

BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

an application by **Killermont Station Ltd** filed  
under **CRC041798** for a water permit to take  
and use surface water at Mānuka Creek,  
Killermont Station

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

PART B - SITE SPECIFIC DECISION

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## 1 INTRODUCTION

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- 1.1 This is the final decision on application CRC041798 by **Killermont Station Limited** (the applicant). This decision follows and should be read in combination with our Interim Decision on these applications dated 16 February 2012.

## 2 INTERIM DECISION

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- 2.1 In our Interim Decision, we concluded that we were not satisfied that the monitoring provisions agreed with the Canterbury Regional Council and submitters would protect the upper reaches of the Omārama Stream, which is, in our view, the waterbody most likely to be impacted by the proposed irrigation.
- 2.2 We directed that Killermont Station and Twin Peaks Station collaboratively agree on monitoring sites upstream and downstream of their combined irrigation fields and that these sites would serve to monitoring the effects of both Stations' irrigation activities and form the basis for a monitoring condition.
- 2.3 The reason we felt it necessary to seek joint monitoring sites is that irrigation from both stations drains to groundwater that flows towards Omārama Stream, but it is difficult to determine with any precision where the effects of one property may end, and the other property may begin.
- 2.4 In addition to the above, our Interim Decision also noted the FEMP for Killermont Station contains an NDA and OVERSEER output estimates based on all consents for Killermont Station being granted, that is, Pebbly Block, Woolshed Block, Frosty Gully, and Mānuka Creek. However as we declined Pebbly and Woolshed, we required a new nominated NDA and OVERSEER outputs based on irrigation to Frosty Gully and Mānuka Creek alone. We suggested that it should be the OVERSEER output for Killermont based on irrigation of Frosty Gully and Mānuka plus 10%. And requested input from the applicant to provide us with this information.

## 3 APPLICANT'S RESPONSE

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- 3.1 In response to our Interim Decision, the applicant provided a report carried out by their consultants Irricon Resource Solutions) that proposed the following:
- (a) Omārama Stream Upstream site: located at or about **H39: 606-246** below the Clifton Downs swamp at the boundary of Twin Peaks and Clifton Downs.
  - (b) Omārama Stream Downstream site: located at or about **H39: 618 -257** at Berwen Station, prior to Berwen k-line irrigation, after one tributary of Clifton Drain and Mānuka Creek discharges into the Omārama Stream
- 3.2 Whilst proposing the above sites Irricon noted that the Omārama Stream Upstream site was affected by other land use influences; namely existing irrigation (not covered by this consent process) and a large expanse of cropping on Clifton Downs. They noted that that the upstream monitoring site proposed for Dunstan Peaks Station (at or about **H40: 613-158**) was upstream of all irrigation and cropping influence not covered by this consent process, and could therefore serve as a true 'upstream' monitoring site for Dunstan Peaks, Twin Peaks, and Killermont Stations.
- 3.3 The applicant also provided a revised NDA with accompanying OVERSEER files and reports. The model was based on current land use practice plus the additional 57 ha irrigation (Mānuka Creek). The applicant advised that the total predicted nutrient losses under this scenario are 8906 kg N and 93 kg P. They have accepted the predicted losses plus an additional 10% (9,797 kg N and 102 kg P) as the revised nutrient discharge allowance (NDA) relating to this consent. The model was run at the developed state on a slightly later version of the model, but was still version 5.

## 4 OUR CONSIDERATION

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- 4.1 In addition to the above, by a separate minute we directed Dunstan Peaks Station to provide additional information relating to changes they had made subsequent to the hearing with respect to intake locations and irrigation command areas. We also asked them to provide monitoring sites on Omārama Stream that were suitable for monitoring the effects of their activities.

