigation of 52 hectares of crops and pasture at Ribbonwood Station, Quailburn Road, Omārama.

- 6.2 Pursuant to section 108 RMA, the grant of consent is subject to the conditions specified at Appendix A, which conditions form part of this decision and consent
- 6.3 The duration of these consents shall be until the 30th April 2025.

DECISION DATED AT CHRISTCHURCH THIS 8TH DAY OF NOVEMBER 2012

Signed by¹:

Paul Rogers



Dr James Cooke



Edward Ellison



¹ This decision has been signed as a majority decision of the three named Commissioners due to the death of Commissioner Mike Bowden.

APPENDIX A

Conditions of Consent (CRC042022 and CRC042025)

Diversion and take of water

1. Water shall only be diverted and taken from the Wairepo Creek at following locations:
 - (a) at or about map reference NZMS 260 H39: 599-458; and/or
 - (b) at or about map reference NZMS 260 H39: 586-461
2. The combined maximum rate and volume of water diverted and taken from both locations specified in Condition 1 shall not exceed 30 litres per second, 2,592 cubic metres per day (being 12.00 am to 12.00 am the following day) and 213,200 cubic metres per year (measured from 1 September to the following 30 April).
3. Whenever the combined naturalised flow (expressed in litres per second) of Wairepo Creek at Lake Ōhau Road NZMS 260 H39: 710-463 and the abstracted flow relating to this permit, as estimated by the Canterbury Regional Council:
 - (a) is equal or greater than 360 litres per second, the maximum rate at which water is taken shall not exceed 30 litres per second;
 - (b) is less than 360 litres per second, and greater than or equal to 300 litres per second, the rate of water taken shall not exceed half of the amount available above 300 litres per second;
 - (c) is equal to or less than 300 litres per second the taking of water in terms of this permit for irrigation purposes shall cease.

Use of water

4. Water allocated in Table A shall be used only for the spray irrigation of crops and pasture for grazing stock, but excluding milking dairy cows to irrigate 52 hectares on the area of land shown on attached Plan CRC042022/CRC042025, which forms part of this consent.
5. Water for irrigation shall only be used on or applied to land that is subject to a memorandum of encumbrance that complies with the requirements of the agreement entitled "Agreement in Relation to the Allocation of Water for Irrigation" between Meridian Energy Limited and the Mackenzie Irrigation Company Limited dated the 31st of October 2006.
6. The consent holder shall, six months prior to this consent being exercised, provide to the Canterbury Regional Council a certificate from the Consent Holder's solicitor certifying that the memorandum of encumbrance provided for in Condition 5(d) is registered on the computer registers for the land shown on Plan CRC042022/CRC042025 and any other evidence of registration as the Canterbury Regional Council may require (if any).
7. There shall be a minimum 5 metre setback, where there is no irrigation, from any permanently flowing waterways within the irrigation area marked on Plan CRC042022/CRC042025.
8. The consent holder shall take all practicable steps to:
 - (a) Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
 - (b) Avoid leakage from pipes and structures; and
 - (c) Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.

9. The consent holder shall ensure water races used to convey water diverted in terms of this permit are well maintained to minimise losses.

Water metering – Minimum flows

10. The consent holder shall, prior to exercising this consent, install:
 - (a) a water level measuring device in a stable reach of Wairepo Creek at map reference NZMS 260 H39: 710-463 that will enable the determination of the continuous rate of flow in the reach of the water body to within accuracy of ten percent.
 - (b) a tamper-proof electronic recording device such as a data logger(s) that shall time stamp a pulse from the flow meter at least once every 15 minutes.
11. The measuring device shall be installed at a site that will retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
12. The recording device(s) shall:
 - (a) be set to wrap the data from the measuring device such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and
 - (b) store the entire season's data in each 12-month period from 1 July to 30 June in the following year, which the consent holder shall then download and store and provide to the Canterbury Regional Council in a format and standard specified in the Canterbury Regional Council's form for Water Metering Data Collection; and be readily accessible to be downloaded by the Canterbury Regional Council or by a person authorised by the Canterbury Regional Council: RMA Compliance and Enforcement Manager; and
 - (c) shall be connected to a telemetry system that collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.
13. The measuring and recording devices described in Condition 10 shall be available for inspection at all times by the Canterbury Regional Council.
14. Data from the recording device and the corresponding relationship between the water level and flow, and any changes in that relationship shall be provided to the Canterbury Regional Council annually in the month of June, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.