- 4.2 As a consequence, the Decision on the Dunstan Peaks applications (CRC011361, 62, 63) has not been finalised. We have therefore taken the opportunity to reevaluate the monitoring for all three stations based on the useful discussion provided by Irricon Consultants.
- 4.3 We have decided that the most cost-effective monitoring regime is as follows;
- (a) H40: 614-161 (Upstream site Dunstan Peaks)<sup>1</sup>
  - (b) H39: 606 -246 (Downstream site Dunstan Peaks and Upstream site Twin Peaks + Killermont Station)
  - (c) H39: 618-257 (Downstream site Twin Peaks + Killermont Station)
- 4.4 The monitoring sites are illustrated on the attached plan at **Appendix A**, which also shows the proposed irrigation command areas applied for all three stations. An additional monitoring site is also included for Dunstan Peaks at H40: 614-193 (as proposed by Dunstan Peak Limited), however that monitoring site does not apply to this application.
- 4.5 We recognise that the above monitoring sites are not perfect, particularly in relation to the middle site (H39: 606-246) in that it may be difficult to unambiguously determine the relative effects of existing irrigation and existing permitted activities (such as cropping) from the effects of the irrigation covered by this hearing. Nevertheless our view is that it will protect the upper Omārama Stream, which is classified as “alpine’ under the operative NRRP from any effects caused by the new irrigation.
- 4.6 We suggest that the monitoring should be started at least one full year before any new irrigation is installed to provide a baseline from which the effects of the new irrigation can be assessed.
- 4.7 Together with a condition that allows two experts (one appointed by the Canterbury Regional Council and one appointed by the applicants) to agree on the cause of any breach in consent conditions, we are confident that the monitoring sites will be both fair and effective.
- 4.8 We accept the revised NDA provided by the applicant and this value has been inserted into condition 29.
- 4.9 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 application, subject to the conditions discussed above.

## **5 DECISION**

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- 5.1 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** application CRC041798 by Killermont Station Limited for the following activity:
- to take and use surface water from Mānuka Creek to irrigate 75 hectares of land at Killermont Station, Quailburn Road, Omārama.
- 5.2 Pursuant to section 108 RMA, the grant of consent is subject to the conditions specified at **Appendix B**, which conditions form part of this decision and consent.

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<sup>1</sup> Slightly downstream of the site suggested by Irricon but suggested by Dunstan Peaks and will serve the same purpose.

5.3 The duration of this consent shall be until the 30<sup>th</sup> April 2025.

DECISION DATED AT CHRISTCHURCH THIS 7<sup>TH</sup> DAY OF MAY 2012

Signed by<sup>2</sup>:

Paul Rogers



Dr James Cooke



Edward Ellison

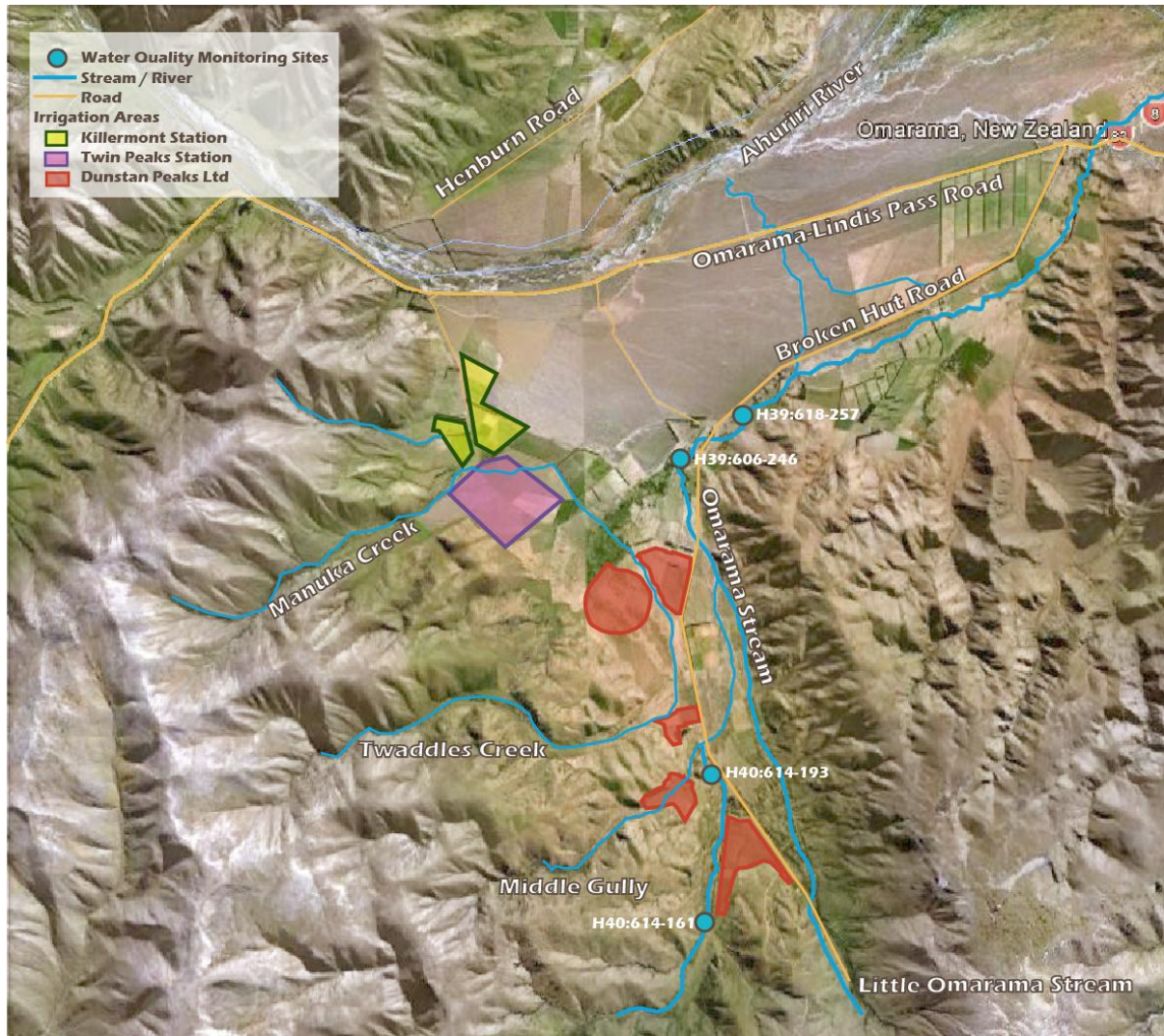


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<sup>2</sup> This decision has been signed as a majority decision of the three named Commissioners due to the unavailability of Commissioner Mike Bowden for health reasons.