Water metering – Take of water

15. The consent holder shall, prior to exercising this consent,, install:
 - (a) water level measuring device(s) in a location that will enable the determination of the continuous rate of flow and volume of water being diverted and taken to within an accuracy of ten percent; and
 - (b) tamper-proof electronic recording device(s) such as a data logger(s) that shall time stamp a pulse from the flow meter at least once every 15 minutes.
16. The measuring device shall, as far as is practicable, be installed at a site likely to retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
17. All data from the recording device and the corresponding relationship between the water level and flow, shall be provided to the Canterbury Regional Council annually in the month of June, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
18. The measuring and recording device(s) specified in Condition 15 shall:

- (a) be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording);
 - (b) store the entire season's data in each 12-month period from 1 July to 30 June in the following year, which shall be downloaded and stored in a commonly used format and provided to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council;
 - (c) unless certified by a suitably qualified person that telemetry is not feasible, be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.
 - (d) be installed by a suitably qualified person in accordance with ISO 1100/1-1981 (or equivalent) and the manufacturer's instructions;
 - (a) be maintained throughout the duration of the consent in accordance with the manufacturer's instructions; and
 - (b) be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
19. No data in the recording device(s) shall be deliberately changed or deleted.
20. All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 15 are at all times fully functional and meet the accuracy standard stated in that condition.

Water metering – Compliance Checks

21. Within one month of the installation of the measuring or recording device(s) specified in Conditions 10 and 15 (or any subsequent replacement devices), the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:
- (a) the measuring and recording device(s) is installed in accordance with the manufacturer's specifications; and
 - (b) data from the recording device(s) can be readily accessed and/or retrieved in accordance with these conditions.
22. At five yearly intervals or at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying that:
- (a) the water meter(s) is measuring the rate of water taken as specified in these conditions; and
 - (b) the tamper-proof electronic recording device is operating as specified in these conditions.

Fish Screen

23. Water shall only be taken when a fish screen with a maximum mesh width and height size of 3 millimetres or slot width and height of 2 millimetres is operated and maintained across the intake to ensure that fish and fish fry are prevented from passing through the intake screen.
24. The fish screen shall be positioned to ensure that there is unimpeded fish passage to and from the waterway and to avoid the entrapment of fish at the point of abstraction, and to minimise the risk of fish being damaged by contact with the screen face.
25. The fish screen shall be designed and installed to ensure that:
- (a) the majority of the screen surface is oriented parallel to the direction of water flow; and

- (b) where practicable, the screen is positioned in the water column a minimum of 300 millimetres above the bed of the waterway and a minimum of one screen radius from the surface of the water; and
 - (c) the approach velocity perpendicular to the face of the screen shall not exceed 0.06 metres per second if no self-cleaning mechanism exists or 0.12 metres per second if a self-cleaning mechanism is operational; and
 - (d) the sweep velocity parallel to the face of the screen shall exceed the design approach velocity.
 - (e) The fish screen shall be designed or supplied by a suitably qualified person who shall ensure that the design criteria specified in Conditions 23 to 25 inclusive of this consent is achieved. Prior to the installation of the fish screen, a report containing final design plans and illustrating how the fish screen will meet the required design criteria and an operation and maintenance plan for the fish screen shall be provided to Environment Canterbury, Attention: RMA Compliance and Enforcement Manager.
26. A certificate shall be provided to Environment Canterbury by the designer or supplier of the fish screen to certify that the fish screen has been installed in accordance with the details provided to Environment Canterbury in accordance with Conditions 23 to 25 inclusive of this consent.
27. The fish screen shall be maintained in good working order. Records shall be kept of all inspections and maintenance, and those records shall be provided to Environment Canterbury upon request.