APPENDIX A

Map of Monitoring Locations

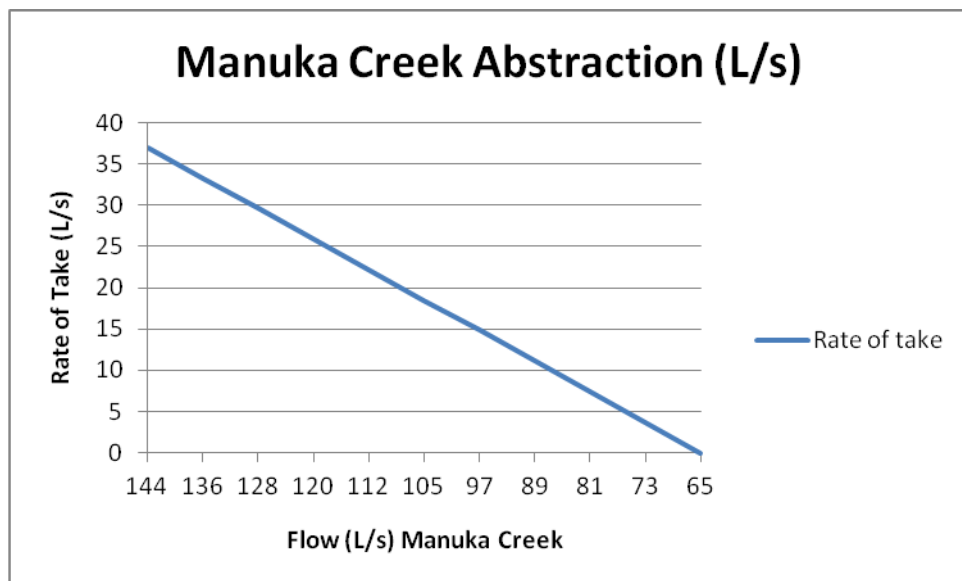


## APPENDIX B

### Conditions of Consent (CRC041798)

#### Diversion and take of water

1. Water shall only be taken and/or diverted from Mānuka Creek at or about map reference NZMS 260 H39:5588-2366.
2. Water for irrigation shall only be taken between 1 September and the following 30 April at a rate not exceeding 37 litres per second, with a volume not exceeding 3,197 cubic metres per day (being from 12am to 12am the following day) and 450,000 cubic metres per year (measured between 1 September and the following 30 April).
3. Subject to Condition 4, whenever the flow in Mānuka Creek, as estimated by the Canterbury Regional Council calculated as the mean flow for the previous 24 hour period (midnight to midnight) at map reference NZMS 260 H39:560-237:
  - (a) is equal or greater than 144 litres per second, the maximum rate at which water is taken shall not exceed 37 litres per second;
  - (b) falls below the flow shown for irrigation on the horizontal axis of the following minimum flow graph attached to these conditions, then the rate of abstraction permitted in terms of this permit shall not exceed those shown as corresponding flows on the vertical axis;
  - (c) is equal to or less than 65 litres per second the taking of water in terms of this permit for irrigation purposes shall cease.



4. Where the Canterbury Regional Council, in consultation with a Water Users Committee representing, but not limited to, surface water and hydraulically connected groundwater users who are subject to the above minimum flow, has determined upon a water sharing regime that limits the total abstraction from the resource as referred to above, then the taking of water in accordance with that determination shall be deemed to be in compliance with Condition 3.

#### Use of water

5. Water shall only be used for the spray irrigation of 75 hectares of crops and pasture per irrigation season for grazing sheep, beef cattle and non-milking dairy cows within the area of land shown on attached **Plan CRC041798**, which forms part of this consent.
6. 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 CRC041798**.
7. 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.
8. 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**

9. The consent holder shall, prior to exercising this consent,, install:
- (a) a water level measuring device in a stable reach of Mānuka Creek at map reference NZMS 260 H39: 560-237 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.
10. 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.
11. 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.
12. The measuring and recording devices described in Condition 9 shall be available for inspection at all times by the Canterbury Regional Council.
13. 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**

14. The consent holder shall, prior to exercising this consent, install:
- (a) a water meter(s) that has an international accreditation or an equivalent New Zealand calibration endorsement suitable for use with an electronic recording device, from which the rate and the volume of water taken can be determined to within an accuracy of plus or minus five percent at a location(s) that will ensure the total take of water from Mānuka Creek is measured; and
  - (b) a tamper-proof electronic recording device such as a data logger that shall record (or log) the flow totals every 15 minutes.
15. If the water meter specified in Condition 14 is not an electromagnetic or ultrasonic meter, the consent holder shall, prior to the first exercise of this consent install or make available an

easily accessible straight pipe(s) at a location where the total water take is passing through, with no fittings or obstructions that may create turbulent flow conditions, of a length at least 15 times the diameter of the pipe, as part of the pump outlet plumbing or within the mainline distribution system, to allow the Canterbury Regional Council to conduct independent measurements.

16. The measuring and recording device(s) specified in Condition 14 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.
17. No data in the recording device(s) shall be deliberately changed or deleted.
18. All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 14 are at all times fully functional and meet the accuracy standard stated in that condition.