Nutrient Loading

28. For the purposes of interpretation of the conditions of this consent Ribbonwood Station shall be defined as the areas in certificates of title and Pastoral Lease numbers Run 532, Run 670 and Section 1 Block VII Ohau Lake SD, OTA2/1131, which total 7,289 hectares.
29. The consent holder shall prepare once per year:
- (a) an Overseer[®] nutrient budgeting model report not less than one month prior to the commencement of the irrigation season; and
 - (b) a report of the annual farm nutrient loading for Ribbonwood Station using the model Overseer[®] (AgResearch model version number 5.4.3 or later).
30. When undertaking the modelling outlined in Condition 29, the consent holder shall use either weather records collected on-farm or from constructed data from the nearest weather station.
31. A copy of the reports prepared in accordance with Condition 29 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within one month of their completion.
32. The consent holder shall not commence annually irrigation under this consent unless the annual (1 July to 30 June) nutrient loading (the nutrient discharge allowances (NDAs)) as estimated in accordance with Condition 29 from Ribbonwood Station does not exceed 18,710 kg of Nitrogen and 843 kg of Phosphorus. Where the NDAs have been reduced by the application of a receiving water quality nutrient trigger condition, the reduced NDA shall apply.
33. The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the commencement of this consent
34. Where Overseer, or Overseer modelling, is referred for the purposes of calculating or determining compliance with the NDA limits associated with activities on the property, it shall be undertaken by an independent person with an Advanced Sustainable Nutrient Management Certificate issued by Massey University or an equivalent qualification
35. The consent holder shall at all times comply with the Farm Environmental Management Plan (FEMP) in particular, the mitigation measures and monitoring set out in section 5 of the FEMP for Ribbonwood Station, a copy of the FEMP is attached to these conditions and marked CRC042022/CRC042025-FEMP and forms part of these conditions

36. Subject to Condition 35, the consent holder shall implement, and update annually the FEMP for Ribbonwood Station. The FEMP shall include:
- (a) Verification of compliance with NDAs (incorporating any reductions required by receiving water quality nutrient trigger conditions) by farm nutrient modelling using the model Overseer (AgResearch model version number 5.4.3 or later).
 - (b) Implementation of Mandatory Good Agricultural Practices ("MGAPS") and requirements to manage in accordance with the Ribbonwood Station Overseer model inputs.
 - (c) The Overseer parameter inputs report, which shall be supplied to the Canterbury Regional Council.
 - (d) A property specific environmental risk assessment (including a description of the risks to water quality arising from the physical layout of the property and its operation which are not factored in as an Overseer parameter) prepared by a suitably qualified person which identifies any farm specific environmental risks along with measures to mitigate the farm specific environmental risks.
 - (e) A requirement to review the risk assessment if there are any significant changes in land use practice.
37. Detailed records shall be maintained of fertilizer application rates, types of crops (including winter feed/forage crops), cultivation methods, stock units by reference to type, breed and age, prediction of realistic crop yields that are used to determine crop requirements and all other inputs to the Overseer nutrient budgeting model.
38. A report on Overseer modelling shall be provided within one month of completion of the Overseer modelling by the person with the qualifications described in Condition 34 and no later than two months prior to the start of the next irrigation season to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The consent holder shall supply to the Canterbury Regional Council all model inputs relied upon for the annual Overseer® modelling.
39. Changes may be made to the Ribbonwood Station Overseer model inputs, provided that written certification is provided that the change is modelled using Overseer, and that the result of that modelling demonstrates that the NDAs are not exceeded. A copy of that certification plus a copy of the resultant Overseer parameter report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, prior to the implementation of that change.

Subdivision

40. The NDAs shall be recalculated if there is a sale or transfer of any part, but not the whole, of the total farm area of 7,289 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 32. The new NDAs may be recalculated on any proportion as long as the total of all the NDAs does not exceed the NDAs of the parent title as set out in Condition 32. The recalculation of the NDAs shall be undertaken and certified using Overseer, completed and provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager together with a copy of the full Parameter report, within one month of the sale or transfer.

Fertiliser and soil management

41. Fertiliser shall be managed and applied in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) NZFMRA 07' or any subsequent updates.
42. The consent holder shall keep a record of all fertiliser applications applied to the property, including fertiliser type, concentration, date and location of application, climatic conditions, mode of application and any report of the fertiliser contractor regarding the calibration of the spreader.
43. For land based spreading of fertiliser:

- (a) where an independent fertiliser spreading contractor is used the consent holder shall keep a record of the contractor used, which can be supplied to the Canterbury Regional Council upon request; or
 - (b) where the applicant's own fertiliser spreaders are used, the consent holder shall test and calibrate the fertiliser spreaders at least annually, and every five years the fertiliser spreader will be certified by a suitably qualified person in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) NZFMRA 07' or any subsequent updates and the results of testing shall be provided to the Canterbury Regional Council upon request.
44. Nitrogen fertiliser shall not be applied to land between 31st May and 1st September.
 45. All fertiliser brought onto the property which is not immediately applied to the land shall be stored in a covered area that incorporates all practicable measures to prevent the fertiliser entering waterways.
 46. Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application except for application of nitrification inhibitor.
 47. No P fertiliser will be applied within three weeks of irrigation
 48. Olden P levels shall be maintained below 30.
 49. If liquid fertilisers, excluding liquid effluent, are stored on-site for more than three working days, the consent holder shall ensure that the fertiliser is stored in a bunded tank, at least 110% of the volume of the tank to avoid any discharge to surface or groundwater and such that it is also protected from vehicle movements.
 50. Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
 51. For land based spreading, fertiliser should not be applied within 20 metres of a watercourse.
 52. Where practicable, the consent holder shall:
 - (a) use direct drilling as the principal method for establishing pastures; and
 - (b) sow and irrigate all cultivated areas within the irrigation area as soon as possible following ground disturbance.