#### **Water metering – Compliance Checks**

19. Within one month of the installation of the measuring or recording device(s) specified in Conditions 9 and 14 (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.
20. 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**

21. The consent holder shall ensure that water is abstracted using a gallery intake and shall be designed to prevent native and exotic fish species from entering the system.
22. The fish screen shall be designed by a person with experience in freshwater ecology and fish screening techniques, and constructed in a manner that ensures the principals of the NIWA



fish screening guidelines (Fish Screening: Good Practice Guidelines for Canterbury, NIWA Client Report 2007-092, October 2007, or other revision of these guidelines. (*Copy available on [www.ecan.govt.nz](http://www.ecan.govt.nz)*) are achieved.

23. No water may be taken in terms of this permit until, upon completion of the intake structure a report is provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The report shall be prepared by the consent holder for certification and shall demonstrate compliance with the following:
  - (a) Design plan for the gallery specifying gallery dimensions;
  - (b) Detail of depths and sizes of layers of gravel over the gallery;
  - (c) Photographic evidence of key stages of construction of the gallery, including demonstrating compliance with gravel specifications in sub clause (c)(ii) above; and
  - (d) Any ongoing maintenance required by the manufacturer is carried out in accordance with their specifications.
24. The intake structure shall be maintained in good working order. Records shall be kept of all inspections and maintenance. And those records shall be provided to the Canterbury Regional Council upon request.

### **Nutrient Loading**

25. For the purposes of interpretation of the conditions of this consent Killermont Station shall be defined as the areas in certificates of title and Pastoral Lease numbers Run 201B Blk III Ahuriri SD, Run 674 Blk III Ahuriri SD, Run 201B and Section 1 Blk V Ahuriri SD and WTK 836261A, which total 3,693 hectares.
26. The consent holder shall prepare once per year:
  - (a) an Overseer<sup>®</sup> 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 Killermont Station using the model Overseer<sup>®</sup> (AgResearch model version number 5.4.3 or later).
27. When undertaking the modelling outlined in Condition 26, the consent holder shall use either weather records collected on-farm or from constructed data from the nearest weather station.
28. A copy of the reports prepared in accordance with Condition 26 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within one month of their completion.
29. 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 26 from Killermont Station does not exceed 9,797 kg of Nitrogen and 102 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.
30. The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the commencement of consent.
31. 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
32. The consent holder shall at all times comply with the Farm Environmental Management Plan (FEMP) for Killermont Station, in particular, the mitigation measures and monitoring set out in section 6 of the FEMP relevant to the Mānuka Creek irrigation area. A copy of the FEMP is attached to these conditions and marked **CRC041798-A** and forms part of these conditions.
33. Subject to Condition 32, the consent holder shall implement, and update annually the FEMP for Killermont 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 Killermont 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.
34. 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.
35. 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 31 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.
36. Changes may be made to the Killermont 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**

37. 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 3,693 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 29. 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 29. 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**

38. 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.
39. 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.
40. 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.
41. Nitrogen fertiliser shall not be applied to land between 31<sup>st</sup> May and 1<sup>st</sup> September.
  42. 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.
  43. Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application.
  44. 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.
  45. Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
  46. For land based spreading, fertiliser should not be applied within 20 metres of a watercourse.
  47. 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**

48. 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.
49. Within two months of the testing referred to in Condition 48(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.
50. 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.

## River water quality monitoring and response

51. The water quality of the Omārama Stream shall be monitored within six months of the first exercise of consent as follows:
- (a) The location for monitoring of Omārama Stream 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. at or about map reference NZMS 260 H40: 614-161 (upstream of all irrigation)
    - ii. at or about map reference NZMS 260 H39: 606-246 (upstream of Killermont Station and downstream of Clifton Downs Station)
    - iii. at or about map reference NZMS 260 H39: 618 -257 (downstream of all irrigation)
  - (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.
52. If the monitoring undertaken in accordance with Condition 51 shows that the average sample result for the downstream (H39: 618 -257 ) Omārama Stream monitoring site specified in Condition 51 over the period December to April is greater than 0.08 mg/L of DIN; or 0.005 mg/L DRP; or 50 mg chl *a*/ m<sup>2</sup> (early warning trigger) but does not exceed 0.18 mg/L of DIN;

- or 0.007 mg/L DRP; or 90 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then the consent holder shall commission a report into the cause of the breach of the early warning trigger.
53. The reports referred to in Condition 52 and 57 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.
54. If both the authors of the report prepared in accordance with Condition 53 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 either:
- (a) the cause of the breach of the early warning trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent; or
  - (b) that it is unlikely that there is a trend towards exceedance of the environmental standard trigger pertaining to the downstream (H39: 618 -257 ) Omārama Stream monitoring site,
- then no further action needs to be undertaken by the consent holder.
55. If Condition 54 is not satisfied, then:
- (a) the NDA, as specified in Condition 29, 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 total authorised irrigation area developed for irrigation at the time of the exceedance under this resource consent 5by the total farm area (i.e. 75 irrigated hectares divided by the total farm area of 3,693 hectares); and
  - (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 56.
56. In relation to the Remedial Action Plan referred to in Condition 55(b) and 59(b)(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 early warning trigger pertaining to the Omārama Stream monitoring site, is returned as soon as practicable to and maintained below the average sample results of 0.08 mg/L of DIN; or 0.005 mg/L of DRP; or 50 mg chl *a*/ m<sup>2</sup> (early warning trigger) for the Omārama Stream 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.
57. If the monitoring undertaken in accordance with Condition 51 shows that the average sample result for the downstream (H39: 618 -257 ) Omārama Stream monitoring site specified in Condition 51 over the period December to April is greater than 0.18 mg/L of DIN; or 0.007 mg/L DRP; or 90 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then the consent holder shall commission a report into the cause of the breach of the environmental standard trigger. This report shall satisfy the requirements specified in Condition 53.
58. If both the authors of the report prepared in accordance with Condition 57 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.
59. If the report prepared in accordance with Condition 57 concludes that the environmental standard trigger has been exceeded because of farm land use practices, then:
- (a) the NDA, as specified in Condition 29, shall be reduced by 10% 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. 75 irrigated hectares divided by the total farm area of 3,693 hectares); and
- (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 56.
60. If a required reduction in nutrient load is in effect under Condition 55(a) or 59(a) and monitoring for that period shows that the average sample results for the downstream (H39: 618 -257 ) Omārama Stream monitoring site over the period December to April is:
- (a) greater than 0.18 mg/L of DIN; or 0.007 mg/L DRP; or 90 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then there shall be a further NDA reduction of 10% x IPF for the subsequent irrigation season.
- (b) less than 0.18 mg/L of DIN; or 0.007 mg/L DRP; or 90 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), but greater than 0.08 mg/L of DIN; or 0.005 mg/L of DRP; or 50 mg chl *a*/ m<sup>2</sup> (early warning trigger), then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
- (c) less than 0.08 mg/L of DIN; or 0.005 mg/L of DRP; or 50 mg chl *a*/ m<sup>2</sup> (early warning 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 29 shall be restored.

#### **Lake water quality monitoring and response**

61. The water quality of the Ahuriri Arm of Lake Benmore and Lower Lake Benmore shall be monitored in accordance with this condition from the commencement of consent as follows:
- (a) Locations:
- i. Ahuriri Arm, Map reference: NZMS 260 H39:8027-2667
- ii. Lower Lake Benmore, Map reference: NZMS 260 H39:8802-2371
- (b) Depths: depth integrated 0-10m, 25m, 50m
- (c) Water quality variables:
- i. total nitrogen;
- ii. ammonia;