Irrigation Infrastructure

53. The consent holder shall ensure that all new irrigation infrastructure (not on the property at the time of commencement of this consent) is:
 - (a) designed and certified by a suitably qualified independent expert holding a National Certificate in Irrigation Evaluation Level 4, and installed in accordance with the certified design. Copies of certified design documents shall be provided to the Canterbury Regional Council upon request; and
 - (b) tested within 12 months of the first installation of the new irrigation infrastructure and afterwards every five years in accordance with the 'Irrigation Code of Practice and Irrigation Design Standards, Irrigation NZ, March 2007' (code of practice) by a suitably qualified independent expert.
54. Within two months of the testing referred to in Condition 53(b) the expert shall prepare a report outlining their findings and shall identify any changes needed to comply with the code of practice. Any such changes shall be implemented within five years from the date of the report. A copy of the report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, within three months of the report being completed.
55. If existing irrigation infrastructure is being used, the consent holder shall obtain an evaluation report prepared by a suitably qualified person, on the following terms:

- (a) The evaluation shall determine the system's current performance in accordance with the Code of Practice for Irrigation Evaluation.
- (b) This report shall be obtained within three months of the first exercise of the consent.
- (c) Any recommendations identified in the report shall be implemented within five years from the date of receipt of the report.
- (d) A copy of the report shall be forwarded to the Canterbury Regional Council within three months of the report being completed.

Fertigation

56. If the irrigation system used in association with taking water in terms of this permit is to be used to distribute effluent, fertiliser or any other added contaminant, then one of the following shall be installed upstream of the point of addition of the effluent, fertiliser or other added contaminant:
- (a) a reduced pressure zone device (RPZD), or
 - (b) a pressure vacuum breaker (PVB), or
 - (c) an air gap backflow prevention system.
57. Installation of a RPZD or a PVB shall be in accordance with section 9 (PVB) or section 12 (RPZD) of Australian/New Zealand Standard AS/NZS 2845.1 Water supply - Backflow prevention devices, Part 1: Materials, design and performance requirements, or an equivalent standard.
58. An air gap backflow prevention system shall have an unobstructed vertical air gap separation of at least twice the diameter of the inlet pipe, from the lowest point of the inlet pipe to the flood level rim of the receptacle into which it discharges.
59. Field testing and maintenance shall be carried out of an RPZD or a PVB at commissioning of the use of the system for application of effluent or fertiliser and annually afterwards, in accordance with AS 2845.3 Water supply—Backflow prevention devices, Part 3: Field testing and maintenance, or an equivalent standard.
60. An air gap backflow prevention system shall be tested at commissioning and annually afterwards. Maintenance shall be undertaken as necessary to ensure that backflow prevention is effective.
61. Installation, testing and maintenance shall be undertaken by a certified irrigation evaluator. A report on the annual testing shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within two weeks of initial commissioning and within two weeks of each annual testing. Each report shall be accompanied with the name, qualifications and experience of the person who undertook the installation, testing or maintenance

River water quality monitoring and response

62. The water quality of the Wairepo River shall be monitored within six months of the first exercise of consent as follows:
- (a) The location for monitoring of Wairepo River shall be as follows unless minor changes are required to ensure that monitoring occurs upstream of all intakes and downstream of the irrigation area to appropriately monitor the localised river effects arising from the exercise of this consent:
 - i. Map reference: NZMS 260 H39: 586-461 immediately upstream of the intake on Wairepo River
 - ii. Map reference: NZMS 260 H39: 615-451 downstream of the irrigation area on the Wairepo River