- iii. nitrate;
  - iv. nitrite;
  - v. total Kjeldahl nitrogen;
  - vi. total phosphorus;
  - vii. dissolved reactive phosphorus;
  - viii. Secchi disc depth; and
  - ix. chlorophyll *a*.
- (d) Calculated key water quality variable: Trophic Lake Index (TLI), using the following equations:
- i.  $TLc = 2.22 + 2.54 \log (\text{chlorophyll } a)$
  - ii.  $TLp = 0.218 + 2.92 \log (\text{total phosphorus})$
  - iii.  $TLn = -3.61 + 3.01 \log (\text{total nitrogen})$
  - iv.  $TLI = \Sigma (TLc + TLp + TLn)/3$
- (e) Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
- (f) Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring lake water quality. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
- (g) The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person that demonstrates that they understand the appropriate methods to use for lake water quality sampling, including depth integrated sampling, and 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.
- (h) 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 and shall be capable of analysing the variables listed in subparagraph c above with detection limits generally recognised by the scientific community as appropriate for oligotrophic lakes.
- (i) The results of all sampling including the calculated average summer TLI, 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.
62. If the monitoring undertaken in accordance with Condition 61 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site over the period December to April is greater than 2.75 (early warning trigger) but does not exceed 3.0 (environmental standard trigger), then:
- (a) the NDA, as specified in Condition 29, shall be reduced by 5% x the Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area under irrigation (i.e. 75 irrigated hectares divided by the total farm area of 3,693 hectares); and
  - (b) a report into the cause of the breach of the early warning trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council

Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.

63. If a reduction in nutrient loading is required under Condition 62(a) and monitoring in the period that that reduction applies shows that the average TLI for the 1 – 10 m depth integrated samples for the monitoring site over the period December to April:
- (a) continues to be greater than 2.75 but does not exceed 3.0 then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
  - (b) is less than 2.75, then for the subsequent season the full NDA for the property, as specified in Condition 29 shall be restored.
64. If the monitoring undertaken in accordance with Condition 61 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site monitoring site over the period December to April is greater than 3.0 (environmental standard trigger), then
- (a) the NDA, as specified in Condition 29, shall be reduced by 10% 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 (i.e. 75 irrigated hectares divided by the total farm area of 3,693 hectares); and
  - (b) a report into the cause of the breach of the environmental standard trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
65. If a reduction in nutrient loading is required under Condition 64(a) and monitoring in the period that that reduction applies shows that the average TLI for the 1 – 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site over the period December to April:
- (a) continues to be greater than 3.0 then there shall be a further NDA reduction of 15% x IPF for the subsequent irrigation season and rising to 20% compounding reductions for any further irrigation season.
  - (b) continues to be greater than 2.75 but does not exceed 3.0 then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
  - (c) is less than 2.75, then for the subsequent season the full NDA for the property, as specified in Condition 29 shall be restored.
66. The nutrient load reductions and investigation referred to in Conditions 62 to 65 inclusive shall not be required if a two person expert scientist panel (with one expert nominated by the Canterbury Regional Council) both conclude after considering all the relevant available information (including catchment resource consent compliance, FEMP compliance monitoring pertaining to this consent and audit reports made available by the Canterbury Regional Council) that the cause of the breach of the early warning trigger or environmental standard (as applicable) was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent.

#### **Review of conditions**

67. 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 Mānuka Creek at which abstraction is required to be reduced or discontinued.

#### **Lapse**

68. 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:**

- *In relation to the lake monitoring required under Condition 61, it is anticipated that all consent holders subject to this condition would coordinate and cooperate together to ensure that the lake water quality monitoring is undertaken and the costs of that monitoring is shared between those consent holders. The Canterbury Regional Council may provide resources to facilitate that coordination and recover the costs of that facilitation from the relevant resource consent holders as a cost of supervising and administering the resource consents. Any non-compliance with water quality monitoring requirements would be a matter for all relevant consent holders and may be the subject of enforcement proceedings.*
- *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.*

PLAN CRC041798

Plan CRC041798  
Killermont Station

TERRAIN  
[Symbol]

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