- (b) Water quality variables monitored shall include:
 - i. dissolved inorganic nitrogen (DIN);
 - ii. dissolved reactive phosphorus (DRP);
 - iii. dissolved oxygen;
 - iv. conductivity;
 - v. turbidity;
 - vi. periphyton biomass as chlorophyll a per square metre (chl a); and
 - vii. E. Coli.
 - (c) This monitoring may be carried out on an individual basis, or may be prepared in collaboration with other consent holders, or on a collective basis by a suitable independent body appointed by all relevant consent holders in the sub catchment.
 - (d) Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
 - (e) Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring river water quality and periphyton biomass. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
 - (f) The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person who demonstrates that they understand the appropriate methods to use for surface water quality sampling, including preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.
 - (g) The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ.
 - (h) The results of all sampling shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.
63. If the monitoring undertaken in accordance with Condition 62 shows that the average sample result for the downstream monitoring site specified in Condition 62 over the period December to April is greater than 0.21 mg/L of DIN; or 0.006 mg/L DRP; or 50 mg chl a/ m² (environmental standard trigger), then the consent holder shall commission a report into the cause of the breach of the environmental standard trigger.
64. The reports referred to in Condition 63 shall:
- (a) be prepared by an expert review panel consisting of two qualified and experienced independent scientists. One of the scientists shall be nominated by the Canterbury Regional Council, and the other shall be appointed by the consent holder; and
 - (b) include the experts' conclusion on whether the exceedance(s) were as a result of natural influences, one off events, or in whole or part by nutrient loss associated with the irrigation authorised by this consent; and
 - (c) include an assessment as to whether the exceedance measured by the monitoring is likely to continue; and

- (d) be completed by 30 July following the sampling; and
 - (e) be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
65. If both the authors of the report prepared in accordance with Condition 63 conclude, after considering all the relevant available information, including on-site monitoring, sub-catchment monitoring, and catchment resource consent compliance and audit reports made available by the Canterbury Regional Council, that the cause of the breach of the environmental standard trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent, then no further action needs to be undertaken by the consent holder.
66. If the report prepared in accordance with Condition 63 concludes that the environmental standard trigger has been exceeded because of farm land use practices, then:
- (a) the NDA, as specified in Condition 32, shall be reduced by 5% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area under irrigation (at the time of the exceedance) under this resource consent divided by the total farm area (i.e. 190 irrigated hectares divided by the total farm area of 21,513 hectares); and
 - (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 68(b).
67. If a required reduction in nutrient load is in effect under 66(a) and monitoring for that period shows that the average sample results for the downstream monitoring site over the period December to April is:
- (a) greater than 0.21 mg/L of DIN; or 0.006 mg/L DRP; or 50 mg chl a/ m² (environmental standard trigger), then there shall be a further NDA reduction of 10% x IPF for the subsequent irrigation season.
 - (b) less than or equal to 0.21 mg/L of DIN; or 0.006 mg/l of DRP; or 50 mg chl a/ m² (environmental standard trigger), then for the subsequent season no NDA reduction shall be required under this condition, and the full NDA for the property, as specified in Condition 32 shall be restored.
68. In relation to the Remedial Action Plan referred to in Condition 66(b):
- (a) It shall set out the methods and timeframes for altering and/or adapting farm land use practices to ensure that the exceedance in the environmental standard trigger, is returned as soon as practicable to and maintained below the average sample results of 0.21 mg/L of DIN; or 0.006 mg/L of DRP; or 50 mg chl a/ m² (environmental standard trigger) for the downstream monitoring site, over the period December to April.
 - (b) It shall be prepared by a suitably qualified and experienced person using Overseer or an equivalent method to demonstrate that the actions to be undertaken will achieve the necessary nutrient reductions as soon as practicable.
 - (c) If the Remedial Action Plan is prepared in collaboration with other consent holders who are required to prepare a Remedial Action Plan for this sub catchment a common Remedial Action Plan shall be deemed to comply with this condition.
 - (d) Any actions required by the Remedial Action Plan shall be incorporated into the consent holder's FEMP. The amended FEMP shall be implemented as soon as physically possible.
 - (e) The consent holder shall provide the Canterbury Regional Council with the Remedial Action Plan and an amended FEMP upon request.

Administrative conditions

69. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, shall be informed immediately on first exercise of this consent by the consent holder.

70. The Canterbury Regional Council may, once per year, on any of the last five working days of March or July serve notice of its intention to review the conditions of this resource consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the resource consent and which it is appropriate to deal with at a later stage, including (but not limited to) amending the flow in Wairepo Creek at which abstraction is required to be reduced or discontinued.
71. The lapsing date for the purposes of section 125 of the Resource Management Act shall be five years from the commencement of this consent.

Advice notes:

- The discharge of effluent, fertiliser or any contaminant would require authorisation as a permitted activity or via a discharge permit. Contact the Canterbury Regional Council for advice on the relevant regional rules.
- If any additional land use consents are required to carry out the proposed activity, those consents must be obtained before giving effect to this consent.

